WMA01-2018

Proceedings of the 1st Workshop on Multidisciplinary and Its Applications (WMA) Part 1 – 2018

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Preface

We are delighted to introduce the proceedings of the first edition of Workshop on Multidisciplinary and Its Applications (WMA) Part 1 - 2018 (WMA01-2018). This conference has brought researchers, developers and practitioners around the world who are leveraging and developing scientific technology.

The technical program of this workshop consisted of 78 papers. We strongly believe that this workshop provides a good forum for all researcher, developers and practitioners to discuss all science and technology aspects that are relevant to this workshop. We also expect that the future KO2PI Workshop will be as successful and stimulating, as indicated by the contributions presented in this volume.

Dr. Dahlan Abdullah

Contents

Analysis of Political Economy of Media Towards Women in Talkshow Television Program

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Abstract. This study aimed to explain and criticize women exploitation in mass media on television, particularly in reality show. Women often served as a capitalism commodity whom described as a fulfilment of the economic interests in media. The critical paradigm was used as a basis to examine and criticize women's reality as 'television media industry logic'. This research used Political Economy Theory of Media offered by Vincent Mosco including the commodification of content, audiences, and labors that concerned on concept of feminism which often views women as a tool of exploitation only in media business, particularly in television. The research method used was a case study regarding the technical media of feminist. The data was obtained by conducting interviews and observation from which could be criticized that media was still in ease to use 'women' as a form of media commodity as a fragile creature, but women today stayed survive and enjoyed such experience. Moreover, the audiences were also geared towards such shows because in which described 'the powerless women', the victim of a man's affair, and yet stayed great for being able to manage her patience for the sake of 'child'. While the commodification of labor had illustrated that television employees worked beyond the working hours and as the interests of media owners, especially when the program was in demand. Thus, as professional workers and had sufficient rational awareness, media workers remained subject to the interests of media owners and capital.

Keywords: Women, television-talkshow, political economy media-Vincent Mosco

1 Introduction

The world of television in Indonesia is growing rapidly, the rise of television stations makes viewers have many options to watch broadcast programs that suit their tastes. Television stations in every day provide a wide variety of programming programs, which are numerous and varied. This is in accordance with Syahputra (2013) that a media regime determines the gates in which information on cultural, social, economic, political and even religious issues will flow, then forming a discursive environment in which a topic is discussed, understood, believed, and responded [1]. Because the present capitalist system of media in Indonesia is also dominated by a group of bourgeoisie/ capitalist elite and the regime holder of media power. Thus, they are free in determining the construction of a particular reality for their sake.

The role or exposure of mass media to the community is enormous. Consciously or unconsciously, the community lifestyle has been controlled by mass media. Gamble and

Gamble (2001 in Rachmat, 2000:14) state that a lot of people spend about seven hours to consume mass media amid busy work. Television is a visual audio medium that does not burden many conditions for the community to enjoy it. Based on its own function [2], television has three functions, namely: Information, Education, and Entertainment, convincing, changing and reinforcing attitudes), mobilizing political participation, anesthetizing functions and others [3].

Media becomes one of the exploitative spaces for women in the value of media capitalism on the one hand. On the other hand, the mass media, fully support the movement of women's emancipation that seen in the number of media, from electronic media and printed media featured female figures. Women seem to get their own place to explore and develop themselves in media. Women can be involved in all areas including in mass media, inseparable from the long struggle by women's movements in post-reformation to rise and gain their rights and freedom.

Women have found their right and freedom in the public sphere to actualize themselves and their thoughts. Also visible in the mass media, a lot of discussion about women about career and success with the life story of the winding. However, when media show a nice and inspirational look about women, it seems women have not get out of the public view as the traditional female figure in terms of domestic and physical.

Mass media has an important role in influencing the community. In the book Skills and Journalism, written by Adriana Venny (2006) in [4], he says that sits role as information media, education, and entertainment, the mass media also plays an important role in social, cultural, and economic life. The mass media today has indeed changed the view of women who are considered weak and always depend on men, thus become an independent figure and never give up. But it cannot be denied that women are still seeing as the object that attracts the audience through their physical form. Of the understanding, Thamrin Amal Tomagola in the Journal of Art Science and Design Ultimart Volume III Year 2011(Kuswandi, n.d.) describes women are considered as an interesting and profitable for business people in media industry to attract the attention of audiences and enhance the company's profits. The figure of women who are often displayed in mass media, such as frame, pillars, fusion, dishes, and association. Frames concerning biological beauty and charm, pillars as a household manager, sex related to affairs, dishes associated with the kitchen, and association for public affairs as a companion work environment.

The appearance of women according to Mansour Fakih in the book Gender Analysis and Social Transformation [6] which is concerned from the physical aspect in mass media is not seen clearly that women looked as an object that has a high selling value, because it has been mixed and has become the daily consumption of society in the market industry so people do not aware of it. Media as a market industry thathas very strong influence should pay attention to what should be contained in media for people consumption in various forms of programs, and one of which is talk show program.

Hitam Putihis a different talk show with other talk show programs. It is a program with Mind reading format where guest star will be made helpless when "bombarded" with questionsby the host of the show Deddy Corbuzier. Through this mind-reading talk show program, Hitam Putih also won Panasonic Global Award in 2011 and 2012. Havinga show host who is a Magician with his remarkable trademark, it is capable to influence others even reading their minds which makes this talk show program different from the others. The show time is on primetime or rest time, night at 19.00. It aims to provide information and entertainment for the audience. In addition to the interactive dialogue with the guests, one segment of the program also provides direct questions that unprepared before addressed by the

host and the guests have to answer instantly which makes the unconsciously reveal their personal things.

At this time, the information program in the form of Talk Show has become such excellent programs on television. Not a single television station that does not broadcast a talk show program. This impression is in demand of audience. The talk show program is one of the most prominent television programs in attracting regular viewers that presented in light and entertaining or formal and serious. The talk show program is still trying to present information since the Law No. 32 Article 2002 paragraph 1 stipulates that a program of broadcast content must contain information, education, entertainment, and benefits for the establishment of intellect, character, morals, progress, nation power, maintaining unity, and practicing religious and cultural values of Indonesia.

Hitam Putih Talk show program is not one of the 7 Talk Show with the most number of viewers. However, according to Black and White host, Deddy Corbuzier, black and white program does not give priority to achieve a high rating but rather to be viral in social media and provide benefits both knowledge and information for the audience. In 2013 Hitam Putih program on Trans7 in 2013 ranked fifth from the top 10 popular talk show programs on private television with TVR (Television Rating) 2.0 and 9.8 share (source: AC Nielsen). The data shows at 2013,Hitam Putih is watched by 2% of television owners or 9.8% of television viewers in Indonesia [7].

Hitam Putih program leads the conversations on personal issues that are thought to be motivating and inspiring. The informants or invited guest stars will surely tell their experience in getting successstobe known by the public. The stories frequently make a guest speakers or guest stars cry. The questions are even straightforward to the guests. Content of this conversation is presented with casual packaging and some attractions, and even music. Personal problems from guest speakers or guests are considered interesting and good to be talking to the public.

Many violence occurs in women because of the developed and instilled of gender inequality in the patriarchal society. Patriarchy is an ideology that refers to gender differences which assume that men are superior to women. As an ideology, patriarchy is defined briefly as male power, the social relationship with which men rule. In the electronic media, especially television, such as on Hitam Putih show aired by Trans 7,people often watch the talk show that in stereotypes women viewed as emotional, irrational, and highly dependent creatures. In this case, the commodity of Nagita Slavina as a victim of the issue of her husband's affair, Raffi Ahmad with Ayu Ting Ting.

Based on the description in the background, the main problem raised in this study is women issue in Hitam Putih Talk show television program aired in Trans7 on April 17, 2017. The formula of the research problem was "How television media reflect women in perspective of political economy by Vincent Mosco in 'Hitam Putih' Talk Show Program on Trans7?

This research focused on women exploitation in media industry,particularly in television. The theme of women, their domestic life in entertainment world seem to be the content that appeals audience. Commodification is done by media workers to produce talks show content that able to inspire the 'sympathy' of audience, especially women. Women are part of social structure and tend to be placed as 'second position' in the household even though in reality it is not necessarily the case. But the concept of women and men has different values and positions in the structure of Indonesian life so it is very possible for a woman experienced injustice from the husband, family, and culture. It is part of the 'media capitalism' system that sells the reality of women as media consumption.

Of course, women's disparity and discrimination are different and opposed by women based on their belief of feminism values. Feminists believe that women are able to resist and determine their reality in their awareness of the importance of that reality to women.

1.1 Political Economy of Media by Vincent Mosco

Vincent Mosco [8] in his book "The Political Economy of Communication: Rethinking and Renewal") mentioned that commodification is "the process of transforming use values into exchange values". Commodification is an attempt to change anything into a commodity or merchandise as a benefit. Commodification is related to how the process of transformation of goods or services with commodity value that has high economic value [9]. The practice of commodification is in accordance with the concept expressed by Vincent Mosco in his book The Political Economy of Communication of the media that marked by the change of content or media content into commodities to tearn profits. [8] Graham [10], mentions the use of advertisement is a refinement process of media commodification in economy.

Mosco [8] is the way capitalism carries out his aim to accumulate capital or realize value through the transformation of use value into exchange value. According to Mosco, a political economy approach is understood in the narrow and broad sense. In a narrow sense, a political economy approach means the study of social relations, particularly power relations, which together form the production, distribution and consumption of resources, especially communication resources. According Mosco [9], the process is widely political control because the process involves a social organization in a community. The study of political economy questions as well as explains the relationship of social, economic and politic, particularly power relations that are mutually formed for the production, distribution, and consumption of resources.

Wenerdha explains that based on the understanding of Vincent Mosco, commodification is an effort made by media to process media content in accordance with the wishes and interests of capitalism, which can be profitable. Commodification is done consciously on three elements: content, audience, and worker/labor. Commodification of media content is done by packing media impressions in such a way that it has economic value [11]. The economic value of media content is characterized by a program favored by audience. The audience is presented with show as if they needed it and important to them. As for the production process, labors are the power of the media to produce programs that appeal to the audience. Media workers are an integral part of the media industry determined by media owners.

1.2 Feminism

Etymologically, feminism is derived from the word femme (woman), which means female (single) who has a purpose to fight for the rights of their people (women in the plural sense), as a social class. So feminism is a woman's understanding that seeks to fight for her rights as a social class. In relation to this, it is necessary to distinguish between male and female with masculine and feminine. The concept of male and female is used to distinguish between biological and natural aspects, while masculine and feminine are used to distinguish between psychological and cultural aspects [12].

Feminism is not only related to emancipation problems that tend to be directly related to equality. Feminism also involves a renewal movement undertaken by men and women in an effort to expect a change in social status, culture, and worldview so as to achieve justice and

equality of rights. With a more civilized language, it can be understood that feminism is a movement that demands the emancipation or equal rights and justice with men.

1.3 Mass Media Industry

The media in its operations aims at audiences and advertisers, the media markets the products to audiences and advertisers. Television broadcasts soap operas to be watched by the audience and for advertisers to advertise on the program. Audiences are people who consume products produced by the media. In the media world, the level, the magnitude, or the amount of a media can be seen from the number of people consuming the media. The level or large audience can be seen from ratings or shares of television and circulation for printed media, as well as viewers for online media. Advertisers are agencies or individuals who use media to inform or market their products. The output of advertisers as a market is revenue or income from advertising for a media [13].

In media industry, there are three types of media ownership: monopoly, oligopoly, and monopolistic competition. In the type of monopoly ownership, a media industry dominates the market. The type of monopolistic ownership usually occurs in authoritarian or communist countries in which the state has a monopolizing media and as a social institution, political, and propaganda tool, which not aiming for economic gain. TVRI in the era of authoritarianism of the New Order government had become a television station that dominates or monopolized "television industry" in Indonesia. The choice for audiences is only to "take it or leave it".

One of the media that popular for Indonesian people is television. Television is a tool of mass communication that functions as Surveillance, Interpretation, Linkage, Transmission of values, and Entertainment [14]. According to Morissan [15], television station is a very complex workplace involving many people with different types of expertise, cameras, image editors, reporters, graphic person, and other operational staff that must interact and communicate in order to produce the best possible broadcast.

Assessing television as a mass media is quite complicated in where a quality overlaps between media realities and the meaning of broadcasts in various interests. On the other hand, the more creative and savvy the producers of television broadcasts are, all kinds of broadcast programs will become news commodities. All news is something that can be commoditized. This is certainly in line with the notion of commodification as an extension of Marxist logic that describe television programs including news, movies, and other entertainments have the value of materials that can be sold [16].

According to John Fiske [16] television is as a cultural commodity. Fiske refers to a cultural economy in which the meaning and enjoyment circulated. According to him, in social culture the audience dismisses their role as a commodity and becomes a producer, producer of meaning and pleasure.

Along with the way of delivery process of the messages content in television media to the viewers, the message content will also be interpreted differently according to the vision of the viewers as well as the resulting effects are also diverse. Ideally, television as other mass media serves as an information tool, entertainment, social control, and geographical area linkage [5].

2 Research Methodology

In this study, the researcher use critical paradigm. Paradigm is the basic orientation for theory and research. In general, a scientific paradigm is the whole system of thinking. The paradigm consists of basic assumptions, research techniques, and examples of a good research techniques should be.

Guba & Lincoln [17] also compile some paradigms in communication science theory. The paradigm proposed consists of positivistic paradigm, post positivism paradigm, critical paradigm, and constructivism paradigm. Some methodologists in social science field argue that positivistic and post positivism paradigms are a unity of paradigms, often called as classical paradigms. The methodological and technical implications of the two paradigms, in practice, do not have much difference. The existence of the paradigm constellation above the theories and the usual research grouped in three main paradigms, namely the classical paradigm, the critical paradigm, and the constructivism paradigm.

In this study, the researcher wanted to know more deeply about the position of women in talk show program in television media industry through "Hitam Putih" program on Trans 7, therefore this research uses qualitative approach.

According to Djunaidi Ghony [18] qualitative research is a study that produces discoveries that cannot be achieved by using statistical procedures or by means of quantification. Qualitative research is explored and deepened from social phenomena or social environment consisting of behavior, events, places, and time. The social background is described in such a way which in conducting qualitative research, it develops the basic question: what and how it happened, who was involved, and where it occurred [18]. The method used in this research is case study method, which describes that case study is an approach to studying, explaining, or interpreting a case in its context naturally without any intervention from outsiders [19].

Case study is a research method that specifically investigates contemporary phenomena contained in a real-life context, implemented when the boundaries between phenomena and the context are unclear, using various data sources. Case studies reveal very detailed things, see through the things that cannot be expressed by other methods, and grasp the meaning that is behind the back of the object in a natural state [20].

In the book Qualitative Inquiry and Research Design: Choosing among Five Traditionswritten by Creswell (1998), it also explains several characteristics of a case study:
1. Identify the "case" for a study.
2. The case is a "system bound" by time and place.
3. Case studies use various sources of information in their data collection to provide a detailed and in-depth description of the event response.
4. Using a case study approach, the researcher will spend time in describing the context and setting for a case.

Meanwhile, Yin (2012) divided the general case study research into two types, namely case study research using single and plural cases or more. In addition, he also classifies it based on the number of unit analysis, holistic case study research using unit of analysis and embedded case study research using multiple units of analysis. The case study is called embedded, because it is tied to its predefined analytical units. The unit of analysis itself is needed to get more focus on its research purpose and objectives. Determination of unit analysis is determined through theoretical framework. Meanwhile, in holistic case study, the research conducted is more freely and focused on the case study and not tied to the unit of analysis as it fused in the case itself. If it is related to those ways of grouping, then the types of

case study research can be arranged into a 2 x 2 matrix [19]. Thus, according to Yin (2012) case study research may consist of 4 (four) types. For more details of the relationship between the two groupings, it can be seen from the matrix images as follows:

The subject of this research is the Executive Producer, the Producer, and the Creative of Hitam Putih, and the Host. The research subject is determined through purposive sampling technique [19]. This technique includes people who are selected on the basis of certain criteria made by researchers based on research objectives [21]: In this study, the interview is questioning to:

1. Sisca Hormansyah as Executive Producer of Hitam Putih program.
2. Jovita Lupi as Producer of Hitam Putih.
3. Christina Ari as Senior Creative of Hitam Putih.
4. Deddy Corbuzier as Hitam Putih Host.

In the interview process, the researchers adjust the time with the speakers, for instances with Sisca Hormansyah, the production process of Hitam Putih talk show is done at night, and with Producer Jovita Lupi who is in tight time due to her dense activity. This becomes an obstacle for the researcher. However, this does not reduce the quality of the results data obtained in the interview.

Data collection in a research is an essential thing. In qualitative research, a researcher becomes the main instrument to search data by interacting symbolically with the informant or subject to be studied [18]. Primary data is obtained directly from the field. The primary data collection method is observation, interview, and documentation.

The purpose of these methods is to obtain information that supports the analysis and interpretation of data during the analysis. The research was conducted on production process in Editorial Room of Hitam Putih and Studio 9 Trans 7 in Trans Corp Area, Jl. Kapten Tendean Lot 12-14 South Jakarta, Indonesia. The study took place in June 2017.

3 Result and Discussion

Hitam Putih talk show is divided into four segments including one segment containing a Gimmick between the Presenters (Deddy Corbuzier) with Co. Host (Chika Jessika) inupdating hot news that is happening in society while added with silly comments from Deddy Corbuzier. In this early segment, it also displayed viral footage video news taken from Youtube and social media.

In analyzing the commodification of women in Hitam Putih talk show in Trans 7 which aired on April 18, 2017, the researchers will use the concept of commodification by Vincent Mosco, as follows.

3.1 Commodification of Content

One form of commodification in communication is the commodification of media content. This commodification of media content to be analyzed is a change of message from a set of data to the system of meaning in the form of marketable products. There is an exchange rate from the content creation process in a media product that results from social relationships between workers, consumers and owners of capital. Content commodification see through everything thatcan serve as a commodity whichmay enrich media owners. Audience is not

aware when dictated about the offerings given by media companies as they feel the need to be entertained, so the media commoditize the content in order to compete and gain profit.

The commodification process of content or media content involves messages that changes from a data source to a system of thought and becomes a marketable product. Hitam Putih on Trans 7 is a talk show which also commands the content or the media content. Commodification occurred on Commodification of content or media content in Hitam Putih talk show was seen from the question and answer section between Nagita Slavina and Deddy Corbuzier which was personal interviews with private questions.

"According to Jovita Lupi, the concept of Hitam Putih is the question form that is made to be interesting without pushing the speakers, as it is for public consumption. Regarding this episode itself, the question is made very carefully than any other episode. For example, the interview starts with platitude, an interview with a cross question abouther son. As we want to dig deeper about something, the mood of the guest should be first built so it is not direct to the main point. At that time we know Nagita never wanted to be interviewed by any infotainment show about the case happened in her family. We are also made an agreement before the shooting. Nagita's side ask a list of questions that will be asked in advance so that she can choose and will answer which questions she approved.

As quoted above the researcher's interview via phone to the producer of Hitam Putih on April 18, 2017 with the theme of *Curhatan Nagita Slavina* (Nagita's Story), it was deliberately raised the theme of female's story through the answers on this episode. Moreover, the addition of speech-language pictures in this episode about her private life, Nagita was depicted as the victim of her husband's affair that tend to Close Up and Big Close Up so that the audience more interested in listening Nagita's story.

Hitam Putih producer is expected to display images that continue to focus on the guest face who is being plagued by the affair issue of her husband thus can give impact to the viewers to enjoy better episode show with the method of shooting Close Up and Big Close Up to the guest as the life story of women.

Commodity content or media content is also seen in the segment distribution, it was viewed from the Co Host and her appearance which suits the theme contained. In Hitam Putih, particularly in the Curhatan Nagita Slavina episode, the female role is highly visible to have been commoditized in content. Both Nagita as Subject and Object. This is seen from the interview withHitam Putih Producer, Lupita Jovi. It is said as the object because Nagita in this episode is described as the objectwho suffered from the affair issue of her husband. On the other hand, as the subject because Nagita herself has been willing to be a guest in Hitam Putih with a certain fee. This isa logical consequence in entertainment world as artists' personal life could not be hidden when emerged to mass media. Content Commodification of women does exist and is deliberately featured in Hitam Putih talk shows in which a concept created by creative team added spices in the questions to gain audience's interest in watching the talk show. From a capital point of view, the commodification of media content is influenced by the creation of surplus value or profit.

3.2 Commodification of Audience

Commodification of audiences in the media industry will affect the media products itself and implicate the extent to which advertisers are willing to spend money on them. It cannot be denied that today the media has become a colossal industry that is very important for the economy as does the manufacturing industry. The position of the audience becomes very important because it has great financial or economic potential. Audiences are beneficial to

media owners, as well as indirectly paying wages or income to workers in the media industry and advertisers. The relationship between media, audiences, and advertisers is inevitable and becomes important in today mass media industry.

To see the relationship between media owners, audiences, and advertisers in the media industry, it can be reviewed through rating and share of a program that used as a measure of media owners and advertisers in achieving their goals. It also happens in Hitam Putih talk Show aired by Trans 7. In order to know whether the audiences also in part of commodification or not, the researchers conduct interviews with producers related to the level of sales and advertisers in Hitam Putih talk show.

The sales level is the main capital number of a successful media business in society. Besides, from which the advertisers will see their success in selling their products or ads. In Hitam Putih talk show, quoted from the Producer's interview stated that:

"In average,Hitam Putih Weekly Ratings and Share program is quite stable, especially when the story edition of Nagita Slavina which simply boosts the program share. Hitam Putih has been a talk show in Trans 7 for quite a while and was dropped, but because of public interest that wanted to return Hitam Putih show, it finally comes back now. Many people already know the success of this program, we also get a trophy in Panasonic Gobel Award. We could say that Hitam Putih still exist in the heart of loyal viewers".

From above explanation, it shows that Hitam Putih has a stable Rating and share level every week. The stable Ratings and Share is an indicator of advertisers in which decided to put ads on certain programs, which means audiences exist at the program. It is stated that the talk show in Indonesia is still much preferred by consumers who enjoy entertainment and information.

Other than displaying special guest episode in Hitam Putih to attract consumers and sales level, the content within not only oriented to audience but also to advertisers. Commodification of audiences in media industry will certainly be clearer when from the beginning to whom the program has found out. Mass audience is a privileged phenomenon in media relating to the huge number of people who read, hear, or watch the same product. The concept of audience is important, at least in terms of defining the material and assisting the sale. The quality information of which the audience obtained is another matter. Similarly, to the meaning and values of messages conveyed by media. In media industry, the quality and meaning of its products are often ignored. Media put forward the benefits to be gained profusely, especially from advertising revenue.

Media have large financial resources, as well as time and experience they use to make their words and images recognize and define the audience by conveying things that are relevant to a particular audience and bringing the audience into the material. In other words, there are interrelated relations between the product and the audience. Both are commoditized in such a way to benefit the media and advertising agencies.

In fact, the audience becomes a commodity marketed to advertisers in all mass media. Advertisers today do not just want the quantity of audiences, but they also need to know what types of audiences who will read, watch, or hear the content. These advertisers' interests, in practice, is responded to and well supported by media. Media construct audiences and content in such a way as to bring in advertisers.

This happens in Hitam Putih talk show that commoditizing his audience for profit. With the commodification of women as resource persons, as well as special editions by displaying many questions that exploit women, the level of sales has increased. Hitam Putih talk show attract consumers' attention by displaying women's issues as models which is interested by advertisers to place their products. Even the billing commitment of advertisers so that the ads

continue to be placed in Hitam Putih talk show. This brings benefits to Trans 7 because the advertiser provides funds to the company for its next production.

3.3 Commodification of Labor

Media workers are often ignored by observers of media political economy. During this time, they tend to pay much attention to commodity content and audiences. Media owners know that workers are their assets in carrying out their duties. It was the optimal use of workers' minds and strength by constructing the minds to please them if they work in a media institution even within appropriate salary. It also happened to media worker in Trans 7 especially of Hitam Putih talk show. According to the informant who is also the producer of Hitam Putih, this is viewed from the working hours that is different from other companies, it is described as follows;

"The total working hours are twelve hours a day, the hours depend on the work load every day, if there is a shoot taping then it will be from seven in the morning until one at night, even if there is a preview 13shooting and only live editing, the team can be relaxed, work at eleven o'clock in the afternoon and go home at eleven at night depending on the condition, you know that working in TV does not provide any overtime money".

From the above explanation, it can be seen that the working time in Trans 7 especially Hitam Putih talk show is not the same as working hours of employees in general which should be counted eight hours from nine am to five pm. The shooting jobs until it is ready to be presented must be completed by the workers and it depends on some conditions. It is stated that, media workers are required to produce Hitam Putih talk show content for a specified time.

The condition is done by media owner to produce Hitam Putih talk show according to its daily run time. However, owners of media through their management has commoditized workers by providing comfort workspace which isin comfortable and informal atmosphere. In addition, there are some other advantages such as, internet access, free phones, as well as personal drivers for the access of media workers in producing Hitam Putih talk show. However, although the benefits or the salary given are also not worthto what they do, it is explained by the informant;

"Of benefit, the salary information is closed only to the employees themselves who know the nominal, for me personally, the salary I received, I think is not enough for my status. However, on the other hand I like my job and the environment here is not too formal that makes me feel comfortable. And most comfortable if our share reached the target, usually we get bonus, only if the target reached".

From the interview results above, it is stated that, even though their salary are not worth to what they worked in Hitam Putih talk show, because of their comfort and joy, it is their reason to stay with the company. Media owners and editors assign the tasks in substitute to the workers in producing material, one of which is to search and research the resource persons to be displayed in every show in Hitam Putih talk show.

Competition in media industry demands business players to commoditize something into a commodity. Media workers are required to accommodate what should be displayed to audiences with the aim at attracting audiences and benefiting from the sales level. At the same time, they have also been commoditized by media owners. According to Vincent Mosco, there is a tendency to ignore aspects of the commodification of workers and the production process.

Workers are assumed to be no longer part of a unified concept, they are not designers of works, not even workforce.

Media workers have a dilemma in which the economy becomes an important factor in the movement of media work. It also happens to media workers in Hitam Putih talk show. Their skills and ability are needed to produce media content on TV shows. Seenfrom the results of informants as media workers in Hitam Putih talk show, the workers not only do the main job yet also do multitasking work. Therefore, Media owners try to make workers comfortable by providing support facilities. Also inHitam Putih talk show, the company provides facilities to support media workers in running the process in producing the talk show.

4 Conclusion

The occurrence of commodification at Hitam Putih Talk Show related to Political Economy of Media approach based on the commodification concept by Vincent Mosco was the attempt to turn anything into a commodity from value to an exchange rate.

a. The commodification of Content was occurred at Hitam Putih Talk Show that aired on April 18, 2017 that seen from a special segment which show personal interview ofone's personal life. In the segment, the guest women are performed in such a way to attract viewers' attention. Women are commoditized through shooting and also special in-depth interviews shown to bring viewers closer to the artist.

b. Commodification of Audience were conducted by the editor of Hitam Putih Talk Show in performing women in TV stations. Female guest are used as selling points to obtain sales level of Hitam Putih Talk Show that seen in the presence of advertisers who make billing commitment with Hitam Putih Talk Show.

c. The commodification of labor. Workers in Hitam Putih Talkshow had also been commoditized by media owners. It was seen in their job which they should be able to do multitasking to the main work and other work. Their skills and abilitywere used for successful production of Hitam Putih Talk Show.

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Descriptive Analysis of Filariasis Occurances in Baktiya And Nisam Sub-Districts Aceh Utara District In 2017

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Abstract. The three provinces in Indonesia with the highest number of filariasis cases are Aceh, East Nusa Tenggara and Papua. In the province of Aceh, the district with the highest number of filariasis cases is Aceh Utara District. This research takes an approach of observational research with descriptive design. The samples taken were total population of filariasis patients in two sub-districts, Baktiya and Nisam Sub-district, Aceh Utara District with 35 cases. The result of research showed that most filariasis patients were 60 years old, predominantly male patient with 54,3% and majorily possessed junior high school as their highest level of education, 48,8%. Most often encountered behavior associated with filariasis occurrence is outdoors gers at night by 54.3% and not using anti-mosquito repellent of 68.6%. Positive behavior encountered was the habit of using bed nets during sleep by 62.9%, and the habit of wearing clothes and trousers by 57.1%. The physical and outdoor environments found are not using of wire screening of 80%, poor ceiling conditions of 77.1%, 77.4% of hanging items at home, 80% poor waste water sewer condition conditions and the presence of paddy fields and shrubs, bushes around the house of 88.6%.

Keywords: Baktiya, deskriptive analysis, filariasis, nisam

1 INTRODUCTION

Filariasis or elephantiasis is an infectious disease caused by filarial worms mediated by mosquito vectors [1]. The worms live in the lymph channels. At an advanced stage, it can cause permanent disability in the form of leg, arm, breast and genitalia, both in men and women [2]. The World Health Organization (WHO) has identified filariasis as a major cause of disability worldwide [3]. WHO data show that filariasis has infected 120 million people in 83 countries around the world, especially in tropical and subtropical regions. There are three types of filariasis parasites within the SEAR (South-East Asia) region, namely Wuchereria bancrofti, Brugia malayi and Brugia timori. The parasites can be found in 9 countries, namely Bangladesh, India, Indonesia, Maldive, Myanmar, Nepal, Sri Lanka, Thailand and Timor Leste [4].

Filariasis cases occur almost evenly throughout Indonesia causing it still as a health problem in Indonesia. In some parts of Indonesia, filariasis has a relatively high endemic level

[5]. Overall, there was 11.914 filariasis chronic cases reported by districts / municipalities until 2009. The three provinces with the highest number of filariasis cases are Aceh Province with 2,359 cases, East Nusa Tenggara with 1,730 cases and Papua with 1,158 cases. When compared with other provinces, the incidence of filariasis in Aceh Province is very prominent and rank as top province with filariasis cases throughout Indonesia. Within the Aceh province, Aceh Utara is the district with the highest number of filariasis cases with a total of 1,353 clinicalcases [6].

Aceh Utara was declared an endemic district of elephantiasis (filariasis) disease. The disease caused by the bites of all the mosquitoes continues to increase. Residents of the disease are scattered in a number of districts. Head of Aceh Utara Health Office Machrozal said, most elephantiasis patients found in Baktiya Sub-District with as many as 24 cases and Nisam Sub-District with as many as 11 cases. The rest of residents are spread out in Langkahan Sub-district and other sub-districts. Generally, elephantiasis patients occur at the aged over 45 years [7].

Based on the above data which show districts with highest cases of filariasis, it is necessary to handle the case to cease it's increase. The first step in the handling process is to identify the factors that influence the incidence of filariasis. Many risk factors trigger filariasis incidence. Some of these are host factors, socioeconomic, behavioral and environmental factors. Environmental factors include indoor and outdoor environment. Indoor environmental factors include the physical environment of houses that do not meet the criteria of healthy homes, such as house construction and wall, lighting, and humidity, so as to trigger filariasis incidence [8].

2 LITERATURE REVIEW

2.1 Definition of Filariasis

Filariasis (elephantiasis disease) is a chronic disease caused by filarial worms and is transmitted by Mansonia, Anopheles, Culex, Armigeres mosquitoes. The worms live in the lymph and lymph nodes with acute clinical manifestations of recurrent fevers, inflammation of the lymph and lymphatic ducts. At an advanced stage, it can cause permanent disability of leg, arm, breast and genital enlargement [9].

2.2 Etiologi

Lymphatic filariasis is caused by Wuchereria bancrofti, Brugia malayi and Brugia timori which can live exclusively in the human body. Worms are in the lymphatic system on the "tissue" between the lymph vessels and blood vessels that maintain the body fluid balance and are essential components for the body's immune defense system. Worms stay alive for 4-6 years and produce larvae (microfilariae) which will blend in blood circulation [10].

Filariasis is also caused by Loa loa, Onchocerca volvulus, Acanthocheilonema perstants, Mansonella azzardi. However, the three most important species are W.bancrofti, B. malayi and B. timori [11].

Up to this point of time, 23 species of mosquitoes of genus for filariasis vector in Indonesia has been found namely: Mansonia, Anopheles, Culex, Aedes and Armigeres. There are ten species of Anopheles mosquitoes identified as vectors of the rural Wuchereria bancrofti. The urban-type Wuchereria bancrofti vector is Culex quinquefasciatus. Six species

of Mansonia are vectors of Brugia malayi. In eastern Indonesia, Mansonia and Anopheles barbirostris are important phialariasis vectors. Some species of Mansonia may become vectors of Brugia malayi type sub periodic nocturna. While Anopheles barbirostris is an important vector against Brugia timori located in Nusa Tenggara Timur and Maluku Selatan islands [4].

2.3 Clinical Manifestation

Clinical symptoms among patients vary widely, ranging from asymptomatic to severe. This depends on the geographic area, the parasitic species, the patient's immune response, and the intensity of the infection. Symptoms usually appear after 3 months of infection but generally bud between 8-12 months. Lymphatic inflammation symptoms occur in the acute phase, while obstruction occurs in the chronic phase. The acute phase is characterized by fever or a series of febrile attacks over several weeks. Even though the fever is usually not too high, it may reach up up to 40.6 ° C. This condition is accompanied by chills and sweats, headache, nausea, vomiting, and muscle aches. Should the parasites attack abdominal lymph nodes, it starts to develop "acute abdomen" symptoms [9].

2.4 Filariasis Risk Factor

1. Host Factor, consist of humans and mosquitoes: the human factor is strongly influenced by age, sex and immunity. The mosquito factor is influenced by the behavior of mosquitoes, the frequency of human biting and the genotrophic cycle needed to ripen the egg [12].
2. Environmental factors, namely (1) physical environment in the form of air temperature, humidity, wind, rain, sunshine, water flow, mosquito breeding, house wall conditions, installation of wire mesh, (2) biological environment is the occurrence of filariasis transmission. Examples of biological environments are the presence of aquatic plants, puddles, swamps, and bushes as a place for the growth of mosquito Mansonia spp. (3) the social, economic and cultural environment is the environment that arises as a result of interaction among human beings, including the behavior, customs, culture, customs and traditions of the population. Like the habit of going out, the use of mosquito nets and anti-mosquito repellent, work and education [13].

2.5 Target for Elimination and Definition of Lymphatic Filariasis

Although parasites can be detected microscopically in the blood, thorough approaches to filariasis elimination are relatively difficult. The primary prevention for the case is to protect from mosquito bites in endemic areas. WHO has established a Global Agreement, namely The Global Goal of Elimination of Lymphatic Filariasis as a Public Health problem by The Year 2020 to combat filariasis disease thoroughly (Haryuningtyas and Subekti, 2004). The program carried out a mass treatment with a combination of diethyl carbamazine (DEC) and albendazole (Alb) recommended once a year for five years. Indonesia carried out elephantiasis disease gradually to commence in 2002.

Strategic plan 2010–2020 The target for elimination of lymphatic filariasis was based on the status of control in countries and published in the Progress report 2000–2009 and strategic plan 2010–2020 (1) of the Global Programme to Eliminate Lymphatic Filariasis in World Health Organization, 2013.

Table 1. Targets in the Global Programme to Eliminate Lymphatic Filariasis for interrupting transmission in endemic countries, by year

YEAR	CATEGORY (OBJECTIVE)			
	Starting (implementation begun)	Scaling up MDA	Stopping interventions and starting surveillance	Verifying absence of transmission
2012	85	70	25	20
2014	100	75	40	20
2016	100	100	70	40
2018	100	100	75	45
2020	100	100	100	70

3 METHODS

This research is an observational research with descriptive design. The samples taken were total population of filariasis patients in two sub-districts, Baktiya and Nisam Sub-district, Aceh Utara District with 35 cases. Using questionnaires, researcher interviewed audience to analyze factors causing filariasis occurrence of host factors in the form of age and gender, socioeconomic factors (level of education) and behavior. In addition, observation was also carried around the respondent's residence or sample to understand the physical condition environment of the patients. The data obtained in this study will be univariatally analyzed to describe the factors that play a role in filariasis incidence in Baktiya and Nisam Sub-Districts.

4 RESULT AND DISCUSSION

This research was conducted in Baktiya and Nisam Sub-Districts Aceh Utara District in 2017. Baktiya and Nisam two sub-districts in Aceh Utara District with the highest number of filariasis cases and are filariasis endemic areas. Baktiya and Nisam Sub-Districts is agricultural area with plenty of rice fields, plantations and swamps. People here rely their lives from farming and gardening.

Table 2. Respondent distribution by age.

No	Mean	Median	Modus	Min-max
1.	57,60	60	60	35-80

Table 2 illustrates the average age of filriasis patients is 57.6 years, the youngest age was 35 years and the oldest age was 80 years old. All ages have comparable chance of contracting filariasis. However, in the case of Baktiya and Nisam sub-districts, filariasis cases were found only in adults. The findings of filariasis cases in these two sub-districts were prompted accidentally as they sought for treatment for their illness and was not the result of the examination conducted by the health service or the puskesmas. Filariasis is hard to detect, but the transmission is slow. Age is one of the risk factors of filariasis. It attacks in all age groups. Basically everyone can catch filariasis when infected by infective mosquitoes (containing

stage 3 larvae) thousands of times [4]. Often times, patients seek new treatments when their disease has been chronic and their limbs has been smelling [14].

Table 3. Distribution of Gender of Respondents

No	Gender	Number	Percentase
1.	Male	19	54,3
2.	Female	16	45,7
	Total	35	100

Table 3 elucidated that men are more predisposed to filariasis by 19 people (54.3%). This fact may br trigerred by many of male habit in the region to be out at night. This has increased possibility being infected with filariasis. This research is in accordance with research conducted by Triwibowo Ambar in sub-district of Ampibabo Sulawesi tengah who found the number of filariasis patients in men is 52.66% [15]. This study is also in accordance with the results of further analysis Riskesdas conducted Santoso who found filariasis patients in men more than women [16].

Table 4. Distribution of respondent level of education

No	Level of Education	Number	Percentase
1.	Primary school graduate	15	42,9
2.	Junior high school graduate	17	48,6
3.	Senior high school graduate	3	8,6
	Total	35	100

Table 4 shows that most people suffering from filariasis attained junior high school education level (48.6%) and elementary school (42.9%). None were found with undergraduate degree education. Therefore, it can be concluded that the average filariasis patients in Baktiya and Nisam sub-districts are poorly educated. Low education closes tightly with knowledge. Generally, people with low education levels result in low knowledge and difficulty receiving and understanding information, in this case, knowledge and information relating to health problems. Research conducted by Ike Ani in southern pekalongan also found filariasis patients found in low education of 33.8% of elementary school graduates and 25% of junior high school graduates [17].

Table 5 shows that most filariasis patients have the habits to be out of their homes at night 54.3%. This habit results in exposure to vector contact [13]. Mosquito Culex sp likes to suck human and animal blood, especially at night [18]. In Acehnese culture, many men enjoy being outdoor during night time to gather with friends or other people. This habit may also exist as social activities such as attending the event of death (Takziah), weddings, village deliberations, or gathering at a coffee shop until late at night. A study conducted by Puji Juriastuti found that Respondents who have a habit of going out at night have a 5.4 times greater chance of developing filariasis disease than those who do not [19].

Table 5. Respondent Behavior

No	Behavior	Number	Percentase
1.	Habits to be out at night		
	a. Yes	19	54,3

No	Behavior	Number	Percentase
	b. No	16	45,7
2.	Habit of utilizing mosquito net when sleeping		
	a. Yes	22	62,9
	b. No	13	37,1
3.	Habits of using mosquito repellant		
	a. Yes	11	31,4
	b. No	24	68,6
4.	Habits of wearing shirt and tro users		
	a. Yes	20	57,1
	b. No	15	42,9

Communities in Baktiya and Nisam sub-districts have a habit of using mosquito nets during sleep at night by 62.9%. This is one positive thing that respondents have done to avoid contact with mosquitoes during sleep. The use of mosquito nets is very effective and useful to prevent contact with mosquitoes. However, such habit is meaningless if not performed routinely. Theoritically, the habit of wearing mosquito nets at bedtime has contributed to the prevention of filariasis, as the bitings at their highest at night time [20].

Table 5 explained that most of the people do not use anti-mosquito repellent 68.8%. Mosquito repellent not only used during sleep, but also at night before bed or during community or family gathenring to prevent mosquito bites. Although most of them used mosquito nets when sleeping, not many use mosquito repellents. Anti-mosquito repellent is one of the efforts to protect themselves from mosquito bites and easily applied, either in the form of anti-mosquito burned, sprayed, or on topical. But this anti-mosquito repellent would not be effective if its use is not at peak hours of mosquito population density or respondents have a habit of going out at night [21].

Another positive thing in the behavior of respondents is the habit of using clothes and trousers. From the interview, 57.1% of respondent wear clothes. Aceh is an Islamic Shari'ah area, so the use of clothing and trousers (covered dress) especially for women is an obligation for the people of Aceh. The use of these clothes and trousers can minimize contact with mosquitoes.

Table 6. Physical environment and outdoor overview

No	Physical environment and outdoor	Number	Percentase
1.	Use of gauze		
	a. Yes	7	20
	b. No	28	80
2.	Ceiling condition		
	a. Poor	27	77,1
	b. Good	8	22,9
3.	Hanging items all over the house		
	a. Yes	25	71,4
	b. No	10	28,6
4.	Waste water sewer		
	a. Poor	28	80
	b. Good	7	20
5.	Existance of rice fields or bushes		
	a. Available	31	88,6
	b. Not available	4	11,4

Table 6 illustrated the physical condition of the respondent's house, from 35 samples of 80% of the respondent's house did not use the wire gauze on the ventilation, this makes it very easy for mosquitoes to enter the house. Research conducted Juriastuti found that respondents who do not have wire gauze at home at risk 7.2 times greater suffering from filariasis than respondents who install gauze. Installation of gauze wire in the ventilation will decrease contact of mosquitoes that are outside the house with the occupants of the house, where mosquitoes cannot enter the house [19]. According to Davey the use of gauze in ventilation can reduce the contact between Anopheles and human mosquitoes [22].

Most of the physical condition of respondent's house has poor condition of ceiling that is equal to 77,1%. Ceiling serves as meaningful separator between the precarious and the room so as not to connect directly. Thus, it can be concluded that the ceiling is necessary to create partition and prevent mosquitoes to freely enter the house [19].

Environmental conditions outside the home or around respondent houses are shown in table 5. 80% of the houses have poor sewerage channels. These conditions resulted in the large number of wastewater puddles around the respondent's home. As mosquitoes uses water for their life cycle, these puddles can become a place for the mosquito breeding. Shortage of breeding water will cut off their growth. Once spawned an adult mosquito can produce ± 100-300 grains, with a size of about 0.5 mm. After 1-2 days the egg will hatch so larvae, 8-10 days become cocoon (pupa), and 1-2 days into adult mosquito [23]. Mardiana et al study found that house with open sewage can have 2.56 times more risk for filariasis than the closed ones. This suggests that filariasis occur in poor sewerage conditions or inadequate health is associated with filariasis [20].

Respondents' house surroundings which were mainly located near the rice fields and bushes, 88.6%, also added to the matter. These places increased the breeding ground for the mosquitoes. Research conducted by Ansari found that the proportion of filariasis in people whose home is close to the mosquito habitat can reach 8 times. This was due to the proximity with the puddles near the house which also serve as the breeding places for Cx mosquitoes. Quinquefasciatus to carry out its life cycle, although the volume of water is small. In addition, as most mosquitoes flying distance is generally ranges from 1 to 2 km, brings thems closer to humans [24].

5 conclusion

In conclusion, filariasis disease in Baktiya and Nisam sub-districts is experienced mostly by male people aged 60. Most people who suffer filariasis have low levels of education. Most dominant habit of filariasis patients associated with filariasis occurrence was the habits of being out door during night time and low use of antimosquito repellant. Physical and external environmental factors supporting the increase in filariasis are the absence of wire netting (gauze) in ventilation, poor ceiling conditions, the hanging items within the house, poor waste water sewer conditions, and the presence of rice fields and shrubs in around the house.

Considering numerous filariasis risk factors available, it is imperative to do Filariasis mitigation comprehensively by taking the mechanism of Epidemiological approach into account; Risk Areas Stratification, Clinical Case Management and Treatment of Patients including Promotion Elimination efforts. Mass drug prevention of Filariasis is expected to break filariasis transmission chain. Sufficient and comprehensive understanding of the

magnitude and risk factors that affect it are vital in order to eliminate filariasis. A control program may transpire in the form of surveillance to find patients with acute and chronic elephantiasis and carry out treatment to enable the patients to take care of themselves.

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The Effect of IFRS Convergence, Independent Commissioner Proportion and Commissioners Board Size on Accounting Conservatism Level

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Abstract. As for the objective of this study was to know the partial influence of IFRS convergence, proportion of independent commissioner, and size of the board of commissioners to level of accounting conservatism. The number of sample used in this research were 32 observation at Food and Beverages companies listed on Indonesian Stock Exchange from 2012-2015. The sample of this research was taken using purposive sampling. The method used in data analyzing was multiple linear regression analysis. The result indicated that partially, IFRS convergence influenced positively and significantly to the level of accounting conservatism with significance level 0.015. Proportion of independent commissioner did not influence on the level of accounting conservatism with significance level 0.438. While size of commissioner board influenced negatively and significantly on the level of accounting conservatism with significance level 0.049. The researcher suggested that (1) management should consider exactly on the influencing factors on accounting conservatism, (2) further researcher should improve the other factors influencing on the level of accounting conservatism such as leverage, bonus plan, debt covenant, political cost, etc.

Keywords: IFRS convergence, proportion of independent commissioner, size of the board of commissioner, level of accounting conservatism

1   INTRODUCTION

One of the principles in accounting is accounting conservatism. Zeghal and Lahmar [1] stated that conservatism is useful for many decision makers.

Hartanto [2] defined conservatism as a principle in financial reporting intended to recognize and measure assets and profits that is carefully conducted due to uncertain economic and business activities. This conservatism is implemented because of the uncertain future economic circumstances. In this case, the level of accounting conservatism applied by each company is varied. Zhang [3] argued that IFRS adoption will reduces the problem about

agency conflict between management and shareholder in information asimetry case. Thus,[4] argued that the application of the conservatism principles also expects companies not to mark up their business results so that creditors and investors as the external parties using financial statements are not deceived by into the high figures of the assets. In addition, the conservatism principle also aims to ensure that the financial statements do not mislead the users in decision making.

Since IFRS was adopted by some countries in the world, make the topic about IFRS become trending topic for researcher [1].

The fair value principle employed in IFRS use more estimation to reasonably assess the assets. While, the estimation made by managers often leads to the problems that has been the focus of accounting conservatism so far. [5] said that with the IFRS will reduces the using of conservatism. But André [6] reported that until now, conservatism or prudence still as a part of the IASB's and FASB's conceptual frameworks.

The implementation of conservative accounting in the financial statements of companies is also influenced by the corporate governance mechanism. For conducting corporate governance well, must be observed about the characteristic of commissioner board. There are two characteristics of the board of commissioners chosen in this study, namely: the proportion of independent commissioners and the size of the board of commissioners.

The characteristics of the board of commissioners related to the proportion of independent commissionersshould be addressed to promote independence in the supervision process of the company performance. The independent commissioners enable a stricter supervision conducted by the board of commissioners which in turn will tend to demand more conservative accounting to habituate corporate mangers in order not to do a fraud in preparing accounting information that cause users to be at a disadvantage. Furthermore, Watts (2003) in [7] contended that the conservatism in accounting is beneficial to avoid the opportunistic behavior of the managers related to the contracts that use financial statements as the contract medium.

The size of the board must be observed by company. Because the number of members of commissioner board related to cost and the way of supervision [8]. The bigger size of the board of commissioners will lead to a more specific task for each member of the board of commissioners as there will be a more specific committee in supervising the company. A broader specialization indicates a more effective supervision so that the accounting application demanded by the board of commissioners is more conservative. Therefore, the number of members of the board of commissioners should be based on the company needs for a more effective supervision [9].

2 LITERATURE REVIEW

2.1 Conservatism

Conservatism is a principle in financial reporting intended to recognize and measure assets and profits that is carefully conducted to face the uncertainty in future [10]. The conservatism concept states that in the uncertain circumstance, the company manager will determine the accounting treatment or action based on the circumstance, expectations of events, or the results considered less profitable. The implication of this concepts in the accounting principle is that accounting recognizes possible cost or loss but not immediately recognizes future income or profit despite its high probability [11]

Conservatism is an important characteristics of company accounting system that can assist the board of commissioners to reduce the agency cost and improve the quality of financial statements which in turn will improve the value of the company and its stock price (Ahmed and Duellman, 2007 in [9]. Conservatism is the most influencing principle on the accounting assessment. However, conservatism is also a controversial concept. Some studies reported that conservative accounting is not beneficial yet some others reported otherwise.

2.2 IFRS Convergence

The convergence of IFRS (International Financial Reporting Standards)is one of the agreement of Indonesian government as the member of G-20 in Washington DC on 15th November 2008. The convergence to IFRS means standard merging and integration, interpretation and framework in the preparation and presentation of financial statements adopted from the current IFRS to be used and directed to a single destination.

There are various changes of financial statements in IFRS, such as the change of accounting method to fair value from historical cost. IFRS loads more principle than rule [6]. The concern of fair value that may eliminate the conservatism to obtain profit from accounting assessment of the company based on the manager estimation is unreasonable. The fair value principle used in IFRS mainly uses estimation to reasonably assess the assets. However, the estimation created by the manager causing the issues that has been the focus of conservatism recently.

Zeghal and Lahmar [1] argued that the absence of conservatism as one of the obstacles mentioned in the conceptual framework of IFRS does not mean the conservatism principle is lost. This is because the accountant has often used conservatism in accounting practice. This raises doubts concerning the absence of the long-standing principle of conservatism in Indonesia even though the IFRS principle has been established. Based on the opinions above, so the hyphotesis is:

H_1: IFRS convergence has an influence on the level of accounting conservatism

2.3 Proportion of Independent Commissioner

In the corporate governance mechanism, the board of commissioners play a crucial role in preventing conflict related to agency. The board of commissioners consists of the commissioncers from outside affiliated party, known as the independent commissioners, and affiliated commissioners

Usually, the members of commissioners board are not affiliated with shareholders controlling, board director's member and the other board of commissioners and the company itself in both business and family-like relationship. The board of commissioners are not allowed to be involved in management task nor representing the company for the transaction with the third party. One of main function of the independent commissioners is to run a more independent supervision function for the company management framework. The existence of the independent commissioners can balance the strength of the management party (especially CEO) in managing company through the supervision function [9].

Independent commissioners are an important part of a company. Wardhani [9] stated that the high the proportion of independent commissioners relative to the total number of commissioners related to the high the level of accounting conservatism (measured by the market size). The higher the proportion of independent commissioners in a company will indicate a strong board of commissioners; the higher the level of conservatism demanded due to a more qualified financial information. When the proportion of independent commissioners

is smaller, the supervision conducted will be weaker leading to the company manager having the opportunity to employ more aggressive and less conservative accounting principles [12].

Indriawati, Ayu, and Sari [13] claimed that the proportion of independent commissioners has no significant effect on the level of accounting conservatism.

This is due to the lack of ideal supervision from the board of independent commissioners as the tool of management supervision. In addition, the independent commissioners are only existing to fulfil formal requirements or regulations instead of up holding a good corporate governance. Based on the theories reviewed, the following hypothesis is proposed.

H_2: Proportion of independent commissioners have an influence on accounting conservatism.

2.4 Size of Commissioner Board

The size of the board of commissioners is the exact number of the members of the board in performing their duties. In Indonesia, good corporate governance role has managed about justification of commissioner board member with the company complexity with a great attention to achieve the effectiveness in decision making.

Yunos, Ahmad, and Sulaiman [11] said that small or large of board size is related to accounting conservatism at least influenced on accounting conservatism level. [14] indicated that the companies with strong board of commissioners as corporate governance mechanisms requires a higher level of conservatism compared to the weaker one. While Indrayati [15] found that the size of the board of commissioners has no significant impact on the level of accounting conservatism.

Ahmed and Duellman [12] stated that the size of the board of commissioners is related to an audit committee who performs its tasks more specifically. The larger size of the board of commissioners is associated with a more specific task for each member of the board of commissioners as there are more specialized committees to supervise the company. A wider specialization can also indicate a more effective supervision.

So, to achieve an effectiveness for company, very important observed about small or large size of member. The bigger the board of commissioners indicates a greater capacity of the board in conducting supervision and the increasing use of the conservative accounting. Based on the reviews, the following hypothesis is proposed.

H_3: Size of commissioners' board have an influence on the level of accounting conservatism

3 METHOD

The following are the variables used in this research
1. Independent variables:
   a. IFRS Convergence
      It is measured using dummy scale. The company that has implemented IFRS is scored 1 and the those that has not yet   IFRS is scored 0.
   b. The proportion of IndependentCommissioners (INDEP_COM)
The following formula is used to measured The proportion of IndependentCommissioners:

$$INDEP\_COM = \frac{Independent\ Commissioner}{Number\ of\ Commissioners}$$

c. The size of commissioners' board (UDK)

This measure is indicated by the number of the members of commissioners' board in a company including both independent and non-independent commissioners. The data related to independent commissioners is obtained from both company annually report and the announcement published by Indonesian Stock Exchange (BEI).

UDK= Number of Commissioners

2. Dependent variable: accounting conservatism The following formula is used to measure conservatism:

$$Con\_Acc = \frac{NI + Dep - CF}{TA}$$

Notation:
Con_Acc = The level of accounting conservatism
NI   = Profit before extraordinary items
Dep = Depreciation and amortization cost
CF = Operating cash flow
TA   = The total asset

Food and Beverage companies are there in BEI (2012-2015) wasused as population in this study. Researcher was obtained about 14 companies.Sampling method used is the purposive sampling that employing certain criteria in choosing the object. The criteria are presented as follows.

1. All of firms in food and beverage sectors are there in BEI in 2012-2015. The food and beverage company chosen to obtain the similar characteristics of the companies.
2. The company did not incure any losses during the period 2012 - 2015.
3. The company has complete data of the year 2012 to 2015

Eight companies meet the above criteria and were chosen as the sample. The total observations were 32 samples.

The researcher was used purely secondary data for this study. The data gathered using documentation technique including:(a) the financial statements of the Food and Beverage companies listed and published in the Indonesian Stock Exchange through www.idx.co.id and (b) reviewing literature including accounting journal and related books.

The acceptance or rejection of hypothesis can determine with using multiple regression. The regression equation model of the analysis is presented as follows:

Y = α + β1X1 + β2X2 + β3X3 + €
Notation:
Y   = The level of accounting conservatism
α   = Constanta
β   = The coefficient of regresion
X1   = IFRS convergence
X2   = Proportion of independent commissioner
X3   = Size of commissioners board
€   = Errorterm

4 RESULT AND DISCUSSION

4.1 Descriptive Statistics

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
CON_ACC	32	-0.1980	0.1670	-0.004734	0.0700960
IFRS	32	0	1	0.94	0.246
COM_IDP	32	0.3300	0.4300	0.384375	0.0365608
UKD	32	3	8	4.94	1.664
Valid N (listwise)	32				

Table 1 shows that the mean of accounting conservatism (CON_ACC) of Food and Beverages companies listed in the Indonesian Stock Exchange from 2012 to 2015 is -0.004734 (SD=0.070096).

IFRS convergence is measured using dummy. Based on the 32 sample, it is indicated that the mean of IFRS convergence of Food and Beverages companies listed in the Indonesian Stock Exchange from 2012 to 2015 is 0.94 (SD=0.246).

The measurement of independent commissioner proportion (COM_IDP) is comparison between the total of independent commissioner and the total of commissioner board. The mean that achieved by firm to the proportion of independent commissioners is 0.384375 (SD=0.0365608).

The size of the board of commissioners (UDK) is measured by the total number of members of commissioners' board in the company. The mean of the size of the board of commissioners of Food and Beverages companies listed in the Indonesian Stock Exchange from 2012 to 2015 is 4.94 (SD=1.664).

4.2 Multiple Linear Regression Analysis

The results of regression analysis is showed in table 2

Table 2. Regression Analysis Results

Variables	B	T_{value}	Sig (t)
Constanta	-0.146	-1.160	0.256
IFRS Convergence (X_1)	0.121	2.593	0.015
Proportion of Independent Commissioner (X_2)	0.277	0.786	0.438
Size of Commissioner Board (X_3)	-0.016	-2.062	0.049
t_{table} = 2.04841			

According to regression result in table 2, the formula of regression analysis is:

$$Y = -0.146 + 0.121X1 + 0.277X2 - 0.016X3 + €$$

4.3 Analysis of IFRS Convergence on Accounting Conservatism Level

The results of partial significant test (t-test) shows that IFRS convergence has an influence on the level of accounting conservatism as indicated by the level of significanceof 0.015 ($p<0.015$). Therefore, this study accepts H_1, indicating that IFRS convergence has a positive impact on the level of accounting conservatism.

It can be concluded that even though IAI has established PSAK-IFRS converge on 1 January 2012, there is possibility for the company to apply accounting conservatism in their financial reporting as conservatism is culture of accounting. IFRS is the new principle of accounting policy in Indonesia. Therefore, accountants have not been able to fully eliminate the conservatism principle. It takes a long process to eliminate accounting conservatism. The finding of this study is in line with [16] reported that no difference changes of accounting conservatism before and after IFRS mandatory adoption period.

The result of this finding is against the finding of [1] reporting that there is a decreasing on accounting conservatism after adoption period of IFRS, where various change occurs in IFRS financial statements such as the change of accounting method used previously, namely historical cost that has been shifted to fair value. The fair value principle put a great emphasis on relevance which is contrary to the conservatism principle emphasizing on the reliability. Thus, when a company applies IFRS, it tends to be less conservative.

4.4 Analysis of Independent Commissioners Proportion on Accounting Conservatism Level

The result of partial significant test (t-test) shows that the proportion of independent commissioners has no influence of the level of accounting conservatism indicating by the significance level of $p=0.438$ ($p>0.05$). Therefore, $H_2$is rejected. This means that the proportion of independent commissioners has no impact on the level of accounting conservatism

This is due to the strong control of the company's founders and majority shareholders which in turn pressing the position of independent commissioners.This means that independent commissioners are no longer independent in their tasks. Managers can easily conduct some manipulation such as marking up report so that the conservatism principle is no longer applied by the company.

The finding of this study is in line with [7] who reported that the proportion of independent commissioners has no significant influence on the level of accounting conservatism. This is due to the lack of ideal supervision by the independent commissioners as the tool of management supervision. In addition, the independent commissioners are only existing for the sake of formal requirement or regulation instead of good corporate governance.

4.5 Analysis of Commissioners Board Size on Accounting Conservatism Level

The result of partial significant test (t-test) indicates that the size of the board of commissioners influences the level of accounting conservatism indicating by the level of significance of 0.049 ($p<0.05$). Therefore, this study accepts the H_3, indicating that the size of the board of commissioners have a negative influence on the level of accounting conservatism.

The negative influence can be interpreted as the bigger the size of commissioners' board the lower the level of accounting conservatism. This indicates that the bigger size of the board of commissioners may lead to communication and coordination issues in supervising the management performance which in turn causing the decrease of the board of commissioners' capacity to control the management. A weak supervision and control of managers results in managers easily manipulating profit. Therefore, there should be regulation regarding the ideal size of the board of commissioners in a company. The right board of commissioners tends to demand for accounting conservatism to avoid the opportunistic behavior of managers.

This study is in line with [12] who found that the size of commissioner board as a part of directors characteristic can help firm to solve the agency problem. The company financial reporting is less conservative despite the bigger number of the board of commissioners.

The finding of this study is in contrast with the study conducted by [7]reporting that size of commissioner board has no significant effect to accounting conservatism that usually exercise by corporate managers in Malaysia who wants to take an advantage of accrual method in accounting.

5 Conclusions

The result indicated that partially, IFRS Convergence influenced positively and significantly to the level of accounting conservatism. Proportion of independent commissioner did not influence on the level of accounting conservatism. While size of commissioner board influenced negatively and significantly on the level of accounting conservatism.

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Advanced Oxidation Process Using UV-H$_2$O$_2$ For Organic Substance Removal in Peat Water Based on Discoloration Signatures

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Abstract: Peat water is surface water that has high color intensity, low pH (pH 3-5) and contains the high organic substance, so it has influenced the health if it's used. Purpose of this research was conducted to the removal of organic substance (%R) in peat water using in UV-Peroxidation process as discoloration signatures indication. UV-Peroxidation is one of AOP (Advanced Oxidation Processes) base on the reactiveness radical hydroxyl (HO$^\bullet$) that originated from the existence of H$_2$O$_2$ with UV radiation. The research doing by varying the concentration of H$_2$O$_2$ 0,0 – 0,11% in the wavelength of UV lamp 360 – 240 nm for 0-240 minutes. The result of that condition was shown that the higher concentration of H$_2$O$_2$ and longer of radiation time led to the bigger efficiency of the removal organic substance (%R). From the experiment, it can be concluded that the optimum dose of H$_2$O$_2$ was gained in at 0,07% and the removal of organic concentration found to 98,56% within 240 minutes. The measurement of water discoloration indicated up to 5TCU clarity.

Keywords: AOP, H$_2$O$_2$, organic substance concentration, peat water, UV-Peroxidation

1 INTRODUCTION

Peat water is surface water found in peat areas. Visually, peat water is reddish brown, tasted acid and smelly. In Indonesia, The study of Geology Resource Center of Energy and Mineral Resource Ministry reported that till 2006 the peat areas coped to 26 million hectares (ha) that spread in Kalimantan (± 50%), Sumatera (± 40%) while the rest of them spread in Papua and other islands. Especially for the peats area, Indonesia owns the fourth biggest area in the world after Canada, Rusia dan Amerika Serikat [1]. Based on this data, peat water in Indonesia is potentially utilized as a source of water for daily use if it has been processed properly.

Theoretically, the reddish brown color in peat water is caused by high content of dissolved organic substances (topsoil materials), particularly acid and its derivation, so the range of the pH is 2-5, high content of organic substances and metal, turbidity and the content of low suspension particles. The topsoil acid comes from organic decomposition such as leaves, trees or wood. Therefore, the technology of peat water processing to be clear water can

be measured by the change of organic and metal contents which meet the standard of clean water.

Some methods of peat water processing have been done in both laboratory scale and real areas, unfortunately, they did not show the maximum results, yet. Conventional coagulation method in laboratory scale which done by using cockle shell and corals in processing peat water in Greudong Pase could only remove 5-58% of Fe concentration and were not able to change the water color which was still brownish yellow. The one of research about peat water treatment using the *Two-Stage Coagulation* method was capable to remove the organic compound of peat water in Bangkinang, Riau up to 88% by using Alum as the coagulant in dose of 280-300 mg/L but still was not significantly good in removing Fe concentration which was stable to the organic.

According to Watts [2] organic compound will easily oxidize by using radical hydroxyl ($HO^\bullet$), so it can be mineralized to be carbon dioxide (CO_2) and water (H_2O). *Advanced Oxidation Processes (AOP)* method is an advanced oxidation process that able to create radical hydroxyl ($HO^\bullet$) as an excellent oxidizer to oxidate all materials found in water. AOP method based on H_2O_2 was explained as the application of AOP by using H_2O_2 as a source reagent in producing radical hydroxyl which has oxidation potential (E^0=2,80 V) bigger than the oxidation potential of hydrogen peroxide (H_2O_2, E^0=1,80 V) itself.

Based on the prior research, UV-Peroxidation in laboratory scale managed to remove 77% of organic concentration (TOC) and 96% of Fe substance in peat water for 60 minutes in the 360 nm wavelength and constant concentration of H_2O_2 0,05% (Elfiana and Zulfikar, 2012) in [3]. The process of UV-Peroxidation was proved managed in removing Fe concentration in groundwater up to 92,10% [4]. In line with the previous study, it is expected that the using of UV/H_2O_2 can give an appropriate way out to the alternative technology in processing peat water by supplying high efficiency to the removing of organic concentration and peat watercolor. Therefore, it is necessary to conduct a study to observe the optimum H_2O_2 dose that can be used as $HO^\bullet$ source after being radiated by UV at 250-400 nm wavelength.

Based on the knowledge of the cause and color content in water and its characteristics, the process and the method that can be applied in processing natural color of water are; oxidation process, adsorption, coagulation-flocculation and separation with the membrane.

Organic substances consisted in nature might originate from plants, oil fibers, animal fat, starch, sugar, cellulose, and others. Those organic materials are related closely to the alteration of the physical characteristics of water, especially with the undesired changing of color, scent, taste, and turbidity. [5] states that AOP is work properly in the process of removing the contaminant in water to reduce the mixing of organic and nonorganic substance, COD, and BOD, which were not oxidated. If the process works completely, the result of organic substance oxidation is carbon dioxide and water, although it is difficult to gain a perfect result. AOP process, according to [6] has a basic rule in producing radical hydroxyl maximally, it is very reactive and also a strong oxidizer that can damage the organic and nonorganic contaminant which reacted with it.

In its development, the combination from several processes has been used such as ozone, hydrogen peroxide, ultraviolet light, titanium oxide, photocatalyst, sonolysis, electron beam or also known as AOP (Advanced Oxidation Processes) method which is a process to produce radical hydroxyl [7].

According to [5] a chemical compound that is hard to be broken through chemical oxidation can be oxidated by using radical hydroxyl (HO*) which is a reactive substance formed from intermediate reaction process. Its oxidation potential (E^o = 2,8 V) is bigger than

other oxidators. Radical hydroxyl formed through AOP is caused by UV radiation simulation and hydrogen peroxide [8].

The mechanism of the radical hydroxyl formation using hydrogen peroxide (H_2O_2) as a limiting reagent was known in three processes i.e Fe[II]/H2O2), UV/H2O2 dan O3/H2O2, as shown in Figure 1.
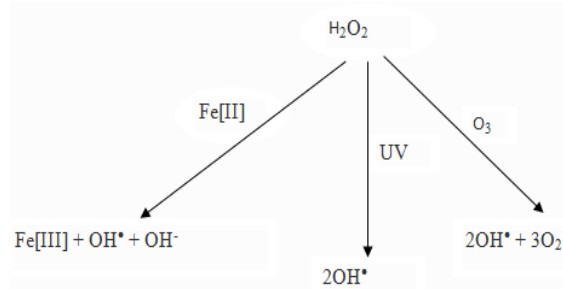
Fig. 1 The production of radical hydroxyl in AOP method based on H_2O_2 through reagent Fenton (Fe[II]/H2O2), UV/H2O2, and O3/H2O2 [9].

Radical hydroxyl reacts with all dissolved constituents, usually in series until the constituents are mineralized completely. It is not selective in zapping the constituents, without any specific class limit or compound group, which is different from other oxidants, and its reaction can be operated in normal temperature and pressure [6].

1.1 Photochemical process of UV

Ultraviolet (UV) was reported by Petersen *et.al*. (1988) as a ray that can be used to oxidate organic pollutant, known as photooxidation.The addition of energy in a system that contains organic substance is a principle process of photooxidation. The reaction of organic compound oxidation with UV ray occurred because the ray induces photochemical in water which produced radical hydroxyl following the reaction below (Cervera and Esplugas, 1983 in Jones, 1999):

$$H_2O \xrightarrow{hv} H^\bullet + HO^\bullet \tag{1}$$

1.1.1 Light Source

Light is one of electromagnetic wave types. The types of light that radiate ray can be classified based on its wave, i.e:
- Ultraviolet vacuum $\lambda = 100$ nm – 200 nm
- Ultraviolet $\lambda = 200$ nm – 400 nm
- Tampak (visible) $\lambda = 400$ nm – 800 nm
- Infra $\lambda = 800$ nm – 106 nm

Based on UV ray source, UV can be classified on:

Natural UV; UV, originated from the sun, consist of "UV-A" (400-320 nm) and more energetic UV which is shortwave "UV-B" (320-290nm). Shortwave radiation is adsorbed stronger by various types of pollutant and biomolecules. However, the basic mechanism of photochemical is same and the difference only happens in chromophore group of the receiver molecule.

Artificial UV, The wavelength is smaller than 290 nm and known as "UV-C". The example of this UV is UV which is created of mercury bar. The intensity produced is usually higher and surely more energetic than sun UV [6].

Based on the UV ray function for photolysis, the effectivity of UV ray can be distinguished from the types of light that produce ray source i.e, polychromatic and monochromatic light. The main characteristic of this light is based on the wavelength emission around UV ray. The shorter energy of light wave the bigger radiation of energy happen. Polychromatic light radiates its ray in 180-400 nm wavelength, while the monochromatic light is in 254 nm (Froelich, 1992) in [5] states that good photolysis result will occur around polychromatic light length wave area, however, the result of photolysis in removing organic substances is more effective in monochromatic light.

1.1.2 UV-Peroxidation (H_2O_2/UV)

UV- Peroxidation is a chemical oxidation process that used Hydrogen Peroxide as a reagent to excited state becomes radical hydroxide ($HO^\bullet$)with the UV radiation. [9] reports that UV-peroxidation has been applied for remediation of good water from several contaminant areas in Nort America and Europe. One of the food industries in the USA used UV-peroxidation for good water contaminated with trichloroethylene (TCE) so the well water is reusable.The result showed that TCE was reduced from 4000 μg/l to 0,83 μg/l in the rate of flow 14 m³/hour, with H_2O_2 50 mg/l and UV 30 kW light.

UV-peroxidation was proven to produce radical hydroxyl and able to oxidate water contaminant according to the reaction mechanism as below :

Initiation Phase:

$$H_2O_2 \xrightarrow{hv} 2\,HO^\bullet + HO^\bullet \tag{2}$$

Propagaation Phase:

$$H_2O_2/H_2O^\bullet + HO^\bullet \xrightarrow{hv} H_2O/OH^- + HO_2^\bullet \tag{3}$$

$$H_2O_2/H_2O^\bullet/O_2 \xrightarrow{hv} HO^\bullet + H_2O/OH^- + O \tag{4}$$

Termination Phase

$$HO^\bullet + HO^\bullet \xrightarrow{hv} H_2O_2 \tag{5}$$

$$HO^\bullet + H_2O^\bullet/O_2 \xrightarrow{hv} H_2O/\,HO^\bullet + O_2 \tag{6}$$

$$H_2O^\bullet + H_2O^\bullet/O_2 \xrightarrow{hv} H_2O_2/HO_2^- + O_2 \tag{7}$$
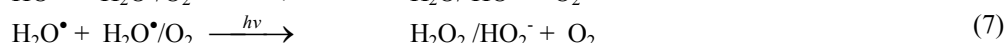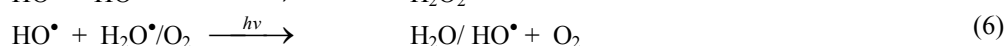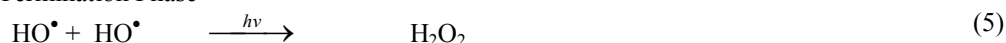
Due to radical hydroxide that reacts with Hydrogen peroxide, the existence of hydrogen peroxide is influential to radical hydroxide in decomposing process. Therefore, the addition of hydrogen peroxide is suggested in optimal concentration to have the optimum decomposition.

2 Methods

2.1 Peat water Characteristics

The sample of peat water from Ek Tren village in Samudra district of Aceh Utara was examined its physical chemistry characteristic based on the parameters; pH, TDS, turbidity, Fe

ion and organic substance (KMnO$_4$). The result of peat water characteristic used is compiled in Table 1 below :

Table 1. The Characteristic of Peat water from Ek Tren Village in Samudra District, Aceh Utara refer to PERMENKES RI No.416/MENKES/PER/IX/1990

Parameter	Unit	Level	Limit of Requirement
pH	-	5,7	6,8-8,5
TDS	mg/L	250	1.500
Turbidity	NTU	4,55	25
Fe iom	mg/L	16,18	1
Organic Substance (KMnO4)	mg/L	395	10

(Source: The result of analyzation in Laboratory, 2016)

2.2 Reagent

The material used in this research were peat water from Simpang Ek Tren in Samudra district, Aceh Utara; technical hydrogen peroxide (H$_2$O$_2$35%; density 1,11 kg/l; BM 34 g/mol; BE 17); aquadest; H$_2$SO$_4$; NH$_2$OH.HCl; HCl; NH$_4$.C$_2$H$_3$O$_2$; H$_2$C$_2$O$_4$.2H$_2$O and KMnO$_4$.

2.3 Prototype of AOP reactor

The installation prototype of UV-Peroxidation reactor refers to the principles of water treatment with AOP in general, which is as shown in process chart flow in Picture 2, therefore the prototype of UV-peroxidation reactor instrument resulted in this research can be seen in Figure 3 and 4.
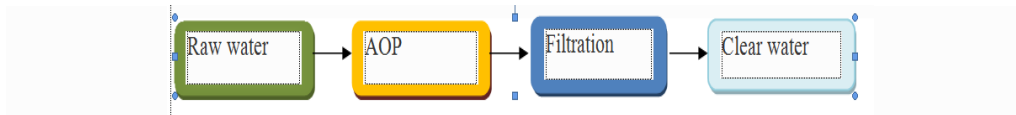
Fig. 2 The Principle of Water Treatment with AOP

The batch system of UV-peroxidation reactor UV-Peroksidasiin laboratory scale is shown in picture 3. The reactor is made from *pyrex-glass*with2 L capacity equipped with a stirrer, pH measurement, temperature, and filter.
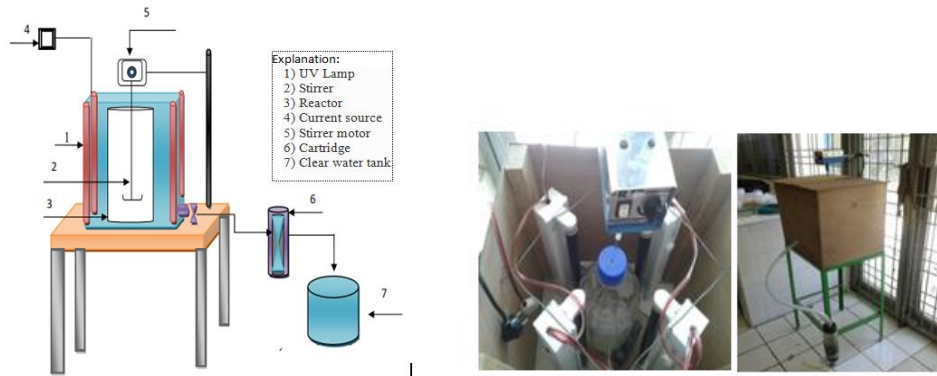
Fig. 3 UV-Peroxidation reactor with batch system in laboratory scale with10 watt UV lamp, brand Elite SK F 10 W T8 BLB (λ=360 nm)

In Figure 4, the equipment series of UV- Peroxidation process consisted of feedback tank 25 L, recirculation pump, peroxidation reactor (Aspirator with 5L capacity, with work volume 3,8L) , reagent tank of H_2O_2 in upper side, Quartz Sleeve UV Lamp 10 Watt brand SNXIN, piping systems (distribution pipe, circulation pipe and bypass pipe, each has 3/8 diameter) connected the UV-peroxidation reactor with cartridge 03μ and 01μ,as the finishing process, filtration is intended to get clean and clear peat wate and has organic concentration and low Fe ion after the process.

Fig. 4 UV-Peroxidation with batch system batch in laboratory scale using 10 WUVlamp brand SNXIN (λ=240 nm)

2.4 Analysis

Ph measurement of peat water used Ph meter brand HANA HI 8424, the analysis of organic substance used Permangometry method with titration while the analysis of water peat color was used by using PtCo Spektrofotometry method.

The performance of each process can be seen from the percentage of removal (%R) parameter concentration gained from the following equation:

$$\%R = \frac{Concentration_{(int\,hebeginning)} - concentration_{(inime)}}{Concentration\,(int\,hebeginning)} \, x \, 100\% \tag{8}$$

3 Result and Discussion

Referring to PERMENKES RI No. 416/MENKES/PER/IX/1990 , it can be concluded that the resulted characteristic of peat water did not meet the requirement as consumptive water because it was beyond the allowable level, the concentration of Fe ion was 16,18 mg/L (>1 mg/L) and the concentration of organic substance was 395 mg/L $KMnO_4$ (>10 mg/L $KMnO_4$). It can be concluded that the values of these three parameters were beyond the determined level, hence it is necessary to carry out the treatment process to improve the quality of the peat water before it ready to use.

3.1 The effect of H2O2 concentration in UV-Peroxidation process to the percentage of the reduction organic substance concentration

In UV-peroxidation process, H_2O_2 is used as the basic reagent of radical hydroxide forming which is formed during the UV- peroxidation process with the existence of UV ray energy. Thus, it is necessary to observe the influence of H_2O_2 concentration in the treatment process of peat water, because oxidation reactivity would be different in each color water type that will be processed. In this research, the effect of H_2O_2 was observed by looking at the changed values of organic substance concentration contained in peat water by processing the peat water with and without the addition of H_2O_2 concentrated 0,05% along with the radiation in 360 nm and 240 nm wavelength. The result gained in this treatment is shown in the graph in Figure 5.

a) UV Lamp Elite SK F 10W T8 BLB (360 nm)   b) Quartz Sleeve UV Lamp SNXIN 10 W (240 nm)
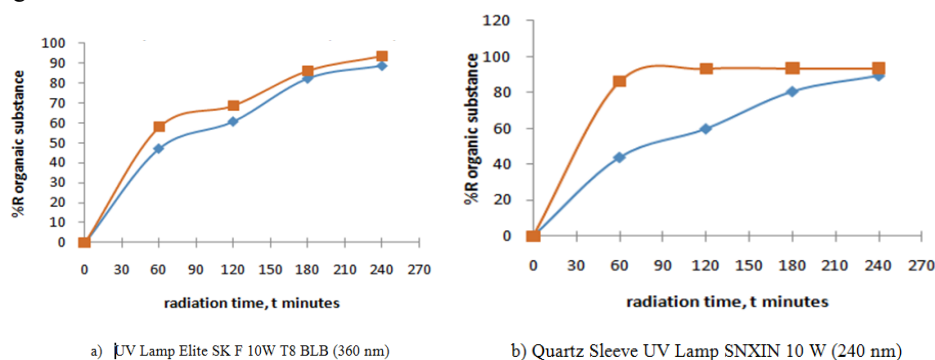
Fig. 5 Plot of %Rorganic substance with time at different wavelength radiation are 360 and 240 nm from the process with and without H2O2. The color is represented as follow: blue is UV ray + H2O2 0% ; and red is UV ray + H2O2 0,05%

3.2 The effect of UV ray wavelength to the reduction percentage of Organic Substance Concentration

In this research, the effect of UV ray wavelength was observed to find out the change of values from organic substance concentration contained in peat water by comparing two processes of UV-peroxidation using UV ray 360 nm and 240 nm. The process of peat water without adding H_2O_2 concentrated in various concentration H_2O_2 (0,0; 0,03; 0,05; 0,07; 0,09; dan 0,11%). The result obtained in this treatment is shown in the graph in Figure 6.
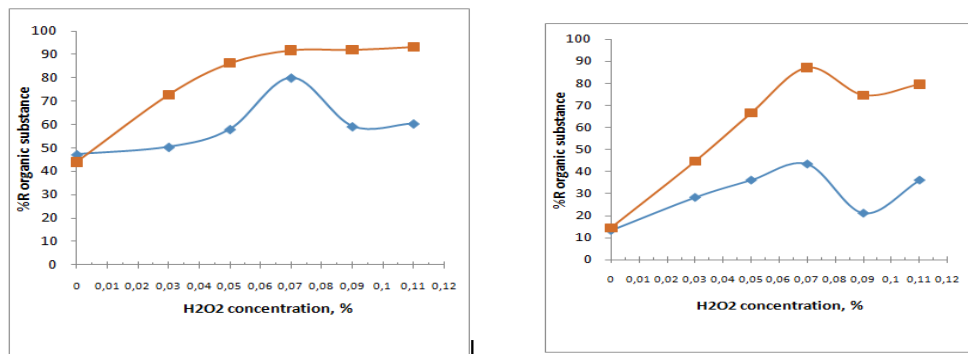
Fig. 6 Profile %R$_{organic\ substance}$ in every time from the various concentration of H2O2 with wavelength UV ray. The color is represented as follow: blue is UV ray 360 nm, and red is UV ray 240 nm

From the graph in picture6it can be seen that %R$_{organic\ substance}$ that gained from UV-Peroxidationprocess with UV ray radiation in the wavelength of 360 nm and 240 nm in various concentration of H_2O_2gave the different attained value percentage of gained organic substance reduction.The treatment using UV ray 240 nm gave a better percentage of organic substance reduction compared to the treatment using UV ray 360 nm. This is due to the resulted photon energy of UV ray 240 nm was bigger than resulted from UV ray 360 nm thus the process reactivity became bigger.The shorter of UV ray wave that radiated into the water, the bigger photon energy resulted because photon energy (E) is inverse with the wavelength (λ) in light velocity (c).

3.3 The performance of UV-Peroxidation process based on reduction percentage of Organic Substance (%Rorganic substance

From the previous treatment, it has been known that the concentration of $H_2O_2$and the UV ray influenced to %R$_{organic\ substance}$ that resulted once the performance of UV – peroxidation process can be known based on the biggest value of %R$_{organic\ substance}$ resulted from varying the dose of H_2O_2in various concentration and length of the wave from UV ray.The result shown from this treatment is displayed graphically in Figure 7
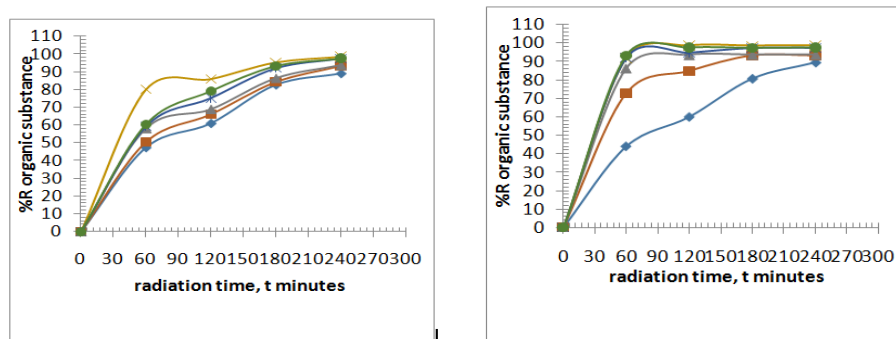
Fig. 7 The Performance of UV-peroxidation Process based on the percentage of organic substance reduction (%Rorganic Substance)

From the graph in picture 7, it is known that the optimum condition for the UV-peroxidation process that gave the best performance based on the efficiency of organic substance reduction. From the graph, it is also known that the percentage of organic substance reduction was gained in the concentration of $0,07\%H_2O_2$, the type of UV lamp with the beginning organic was 395 mg/L $_{KmnO4}$ can be reduced up to 98% became 5,6 mg/L 60-120 minutes radiation time. Several samples of water around the damn were shown in picture 8.

Fig. 8 Sample of peat water and processed peat water

4 Conclusions

The conclusions achieved from part of the research are the characteristic of peat water in Ek Tren Village in Samudra district, Aceh Utara contains 395 mg/L organic substance, 16,18 mg/LFe$_{total}$, 9,85 mg/LFe^{2+}. The optimum dose of H_2O_2 optimum gained based on the percentage of organic substance concentration reduction (%R$_{organic\ substance}$) which is the biggest of H_2O_2 concentration variation (0,0% – 0,11%), which is 0,07% with %R$_{organic\ substance}$ = 98%.

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Development of Sustainable Beef Dendeng Agro industry Business Scale in Aceh Province with SWOT Analysis
Case Study: Beef Dendeng Aceh of PT. Gunung Seulawah

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Abstract. The development of sustainable agro industrial scale beef dendeng aceh (BDA) in Banda Aceh City has never been done as one of the regional economic improvement. The purpose of this study is how the strategy of developing the business of BDA in Banda Aceh City, become a new scientific contribution in the development of science in the field of agro industry of sustainable livestock and become a new concept for the development of other local agro industry. This research has been conducted for a year through analysis of SWOT on agro-industry of small-scale BDA that has been established over 25 years. The result of this research that in ABDA-GS have internal factor strength is > 2.50 while the weakness < 2.50 meanwhile treats is also >2.50. Therefore, the ABDA-GS business scale development strategy is an internal factor that needs to be improved, strengthened, and retained are product and capital, and promotion, service, corporate finance, innovation, and business risk (weakness), while external factors are necessary to enhance, utilize or cooperate, consumers, technology, the involvement of the Aceh Government, current economic conditions, socio-cultural activities and traders (opportunities) and market share, the same business competitors inside and outside areas as well as security.

Keywords: Livestock Agro Industry, Beef Dendeng, Internal Factor, External Factor, Sustainable

1 INTRODUCTION

PT Gunung Seulawah Dendeng Aceh is a small-scale industries that move in the field of meat processing since 1982 until now (above 25 years) to obtain permission from The Ministry of Industry No. 157/117/IX/ 87 with the code MD 9881521. The location of the

product sales business this beef dendeng in Jl Tgk. Chik di Tiro, Simpang Surabaya No. 148-150 Banda Aceh.

Beef dendeng business is growing rapidly with high product demand level, so that changed to a limited Liability Company (PT. Gunung Seulawah) with Notary deed No. 10/Not/PSA/V/1999 date 20 May 1999. After post-Tsunami 2004, PT Gunung Seulawah managed directly by the family of Mr H. Lukman Hakim, and have some employees in the field of production, packaging, marketing and finance. Pt Gunung Seulawah besides producing beef dendeng, also produce dendeng deer and cracker cow skin. The production of beef dendeng produced with the size of the 250 grams price IDR. 65,000,- and 500 grams price IDR.130,000,.

According to the report KPjU Aceh Province (2012) that the number of business players beef dendeng aceh in the city of Banda Aceh which has been registered in Disperindakop SMB of the city of Banda Aceh consists of 9 units of business namely Dendeng Seulawah and Dendeng Blangrakal (including small scale), Dendeng Aceh, rencong Aceh, Dendeng Bungoeng Jaroe, Dendeng Crown, Dendeng Pinto Aceh, Dendeng Putro Seulawah, and Dendeng Seulawah Agam (including the scale of micro business).

To do further research relateds to strategy of business scale beef dendeng sustainable development in aceh.

2 METHOD

2.1 Place and Time

Determination of the research done by research areas deliberately (purposive sampling) with business time above 25 years, with the research from February 2016 - February 2017.

2.2 Measurement

The measurement in this research is used by the survey explorative and descriptive. Method of explorative aims to get a description of the phenomenon is the temporary and permanent about agro-industry Beef Dendeng Aceh (ABDA), while the description of the method aims to get more information about the development of ABDA Business in a specific period of time with how to describe the research object at the current situation based on the facts as the data of quantitative collection from qualitative, be clarified in, and analyzed while the description of the method aims to get more information in a specific period of time with how to describe the research object at the current situation based on the facts as the quantitative data collection, then arranged, be clarified in, analyzed and interpreted.

2.3 Population and Sample

The population in this research is a number of the population of infinite wisdom and infinite [1], while the sample is part of the number and characteristics which owned by the population.

The number of large populations (sampling) in this study because of limited funding research time and energy. Based on some opinions Dillon and Hardaker [2] then sampling in research can be done by considering the adequacy of the framework samples, the aim of the research, the availability of data and resources required, while the priority of the

recommendations of the innovative model of agro industry development beef dendeng aceh sustainable development through the method of Strength, Weakness, Opportunities, Treats Analysis (SWOT Analysis) on business players ABDA [3].

Sampling in research is on the SWOT Method sampling on business players in the sampling Judgmental sampling based on the scale of business namely the scale of small businesses and have experience (experience) above 25 years namely Beef Dendeng Gunung Seulawah.

2.4 Data Collection Method

The data that used in the data obtained directly from the questioner were quantitative and qualitative research that has in advance while the interview used to get more information with the consumer, business players and expertise related to.

Secondary data is data that is not directly and acquired from business practitioners, Dinas or related institutions, publication of institutions that are relevant, Laws Government Regulation, the Decree of the Minister of Agriculture, RPJM Ministry of Agriculture, Local Government Regulations Aceh, RPJM Local Government Of Aceh, Strategic SKPA, Data BPS and other data source.

Equations in this research are:

Weight Value (A) x Average Value (B) = Score Weight (C) (1)

Strengths (S) + Opportunities (O) = SO Strategy
Weakness (W) + Opportunities (O) = WO Strategy (2)
Strengths (S) + Treats (T) = ST Strategy
Weakness (W) + Treats (T) = WT Strategy

3 Results

3.1 Analysis of Business Practitioners with SWOT Method

The results of The Analysis Variables The Internal Factors - Strength ABDA-GS at the Table 1 and Table 2. provides information that the highest internal factor is the product quality, due to also use frozen beef imports by 98% and 2 percent using the remaining local beef from the proceeds from the sale of local beef to consumers fresh meat, while the lowest factor is labour, this is due to indiscipline employees in working in the industry.

Overall the total value of the average The Internal Factors on the strength is above the value is still below the 2.5 namely listing 2.33. The The Internal Factors on the strength of which has a value above 2.5 is product quality and capital. This is relevant with (Chen, 2009) that facing tight competition business need to apply as a capital expenditure of ABDA platform GS in the improvement of the quality of the products.

Table 1. The Average value of the variables The Internal Factors on the ABDA GS

The Internal Factors	The average value
Strenghts - S	
Product Quality	3.60
Product Prices	1.80
Product Access	2.40
Employment	1.00
Capital	3.00
Weakness - W	
Product durability	2.00
Business Risk	1.20
Product Innovation	1.60
Product Promotion	2.20
Employee Services	2.20
Corporate Finance	1.67

Table 2. The Average value of the variables The Internal Factors on the ABDA GS

The External Factors	The average value
Opportunities - O	
Partner Relationship	3.67
Customer Relationship	3.67
Technology	3.67
Economic Conditions	3.33
The availability of raw material	2.00
The raw material supply	2.33
The involvement of local government	3.67
Social and Culture	3.33
Traders Broker	3.33
Treaths - T	
The market share	4.00
Climate Change	2.33
Security	3.33
Politic	2.00
The competition outside the area	3.33
The same business Competitors	3.33
Prices of raw materials	2.00

3.2 The Matrix Strength - Weakness - Opportunity -Threat (SWOT)

The results from the formulation of the alternative strategy of matching the value of IFAS EFAS Variable The Internal Factors and External Factors on the ABDA -GS Variable in Table 3.

Table 3. The Matrix IFAS and EFAS ABD-GS Aceh

The Main The Internal Factors (S and W)	The Main External Factors (O and T)	The strategy that produced
S = 2.70	O = 3.33	SO = -0.63
W =1.86	O =3.33	WO= -1.47
S = 2.70	T = 3.05	ST = - 0.35
W =1.86	T = 3.05	WT= -1.19

Table 3 provides information that the result of the value of the factor opportunities (O) on the ABD GS greater namely 3.33 and threat value (T) is 3.05 while the value of The Strengths namely 2.70, and the value of the weakness namely 1.88, so that the alternative strategy of external and The Internal Factors on the ABD GS is as follows.

3.3 QSPM

The best strategy on ABDA - GS from the results of the input analysis Stage 1 (first) and Stage 2 (two) from the Total Strategic Quantitative (QSPM), the ABDA GS is the overall number of Total Attraction (Sum Total Attractive Score of STAS) on the First strategy is the ABD GS (5.82), with the key factors that have the value of the attraction: 1. Very Interesting (U.S. value 4) consists of The Internal Factors namely product quality, product prices, access product, capital, product innovation and financial companies, and external factors are partners relationship, consumers relationship, raw materials available, supplying raw materials, security, competitor outside area, the business competitors, raw material cost and security.

4 DISCUSSION

On the weakness of (W) ABDA GS Weakness - The GS has the highest value on the promotion of our products and services employees, this is due to the ABDA GS actively involved in the exhibition held by the government in Aceh or outside aceh i.e. Local Government brought the ABD-GS products to the national level exhibition held by other provinces. The factor of weakness is the lowest is innovation product, because the taste of beef dendeng produced still is not changed the foxes. This is due to the owner of ABDA GS itself is preparing ingredients and then submitted to the work force. Overall the internal Factors of ABD GS at the weakness still under 2.5 namely 86.62, and none of the The Internal Factors on the weakness that has a value above 2.5.

Therefore, The Internal Factors ABDA-GS shows that the power that is owned by the ABDA-GS also need to be increased and maintained so that capable to overcome the weakness that owned such as the improvement of the quality of that according to the consumers, capital improvement efforts through other parties such as banking, ease consumers get the products with the strategic market, product prices also must be in accordance with the money paid by consumers and improvement of labour skills training.

Relevant with Kusdiarni [4] stated that the increase in the The Internal Factors such as product characteristic and performance ABD GS performance has a significant impact on strengthening the business players ABDA-GS, can reduce the weakness of the ABDA GS on power factor hold product, business risk, product innovation, product promotion, employees and financial services companies.

Ismail [5] stated that institutions that good is the main key to the success of agro industry which is capable of raising the competitive advantages and Zhou [6] also added that the quality of information about the products produced related to relevance, adequacy, accuracy, and time information, because the information of quality will improve capital between the buyer and seller with 2 reasons namely 1) allows customers to get a useful information and 2) help business players in developing the understanding of better products [7].

The results of the analysis of variables External Factors Opportunities (Opportunities- O) ABDA-GS Aceh can be seen in the Table 2. that the highest value Internal factor in the opportunity is the relationship with business partners and customers, technology and the involvement of local government in it, this is because the product sales done together as partners in the souvenir shop, supermarket, hotel, the airport and the house eat, relationships with customers is very good due to the creation of the first beef dendeng products is the ABDA GS, so that the products beef dendeng aceh ABD-GS always recommended by the local government involved for the product exhibition was held at the centre or the Province of the other districts and also get the allowance of funds in the construction of the building drying beef dendeng from its fiscal regional funds and the ABD GS has been using technology tools such as the engine grinder herbs, machine Slicer meat, freezer, and sillier.

Overall the total value of the average external factors is above the value of the average 2.5 namely 3.2 consists of factors relationship with partners, customer relationships, technology used in the production of the involvement of the government in the development of business activities of social and cultural cooperation with merchants intermediary, and supplying raw materials from Medan.

Analysis of the external factors on the threat (T) ABDA-GS Treats--GS at the table 2. provides information that the highest value on the Market Share due to the production of which is produced in large number with the use of fresh beef 1310.95 kg a month, this is due to the extent of the location of the spread of the product to in the market as in the city of Banda Aceh, Aceh Besar, Bireuen district, city of Lhokseumawe, City Langsa, Meulaboh, District, and Medan. While the lowest value on political factors and raw materials, this is due to the heat of the national political in temperature can make the economy cycle difficult player of business and raw materials such as cattle with limited local population and also a high price due to the request of the local community to the local beef high. Overall the total value of the average above 2.5 namely 2.9 consists of market factors, security, competitor from outside the area and competitor the same business.

Therefore, this indicates that the ABDA GS responded very good opportunities like working relationship with partners and customers, technology, economic conditions, available of raw materials, supplying raw materials, the involvement of the regional government and the social and cultural activities and merchants intermediary, and it can minimize the threat of company strategy effectively able to profit from the opportunities and minimize the negative influence from external threats such as the market share, climate change, security, political competitors outside the area, business competitors the same raw material prices.

The strategy ST, on the ABD GS is -0.35 namely using the strength of the company to increase, face, avoid or reduce the impact of external threats. The strategy are increase and maintain the quality of products 1) in the market share, 2) in the same business competitors outside or in areas, and 3) in security threats. Therefore the internal strength maintaining or improving the quality of and capital is very important to reduce the threat of market share, the same business competitors in the region or outside the region, security politics and the current climate. The ABDA GS, creates ease the products by consumers and the price is easy to reach

by consumers also with the ministry of manpower that can improve customer satisfaction and loyalty.

Strategy SO, on the ABDA GS is -0.63 take advantage of internal company strength factor to profit from external opportunities factors namely through 1) increase and maintain product quality through maintain relationships with partners, 2) increase, maintain and utilize the product quality to maintain emotional ties with customers, 3) improve and maintain quality products using or increase the current technology, 4) maintain product quality by utilizing the involvement of local government of Aceh, 5) maintain product quality by utilizing the condition and social culture wisdom, 6) maintain of quality product and advantage of the cooperation with the merchant broker in the product marketing, 7) increase the capital to take advantage from the opportunities in cooperation with business partners and the local government of Aceh, and 8) increase capital business using the merchant broker.

Because of the ABDA GS improve the quality products using the appliance technology from upstream to downstream, working with consumers in discussing the product prices are easy reach by consumers with their economic condition, the cooperation with related partners with access to the products so that the income of the ABDA GS increased, involving the local government to get training or expertise of the ministry for employees such as from the Education Department of Industry, cooperatives and microfinance unit Banda Aceh City, Animal Health Office and Animal Husbandry Aceh, Tourism and Culture of Aceh and other stakeholders. The capital can collaborate with suppliers as raw materials is still be there.

The strategy WT, on the ABDA GS is -1.19, namely improve or minimize the factors internal weakness in the ABDA GS to survive or avoid the threat of external factor, namely through strategy 1) increase product promotion in face of market share through off/online promotions or soft/ hard tools, 2) increase product promotion in cooperation with the same business competitors inside and outside the region, 3) maintain exist product promotion in the face of security threats through cooperation with stakeholders, 4) improve service performance of company in face of market share through human resources capacity, 5) improve service performance of the company in the face of the same business competitors with inside and outside the region, and 6) improve performance service of the company face of security threats through emotional closeness with working partners and consumers. Therefore the ABDA GS can improve the factor of weakness which is owned by increasing the finance companies to avoid the threat from the same business competitors inside and outside area, and improve innovation product at least a new brands and performance service employees in order to survive when there is a dynamic result from politic and security can affect the price of raw meat, and minimize the impact the influence of climate change on the products that can reduce the risk of ABDA GS . If in strategy WT this really is in a dangerous position and the ABDA GS must strive to survive, merger, or radically downsize the business.

The strategy WO, on the ABDA GS is -1.47 , namely the ABDA GSS must increase, resolve or improve internal weakness factors and take advantage or take advantage of external opportunities factor, namely through a strategy they are: 1) increase product promotion by the system of cooperation with partners, 2) increase product promotion through emotional relationship consumers, 3) increase product promotion through technology today, 4) increase product promotion through cooperation with the local government of Aceh, 5) increase product promotion with using economic conditions today, 6) increase product promotion through social activities of the cultural, 7) increase product promotion through cooperation with merchants, 8) improve performance service of the company through the opportunity of cooperative relationship between business partners and customers, 9) improve the services company performance use of current technology, 10) increase The Ministry of the

performance of the company through the program of local government of Aceh, 11) improving service performance of the company through the economic condition of the company currently, 12) improve the services company performance through social and cultural actors and 13) improving service performance of the company through the merchant mediator such as customer complaints, advice consumers and others in the products produced. ABDA GS can increase products durability and product innovation through technology, reduce business risk through the creation of a good relationship with business partners and customers, improve ABDA GS financial with increased promotion of product and service performance of employees is also still working with traders broker in the product marketing, perform related product innovation with social activities local community culture especially so easy to marketed products and improve the cooperation with the supplier such as beef so that the availability of raw meat always available.

This is relevant with Markides [8] that need to build cooperation with buyers, suppliers, the same business competitors and competitor outside the area, economic practitioners and others as market development efforts to enhance the profit business players ADSA., 2). Interestingly enough (U.S. value 3) consists of The Internal Factors namely manpower, power hold product, product promotion and the service of employees and external factors is the technology to supply raw materials, the involvement of the regional government and the social and cultural. This is in line with Kusdiani [4] that product quality identification needs to be done so that the quality of the ADS product guaranteed, and product promotion and employees ABDA-GS service have strong influence to development of the market, and 3). Quite Interesting (U.S. value 2) consists of The Internal Factors in the form of business risk and external factors namely social culture. Although in both ABDA-GS has weaknesses in the business risk but can be addressed in strength factor on The Internal Factors, and also on the external factors, namely social culture, both ABDA-GS has great opportunities in the market its products due to many social and cultural activities in the province of Aceh community associated with the consumption of meat in particular and also the national society in general.

This is relevant with the Government Regulation No.68 2002 about national food resilience that agro-industry (beef dendeng) is the raw material processing industry with commodities of cattle to produce a product that economic value, meet customer needs and the development of animal food resilience among others: (1) food that is available not only to meet the needs of calories but have the composition of nutrients in accordance with the requirements of the body metabolism and free from materials and or the organism pathogenic virus; (2) food should distribute from both the dimensions of space and time evenly; (3) in the socio-cultural in accordance with the desire and public perception; (4) food should be used properly to meet the nutrition that is needed for the growth of health and productivity. Local culture and institutional have important role in transforming the comparative advantages become competitive advantages which eventually can strengthen regional agribusiness product competitiveness.

Jamilah [9] also states that to increase their food availability fats then required increased the population of cattle aceh as raw materials and agro-industry (beef dendeng) each year and is required for the empowerment of local breeder, the use of technology in improving the infrastructure of the husbandry and increase awareness and assistance from local government.

Karim [10] stated that to increase the population of cattle Aceh, Aceh Government have set up a regional development program local Cow Aceh specified in Aceh Development Planning for 5 Districts in Aceh Province. As the Law No. 9 of 1995 that the development of agro-industry business scale and micro scale farming or small by the individual or group is the duty and responsibility of the local government in realizing the national economy nations.

According to the Bereue Statistic Agency Banda Aceh City in 2011 that opportunity development of agro industry animal husbandry (dendeng business) cows aceh beneficial for the regional government that is since a crisis until 1998, agro industry farms in Aceh remains survive, and on 2010 is also able to accommodate employment most high 175 people, with investment value third sequence from other industries namely IDR. 1.134.000.000,- production cost high IDR. 2.290.000.000,- and gross value added most high IDR. 1600.000.000,-.

5 Conclusions

In Aceh ABDA-GS, the Internal Factors that need to be done on the improvement, strengthening and maintaining is product quality and capital (power), and the promotion of our products and services (weakness), while external factors is needed to be done improving utilization of or cooperation with partners, consumers, technology, the involvement of local government of Aceh, economic conditions today, activities/ perpetrators social culture, and traders broker (chance) and markets, competitor inside and outside area also security.

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Legal Protection for Justice Seeker Through State Administrative Court

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Abstract. This research is aimed to analyze how the implementation of legal protection for justice seekers through state administrative courts and what steps can be taken so that legal protection for justice seekers can be binding. The approach was used a statute approach and concept approach. The result of the research show that legal protection for justice seekers can be realized in case there was a good faith from the state administrative agency or officials who were subject to the decision to implement the judicial decision of the state administration and the supervision and activeness of the community in guarding the implementation of the decision. Base on the correct evidence of the parties to the dispute, the verdict said to provide legal protection. It was produced from fair trial process and a fair, and also decision may be exercised

Keywords: Legal Protection, Justice Seeker, State Administrative Court.

1 INTRODUCTION

Legal protection is needed by the citizenry, especially in welfare state type. As is known, in the welfare state had vulnerable arise friction of interest between the community and the government when the government had a very big role, even entered on the aspects of private life of its citizenry. Therefore, the community needed a clear legal protection if the people perceive their interests were disturbed by a legal action of the government, so in this case the government also had control over the authority possessed.

Legal protection (rechtsbescherming) related to law enforcement can be interpreted as provide the access to justice for justice seekers. Access to justice in this case was defined as given fair and impartial treatment and also was given everything accord to its rights and portions. Legal protection for community disputes with the government was also a form of respect for human rights that was basically based on the needed for a clean and

Responsible governance condition. On the other hand, on the legal state framework, a clean and responsible government was part of the requirements of a country to be called a legal state [1]. Governance is a central point that can perform various actions related to its position. Therefore, a real form of legal protection was needed for the citizenry as justice seekers so that the citizenry can be protected from abuse and abuse of authority by the government. Based on that can be distinguished two kinds of legal protection for the citizenry. It was protection of preventive law and repressive law protection. In preventive legal protection, the citizenry were given the opportunity to file an objection (inspraak) or opinion

before a government decision got a definitive form of determination. Thus, preventive legal protection aimed to prevent the occurrence of disputes, while repressive legal protection aimed to resolve disputes.

The State Administrative Tribunal was divided into three types: the function of advisory, referral and judiciary of the three functions can see that there were two functions that precede the function of the judiciary. First, the function of the advisory in the State Administrative Court was strived that the

dispute between the people and the government can minimize, while the referral function for the achievement of peaceful efforts to resolve the dispute between the government and the people. Thus, the principle of harmony between public relations and government can carry out ideally. However, the settlement of disputes in a peaceful manner did not mean abandoned the principles and rules of law that applied but rather to the discovery of awareness of the principle and the rule of law was not intended for the determination of the winner or the losers, but rather the state of mutual understanding and recognizing the nature of the existence of existing laws and regulations

In general there are three kinds of government actions (bestuurhandeling). First of all, the actions of the government in terms of made laws and regulations (regeling). Second, the actions of the government in the issuance of decisions (beschikking). Third, the actions of government in the field of civil law (materialele daad). Government actions in regeling and beschikking occur in the fielded of public law, so it must be subject to public law, while the actions of the government in terms of civil, then subject to the provisions of civil law. The Government may be deemed to be unlawful in violation of the subjective rights of others if the government commits an act sourced in a civil law relationship and violates the provisions of that law and commits an act which originated in public law and violated the provisions of the law. The consequences of such government interference were the emergence of a number of irregularities such as abuse of authority (detournement de pouvoir), exceeding power limits (exces de pouvoir), arbitrary (willekeur) and so on [1].

In order to provide legal protection for justice seekers, Law Number. 5/1986 on Law Number. 9/2004 in conjunction with Law Number. 51 Year 2009 on the State Administrative Court, pursuant to Article 144 called the State Administration Judicature Act. The position of the State Administrative Court which is expressly regulated in the constitution as a reflection of the provision of legal protection for the people due to the attitude of acts or acts of government was placed at a high position in the life of the nation and state in Indonesia. This is considering that Indonesia adheres to the type of modern legal state (moderne rechtstaat) better known as the type of welfare state (welfare state type) which resulted in extensive government intervention in aspects of people's lives.

Handling of legal protection for the people by the judiciary including by the State Administrative Court in this case was a repressive legal protection. Legal protection facilities for repressive people in Indonesia were known to be a few bodies and were grouped into the following groups (Sri Pudyatmoko dan Ridwan tjandra, 1996):

1. Courts within the State Administrative Courts;
2. Courts within the General Courts;
3. Government agencies which were administrative apparatuses;
4. Special agencies.

One form of legal protection for the people carried out through the State Administrative Court was a form of legal protection for the people in dispute with the Board or the State Administration Officer. The principle of legal protection for the people who in practice put forward the principle of equality before the law, in this case the principle of justice taken

precedence before the application of legal norms in order to achieve harmony of relations between the government and the people based on the principle of harmony.

State Administrative Court was a court that can resolve the dispute because the community was not satisfied or harmed by the actions of the government; at least the act is not fun. The incidence of such loss or discomfort was caused by the following matters [2]:

1. The decision of the organ of state or government administration were deemed inaccurate (onjuist).
2. Decisions of organs of state or government administration were considered in violation of the law (onwetmatig).
3. The decision of the organ of state or government administration were considered unwise (ondoelmatig).
4. The decision of the organ of state or government administration were considered unlawful (onrechtmatig).

The function of State Administrative Court which should be able to provide legal protection to the community, has not yet been fully realized. Legal efforts by justice seekers often get unsatisfactory results, or even if they arrive at the hearing and the ultimate verdict is the justice seeker who were won, sometimes the government or the ruler does not run the content of the decision that already has such permanent legal force. Based on the background that has been described above, there are two problem formulation that can be arranged in this research, that is:

1. How is the Implementation of Legal Protection of Seekers of Justice through State Administrative Court?
2. What steps can be taken to ensure that legal protection for justice seekers through the State Administrative Court can be binding?

In accordance with the issues that were the focus of this research, the purpose of this study were to describe the legal protection for the justice seekers through the State Administrative Court and find the steps that can be done so that legal protection for the justice seekers can be binding, while the benefit of this research was for legal protection for justice seekers through the State Administrative Court can be realized as well as the State Administration Officers or Officers more cautious in issuing a Decision of State Administration so as not to harm the community.

2 METHOD

Research method was used in this research was normative law research method. Normative law research method or literature law research method was a method or method was used in legal research conducted by examining existing library materials include written legal norms. In relation to this type of research which is a normative legal research, the correlation between das sein and das sollen was analyzed by normative juridical with qualitative approach. In the Qualitative approach, the analysis was done to answer the questions in the research problem matters and was carried out through the process of developing a logical series of evidence. The process of establishing the road of proof was done slowly so that an initial understanding of the main factors can be used to develop a logical relationship and can be explained in an analysis [3].

The first stages of normative legal research is research that aims to get the law that was objective, namely by conducting research on legal issues. The second stage of normative legal

research is research aimed at obtaining a subjective law. In normative legal research, the research conducted was descriptive that describes the symptoms in the community environment to a problem under study, the approach was qualitative approach.

In the normative legal research method, there are three types of library materials was used :
1. The primary legal material, which were the binding legal material or which requires the person to comply with it, such as the laws and regulations of the judge. The primary legal material was used in this study was Law No. 5 of 1986 Jo Law No. 9 of 2004 Jo Law 51 Year 2009 on the State Administrative Court.
2. Secondary legal materials

Secondary law was a non-binding legal material but explains the primary legal material derived from the opinions of experts or doctrines. The meaning of secondary materials in this study was the doctrine contained in books and legal journals.
3. Tertiary legal materials

Tertiary legal material was a legal material that supports primary legal materials and secondary legal materials by providing insight into other legal materials.

In legal research there are several approaches, with the approach the researchers got information from various aspects of the issues to be discussed. The approach was used in legal research was [4]:

1. Statute approach;
2. Case approach;
3. Historical Approach ;
4. Comparative approach (comparative approach)
5. Conceptual approach (conceptual approach).

The approach was used in this research was the approach of law (statute approach) and conceptual approach (conceptual approach).

3 DISCUSSION

3.1 Implementation of Legal Protection for Justice Seekers through State Administrative Court.

Legal protection for the people as seekers of justice against an adverse State Administration Decree basically stems from the concept of recognition and protection of human rights. State Administration Body or officer was a party having power to take action to achieve prosperity for all people. The Government was a party to the disputing power with the people as the governed party in an unequal position. Therefore, the State Administrative Court is aimed at providing legal protection for the people in conflict with the government so as to obtain justice in an equal position.

The State Administrative Court was one manifestation of the fulfillment of the rights of the people in dispute with the government, included as a form of guarantee to obtain justice when filing a lawsuit related to the state administrative decree issued by the state administrative officer [1]. State Administration intended in this case was a state administration that performs functions to administer a government or executive ruled, whether at the central or regional level, to implement it in accordance with applicable laws and regulations. The said party has the authority to make decisions which contain state administrative law actions based on concrete, individual, and final legislative regulations and cause consequences for a person

or a civil legal entity. The effect was sometimes contrary to the interests of the community so that then disputed.

The State Administrative Judiciary was an institution born at the time of development of the modern legal system has been developed based on the needs of modern legal system consisting of formal processes, in which formal processes together with the informal process form the fabric of procedures which were the heart of the law [5]. In the modern legal system, recognition of the protection of human rights has a sizeable portion and one of them is realized through the provision of legal protection for the people. Formal processes include bureaucracy, administration, transformation, and sub-systems that synergistically form a braid of the State Administrative Court system [6]. The main principle of the judiciary should be based on the principle of law that serves human beings so that the law is for human beings and not the other way around, therefore the justice seekers should not adapt to the judicial machinery even if the justice seeker must submit and follow the judicial system [7].

The justice seeker side, the State Administrative Court was a media that was expected to solve the problems [8]. From a procedural point of view, justice seekers want the State Administrative Court to be able to solve the problem quickly and through a less complicated process. Whereas from the substantial point of the justice seekers, the State [8] Administrative Court can create decision products that actually solve the problems and be able to provide a sense of justice for the public who lit with the state administrative officials. Justice in this case becomes very important because the people in the judiciary.

Legal protection for justice seekers conducted by the State Administrative Court cannot be separated from the principles of the State Administrative Court. The principles of the State Administrative Judicature are as follows [9]:

1. Principle of Presumption Rechtmatig, which implies that any act of the authorities shall always be deemed true until there was a denunciation, so that a State Administration Decision being sued shall not be the basis for delaying the implementation of the said defendant's decision;

2. The Free Proof Principle, meaning that the judge has the freedom to determine the things that must be proven, and the burden of proof and the evidentiary judgment; the principle was saw in article 107 of the State Administration Judicature law

3. Principle of Activity of Judge (*dominus litis),* the activeness of judges in this case was intended to offset the position of unlawful litigants, because the defendant was the Board or the State Administration Officer who controls the legislation relating to the authority or basis of the decision were sued, while the plaintiff does not necessarily possess the rules underlying the issuance of the decision;

4. The Principle of Judgment of Courts having Strength of Binding (*erga omnes*), this principle relates to a State Administration dispute which is a dispute in the realm of public law so that the legal consequences arising from the judges' judgment shall have legal force not only to the parties to the dispute ;

The four principles of the State Administrative Court are intended for legal protection of justice seekers. A justice seeker who filed a lawsuit over a State Administrative Decision in this case is entitled to legal protection and is treated equally in the eyes of the law even though the party sued was the State Administration Officer.

In this case, the public who filed the lawsuit should pay attention to some of the characteristics of government legal action in the field of public law as follows [10]:

1. The nature or characteristics of a State Administrative Decree (*beschikking)* shall always be deemed valid as long as it has not been proven otherwise, so in principle the State Administration Decree shall be immediately enforceable. In which case, the state

administration decision made must not be considered wrong before it was declared wrong, so it cannot postpone implementation declared wrong.

2. The principle of protection of public or public interest that stands out apart from the protection of the individual. This principle is intended to protect the interests of the common people broadly above individual interests;

3. The principle of self respect or self-obedience of the government apparatus against administrative judicial decisions. This principle relates to the implementation of the Decision of the State Administration in a voluntary and conscientious manner by the parties to the decision. This is related to the absence of coercive efforts in the State Administrative Court directly through a bailiff as well as civil law.

The lawsuit for the settlement of a State Administration dispute is a lawsuit concerning the validity or impropriety of a State Administrative Decision which causes a State Administrative dispute. In view of the lawsuit for the completion of the Decision of State Administration concerning the validity or impropriety of the State Administrative Decree, in fact for the settlement of the State Administration dispute does not recognize the existence of peace. Therefore, the possibility of peace among the parties litigating in the State Administration dispute can only be done outside the court. The facts then underlie the State Administrative Court will offer a dispute resolution by deliberation. The State Administrative Judiciary in this case shall seek a mediation step first and be offered to the parties in the State Administration dispute case so that the trial proceedings shall be the last attempt made if no agreement is reached through mediation between the litigants.

The authority possessed by the State Administrative Court was mentioned clearly in the provisions of the State Administration Judicature law. Article 47 of the law mentions that the State Administrative Court was responsible for examined, decided, and resolved state administrative disputes. The authority of the State Administrative Court was carried out for state administrative disputes. The authority of the State Administrative Judicature was carried out for a state administrative dispute at the first level. While the state administrative dispute was at the appeal level, the authority to examine and decide to be in the hands of the state administrative high court. The division was filed the existence of a relative authority of the State Administrative Court.

The State Administrative Court was authorized to examined, decided upon, and resolved a state administrative dispute involving the public with state administrative officials. In this case, the authority of the State Administrative Court did not include the authority to handle state administrative disputes that occur within the armed forces. A state administrative dispute within the armed forces the jurisdiction of the military court to solve it.

Implementation of the authority of the State Administrative Court was conducted to resolve disputes between the litigants, so that justice seekers who feel harmed on a state administrative decision may protect by their rights. In this case, the authority of the State Administrative Court shall only arrive at the judgment of the case which has filed lawsuit. Based on Law Number. 51 of 2009 on the State Administrative Court, it was mentioned in Article 97 paragraph 7 that the Decision of the State Administrative Court may a lawsuit rejected, a lawsuit was granted, a lawsuit was not accepted, or a lawsuit fell. The verdict was a form of implementation of the authority of the State Administrative Court to resolve the state administrative dispute among the parties to the dispute.The authority possessed by a judicial body was tried a case can be distinguished into two, namely the authority of a relative nature and authority that is absolute. First, relative authority was the jurisdiction of the courts to try cases in accordance with their jurisdiction. Second, the absolute authority was the jurisdiction of a court judged a case by the object, matter, or subject matter of the dispute. The state

administrative court as a court body also has two such powers. The relative authority of the State Administrative Court was described in Article 47 of the State Administration Judicature law, while the absolute authority of the State Administrative Court was based on the provisions of Article 1 point 10 of the law.Absolute, the Administration of State Administration Judicature was examined and judged two main points; there was state administrative dispute and civil service dispute. This is as regulated in Law Number. 5 of 1986 Article 1 point 10 that the state administrative dispute was a dispute arise in the field of state administration between a civil person or legal entity with a state administrative body or officer, both at the center and in the region, as a result of the issuance of the decisions of the state administration, including the civil service dispute based on the prevailing laws and regulations.

Regardless of the authority of the State Administrative Judiciary, not all powers to conduct the examination, termination of case or settlement of state administrative dispute was conducted by the State Administrative Court. There were special exceptions to a state administrative decision issued in certain situations that are not under the jurisdiction of the State Administrative Court. This matter was regulated in Article 49 of State Administration Judicature law. State administrative decisions issued in time of war, hazards, state of natural disasters, or extraordinarily dangerous circumstances shall not be the authority of the State Administrative Court to resolve disputes. In addition, state administrative decisions issued in urgent circumstances for public interest and taken under applicable laws and regulations were also outside the jurisdiction of the State Administrative Court to examine or to decide upon his/her dispute. The restriction was done because in the implementation of the state was not always an act of organizational state tools including administrative bestuur, but can also an action done by the state tool outside bestuur, but the tools of the state whose main duty to perform the functions of legislation and the judiciary was also authorized to issue a decision state Administration [11].

The object of a state administrative dispute was a state administrative decision issued by a state agency or administrative authority. The decisions referred to in this case ware decisions that negatively impact society or harm certain groups in society. However, in the case of a lawsuit against the Administrative Decree, there were several State Administrative Decisions which were an exception was sued in the State Administrative Court, as set forth in Article 2 of Law number 51 of 2009 concerning the second amendment to the law number 5 of 1986 follows:

  a) Decision of state administration which was a civil law act;
  b) Decision of state administration which was a general arrangement;
  c) State administrative decisions that still required approval;
  d) Decision of state administration was sued under the provisions of the criminal law code and the criminal procedure code of criminal law or other laws of criminal law;
  e) Decision of state administration issued on the basis of the results of the examination of the judiciary in accordance with applicable laws and regulations;
  f) Decision of the state administration concerning the administration of the national state of Indonesia;
  g) The decision of the election commission was viewed or in the region regarding the results of the general election.

3.2 Steps that can be taken so that the Legal Protection of the Seeker can be binding

The existence of state administrative courts in various modern countries, especially countries followed to welfare state was a milestone that became the foundation of the hope of society or citizens to defend their rights that were harmed by public legal acts of the agency or state administration officials because the decision issued.

Decisions gave at the last level by the court other than the Supreme Court may request by appeal to the Supreme Court. The cassation in this case was not meant to constitute the Supreme Court as a third-level court because the Supreme Court only conducts judgments on judicial jurisdiction and errors in procedural law, and in principle did not repeat the facts or incident (judex juris), in it was development, the Supreme Court as a cassation judiciary institution also casuistically domiciled as a judex juris institution as well as judex factie.

The examination of cassation was done by the Supreme Court as judex juris was due to the examination and verification of facts or incidents and the application of the law has done by the court of first instance and has reviewed at the appeal level. In its development, the cassation was used as a means to test a verdict of the first instance at the appellate level, not only limited to the application of the law but also to the written regulations of the unwritten law. Therefore, through the Supreme Court Supreme Court can arrange, guide and develop the law through jurisprudence, so that it can adapt the law to fit the development of society and especially the contextual interpretation of the laws and regulations when deemed inadequate or less able and out of touch with the motion of life dynamics socially, when there was a request for a cassation against a decision of the State Administrative Court accepted by the Supreme Court, then it means that the ruling may be annulled by the Supreme Court.

The Supreme Court recognizes that fair and transparent courts were established in order to bring about a quality judiciary. to achieve this, judges and judicial authorities must had adequate integrity, knowledge and skills.

To provide legal protection to justice seekers in order to be binding, the following steps may be taken:

1. Socialization to the public regarding the competence of the State Administrative Court and the supervision of the community against the decision;
2. Efforts that can be made to increase public understanding of the authority possessed by the State Administrative Court in this case were through broad socialization. Socialization can be done either from the State Administrative Court or from the Regional Personnel Agency
3. Require activeness from the litigant community to oversee the execution of the decision;
4. The activeness of the public who participate in the supervision of the implementation process of the judgment of the Administrative Court is necessary because the State Administrative Court only has authority to arrive at the decision of the case. as known, the Administrative Court does not have the executor of the judge's verdict because the executor on the State Administrative Court was the party subject to the verdict.
5. Inherent Control by Public Officials for Decisions Addressed to State Administration Officials;
6. For the State Administrative Officer subject to the decision by the Administrative Court of the State Administrative Court issued, the superior of the officer subject to the decision shall also provide supervision in order that the execution of the judgment can be made quickly and optimally.

7. Implementation of Strict Sanctions In accordance with the provisions of the Laws and Regulations;

8. Implementation of sanctions for State Administration Officials who did not implement the decision has been regulated in Law Number 51 Year 2009 concerning State Administrative Court Article 116 paragraph (4) stating that "In the case of a defendant was unwilling to carry out a court decision which has had permanent legal force, concerned shall be liable to force of forced payment and / or administrative sanctions. Furthermore, Article 116 paragraph (5) of the State Administrative Justice Act states that "For officers who do not carry out court decisions, it shall be announced to the printed local media by the clerk from the non-fulfillment of such provisions".

9. Reporting from Administration Officials on the Implementation of Decisions Reported to the Administrative Court;

The reporting mechanism referred to in this case was the reporting of officials who are subject to verdict to the Administrative Court. The State Administration Officer subject to the decision shall be required to provide a report on the execution of the decision to the Administrative Court. Reports on the State Administrative Court in this case may serve as a means of control of an official subject to a ruling by the Administrative Court.

4 CONCLUSIONS

Based on the things that had been mentioned above, then the conclusions of research that can be taken is as follows:

1. Legal protection granted by the State Administrative Court can be realized if there was a good will from the Board or the State Administration Officer itself, because the process of execution of the verdict was directly in the hands of the party subject to the decision in this case the Board or the State Administration Officer.

2. The steps taken to make legal protection for justice seekers more binding, namely:
   a. Socialization to the public about the competence of the Administrative Court and the supervision of the community against the decision;
   b. Require activeness from the litigation community to oversee the execution of the decision;
   c. Supervision was attached by a public official to a decision directed to the State Administrative Officer;
   d. Adoption of strict sanctions in accordance with the provisions of legislation; Reporting from administrative officials on the execution of decisions reported to the State Administration Court.

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Developing Halal Tourism (Syari'ah): Investigating The Role Of Intellectual Capital, Organizational Citizenship Behavior, And Spiritual Capital

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Abstract. This research aims to test and analyze the role of intellectual capital, spiritual capital and OCB in improving organizational performance at the Tourism Office of Banda Aceh. A survey which uses multiple regressions as the data analysis method is applied. The respondents consist of 75 employees of Aceh Tourism Department and convenience sampling is utilised. This study finds that the role of IC, SpC and OCB in influencing organizational performance are proved to be positive and significant. Simultaneously, the influence of IC, SpC and OCB are able to explain and influence the organizational performance variable (73.3%). Hence, Banda Aceh Tourism Department should focus on building organizational resources, providing various skills and implementing reward systems for outstanding employees. Realizing and reinforcing Islamic organizational culture as the basis for of employee behavour and identity. Establish cooperation between agencies related to the development of sharia tourism in Banda Aceh. The achievement of performance for non-profit organizations is not assessed by how much profit the company generates but rather on how the community feels satisfied with the services and pro-people policies given by the organization.

Keywords: Islamic Tourism, Intellectual Capital, Spiritual Capital, OCB, Organizational Performance

1 Introduction

Today, Islamic economics is an important element in the development of global economy. In Islamic Economics, at leastthere are 7 important sectors that continue to grow, namely the culinary sector, finance and Islamic banking, insurance industry, fashion, cosmetics, pharmaceutical, entertainment, and tourism, all of which carry the concept of halal in each of its products. Discussing about the definition of the concept of halal then what will come to mind of public in general is the product of cosmetics, drugs and food drinks that contain no alcohol andother "haram" raw materials. Nowaday, an evolution in the halal industry to

financial products (such as banking, insurance, etc.) and lifestyle products (travel, hospitals, recreation and medicine) is salient. One sector of Islamic economic growth is experiencing rapid growth is the tourism sector of sharia. Sharia tourism is different from religious tourism which is generally understood byIndonesian as visiting the graves of ulama (religious figures), mosques, and other sites of Islamic relics. Sharia tourism has a broader range of cultural, natural, culinary, cosmetic and spa (beauty) tours, shopping, travel and more.

The rapid growth of world population is the reason for the rapid growth of sharia tourist trends in various parts of the world. According to a research note by the [1], the Muslim population in 2010 was 1.599 billion or 23.2 percent of the world's population and estimated by 2050 the world's Muslim population will be accounted for 2.761 billion or 29.7 percent of the world's total population. The growth of population from 2010 to 2050 has grown to 1.161 billion people. The population of Muslim is the secondto the Christian population of 2.168 billion in 2010 or 31.4 percent of the total world population, while the increase in the number of Christian population up to 2050 is only 749 million. Table 1 belowindicates the growth of Muslim population of the world compared to other residents

Table 1. Number and Prediction of Population Growth by Majority Religion Group in the World Year 2010 – 2050

	2010 POPULATION	%OF WORLD POPULATION IN 2010	PROJECTED 2050 POPULATION	%OF WORLD POPULATION IN 2050	POPULATION GROWTH 2010 – 2050
Christians	2.168.330.000	31,4	2.918.070.000	31,4	749.740.000
Muslims	**1.599.700.000**	**23,2**	**2.761.480.000**	**29,7**	**1.161.780.000**
Unaffiliated	1.131.150.000	16,4	1.230.340.000	13,2	99.190.000
Hindus	1.032.210.000	15,0	1.384.360.000	14,9	352.140.000
Buddists	487.760.000	7,1	486.270.000	5,2	-1.490.000
Folk religions	404.690.000	5,9	449.140.000	4,8	44.450.000
Other religions	58.150.000	0,8	61.450.000	0,7	3.300.000
Jaws	13.860.000	0,2	16.090.000	0,2	2.230.000
World total	**6.895.850.000**	**100,0**	**9.307.190.000**	**100,0**	**2.411.340.000**

Source: world religions' future: Projection of population growth 2010-2050 (PEW research centre, 2015)

Additionally, according to [2] publication data from 55 countries in the Global Islamic Economy Report 2016 - 2017, the total world Muslim expenditure in the halal food and beverage sector in 2015 reached US $ 1.173 billion or equal to 16.6 percent of food expenditure and drink the world's population. This expenditure will reach US $ 1.914 trillion or 18.3 percent of global food and beverage expenditure by 2021. In travel sector 2015, the Muslims worldwide spend about US $ 151 billion for travel or about 11.2 percent of global spending. It is estimated that the number will continue to increase to US $ 243 billion or 12.3 percent of global travel sector expenditure in 2021 (excluding Hajj and Umrah). In the fashion sector, Muslim worlds spend aboutUS $ 243 billion or 11 percent of global spending by 2015 and this number is expected to reach US $ 368 billion by 2021 [2]. Based on these data, the magnitude of the World Muslim market potential is certainly very tempting for the tourism business both the global business as well as Indonesia.

The tourism industry poses a significant role in the government development program in region. Several regions in Indonesia define the tourism sector as a major focus in increasing local revenue and income sources for the people. Sharia tourism activities have become an industry with a rapid growth not only in Indonesia but also in the world. Aceh province which implements Islamic law in social governance and social sytem, views that the current sharia tourism has a great potential to be developed in Aceh. Along with the hope of a superior Islamic tourism, it will beable to provide economic benefits both to the Government of Aceh and its people.

To become one of the main Sharia Destination (DTW) in Indonesia, through the Tourism Department, Banda Aceh should be able to rearrange its program. Rearranging by providing convenience element through its policy / regulation, provision of tourism infrastructure and non-infrastructure. Non infrastructure defined as the Human Resources (employees) readiness. Sincethrough employees who have intellectual capital, motivation, skills, commitment, morale, and responsibility to the task, it will create an organizational atmosphere that supports the mission and organizational goals which is making Banda Aceh as the leading DTW sharia in Indonesia.

Ministry of Tourism and Creative Economy of Indonesia which acts as a locomotive (responsible) of the main development of Islamic tourism in Indonesia, has prepared various strategies to promote sharia tourism in Indonesia. With the preparation of strategic steps to accelerate the development of Islamic tourism such as formulating promotional strategies, regulation, building standardized infrastructure, carrying out socialization and education. However, among the various strategies formulated by the Ministry of Tourism and Creative Economy to promote sharia tourism in Indonesia, the readiness of Human Resource (HR) which acts the perpetrator of Islamic tourism, yet still defined as an aspect that is not less important to note. Without human resources as a source of intellectual capital (intellectual capital) excel in the organization, it will be difficult for sharia tourism to grow in Indonesia.

The intellectual capital factor is crucial to the progress of modern organizations today. Different from profit-based organizations that require intellectual capital to maximize performance through the achievement of corporate profit targets; a non-profit organizations such as government agencies are also required to have maximum performance. Yet the measure of organizational performance is not judged by corporate profits, but rather from productivity, effectiveness, service quality, and accountability [3].

The development of Islamic tourism in Indonesia cannot be separated from the importance of the role of human resource factor (intellectual capital) that works in tourism offices throughout Indonesia as an organizational resource. The tourism office in the region / province under the command of the Ministry of Tourism (KEMENPAR) RI, is responsible for the development and implementation of tourism in the relevant region / province. The issuance of pro-tourist regulations, tourism stakeholders and the formulation of appropriate targeted promotional strategies is a heavy responsibility to be undertaken by the tourism office. Without the support of qualified intellectual capital, it is difficult for sharia tourism in the region / province to grow.

In addition to the intellectual aspects of employees who are able to determine the success of an organization, there are other aspects that affect employees in behaving towards the organization, namely spirituality (spiritual capital) and OCB. [4] explain that the intrinsic values of spirituality can control how an employee behaves in certain situations. Even the value of spirituality that employees have will motivate employee behavior and enable to contribute more both to the organization and to society [5]. OCB's role is also crucial since employees with OCB properties will improve organizational efficiency and effectiveness[6]–

[8]. Thereforethefocus of the research is to examine and analyze the role of intellectual capital, spiritual capital and OCB in improving organizational performance at the Tourism Office of Banda Aceh.

2 Literatur review

2.1 Intelectual Capital (IC)

In the [9], it is explained that intellectual capital is essentially a collection and synergy of knowledge, experience, invention, innovation, market share and community that can impact on a company's performance. IC is the ownership of knowledge, organizational technology, applied experience, professional skills and customer relationships which act as a competitive advantage for a company. IC plays an important role as an entity that includes knowledge, experience, invention, innovation, market and community share that can impact a company's performance [10]. According to [11], IC is the brain and the future of every company. The IC consists of knowledge that increases the value of a company such as; management, technology, consumer and supplier skills, patents, and processes. IC has three main components namely structural capital, human capital, and relational capital [12], [13].

2.2 Human Capital (HC)

Alipour (2012, in [14] defines HC as a resource or asset that assigns value to a company. HC plays a key role in promoting the dynamics of value creation of products and services offered by companies as well as good customer relationships. In line with the conceptKhalique *et al* (2015) argues that HC is the most important variable of IC that includes knowledge, education, skills and loyalty to the organization and motivation of employees, and is very vital for business organizations[16]. [17] argues that HC reflects the factors of employee experience, intelligence, training, relationships among all stakeholders within the company.

2.3 Structural Capital (SC)

SC consists of intangible assets as well as technological infrastructure whichintermediates the flow of knowledge in order to excel the operational efficiency of the company [18]. [12] explains that SC is a concept that includes the structure and mechanism of an organization. SC consists of many components, among others; databases, organizational culture, information systems,copyrights, patents, trademarks, innovation, teamwork, orientation of quality transfer of knowledge and others. SC plays as a mechanism and structure that helps to achieve the fulfillment of employee duties to the optimum point of intellectual performance and to overall company performance.

2.4 Relational Capital (SC)

RC is defined as a value that is formed from relationship that the company built to its consumer and marketing channels (Ariawan et al, 2016). RC is a knowledge that comes from its relationships with the company's stakeholders. RC is established through maintaining and developing high-quality relationships between organizations, individuals and groups since

they can pose a prominent effect on the viability of a company (Mondal&Ghosh, 2012 in Obeidat et al, 2017).

2.5 Spiritual Capital (SpC)

The fact that spiritual capital (SpC) is acrucial factor in understanding each aspect of life in terms of individual beliefs as well as behavior whichhas a profound impact on the economic, social and political activities of society (Palmer and Wong, 2013). Some researchers explainSpC as a group or individual capacity generated through a process of intrinsic values affirmation such as spirituality, which can control on how a person acts in certain situations [4]. Baker & Smith (2010) also explains that SpC is a valuable value as well as a vision of the future and can motivate individuals to contribute to society. The concept of SpC has been absorbed in many fields of science and one of them is management and leadership. It is mentionedthat SpC is implemented through the application of the spiritual intelligence that employees or individuals have to the organizational level (Zohar & Marshall, 2004 in [4]). According to Farsani et al. (2013) in[19], SpC and employee character are elements that play a key role in an organization's success.

Considering from the influence of SpC on the performance of the company, SpC is considered vital for employees and organizations since it is able to influence how employees of a company carry out its duties and how the company generates the desired profit. [20] argues that SpC is a growing company asset within its individual employees. It will be more useful when it is not manipulated by the company. SpC should be viewed as an independent asset in order to get the desired company performance. Spirituality in work not only creates a feeling of unity among employees, but also the feeling that employees are part of the organization.

2.6 Organizational Citizenship Behaviour (OCB)

OCB behavior is a form of human nature as a social being and mutual help [21]. According to [22] OCB is a form of voluntary individual behavior (employees), beneficial to the organization, does not expect to be recognized by the organization, and is spontaneous [23]. So it can be understood that OCB is a behavior that has the criteria; a) is not an official employee job descriptions [24], b) not mandatory, c) will not be rewarded by corporate rewards systems, and d) essential to organizational performance success [25]. Furthermore, Applebaum et al. (2004 in [26], defines OCB as a set of behaviors that are not official duties of an employee, but by the tasks and functions of the organization carried out effectively and to improve performance.

According to [6], if a company where employees tend to have OCB behavior, then it will improve the efficiency and effectiveness of the company. It is because employees are voluntarily willing to provide above average work [22]. Some examples of OCB include; willingness to work with colleagues, doing extra tasks without complaint, helping others, using time efficiently, maintaining corporate resources, sharing ideas and representing organizations positively [27]. Based on the amount of benefits the company will gain from OCB, the company's management should be able to motivate its employees to behave in an OCB by creating a conducive and supportive work environment or even a special reward system for employees with OCB [28]. OCB can be categorized into 7 types (Podsakoff*et al.,* 2000 in [29]: (1) help-oriented behaviors, (2) sportsmanship, (3) individual growth, (4) organizational commitment, (5) individual innovativeness, (6) civic virtue, (7) self-satisfaction.

2.7 Organizational Performance

In many studies, organizational performance has always become an subject to be researched as well as acts as a dependent variable, and has become a very common study [30], [31]. The scope of the discussion on organizational performance typically includes financial factors, physical assets, employees, and other organizational assets that companies use [17].In many modern studies, organizational performance is always defined as the company's ability to generate financial performance (profit) of a company [13], such as return on investment (ROI), return on assets (ROA),return on equity (ROE) and etc. While Ling and Hong (2010, in [13]believe that company performance is the overall achievement of all organizational units involved in achieving organizational goals (vision-mission). From this understanding, it can be seen that the organization's performance shows the extent to which the level of achievement of the taskswithin an organization, an effort to realize its aims, mission, as well as vision of the organization.

The performance of the organization in many studies was measured using financial performance indicators [32]–[34], indicators of balance score cards (Kaplan and Norton, 1982 in [35]and sucess dimension [35] and Dvir, 1996 in [35]. While in research [36], non-profit organization performance is measured using quality of working environment; donations; increased rate of beneficiaries/funders; increased rate of volunteers; increased rate of members, level of competence of collaborators, and degree of perceived social image. In [35], organizational performance was measured using 5 indicators, namely financial, customer / market, process, people development, and future, which include:

- Financial defined as a financial indicator such as profits, return on investment,sales figures, return on assets, return on equity, etc.;
- Customer / market defined as a relationsip formedbetween the company and its customers. Companies that strive to meet every customer's needs and desires in product design, strive to provide customer satisfaction through excellent service and products;
- Process defined as the company's achievement of efficiency in its operational process and production (TQM), learning organization, team cohesiveness, etc.;
- People development defined as an indicator of organizational success due to employee training programs, employee development, employee commitment, and leadership roles;
- Future defined as an organization's planning on current issues such as strategic planning, an analysis for any changes in the business environment,partnership planning and partnerships, and investment in new markets / segments and investments in technology.

2.8 IC Relationship on Organizational Performance

Researches examining IC relationships on organizational performance have been widely used [9], [13], [16], [37]–[39]. Other studies more specifically found that the IC components consisting of HC, SC, and RC, positively impacted the company's performance [10], [40].

The results of [10] revealed that there is a significant influence between IC on company performance, in addition to positive and significant relation on company performance, even HC and SC also act as a moderating variable. [40] found that three IC dimensions improve organizational performance on a number of companies that become object in their research, [40] also explained that confidence is the determining factor in developing the dimensions of IC, namely HC, SC, and RC. While [41] revealed that the IC has a significant and positive effect on the performance of the company, where the relational capital component becomes the main predictor of performance.

Hypothesis 1: IC has a positive and significant effect on organizational performance

2.9 SpC Relationship on Organizational Performance

Research on the relationship between SpC on organizational performance undertaken by [14] and [42] indicated that SpC variable has a positive and significant effect on organizational performance. [19] in their research on the influence of SpC on organizational performance found that SpC has a positive impact on corporate financial performance. Similar research by [20] also states that SpC has a positive influence on performance of a company since SpC is considered as a form of intelligence that can give strength to employees.
Hypothesis 2: SpC has a positive and significant effect on organizational performance.

2.10 OCB Relationship on Organizational Performance

OCB acts as a mediator on [27], but in [43]OCB's role as mediator is not proven, but OCB is vital in improving the service performance of public organizations. This study examines the relationship between trust in organizations on employee productivity, with OCB as a mediating veriabel. In the research of [6] and [26], the OCB is pivotal in improving organizational performance, in which the OCB business of employees is able to increase corporate profits and increase customer satisfaction and loyalty. In [44] study also revealed the result that OCB poses a significant and positive effect on organizational performance. While the [45] study showed that OCB is able to improve hospital performance, and also improve the company's image.
Hypothesis 3: OCB has a positive and significant effect on organizational performance.

Table 2. Tabel 2. Validity Test

Construct	Pearson Correlation									df = 73
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**P = 0,05**
Intellectual Capital	,688	,745	,780	,715	,470	,280	,686	,570	-	**r table 0,227**
Spiritual Capital	,516	,448	,581	,514	,593	,532	,370	,548		
OCB	,396	,532	,584	,610	,524	,659	,543	,528	-	
Organization Performance	,593	,648	,509	,579	,691	,380	,511	,502	,563	

3 Methods

This type of research is confirmatory with survey method. Using a questionnaire (Likert Scale), Data collected at Banda Aceh Tourism Office, which was addressed to employees who worked at the City of Banda Aceh Tourism Office. Convenience sampling tehnique is utilisied. The data will be tested for validity using pearson correlation where kuesioenr data is

said valid if value of pearson correlation > r table (0,227), while reliability testing using cronbach's alpha (CR> 0,70). Multiple regressionsis used as the data analysis (t-test and F-test).

Measurement of variable intellectual capital using indicators of skills, knowledge & expertise, attitude and intellectual agility, infrastructure and systems, policies and procedures, customer satisfaction & loyalty; the measurement of spiritual capital variable uses indicators of knowledge of religious, ethical values [15]. Measurements of OCB variables use sportmanship indicators, civic virtue, conscientiousness, and altruism [6]. While the variable organization performance using indicators customer / market, process, people development, and future [35].

4 Result

From the questionnaire results obtained demographic data of respondents, where it is known that male respondents amounted to 36 people (48%), while female respondents amounted to 39 people (52%). Employees who work at the City of Banda Aceh Tourism Office have a majority of 35-39 year olds (32%), with a majority of over 6 years (24%).

Table 2 shows the test results of the validity of the research questionnaire, where the item questionnaire is considered valid if it has a pearson correlation > r table (0.227).

The test results of 33 questionnaires indicate that the whole item of the questionnaire has been valid.

While testing the questionnaire, the reliability can be known from Table III. Research variables are said to have good reliability if it has a value of cronbach's alpha greater than 0.70. In the spiritual variable capital the value of cronbach's alpha is 0.600 and in the OCB variable the cronbach's alpha value is 0.658 (< 0.70), but the value of 0.6 is still acceptable (Hair et al., 2006, p 102). So in this study all research variables have good reliability.

Table 3. Scale Reliability

Construct	Cronbach's Alpha
Intellectual Capital	0,773
Spiritual Capital	0,600
OCB	0,658
Organization Performance	0,707

Hypothesis testing in this research use multiple regression method. This method is used to test and explain the causal relationship between research variables shown in the series of path analysis model [46]. From the analysis of multiple regression, the results obtained in Table IV show that all hypotheses are supported positively and significantly (sig < 0,05).

Table 4. Hypothesis Testing

Construct	Sig	Correlations	F test	R Square
Intellectual Capital	0,000	0,824	65,091 Sig=	0,733
Spiritual Capital	0,027	0,688	0,000	

OCB	0,049	0,459

Table IV shows the results of hypothesis testing, where the relationship of IC effect on organizational performance proved to have positive and significant relation, ie significant value 0,000 <0.05 (H1 accepted). In relation of influence of SpC to organizational performance also significant, significant value 0,027 <0,05 (H2 accepted).

While the hypothesis that there is influence between OCB on organizational performance also proved significant, ie significant value 0.049 < 0.05 (H3 accepted). The simultaneous effect test between independent variable to dependent variable is shown through F-test. Where it is known that simultaneously there is influence of IC, SpC and OCB to organizational performance (F test = 65,091 < F table = 2,73). Then the square R square is 0.733, which means that as much as 73.3% variations of IC, SpC and OCB are able to explain and influence organizational performance variables, while as much as 26.7% is explained by other variables outside the model.

5 Discussion

The development of the modernization of the world has brought about rapid changes in the economic field. The world's economic development requires businesses to adapt competitive strategies to win global competition and survive in industrial environments. [17] explains that corporate resources are a set of factors owned by a company consisting of tangible assets (such as machinery and equipment) as well as intangible assets (employees). [47] on resource-based view provides an understanding that with the uniqueness of resources it will produce superior performance in competing, and if managed well then the company will be able to achieve sustainable competitive advantage. Companies must able to control the strategic resources of both tangible and intangible organizations. The role of an intangible resource plays a more crucial role for the company since the intangible assets (organizational resources) that are valuable, loyal, and not easily replaced and replicated are the keys to the company in winning the industry competition.

Intellectual capital as an organizational resource plays a pivotal role in improving the company's performance as well as becomes the primary source of competitive advantage over competitors. According to [10] the most important resource that a company should have in order to be able to perform well is not to tangible assets such as buildings, machinery and buildings, but most importantly, intangible assets are intellectual capital. Especially for non-profit organizations such as the Banda Aceh City Tourism Office, organizational performance is not viewed through how much profit the company generates, how the community feels satisfied with the performance of the policies and good service to the community, this intellectual capital's role becomes very crucial [3].

In this study the overall hypothesis proved positive and statistically significant, meaning that there is the influence of IC, SpC, and OCB on organizational performance at the Tourism Department of Banda Aceh City. This study proves and reinforces the findings of previous researchers who expressed the magnitude of IC's role to organizational performance [10], [12], [15], [37], [40]. The result also support the findings of previous researchers who reveals the role of SpC in organizational performance [14], [19], [20], [42]. It also support previous research hasol that proves if OCB has a positive and significant effect on organizational performance [6], [26], [27], [43], [44].

The interesting thing was found in this research that IC proved very dominant influence organizational performance. The correlation coefficient of IC (0.824) shows that 82.4% of variabel IC is capable of influencing organizational performance. According to [47] and [10], the role of IC as an intangible asset is important as it capable to provide a competitive advantage for the organization. In this study also reveals the great role of SpC in influencing organizational performance. This can be proved by looking at the correlation coefficient SpC (0.688), which shows as much as 68.8% organizational performance variables explained by SpC variables. The role of SpC in the Tourism Office of Banda Aceh City revealed that employees at the Tourism Department already have the spirit of spirituality in work. Working is considered as worship and full of sincerity. Researchers argue that this culture of spirituality is in line with the spirit of Islamic Sharia applied in Aceh, where all government and private institutions should uphold and support the enforcement of sharia.

According [14] SpC owned organization to be able to play a role in keeping every element of the organization in working / acting in accordance with legal corridors and ethics. SpC-owned organizations are also able to provide honesty motivation for individual organizations in the work. Similar opinion was also expressed by [4], that spiritual capital is also proven to have a significant effect on organizational progress, in which the intrinsic values of spirituality can control how employees behave in certain situations, and even the value of spirituality they possess employees will motivate employee behavior to contribute more both to the organization and to the community. Spirituality of employees gives influence to the way employees work, both in the attitude and behaviorof [5].

Besides the crucial role of intellectual capital and spiritual capital as the driving force of the organization, the role of OCB is also crucial in achieving the maximum performance of an organization. The results of this study also proves that OCB is capable of affecting organizational performance by 45.9% (correlation coefficient 0.459), if a company has employees who behave OCB, then the organization will be able to improve the efficiency and operational effectiveness of the company [6]. Employees at the Banda Aceh City Tourism Office who have an OCB attitude will tend to have an attitude of willingness to work with colleagues as a team, willing to do extra duties without complaining, helping others, using time efficiently, maintaining company resources, building organizations [27]. Finally, the attitude of OCB owned by the employees of the City of Banda Aceh Tourism Office will create an organizational atmosphere that supports the achievement of the vision and mission of organizational goals, which makes Banda Aceh as one of the leading Sharia Destination Destination in Indonesia.

6 conclutions

The organization's performance at the Banda Aceh Tourism Office is influenced by the role of IC, SpC and OCB. However, IC has the most dominant role of all independent variables in influencing organizational performance. With the existence of superior intellectual capital dilimiki by Tourism Department of Banda Aceh, is expected to be able to boost sharia tourism, and make Aceh as one of the leading tourist destination (DTW) in Indonesia.

Limitations of this study are Firstly, the limited number of samples studied, with very homogenous sample characteristics. So the result of the study only has a very narrow coverage of the Tourism Department of Banda Aceh City. Second, the absence of testing the role of

mediation of OCB variables, which in many OCB studies often acts as a mediating variable of the influence of IC on organizational performance [27], [43].

The results of this study indicate the role of intellectual capital and spiritual capital in realizing the achievement of optimal organizational performance. Therefore, the policy implications recommended to the Tourism Office of Banda Aceh are (1) focus on building organizational resources, by providing various skills training, and applying reward system to achievers. (2) Realizing and reinforcing Islamic organizational culture (Sharia) as the basis for behave and identity for employees. (3) Establish cooperation (MOU) between institutions / Dinas / CSOs related to the development of sharia tourism Banda Aceh, as well as the form of participation of the community (stakeholder) in developing sharia tourism in Banda Aceh. This is important to make the community (stakeholder) have a sense of ownership and willing to keep the continuity of sharia tourism to continue as a source of revenue areas and people of Banda Aceh City.

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ERP System Success Analysis Based on SAP Applications Using Success System Information Model: Case Study PT. Adelphi Transasia Indonesia

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Abstract. This study aims to analyze the successful application of ERP systems based on SAP Applications in PT. Adelphi TransAsia Indonesia using the successmodel of DeLone & McLean information system consisting of system quality,information quality, service quality, user satisfaction, and net benefits. Dataretrieval in this study was conducted through questionnaires distributed to allemployees who in the process of working connected or using SAP applications. The analytical method used in this research is structural equation modeling usingSmart PLS Application Version 3.2.6. The conclusion of this research is Quality of System have positive and significant influence to User Satisfaction; Information Quality has positive but not significant effect to User Satisfaction; Service Quality has negative and insignificant effect to User Satisfaction and User Satisfaction has positive and significant impact to Net Benefit.

Keywords: ERP systems based on SAP Application, success model information system, structural equation modelling.

1 Introduction

The rapid development of information technology makes the company make changes in information system strategy. The company made changes not only to increase profit but also to synergize information on every division within the company. Information that has been well synergized can help decision makers in making decisions effectively and efficiently so that companies can compete with a competitor company.

One well-known concept that is a system that integrates the processes of each division within the company in a transparency and has a fairly high accountability that is the concept of Enterprise Resource Planning (ERP) [1]. While the definition of the concept of ERP is an information system intended for manufacturing companies and services that play a role to integrate and automate business processes related to aspects of operations, production and distribution in the company concern [7]. ERP concept is an integrated information system technology and used by world-class manufacturers in improving company performance. ERP concept is a system, either as a planning system, or as an information system [6].

PT. Adelphi TransAsia Indonesia is a manufacturing company engaged in food and beverages. As a company that still proceed to progress and develop PT. Adelphi TransAsia Indonesia realizes the importance of an information system for business advancement in order to achievecompetitive advantage. And to support it since 2015 PT. Adelphi TransAsia

Indonesia has implemented the Enterprise Resources Planning (ERP) concept by applying System Application and Product in Data Processing (SAP).

- What factors affect the successful application of SAP-based ERP application system at PT. Adelphi TransAsia Indonesia?
- Does the application of SAP-based ERP System provide satisfaction and support employee performance?
- Does the application of SAP-based ERP System have a positive impact on the effectiveness and efficiency of the company's business?

This research was conducted at Head Office and Factory PT. Adelphi TransAsia Indonesia located in Cikupa, Banten in all company divisions integrated with ERP system based on SAP application applied by company.

a. To test the effect of quality of SAP-based ERP system in PT Adelphi TransAsia Indonesia to user satisfaction SAP Application of PT Adelphi TransAsia Indonesia.
b. To test the effect of quality of ERP information based on SAP application in PT Adelphi TransAsia Indonesia to user satisfaction of SAP Application of PT Adelphi TransAsia Indonesia.
c. To examine the effect of the quality of ERP services based on SAP applications in PT Adelphi TransAsia Indonesia towards user satisfaction SAP Application PT Adelphi TransAsia Indonesia.
d. To examine the effect of SAP application-based ERP user satisfaction in PT Adelphi TransAsia Indonesia on the net benefits of SAP Application PT Adelphi TransAsia Indonesia.
e. In the framework of preparing the thesis for the writer as one of the requirements to obtain a Master degree of Management Postgraduate Program Budi Luhur University Jakarta.

Measurement Success Model of DeLone and McLean Information Systems. This study uses the successful model of the success of information systems that have been updated. The updated things are as follows: [3]

a. Adding service quality dimensions in addition to the existing quality dimensions.
b. Combining individual impacts and organizational impacts into one variable is net benefits.
c. Adds an intention to use dimension as an alternative to usage dimensions.

With the addition of several variables to the model, the updated DeLone and McLean model (2003) appears as follows:
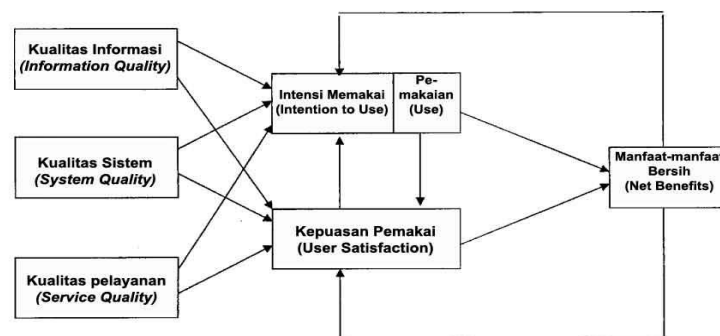
Fig. 1. Model DeLone & McLean (2003).

In this study, do not use all the variables mentioned in fig.1. Of the six variables, five variables are taken, namely System Quality, Information Quality, Service Quality, User Satisfaction and Net Benefits [8]. The author does not include Intention to Use because the application of this SAP system is a necessity and not on the basis of desire [2].

The study used variables adapted from the DeLone and McLean models of system quality, information quality, service quality, user satisfaction, and net benefits [4].

Table 1. Research Variables.

No	Variable		Indicator
1	System Quality (SQ) X1	1. 2. 3. 4.	Reliability Usability Ability to work together Response time
2	Information Quality (IQ) X2	1. 2. 3. 4.	Relevant Accurate On time Complete
3	Service Quality (SQ) X3	1. 2. 3.	Reliability Responsiveness Assurance
4	User Satisfaction (US) Y1	1. 2. 3.	Efficient Effective Satisfaction
5	Net Benefit (NB) Y2	1. 2. 3.	Cost savings Quality Improvement Competitive Advantage

Source: Fendini, Kertahadi, & Riyadi, 2013; DeLone & McLean, 2003

Based on the descriptions in the sub-chapter of model development above, the following hypotheses can be assembled:

H1: Quality of SAP-based ERP System has positive effect on User Satisfaction.

H2: Quality of ERP Information based on SAP application has a positive effect on User Satisfaction.

H3: Quality of ERP Service based on SAP application has a positive effect on User Satisfaction.

H4: User SAP-based ERP application satisfaction positively affects Net Benefit.

2 Research Methodology

This research is causal explanatory relationship in the form of survey which aim to know the pattern of causal relationship between variable of System Quality, Quality of Information, and Quality of Service. Causal explanatory research can be said as testing the hypothesis testing the causal relationships among the variables studied. This study contains a proof that is built through the theory with the approach of Information Systems Success Model [3]. Data collection technique used in this research are Field research with a direct review on the employees of PT. Adelphi Trans Asia Indonesia as respondent to obtain primary data and library research with literature study to obtain useful secondary data as theoretical guidance

during field research, and to support and analyze data. This data is obtained from compulsory books, scientific journals, and auxiliary books. The location of this research is located at the factory and head office of PT. Adelphi TransAsia Indonesia Jl. Bumimas VIII No.2, Cikupamas Industrial Area, Tangerang Regency, Banten. The study schedulewill be conducted within months ranging from March to July 2017.

Design Analysis and Hypothesis Testing. The validity test shows the extent to which a measuring instrument measures the construct to be measured. The homogeneity test was performed to test the validity analysis. To measure the validity of the construct can be identified through its loading factor value. Requirements for data to be valid if significant loading factor. Since significant loading factors may still be low in value, the standardized loading estimate should be equal to 0.50 or more and ideally should be 0.70 [5]. Testing of the reliability of data can be done by analyzing the value of Variance Extracted (AVE) and Construct Reliability (CR). According to Ghozali (2014), the data criteria are called reliable if the AVE value is equal to or above 0.50 and the CR value is equal to or above 0.70.

3 Results And Discussion

Structural model analysis is done with three stages, namely: analysis of measurement model (Outer Model), structural model analysis (Inner Model), and Hypothesis Testing.
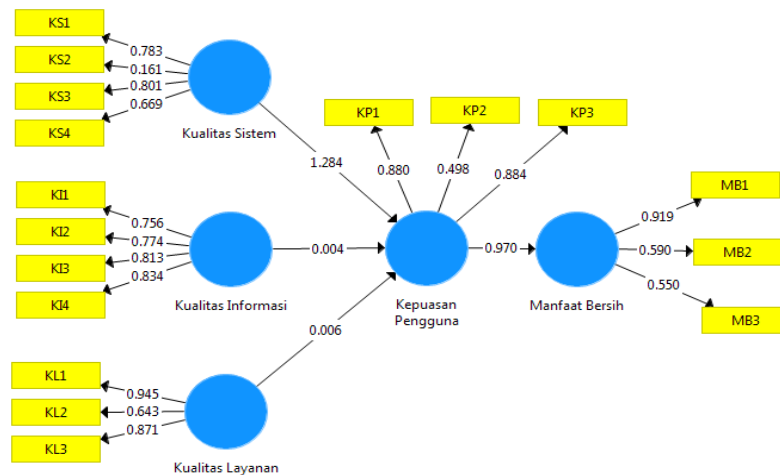
Fig. 2. Output Analisis Weighting Scheme.

The loading factor value of the weighting scheme should be greater than 0.7 of each indicator. Indicators having a loading factor <0.7 must be removed from the model and recalculated. Indicators that meet the requirements are KS1, KS3, KI1, KI2, KI3, KI4, KL1, KL3 KP1, KP3, and MB1. Here's a picture of structural model re-estimation.
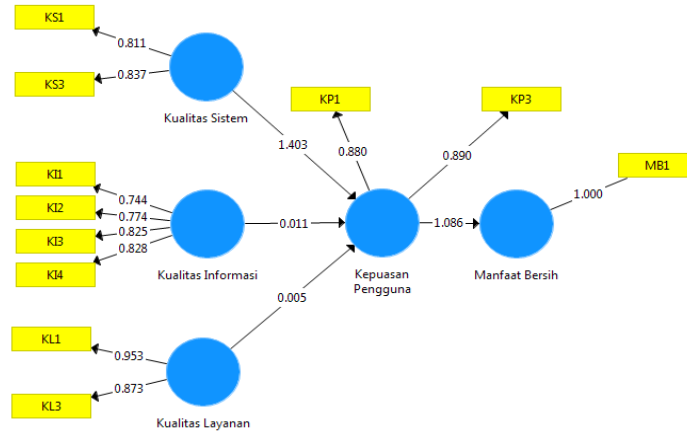
Fig. 3. Re-estimate Analisis Weighting Scheme

Once re-estimate, the results have met convergent validity because all loading factors> 0.7. Thus it can be said that the convergent validity of the System Quality construct, Information Quality, Service Quality, User Satisfaction, and Net Benefits are valid.

Discriminant validity evaluation can be done by comparing the square root of the Average Variance Extracted (AVE) value for each construct with the correlation value between the constructs in the model. A good AVE value must be greater than 0.5. In this study, the value of AVE can be seen in the following figure

	Average Variance Extracted (AVE)
Kepuasan Pengguna	0.783
Kualitas Informasi	0.630
Kualitas Layanan	0.835
Kualitas Sistem	0.679
Manfaat Bersih	1.000

Fig. 4. AVE Value.

Based on the AVE results in Fig. 4 AVE values all constructs> 0.5. it can thus be said that the convergent validity of the System Quality construct, Quality of Information, Service Quality, User Satisfaction, and Net Benefits is valid by AVE testing.

In addition to the validity test, reliability test is also performed to test the reliability of a construct. Reliability test is performed to prove the accuracy, consistency and accuracy of the instrument in measuring the construct. In PLS-SEM to measure the reliability of a construct with reflective indicators can be done in two ways that is with Cronbach's Alpha and Composite Reliability (CR). Rule of Thumb is usually used to assess the reliability of the construct that is the value of Composite Reliability must be greater than 0.7.

	Composite Reliability
Kepuasan Peng...	0.879
Kualitas Inform...	0.872
Kualitas Layanan	0.910
Kualitas Sistem	0.809
Manfaat Bersih	1.000

Fig. 5. Composite Reliability.

Based on the test results in Fig. 5 Composite Reliability values of all constructs> 0.7. Thus it can be said that the Composite Reliability of the construct of System Quality, Information Quality, Service Quality, User Satisfaction, and Net Benefit is reliable.

After passing validity test and reliability test, then got result that data used in this research have valid and reliable. The next step in this test is the significance between exogenous and endogenous constructs. Significance of model outer can be known after bootstrapping. The significance of endogenous constituent indicator can be seen from the statistical t value. If t value> t table, then all indicators can significantly measure endogenous constructs. The t table value for the degree of freedom => 200 (~) and α = 0.05 is 1.96.
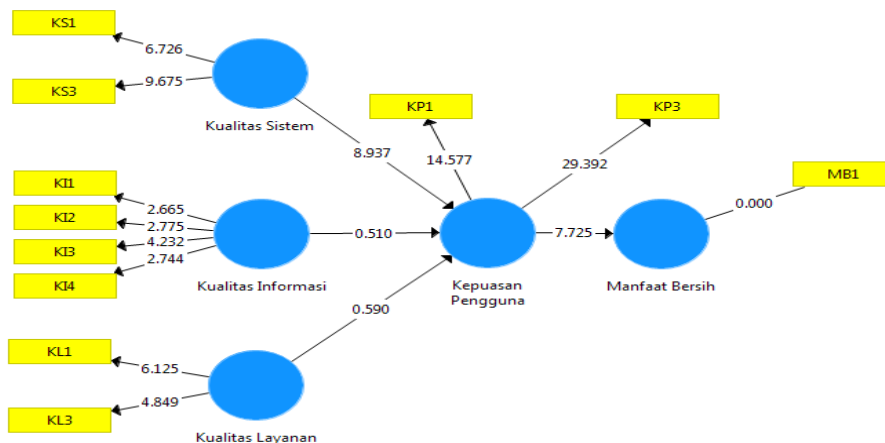
Fig. 6. Bootstrapping.

	Original Sample (O)	Sample Mean (M)	Standard Deviation ...	T Statistics ...	P Values
Kepuasan Pengguna -> Manfaat Bersih	0.722	0.724	0.093	7.725	0.000
Kualitas Informasi -> Kepuasan Pengguna	0.077	0.109	0.151	0.510	0.610
Kualitas Layanan -> Kepuasan Pengguna	-0.054	-0.055	0.092	0.590	0.556
Kualitas Sistem -> Kepuasan Pengguna	0.790	0.778	0.088	8.937	0.000

Fig. 7. Bootstrapping Value.

From figure 7 above the value of parameter coefficient and t-statistic value, it can be concluded the test result from each hypothesis is as follows:

Hypothesis 1 states that the factor of System Quality has a positive effect on User Satisfaction significantly. Hypothesis test results show the path between Quality System with User Satisfaction has a parameter coefficient of 0.790 which means that the Quality System positively affect the User Satisfaction, the higher the Quality System then the higher User Satisfaction. The value of t-statistics is 8,937. This shows that the Quality of System factor significantly affects User Satisfaction. That is, the first hypothesis is acceptable.

Hypothesis 2 states that the factors of Quality of Information positively affect the User Satisfaction. Hypothesis test results show the path between Quality of Information with User Satisfaction has a parameter coefficient of 0.077 which means that the Quality of Information positively affect the User Satisfaction, the higher the Quality System then the higher User Satisfaction. The t-statistical value is 0.510. This shows that the factor of Quality of Information affects User Satisfaction is not significant. That is, the second hypothesis is rejected.

Hypothesis 3 states that the factor of Service Quality has a positive effect on User Satisfaction. Result of hypothesis test show path between Quality of Service with User Satisfaction have parameter coefficient equal to -0,054 which mean that Service Quality negatively affect User Satisfaction. The t-statistics value is 0.590. This indicates that the Quality of Service factor affects User Satisfaction insignificantly. That is, the third hypothesis is rejected.

Hypothesis 4 states that the factor of User Satisfaction has a positive effect on Net Benefit. Result of hypothesis test show path between User Satisfaction with Net Benefit have parameter coefficient equal to 0,722 which mean that User Satisfaction have positive effect to Net Benefit, Higher User Satisfaction hence higher Net Benefit. The value of t-statistics is 7,725. This indicates that the User Satisfaction factor affects the Net Benefit significantly. That is, the fourth hypothesis is acceptable.

Structural Model (*Inner Model*)

The evaluation of the structural model (inner model) aims to predict the relationship between the latent variables whether they have a constructive match. The structural model (inner model) can be evaluated by looking at the percentage of variance explained by looking at the R-square value of endogenous latent construct. The higher the value of R2 means the better the prediction model of the proposed research model [5].

Fig. 8. Nilai R-Square.

In Fig. 8, the value in the User Satisfaction construct of 0.643 can be interpreted that, the user satisfaction construct variability which can be explained by System Quality, Information Quality, and Service Quality of 64.3%, while 35.7% is explained by other variables outside of the studied. Then the value on the net benefit construct of 0.521 which can be interpreted that, the variability of net benefit construct which can be explained by User Satisfaction of 52.1%, while 47.9% is explained by other variables outside of the studied.

Final Model of Research

From the results of data processing that has been done on the questionnaire distributed to employees of PT. Adelphi TransAsia Indonesia, obtained research model as follows:
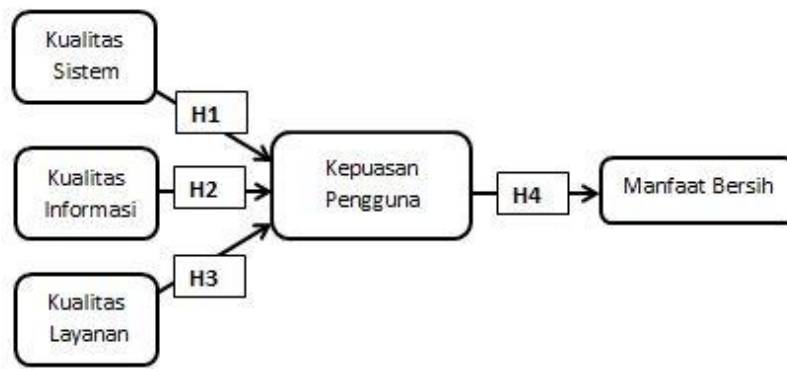
Fig. 9. Final Model of Research.

Based on the final model of research, it is known that Quality System directly affects User Satisfaction. Hypothesis test results show the path between System Quality and User Satisfaction has a value of P-Value of 0.000 and t-statistics of 8.937. This means that the first hypothesis is of significant positive or acceptable value. Quality of Information directly affects User Satisfaction. Hypothesis test results relationship between Quality of Information and User Satisfaction has a value of P-Value of 0.610 and t-statistics of 0,510. This means that the second hypothesis is not significant or rejected. While Quality of Service does not directly affect User Satisfaction. The result of hypothesis test of relationship between Service Quality and User Satisfaction has P-Value value of 0,556 and t-statistic equal to 0,590. This means that the third hypothesis is not significant or rejected As for the relationship between User Satisfaction and Net Benefits has a value of P-Value 0.000 and t-statistics of 7.725. This means that the fourth hypothesis is positive and significant or acceptable.

4 Conclusion

Based on the results of research, obtained some conclusions in the study as follows:

System Quality affects User Satisfaction positively and significantly. Means the higher Quality of SAP-Based ERP System Applications from PT. Adelphi TransAsia Indonesia, the higher its User Satisfaction.

Quality of Information affects User Satisfaction positively but not significantly. Means Information Quality of ERP System Based on SAP Application from PT. Adelphi TransAsia Indonesia has not significantly impact on User Satisfaction so it needs to be improved again and need other variables that can influence significantly.

Service Quality does not affect User Satisfaction positively and significantly. Means Quality of Service ERP System Based on SAP Application from PT. Adelphi TransAsia Indonesia has not significantly impact on User Satisfaction so it needs to be improved again and there needs to be other variables that can affect positively and significantly.

User Satisfaction, affecting Net Benefit positively and significantly The results of 52.1% valued research have been impacted significantly to the benefits gained by the company and can be considered successful, but still needs to be improved again.

Some suggestions to consider in relation to the results of this study are as follows:
1. Need to improve the Information Quality of ERP system based on SAP Application to have a significant effect on User Satisfaction.
2. Need to be evaluated Service Quality of ERP system based on SAP application and other supporting indicators in order to positively influence and increase User Satisfaction.
3. Need to do training periodically and depth to all employees of PT. Adelphi TransAsia Indonesia on the use of SAP-based ERP system for the function of the system is used properly and maximally to improve User Satisfaction.

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The Analysis of North Korea's Behavior in Six Party Talks (2003-2010)

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Abstract. The clash between North Korea and South Korea has started since 1950. The conflict between ideological backgrounds and the border issues among the two countries has not been over and still continues today. The development of these conflicts indicates that there has been an ongoing increase in weaponry by both countries. Nevertheless, the peace effort still being pursued and one of them is the *Six Party Talks* which is initiated by China. This study analyze North Korea's behavior during *Six Party Talks*. Moreover, this study highlight the dynamic relations between North Korea and South Korea, particularly in the *Six Party Talks* as peace effort.

Keywords: Security dilemma, conflict, North Korea, South Korea, Six party talks.

1 Introduction

Occupation in the post-World War II era left a scar that never recovered for the territory of the Korean peninsula. The Korean peninsula is now divided into two countries, namely North Korea and South Korea. The separation of these two regions begins with foreign occupation intervention, namely the United States and the Soviet Union. The United States occupied the southern area of the peninsula, while the Soviet Union occupied the northern region of the Korean peninsula.The decision of division was arranged by the two big state—the United States and the Soviet Union—in1945, without the Korean consent. At that time no expert advisor was involved in the decision. Korea peninsula then "temporarily" divided into two occupational zones, while the Cold War took place and deepened.

The two occupational zones make Korea divided into two different regimes.The northern region of Korea was finally thick with communist ideology which is an ideology that carried by the Soviet Union. While the south of Korea is more colored by liberalism, which is the basis of the United States. The difference of ideology, i.e. communist and liberalist, is what underlies the splitting of the Korean peninsula into two regions [1]. This ideological distinction is also the basis of the background of the conflict between North and South Korea since 1950.

Peace and negotiation efforts are underway to address the peaceful condition for Korean peninsula. One such peace effort is the Six Party Talks. Six Party Talks agenda was conceived as a serious form of conflict handling on the Korean peninsula, highlighting one of the key issues of the North Korean nuclear development project which is considered quite disturbing. In other words, Six Party Talks was conducted as a multilateral platform to attain

denuclearization of Korean peninsula [2]. North Korea has agreed to join the Six Party Talks, but the journey of peace efforts has not been smooth and started to break in 2012.

Six Party Talks orDiscussion of Six Nations is one of peace efforts current initiated by China. *Six Party Talks* agreement was happened on August 27th, 2003 and involved six countries, namely Russia, China, USA, Japan, North Korea and South Korea. *Six Party Talks* was conducted in Beijing, China. The peace efforts made in order to pave the way of peace for the conflict in the Korean peninsula. Purpose of establishing the *Six Party Talks* is to create a safe situation and stabilitybetween North Korea and South Korea [3].

In addition, the *Six Party Talks* are also established in order to facilitate the communication of other countries with the North Korean side, which is known as a country that rarely have diplomatic relations with the other state. Thus, the main issues discussed at the *Six Party Talks* is the matter of nuclear weapons development by North Korea. *The Six Party Talks* is not just reconciliation of the Korean peninsula, but also the development efforts of North Korea's communication and diplomacy over the controvercy of nuclear proliferation, which sufficient to make many countries in the world uncomfortable.

2   Methods
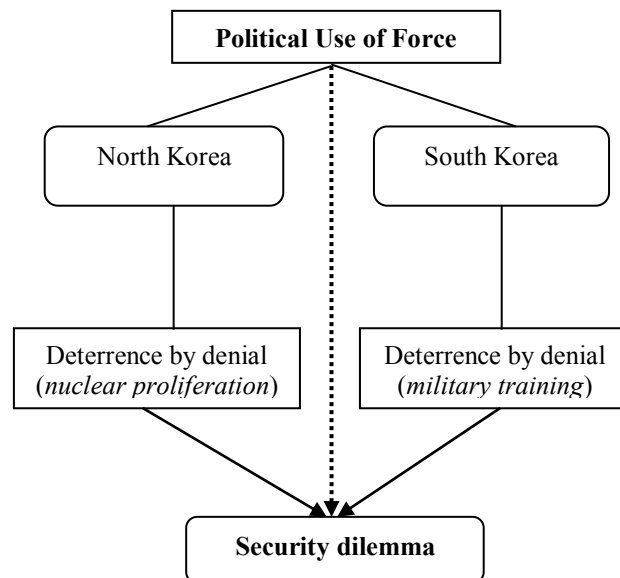
Fig. 1. Operasionalization of Theory.

The security dilemma (security defensive offensive dilemma) and political forces (political uses of force) will be the underlying theory of this study.The diagram above explains how the theory is used to analyze the behavior of North Korea in this paper.

According to Jervis, the security dilemma is one of the problems that occur and exist in the world of international politics. The dilemma of security (security dilemma) is widely translated as a state where a country improves the security of its country and reduces security for other countries. Thus, if there is a country that increases its security then the country will

not threaten other countries withcaution.Two important variables appear. First, whether defensive strategies can be distinguished from offensive strategies-whether in terms of more military weapons, or more political policies. Second, which is more advantageous, defensive strategy or offensive strategy [4].

Art divides the political uses of force into four functional strategies: defense, deterrence, compellence, and swaggering. The defensive use of force is the spreading of the military power of a country so that it can do two things, namely to ward off attacks and minimize damage caused by the attack. The deterrent use of force is an attempt to make military force prevent others / opponents from committing an attack or any action that endangers the state. The compellent use of force is an attempt to make a country's military power able to change the behavior of others. While swaggering use of force is an outside effort other than defense, deterrence and compellent. Swaggering is one of the strategic functions of use of force that is difficult to identify.

The main aspect of deterrence is threat. Threats are made as a preventive measure for other parties from doing actions that endanger the state. Deterrence can be done in two ways, namely with prevention and punishment. The deterrence by denial (prevention) is done by opening the military power to other parties. Prevention is done by showing the power possessed by the state, in order to prevent the state or other parties to attack. The second way is with punishment, deterrence by punishment, threats that are accompanied by the threat of punishment that will give fatal consequences for others. Both ways are essentially threats, to prevent others from attacking or endangering a country [5].

3   Research And Discussion

Six Party Talks which is a forum in deploying peace on the Korean peninsula, as well as container diplomatic relations and communication with North Korea on developing nuclear weapons have turned out to be only lasted from 2003 until 2012. The efforts to establish communication and diplomacy with North Korea's state was not as easy as expected. During participated in the *Six Party* Talks, North Korea displays behaviors that are still difficult to understand and accessible by other countries. The following will explain the development of *the Six Party Talks* as well as the behavior of North Koreaas a state from its inception until North Korea declared out of the *Six Party Talks*.

3.1   The Dynamics of North Korea's Ties with Other State of The Six Party Talks

Starting in 2001, in which North Korea says the threat to the Bush administration. North Korea threatened to compromise the *Agreed Framework* between North Korea with the United States, if the Bush administration did not continue the policy of previous governments that the Clinton administration. In addition, North Korea also argues that the United States is not sincere to implement *the Agreed Framework* was agreed upon, and even continued to delay its implementation.

United States respond to the threat of North Korea by offering a serious dialogue between the two countries. Nonetheless, Bush expressed concern about the deal that will be woven together North Korea. Eventually in June 2001, the Bush administration envoy met North Korea's envoy in Pyongyang. This meeting resulted United States agreement to proceed talks with North Korea a review during three months.

A year later, Bush declared in a speech that North Korea as the axis of evil in the world for developing nuclear weapons. However, negotiations and cooperation between North Korea and the United States is still ongoing. This is an evident from the activity of the talks between the two countries continuing from April to October 2002. In the same month the United States claims that North Korea admitted their nuclear weapons development is being carried out, although this is still marked by conflicts of interpretation. In October 2002, North Korea was allegedly developed the Highly Enriched Uranium program (HPU) [6].

Afterwards in November 2002, Bush said it would halt shipments of fuel oil (heavy oil)to North Korea if the country does not want to stop the pace of weapons programs [7]. North Korea was responding to Bush by threatening, that North Korea would reactivate the nuclear advancement program as a consequence of termination oil shipments by the United States, as well as expel US envoy in North Korea. Essentially, United States and North Korea have different aims. North Korea was anxious with regime viability, on the other side United States search for denuclearization [8].

In 2003, North Korea declared out of the Treaty on *theNon-Proliferation of Nuclear Weapon* (NPT). February 5, 2003, North Korea declared the re-activation of the Yongbyon nuclear reactor. Sometime after the declaration of North Korea, South Korea along with the United States announced it would conduct a joint military exercise in March. North Korea's response to military exercises by conducting missile launch in February and March. In April, North Korea stated its aim to establish multilateral negotiations. From here formed three countries meeting between North Korea, China and the United States. China was quite active back then as mediator up to five round of Six Party Talks from August 2003 to November 2005 [9]. In this year also formed the very first round of the *Six Party Talks*. This occasion was organized in Beijing, with the participation of Foreign Minister Li Zhaoxing from China [10]. No binding agreement is formed, but all parties agreed to resume the multilateral talks. Even though no binding agreement is formed, first round of the *Six Party Talks* manage to established institutionalized structure of dialogue dealing with the nuclear issue [11].

In 2004, US nuclear expert come to North Korea to examine the advancement of nuclear weapons, but did not find enough evidence to support North Korea's possession of nuclear weapons. The second round of the *Six Party Talks* took place in February 2004, members of the talks agreed to coordinate steps in handling the North Korean nuclear issue, despite not yet seen as strong commitment. The third round of meetings took place in June of the same year, all members of the *Six Party Talks* agreed with the efforts of real denuclearization in the Korean peninsula [7].

The decision shocked out of North Korea in early 2005. North Korea said it would redevelop nuclear weapons and suspend any form of talks until an undetermined time. South Korea claims that North Korea close down the reactor to extract nuclear weapons. In May, North Korea to participate in missile tests. Pressuresamong North Korea and South Korea was followed by the failure of the fourth round of the *Six Party Talks*. The fourth round was again held in September 2005 and all members of the *Six Party Talks*settled to sign a *"Statement of Principles"*, in Pyongyang. The statement agreed to stop entire nuclear programs, return to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and welcome the United States government envoy on North Korea. Constraints re-occur, because North Korea and theUnited States are still suspicious of each other and do not trust each other.

Although the *Statement of Principles* was signed, the deal *Six Party Talks* delayed for approximately one year. This is motivated by the problems in the financial sanctions in the agreement between North Korea and the United States. The United States also freeze the assets of the Macau-based Banco Delta Asia, the United States accused the bank in money

laundering for the nuclear program. As a result, North Korea again rejected the deal and any talks, as well as re-developing nuclear weapon. North Korea also see the United States again not enforce the *Agreed Framework*.

The behavior of North Korea, which shows the reaction of a failed negotiation seen in 2006. North Korea's test-launch of seven missiles and including long-range missiles. In addition, North Korea also today announced plans testing nuclear devices. In October 2006, North Korea actually did its first nuclear experiment. The results of these trials showed a weapon test results are still not meet the target of North Korea. As reaction, the United Nations Security Council passed Resolution 1718 to put in place sanctions for North Korea's nuclear test. Beijing's efforts behind the scenes negotiations proved fruitless. North Korea back to *the Six Party Talks* in November 2006. All members of the *Six Party Talks* agreed to reaffirm *the Joint Statement* adopted in September 2005.

In February 2007, North Korea agreed *Action Plan* is based on the *Statement of Principle* in 2005. Based the deal, North Korea agreed to close down the nuclear development facilities at Yongbyon within 60 days. In return, North Korea will gain remuneration of 50,000 tons of fuel. A distinctive bilateral dialogue with the US and Japan also will be done.

Later,the fuel aid weighing 950,000 tons will also be given after North Korea's nuclear ammunition program shut down thoroughly. In March 2007, North Korean assets in Banco Delta Asia was detached, and the International Atomic Energy Agency (IAEA) confirmed the closing of North Korea's nuclear facilities in Yongbyon. Then in October, the *Six Party Talks* was held back and all parties agreed to the formulation of *Second Phase Action Plan* which calls for North Korea to immobilize nuclear facilities in Yongbyon and to hand over the declaration of the entire nuclear program on December 31, 2007.

In 2008, North Korea handed documents containing everything about his nuclear program and a month later they released a declaration of nuclearprograms for all members of the *Six Party*Talks.North Korea criticized the United States that they had a uranium enhancement program and documents submitted are still not detail. Meanwhile, the disablement of the Yongbyon reportedly almost completed and North Korea destroyed the refrigerant tower of Yongbyon experimental reactor as a commitment to them. Verification was performed and the United States pull out North Korea from the list of countries supporting terrorism.

On April 5th, 2009 North Korea attempted to place a satellite with the launch of two missiles. The first missiles fell in the waters of the Sea of Japan, while the second missile crashed in the Pacific Ocean region. North Korea's missile-launch to get criticism from the international community and was a violation of UN resolutions in 1695 and 1718. The UN Security Council insisted abuse of the UN resolution in 1718 conducted by North Korea. The statement demanded North Korea not to continue with the missile launch attempt. In addition, a committee for the adjustment of sanctions is also formed.

North Korea responded to UN Security Council action to declare out of the *Six Party Talks* and expressed his intention to restore the nuclear weapons improvement program in Yongbyon. One of the media in North Korea says North Korea threatened to hold a nuclear test and missile launch back if the United Nations Security Council did not draw condemnation and apologized to North Korea. May 2009, North Korea arranged a nuclear test, and once again the international community along with the United Nations Security Council condemned the action.

The United Nations Security Council approved resolution 1874, and impose economic sanctions against North Korea. In addition, the resolution also called on North Korea to come back into the NPT and to rejoin the *Six Party Talks*. In September, North Korea declared its willingness to establish bilateral negotiations with the United States. After the visit of Prime

Minister of China in October, North Korea expressed its eagerness to rejoin the *Six Party Talks*. Meanwhile, news from South Korea's Yonhap reported North Korea has almost completed the restoration of its main nuclear facility in Yongbyon.

In January 2010, North Korea announced the establishment of a peace covenant with the United States is a prerequisite for the return of North Korea in the *Six Party Talks*. Then in March 2010, the South Korean warship sank due Choenan's physical contact with a torpedo. These events yield in thedeaths of 46 South Korean soldiers. South Korea then blamed North Korea of deliberately launching torpedoes. North Korea has denied and insisted it was not involved in the incident. South Korea finally declared not willing to continue the *Six Party Talks* before the Choenan's incident completely resolved.

Prime Minister of Russia back to collect *the Six Party Talks* after North Korea said it would not eliminate its nuclear program and also would like to cooperate with other nations in a nuclear development project. Again, the Chinese side to convince North Korea to rejoin the *Six Party Talks*. Meanwhile South Korean military action in the border region is still ongoing. This certainly makes the tension between North Korea and South Korea are increasingly becoming the time. In November 2010, China again called *Six Party Talks* gathered to deal with these tensions. However, three members namely South Korea, the United States and Japan feel *sixparty talks* cannot be started because time is less precise and demanding North Korea disarmament before the talks resumed.

In the same month, North Korea revealed a secret uranium developmentprogram at Yongbyon. North Korea argues that the program is carried out for a light water reactor being built in the same complex. Even so, the United States and South Korea to doubt the purpose of the development of uranium enrichment by North Korea it. North Korea expressed no objections when IAEA envoys to visit and inspect the uranium enrichment program. Then, the President of South Korea expressed willingness to reopen diplomatic communications and support for the revival of *the Six Party Talks* in an effort to resolve the tensions of the Korean peninsula.

In 2011, South Korea and the United States re-start the program of joint military exercises. This is a defensive effort that made South Korea in the tense Korean peninsula. However, North Korea joint military exercises are seeing is the aggressive efforts of South Korea and the United States. In March 2011, South Korea rejected an offer to return to *the Six Party Talks*. South Korea demands North Korea to take action disarmament real and not limited to the agreement only.

In July, the negotiators of North Korea and South Korea meet again in the ASEAN Regional Forum and convey its urge to resume *the Six Party Talks*; the United States, Japan and Korea South back in agreement and issued a trilateral agreement, that peace efforts would be resumed if North Korea really wants to change his behavior and work well together in the peace efforts. North Korea is negotiating with the Russian side reveal inclination to resume *the Six Party Talks*. However, the United States and South Korea are still skeptical of the North Korean statement.

In 2012, North Korea agreed to stop all testing of nuclear, missile launches and uranium enrichment at Yongbyon. North Korea was also willing to accept IAEA envoy to watch the moratorium on uranium development. In return, the United States agreed to ship food aid as much as 240,000 metric tons to North Korea. This agreement is known as *Leap Day Agreement*.

Then, in April 2012, North Korea launched threeKwangmyongsong's satellites at the 100th anniversary of the death of North Korean leader Kim Il Sung. United States and South Korea saw the launch is a missile test effort was again executed by North Korea. United States

has halted shipments of food aid to North Korea. In May, the UN Security Council issued a collective agreement that urges North Korea to meet its commitment to the *Six Party Talks* and stop all nuclear activities and weapons. North Korea also took the step of self-defense, and promised to resume its nuclear program [7]. After that, negotiations *Six Party Talks* is not yet see the meeting point until the end of year.

3.2 The Analysis of North Korea's Behavior in The Six Party Talks

The dynamics of North Korea's behavior is the evident of the Six Party Talks development which have been outlined above. North Korea shows a closed attitude, so many misunderstandings between North Korea with other countries involved in *the Six Party Talks*, in particular South Korea, the United States and Japan. North Korea showed more cooperative behavior when in dialogue with countries of similar ideologies such as China and Russia. Of these, two ideologies seen interacting in the *Six Party Talks*. First, the liberal ideology promoted by South Korea, Japan and the United States. Second, the communist ideology which is owned by North Korea, China and Russia. Then the effort conversation *Six Party Talks* is reasonably reflected the cornerstone of the two ideologies are struggling, namely the South Korea and North Korea.

Most of the behavior exhibited by North Korea in the development of the *Six Party Talks* is a threat. North Korea several times threatened to proceed its nuclear weapons development program. NorthKorea hold comprehensive threats as a form of *thedeterrence* of *use of force* (prevention). North Korea prevention of other countries to harm or attack North Korea, the threat of a nuclear program. Although using nuclear weapons as a threat, North Korea's actioneffort is a peaceful *defensive*. Politicalstrategy *uses of force* in the form of *deterrenceby denial*is used by North Korea; revealing the power that the country is still conducting nuclear development program. North Korea's actions included in the action *deterrenceby denial* since North Korea prevention efforts in the form of threats by revealing the power to its opponent. North Korea revealed that the country is developing nuclear and uranium enrichment. Other actions that show the action of *deterrencedenial by* North Korea is missiles launch and nuclear test. North Korea again wants to show military strength is being owned and developed as a threat and prevention to the attack of other countries.

North Korea's *defensive*effort is not only able to prevent attacks from another country, but also have an impact on the appearance of a security dilemma. Other countries did not attack North Korea, but it also resulted in the emersion of the security dilemma. Security dilemma arises when a country shows its strength. The appointment of the strength of a country will make other countries threatened, and so will try to increase the country's military strength. Then the state or others who see the efforts to increase the country's military strength will also feel threatened, and sought again to upgrade its military strength. The situation will continue to occur with the same cycle.

Dilemmas security appears in the middle of the country at odds with North Korea, which South Korea. Tensions conflict not ended, and the location is very close to North Korea making South Korea act aggressively upgrading or improvement of its military power. As security threats in the form of nuclear weapons cultivation program of North Korea, the South Korean military forces got busy. This is evident from the efforts of a joint military action held by South Korea along with the United States in the border region which are done several times. South Korea feels endangered by the news and discourse project of North Korea's nuclear weapons development and continued to work on improving military capabilities with the support of the United States.

In diplomacy and communication, visible difference in the two camps with different ideologies in the *Six Party Talks*. South Korea also looks tighten cooperation with Japan and the UnitedStates. The three countries even issued a trilateral agreement that called on North Korea to stop developing nuclear. Meanwhile, the North Korean side, the state of China and Russia to lead a liaison diplomacy. When North Korea was about to get out of the *Six Party Talks*, the Chinese and the Russians are always trying to reassure North Korea to end up going back to join the forum.

4   Conclusion

Tension and conflict on the Korean peninsula, which lasted from 1950 have not seen the point of peace until now. Various attempts to reconcile the North and South Korea continue to do, but have not produced results. Current effort is the establishment of *the Six Party Talks* or Talks Six Nations, which was initiated in 2003. *Six Party Talks* was initiated by China, managed to maintain the United States, Japan, Russia, North Korea, and South Korea to sit together to ease tensions on the Korean peninsula. *Six Party talks* was also initiated as a forum for negotiation and communication to North Korea, particularly with respect to its nuclear development program.

Unfortunately, the peace forum *Six Party Talks* haven't give any significant influence to the reconsiliation in Korean Peninsula; but the *Six Party Talks* contribute to the status quo of the conflict between North Korea and South Korea. The dynamics relations among North Korea and other countries in the negotiations is still not stable. It is also because of diplomatic relations is not running smoothly. If the other party is not willing to agree to his request, then North Korea showed behavior that most tend *defensive* passing threat. Preventive action *(deterrenceuse of forceby denial)* repeatedly carried out by North Korea to threaten other countries and unlock the power of its nuclear development program.

North Korea's behavior was influential to other parties who are in conflict with these countries, namely South Korea. South Korea, which feel threatened security as viewed North Korea's nuclear development and then conduct joint military exercises the United States in the border area. This is done in South Korea as well as *defensive* effort to open the preparation of military force which was built along the US side. Each of these countries feel threatened by efforts to improve the military another party, and then try to increase military forces for the security of their respective countries. This shows the security dilemma that struck North Korea and South Korea, as the effects of *defensive* behavior exhibited by North Korea. In fact, it can be concluded that the *defensive* behavior of North Korea and South Korea are already so entrenched that now appears very naturally.

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Signature Identification with Gray Level Co-ccurrence Matrix and Extreme Learning Machine

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Abstract. Identification of the signature is a process used to identify the signature of a person. The Identification of the signature can be divided into two parts. Identification signature off-line and the Identification of signatures on-line. Forgery of signatures is still common in data security systems. So, we need an approach to improve the accuracy of signature recognition on Extreme Learning Machine algorithms. This study use a gray level co - occurrence matrix (GLCM) for feature extraction and modification of Extreme Learning Machine (ELM) for recognition. ELM is a new learning method of a neural network or commonly called the Single Hidden Layer Feed forward Neural Networks (SLFNs). From the experiments the identification of the signature using the gray level co-occurrence matrix (GLCM) and signature classification using extreme learning machine with the addition of elementary transformations showed that the accuracy on identification of the signature is 43% using of features contrast, correlation, energy and homogeneity, while using just ELM accuracy is 36%.

Keywords: Signature Identification, Extreme Learning Machine, Gray Level Co-occurrence Matrix.

1 Introduction

Signature, fingerprint, voice, and handwriting are some that have been used to verify the person's identity. Among all, the signatures have a fundamental advantage that it is the most frequently used in identifying a person in everyday operations such as automated banking transactions, electronic funds transfer, document analysis, and control access. However, the forging of signaturesfrequently occurs among other things due to the unfavorable identification system

The signature identification system can be divided into two parts. The off-linesignature identification and on-line signature identification. The off-line signature identification takes an image of the signature as an input that will be used later in the process. While the input to the on-line signature identification is obtained directly from the digitizer that produces the dynamic values, such as coordinate values, long a signature and signature speed. This study uses Gray Level Co-occurrence Matrix for extract features texture and Extreme learning machine as classification. Gray Level Co-occurrence Matrix (GLCM) was first introduced by

Haralick to extract texture featuresand perform image analysis based on the statistical distribution of pixel intensity [1]. Extreme Learning Machine (ELM) is a new learning method of the neural network. This method was first introduced by Huang. ELM is a feed forward neural network with a single hidden layer or commonly called the Single Hidden Layer Feed forward Neural Networks (SLFNs) ELM learning method created to overcome the weaknesses of the neural network learning, especially in terms of speed [2]

Research classification using ELM has a lot to do. Among the researches, onewas conducted by FitriatiDesti (2016). She compared the performance of CNN Lenet 5 and Extreme Learning Machine on image recognition handwritten numbers, the results showed that CNN Lenet 5 wasexcellentsince it was able to recognize handwriting pattern number with a confidence level of 78.14% for 98.04% of primary data and secondary data, while ELM achieved 30% accuracy rate. However, in this case the ELM was excellentin terms of computing time reaches 0.00078 milliseconds [3]

Based on the research can be concluded that research using Extreme Learning Machine haspoor accuracy in recognizing the image of handwritten numbers. Therefore, in this study the researchers tried to re-examine by modifying the algorithms that are expected to improve the accuracy of the signature image recognition.

2. Previous Research
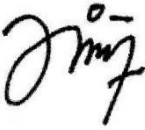
Research using Gray Level Co-occurrence Matrix for extracting texture features of the image has a lot to do, including research by Amalia, I (2014) elaborated on the signature recognition using the Gray Level Co-occurrence Matrix (GLCM) as the algorithm to extract features and Probabilistic Neural Network (PNN) to classify signatures. This study uses dissimilarity, Entropy and homogeneity. The extraction of features it will be input to the classification by using PNN. Each test data consists of 3 feature, measured proximity to three training data feature of the ten classes. These features are able to recognize the signature. Study showed that the average accuracy of PNN in performing signatures recognition was at 71%[4].

[5]compared the Extreme Learning Machine and Particle Swarm Optimization Extreme Learning Machine for forecasting total sales of goods in one minimarket in Bali. The results showed PSO method can be applied to the ELM method to optimize the number of hidden nodes. Particle Swarm Optimization Extreme Learning Machine is able to overcome one of the weaknesses of the methods ELM. The number of hidden nodes is determined by trial and error, so it can not be known how many hidden nodes the right to obtain an accurate forecasting results using ELM. Particle Swarm Optimization method to find the optimal number of hidden nodes. The results showed PSO method can be applied to the ELM method to optimize the number of hidden nodes. Mean Square Error (MSE) generated by PSO method is smaller than the ELM methods, ranging from 0.01161 to 0.01121 until ELM PSO method and ranged from 0.01419 to 0.01315 until ELM method. PSO method is able to optimize the number of hidden nodes of ELM method to predict the amount of sales of goods.

3. Data Used

The data used in this study is the signature of a digital image of the acquisition by using Epson L360 scanner which will be used for learning (learning dataset) and set of images for testing (Testing dataset) with image size 200 x 200 px and JPG format. Here is the signaturesdataset shown in table 3.1.

Table 3.1 Signatures dataset

Signatures	
1st Person	
2nd Person	
3rd Person	
4th Person	
5th Person	
6th Person	
7th Person	
8th Person	

9th Person	
10th Person	

4. Gray Level Co-Occurrence Matrix

GLCM is a matrix that is built using second-level histogram statistical texture features. The spatial dependence of gray level is calculated by 14 features of the co-occurrence matrix [6]. GLCM feature selection is based on the analysis of the test results accuracy for picking the best suitable for the identification of the signature. Once the image is converted into gray level images (grayscale), then the next step is feature extraction stage. Feature extraction is done to get the value that can represent the image. In this study, the method used for extraction of image features is the Gray Level Co-Occurrence Matrix (GLCM). Here is a calculation using a statistical features contrast, correlation, energy and homogeneity.[7].

1. Contrast
   contrast feature is used to calculate the different range of gray degree in an image. The bigger difference in the gray degree of each pair of pixels, the higher the contrast value will be. Contrast is defined as follows in equation (4.1):
   $$\text{Contrast} = \sum_x \sum_y (x - y)^2 \, P(x, y) \ldots\ldots\ldots\ldots (4.1)$$

2. Correlation
   The correlation feature shows the linear dependence of the grayness of the image. Here is the definition of correlation in equation (4.2):
   $$\text{Correlation} = \sum_x \sum_y \quad P(x, y) \left[\frac{(x - u_x)(y - u_y)}{\sqrt{\delta_x^2 \delta_y^2}} \right] \ldots (4.2)$$

3. Energy
   Energy feature or angular second moment (ASM) states textural uniformity size of an image. Energy on the image will be valuable if the gray intensity is distributed constantly. Following the definition of energy in equation (4.3):
   $$\text{Energy} = \sum_x \sum_y p(x, y)^2 \ldots\ldots\ldots\ldots\ldots\ldots (4.3)$$

4. Homogeneity
   Homogeneity feature will calculate the variations of gray degree from an image. Homogeneity will gain great value if the pair of elements in the matrix has a small gray level differences. Features homogeneity is defined as follows in equation (4.4):
   $$\text{Homogeneity} = \sum_x \sum_y \frac{1}{1 + (x - y)^2} \, P(x, y) \ldots\ldots (4.4)$$

5. Extreme Learning Machine

Extreme Learning Machine (ELM)a new method of neural network.ELM was first introduced by Huang. ELM a feed forward neural network with a single hidden layer or commonly called the Single Hidden Layer Feed forward Neural Networks (SLFNs) ELM learning method created to overcome the weaknesses of neural network learning, especially in terms of speed.

In ELM inputrandomly parameters such as weight, hiddenand bias, so that the ELM has a fast learning speed and is capable of producing good generalization performance. Extreme learning machine is a learning algorithm that utilizes hidden architecture of Single-Layer Feed forward Networks (SLFNs). The essence of this method is to learn without iteration. So the learning process of this method is rapid (extreme).

5.1 Neural Networks with Elementary Transformations Extreme Learning Machine

Here are the steps to be taken to the learning process ELM with the addition Elementary Transformations .

Step 1: Initialize all weights and biases with small random numbers [-0.5, 0.5]

Step 2: Each unit of input xi (i = 1,2, ...n) receives the signal and forwards the signal to all units in the hidden layer.

Step 3: Counting each hidden layer unit Zj (j=1,2, ..., m) by summing the weighted input signals:

$$\sum_{i=1}^{N} \beta_i \, g_i(x_j) = \sum_{i=1}^{N} \beta_i \; (wi.xj+bi) \; = 0j \ldots \ldots (5.1)$$

The next count output of hidden layer with sigmoid activation function:

$$g(x) = \frac{1}{1+e^{-net}} \ldots \ldots \ldots (5.2)$$

After getting the output of the hidden layer, it will proceed next step.

Step 4 : Establish order mxn matrix H, where m = lots of input units and n= many hidden units

$$H = \begin{pmatrix} g(b_{01} + x_1 * w_{11}) & \cdots & g(b_{05} + x_1 * w_{14}) \\ \vdots & \ddots & \vdots \\ g(b_{01} + x_4 * w_{41}) & \cdots & g(b_{05} + x_4 * w_{44}) \end{pmatrix} \ldots (5.3)$$

After getting matrix H with size m x n, Next is calculating the matrix H using Elementary Transformations . The operations performed on Elementary transformations is as follows:

  i. Redeeming i th row by row to j, written and columns $B_{ij}K_{ij}$,
 ii. Multiplying a row or column with numbers k (scalar) where k> 0.
iii. Adding on every element on the line to -i with scalar that is not equal to zero.

Next calculate$H^{\dagger}$ which is a pseudo inverse matrix of the matrix H to be used in searching the weights between the hidden layer and output layer, as the following equation:

$$H^{\dagger} = (H^T H)^{-1} H^T \ldots \ldots \ldots (5.4)$$

Step 5 : Looking for a weight to the output layer (β) with the following equation: $\beta = H^{\dagger} t$

Step 6: Calculating the value of output by using the equation:

$$y_{net} = \sum_{i=1}^{2} \beta ig(w_i.x + b_i) \ldots \ldots \ldots (5.5)$$

5.2 Calculation Extreme Learning Machine

Here is calculation of artificial neural network extreme learning machine, which requires input of objects in the image and label each image will represent the input matrix x and the target matrix*t*, For example, the training process will be conducted for the introduction of two types of objects. Extreme Learning Machine architecture that is used consists of 4 nodes in the input layer, 2 nodes in the hidden layer, and 2nodes in the output layer.

Input	Target
X_1=0.47;X_2= 0.67 ;X_3= 0.84 ;X_4= 0.95	t_1= [1,-1]
X_1=0.33;X_2= 0.76 ;X_3= 0.83 ;X_4= 0.95	t_2= [1,-1]
X_1=0.77;X_2= 0.68 ;X_3= 0.87 ;X_4= 0.95	t_3= [-1,1]
X_1=0.77 ;X_2=0.70 ;X_3= 0.85 ;X_4= 0.95	t_4= [-1,1]

Table 5.1 Value of inputs and Targets.

5.2.1 Training

Step 1: Initialize the weights connected to the unit hidden by the random number [-1, 1]

	Z_1	Z_2
x_1	w_{11}= 0.56	w_{12} =-0.99
x_2	w_{21} = - 0.2	w_{22} =0.77
x_3	w_{31}= -0.54	w_{32} = -0.23
x_4	w_{41} = 0.11	w_{42} = 0.12
b_0	b_{01}= 0.55	b_{02}= 0.43

Table 5.2 Weights and Biases

Step 2 : Each unit inputs x_i (i = 1,2, ...n) receives the signal and forwards the signal to all units in the hidden layer.

Step 3 Calculate the output of the unit hidden by the formula:
$z\_net_j = b_{0j} + \sum_{i=1}^{n} x_i w_{ij}$, For n = number of input values and j = 1,2
For j = 1

$$z\_net_1 = b_{01} + \sum_{i=1}^{4} x_i w_{i1}$$
$$= 1.05582$$

For j = 2

$$z\_net_2 = b_{02} + \sum_{i=1}^{4} x_i\, w_{i2}$$
$$= 0.4016$$

The results of the above calculation will be enabled using sigmoid activation function.

$$z_j = g\,(z\_net_j) = \frac{1}{1 + e^{-z\_netj}}, j = 1,2$$

$$z_1 = \frac{1}{1+e^{-\,1.05582}} = 0.347907$$

$$z_2 = \frac{1}{1+e^{-0.4016}} = 0.669248$$

Step 4 : Establish order nxm matrix H, where n = lots of input units and m = many hidden units

$$H = \begin{pmatrix} g(b_{01} + x_1 * w_{11}) & \cdots & g(b_{05} + x_1 * w_{14}) \\ \vdots & \ddots & \vdots \\ g(b_{01} + x_4 * w_{41}) & \cdots & g(b_{05} + x_4 * w_{44}) \end{pmatrix}$$

$$g(b_{01} + x_1 * w_{11}) = 0.773353$$
$$g(b_{02} + x_1 * w_{12}) = 0.278392$$
$$g(b_{01} + x_2 * w_{21}) = 0.779167$$
$$g(b_{02} + x_2 * w_{22}) = 0.449826$$
$$g(b_{01} + x_3 * w_{31}) = 0.910209$$
$$g(b_{02} + x_3 * w_{32}) = 0.062038$$
$$g(b_{01} + x_4 * w_{41}) = 0.9321$$
$$g(b_{02} + x_4 * w_{42}) = 0.073935$$

Next is to calculate the matrix H using Elementary Transformations . The operations

$$H = \begin{pmatrix} 0.773353 & 0.278392 \\ 0.779167 & 0.449826 \\ 0.910209 & 0.062038 \\ 0.9321 & 0.073935 \end{pmatrix}$$

Performed transformations redeeming elementary is the i-th row by row to j, written with.B_{ij} Line 3 is replaced with the line 2:

$$H = \begin{pmatrix} 0.773353 & 0.278392 \\ 0.910209 & 0.062038 \\ 0.779167 & 0.449826 \\ 0.9321 & 0.073935 \end{pmatrix}$$

After calculating the inversion of $H^T H$ matrix, the next step is to calculate the MoorePenrose as follows:

$$\mathbf{H}^\dagger = (H^T H)^{-1} H^T$$
$$H^T = \begin{pmatrix} 0.773353 & 0.910209 & 0.779167 & 0.9321 \\ 0.278392 & 0.062038 & 0.449826 & 0.0739 \end{pmatrix}$$

$$H^TH = \begin{pmatrix} 2.902466 & 0.691168 \\ 0.691168 & 0.289161 \end{pmatrix}$$

Next determine the inverse matrix: H^TH

$$(H^TH)^{-1} = \frac{1}{\det H^+H} \begin{pmatrix} 0.289161 & -0.69117 \\ -0.69117 & 2.902466 \end{pmatrix}$$

$$= \frac{1}{ad-bc} \begin{pmatrix} 0.289161 & -0.69117 \\ -0.69117 & 2.902466 \end{pmatrix}$$

$$= \frac{1}{0.36156} \begin{pmatrix} 0.289161 & -0.69117 \\ -0.69117 & 2.902466 \end{pmatrix}$$

$$= \begin{pmatrix} 0.799744 & -1.91159 \\ -1.91159 & 8.027466 \end{pmatrix}$$

After calculating the inverse of a matrix then the next is to calculate the matrix MoorePenrose as follows:

$$H^\dagger = (H^TH)^{-1}H^T$$

$$H^\dagger = \begin{pmatrix} 0.086313 & 0.609342 & 0.23675 & 0.60410 \\ 0.75645 & -1.24194 & 2.121516 & -1.18828 \end{pmatrix}$$

Step 5 : Then calculate the matrix that weights between the hidden layer to the output layer to the formula: $\beta = H^\dagger t$

$$H^\dagger = \begin{pmatrix} 0.086313 & 0.609342 & 0.23675 & 0.60410 \\ 0.75645 & -1.24194 & 2.121516 & -1.18828 \end{pmatrix}$$

$$t = \begin{pmatrix} 1 & -1 \\ 1 & -1 \\ -1 & 1 \\ -1 & 1 \end{pmatrix}$$

$$\beta = \begin{pmatrix} 0.328297 & -0.3283 \\ -1.41872 & 1.418723 \end{pmatrix}$$

after obtaining the weight of the process of training the next step is to perform the testing process.

5.2.2 Testing

Once the training process is done, then the next step will be tested using the weights and biases resulting from the training process. The testing process requires input in the form of images and will give an output in the form of the object image recognition.

Features of images:
$x_1 = 0.33$ $x_2 = 0.76$ $x_3 = 0.83$ $x_4 = 0.95$
Calculating the value of output
$$y_{net} = \sum_{i=1}^{2} \beta ig(w_i . x + b_i)$$

$= \beta_1 g (w_1*x+b_1) + \beta_1 g (w_2*x+b_2)$
$= [0.461507, -0.46151]+$
  $[-0.48645, 0.486452]$
$= [0.947959, -0.94796]$

The results obtained are $0.947959 > 1$ and $-0.94796 < 0$ then obtained matrix [1, -1]. Based on table 3.1 the image is identified with the target [1, -1].

6. Results And Discussion

The testing process was conducted to determine the accuracy of Extreme Learning Machine learning on the identification of the signature. In this study show the results of the learning accuracy of extreme learning machine using gray level co - occurrence matrix as feature extraction.

6.1 Testing Using Extreme Learning Machine

This test was conducted to determine the accuracy obtained using extreme learningmachine with features contrast, correlation, energy and homogeneity. Here is a interface feature extraction.
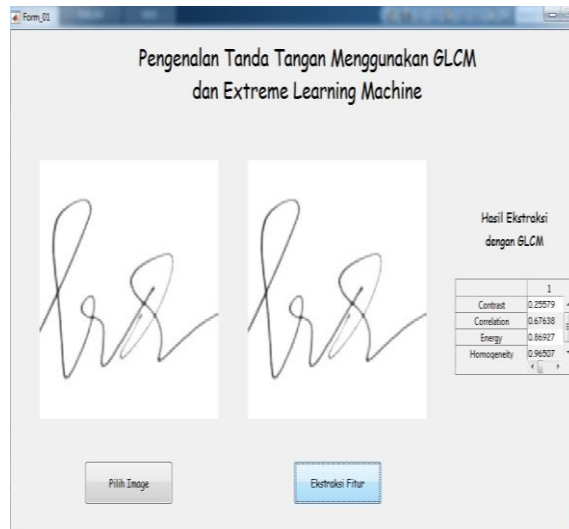
Figure 6.1 Interface feature extraction

After obtaining the value of the data features throughout the entire training data will be trained. After training data, then the next step for testing. The entire test data will be entered into the software testing. Here's signature test software uses extreme learning machine with features contrast, correlation, energy and homogeneity.
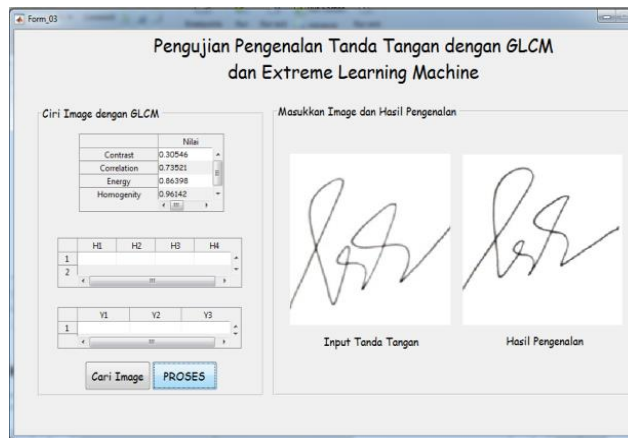
Figure 4.3 Testing signature

Based on experiments the accuracy of gray level co-occurrence matrix and extreme learning machine with the addition of elementary transformations have an accuracy better than just using extreme learning machine. In this test the accuracy of ELM + Elementary transformations is 43% while the test results using extreme learning machine accuracy is 36%. Table 6.1 The Result Of The Signature Identification Using Elm And ELM + Elementary Transformations.

features	Signatures	Result	
		ELM	ELM +TE
Contrast Correlation Energy Homogeneity	1st Person	✖	✖
		✔	✖
		✔	✔
	2nd Person	✖	✔
		✖	✖
		✖	✖
	3rd Person	✖	✔
		✖	✖
		✖	✔
	4th Person	✔	✔
		✔	✔
		✔	✔
	5th Person	✔	✖
		✔	✖
		✔	✔
	6th Person	✖	✖
		✖	✖
		✖	✔
	7th Person	✖	✖
		✖	✖

		✓	✓
8th Person		✗	✗
		✗	✗
		✗	✓
9th Person		✗	✗
		✗	✗
		✗	✓
10th Person		✓	✗
		✓	✗
		✗	✓
Recognize		11	13
		11/30	13/30
Accuracy		36%	43%

7. Conclusion

From experiments to identify the signature image using feature extraction gray level co-occurrence matrix (GLCM) and identification using extreme learning machine with the addition of an elementary transformations obtained a better accuracy rate compared to only use extreme learning machine. Experiment results show that the accuracy is 43%, while using just ELM accuracy is 36%. Accuracy in this study was very small, it is caused by ELM learning that does not use iteration parameters so that the accuracy is only dependent on the hidden nodes, weights and biases.

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Evaluation of Effect Mobility Node on Underwater Sensor Network Using VBVA Routing

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Abstract. We will show evaluation of performance Vector Based Void Avoidance (VBVA) routing for application mobility node on Underwater Sensor Network (UWSN). The research method is building the simulation using Network Simulator (NS-2.30) under operating system Linux Ubuntu. The installed NS-2.30 is added with Aqua-Sim module developed by Peng Xie. The final output from NS-2 will be visualized to graphic and table that will be analyzed using measurement metric packet delivery ratio, throughput, delay, and packet loss and energy consumption using AWK scripts with added with several modifications. The result of this simulation indicates that increasing number of nodes will result in loss of quality. One of them is decrease in packet delivery ratio. The decline was caused by that many packet collisions happen.

Keywords: UWSN, Routing, VBVA, Network Simulator, Mobility.

1 Introduction

Earth is a planet that is more than 71% of its surface is covered by ocean, most of which have not been investigated. As one way to find out the aquatic environment, is to use an Underwater Sensor Network (UWSN). UWSN has become a challenging research material for researchers. There is a difference between an UWSN with terrestrial sensor network.

One of the fundamental differences between UWSN with a terrestrial sensor network is a communication method. Terrestrial network using electromagnetic waves or radio waves to transmit data. While UWSN using acoustic signals.

The next difference is the underwater sensor nodes usually move due to water flow. Furthermore, when compared with terrestrial sensor node, the underwater node is usually much larger, more energy consuming, difficult to recharge and more expensive. The reason is more expensive causing placement in a wide area will not be solid. When nodes are placed with distance between nodes which has been determined, then the stream will change the distance between nodes. Because of the changing position of the nodes of the starting position, then the routing scheme will change. Changing the routing scheme will affect the success of the package is delivered. In this research, authors designed a simulation to measure the performance of routing for mobility nodes in UWSN using the NS-2.

2 Research Methodology

2.1 Underwater Sensor Network

Underwater sensor network (UWSN) is a network that consists of multiple nodes that are placed in underwater with the aim to monitor the underwater environment. The greater characteristic of the UWSN the carrier wave using sound waves. UWSN is a new technique. This is significantly different from ground-based sensor networks. First, the Radio Frequency (RF) not function well in the underwater environment. In contrast, which acoustic signal should be used. Contrast to wireless link between ground-based sensors, underwater acoustic channel has large latency and low bandwidth.

Sound waves are waves which have the kind of pressure and caused by vibrations from an object in the transmission medium. Humans can only hear sound waves at a frequency between 20 Hz to 20kHz. While the frequency used in the underwater sensor network is a frequency above 20 kHz called ultrasonic.

In addition to sound waves, radio waves and optics had been tried applied to underwater sensor networks. However, experience high attenuation of radio waves in the sea water. Radio Frequency (RF) signal can propagate over long distances through the medium of water only at extra low frequencies (30-300 Hz), which require large antennae and high transmission power [1]. Therefore, the radio waves are not fit to use in underwater sensor networks.

For optical signals, the disadvantage is signal can propagate only short distances and Line Of Sight (LOS). The maximum transmission range of the optical wave is 8 meters in clear water (swimming pool). However, in highly turbid water with maximum visibility 1.4 meters, maximum range is 1 m [2]. Thus, the physical communication channel which most appropriate for the underwater sensor network is aqustic channel.

Second, most of the sensor nodes in the ground-based sensor networks usually static. In contrast, the majority of underwater sensor nodes except for some nodes will stay its place as it is equipped buoys move because of water flow. According to observations, underwater objects can move at speeds between 2-3 knots (3-6 km / h) [3]. Third, the period underwater sensor network system can be varied from a few minutes up to several years for a variety of applications ranging from short-term investigation of ships or for monitoring anti-submarine under water long term.

Speed of signal propagation in the underwater channel sensor networks is about 1.5 x 103 m / s, which is five times lower than the radio propagation speed (3 x 108 m / s). The bandwidth available for underwater sensor network is limited, depend on both transmission range and frequency. Frequency of underwater sensor networks is limited due to absorption, mostly underwater sensor network operating system below 30 kHz. [3].

2.2 Vector-Based Void Avoidance (VBVA)

Vector-Based Void Avoidance (VBVA) is the development of vector-based forwarding (VBF) with the capability to resolve the problem the void [4]. The node transmission in VBVA routing, which is as same as the VBF routing, can be defined by knowing the node location of its neighbor. The node will save the node forwarding location information as the node transmit the data packet. The forwading path of a packet is denoted as a vector and transmitted with a VBVA packet. When there is no void in the forwading path, VBVA will operate like VBF. What distinguishes between VBVA and VBF are VBVA is able to detect the presence of voids in the forwading path. by using the void avoidance mechanism, VBVA

is able to find other forwading trajectories so that packet data transmission can still be done. As a result, network resistance can be improved.

Void node is defined as a node that has a vector value that is greater than the surrounding neighboring nodes. The trick is the node will listen to network and compare the value of the vector of its neighbor nodes. To overcome the void problems, VBVA uses two mechanisms such as vector-shift and back pressure.

1. vector-shift mechanisms

   On VBVA if the node knows that there is a void node in the packet forwarding path, then that node will attempt to bypass the void by shifting the forwarding vector [4]. To perform a shift vector, the void node will perform a broadcast packet control vector-shift to the surrounding nodes. When this packet control is received by the node, all nodes that are outside the void regional path will forward the forwarding data packet by following the new path based on the new forwarding vector from the sending node to the receiving node. This process is called vector-shift. When there is a node that can not find alternative routing paths although've done with the vector-shift mechanism, it must use other mechanisms that back pressure mechanism.

2. Back-pressure mechanism

   When a node can not continue a data packet because it knows that it is the final node, it will broadcast a control packet called the BP packet (Back-Pressure) [4]. When the node receives the BP packet, each node will shift the forwarding vector to get a new forwading path

2.3 Reference Point Group Mobility (RPGM)

Reference Point Group Mobility is a mobility model introduced by Xiaoyan Hong [3]. In this mobility model, each group has one central node. The central node which will be the reference of the location, speed, direction of all nodes within a group. Thus, the trajectory of the group specified by providing a way for the central node. Typically, nodes will be set uniformly in a geographic group. Each node is assigned a reference point for movement in a uniform group. Placement A node will be done randomly. The reference point scheme enables independent random movement behavior for each node, in addition to group movement..

2.4 Aqua-Sim

In the NS-2, the development of wireless packet CMU done for terrestrial wireless networks. As for the development of an underwater network should be added with aqua-sim [5], because the underwater environment different from the terrestrial environment. Specifically, under the water network has a long propagation delay and high damping. Terrestrial radio channel attenuation model cannot be applied again to lower the water network channels. In addition, the long propagation delay makes the collision behavior is very different from the behavior of collisions in radio networks that require different ways to simulate collisions in underwater sensor networks. In the NS-2, Aqua sim paralleled with wireless simulation package Carnegie Mellon University (CMU) as shown in Figure 1 [5].
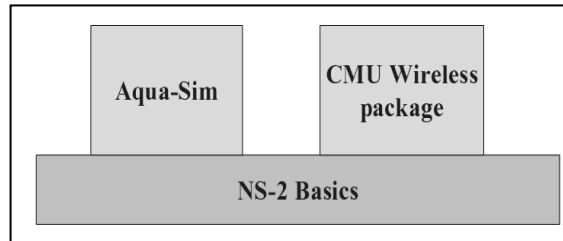
Fig. 1. The relationship between Aqua - Sim and other package of NS-2 [5].

2.5 Aqua-Sim class diagram

In Figure 2 Showing the class diagram of Aqua-Sim. "UnderwaterNode" is an abstraction of an underwater sensor node that contains various information from nodes such as location and speed of movement. "UnderwaterChannel" is an underwater acoustic channel where all packages will experience queues here before being sent. "UnderwaterChannel" also provides an interface for the top layer like the routing layer.
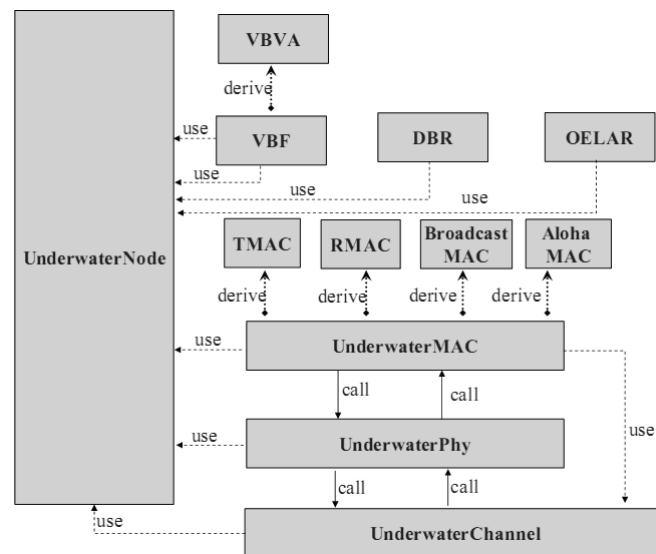
Fig. 2. Aqua class diagram - Sim [5].

2.6 Network Simulator

Network Simulator (NS) was first built in 1989 at the University of California Berkeley (UCB). In 1995 the Network Simulator-2 (NS-2) was first developed that is supported by the Defense Advanced Research Projects Agency (DARPA). NS-2 is a system that works on the operating system Unix/Linux.NS-2 can also run on a Windows operating system, but must use the Cygwin Linux environment it. Basically NS-2 is the OTcl interpreter with network

simulation object libraries. The simulator supports a class hierarchy in C + + (compiled hierarchy) and a similar class hierarchy in OTcl interpreter (interpreted hierarchy). The two hierarchies are interrelated to each other. Thisis the root of the hierarchy Object Tcl. Users create a simulator object (of class Simulator) recently through an interpreter, and reflected by an object is proportional to the compiled hierarchy. Once the Simulator object is created, then the methods to create the topology, nodes and other network components are called. NS-2 is also a simulator which triggered by an event (event-driven simulator). Scheduler runs by executing the next event which the most advance until finished, then re-run the next event. While communicating with the network passes the packet, but it does not spend a lot of time. If the components are made require a delay, then the event scheduler is used to publish events to the package and wait for stop event before the next event is run. Flowchart globally NS systems work can be seen in Figure 3.
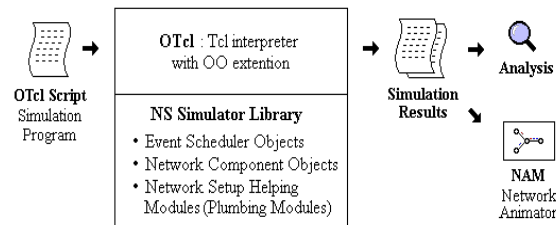
Fig. 3. Flowchart work system NS-2.

2.7 Scenario

Many of the techniques which can be used in evaluating a system. Simulation is one such technique. Simulation techniques are often used to test the proposed system in a short time and with low enough cost. For this reason, the simulator becomes the most important tool for researchers to researching new technologies. The author uses the NS-2 simulator to evaluate underwater sensor networks Because NS-2 has been used extensively and researchers have contributed to its development. This indicates that the simulator is quite complete and has many extensions for applications, protocols and traffic models different.

2.7.1 Scenario simulation

In analyzing the operating performance of the routing on the network UWSN, the authors conducted several scenarios of various traffic conditions with some variable parameters. The variable parameters in this simulation is the number of nodes and node speeds. The test is done by creating a test area with dimensions of 500m X 500m X 500m. In the testing area will be placed 10 to 50 nodes with 5 nodes each test differences. Distribution and movement of the nodes will be done randomly. Mobility of nodes will be moving at a speed of 0.8 m/s and 1.6 m/s (based on research) [3]. For each combination of variable parameter experiment is run ten times to obtain an average value. Scenarios to be run is used to see the effect of the routing operation VBVA to mobility node applications. This scenario also aims to obtain the effect of variations in the number of nodes and node speeds on packet delivery ratio, throughput, delay, and packet loss and energy consumption. There are two scenarios that will test them, that is:
1.   Scenario 1: Traffic with a single source

In the first scenario is one source node and destination node. Remaining nodes will serve as a relay node to be distributed randomly and perform random mobility. The relay nodes to function as an intermediary node sending packets from the source node to the destination node. The topology of the first scenario can be seen in figure 4.
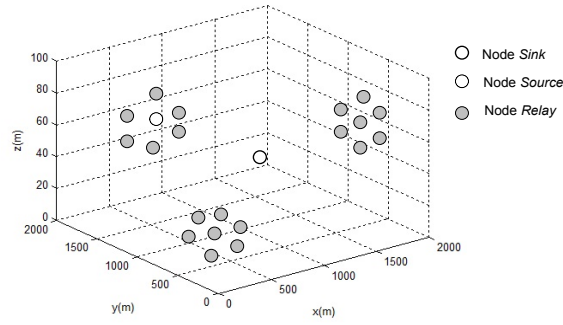
Fig. 4. Scenario 1.

2. Scenario 2: Traffic with multiple sources

In the second scenario there is one node that serves as the destination node and the remaining nodes will serve as a source node that can also function as a relay node. The topology of this second scenario can be seen in figure 5.
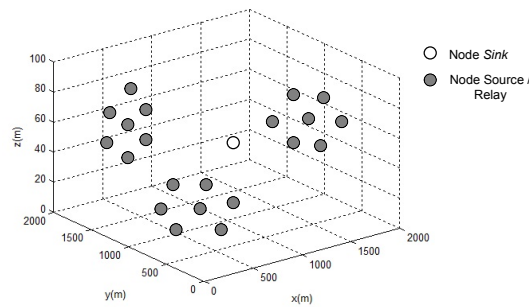
Fig. 5. Scenario 2.

2.7.2 Simulation Parameters UWSN

To get the results of a simulation of the system to be done, then it iis necessary to determine some parameters of the simulation. Simulation of routing in UWSN using the parameters shown in table 1.

Table 1. The Simulation Parameters.

Parameter	Value
Bit rate	10 Kbps

frequency	25 KHz
Number of nodes	50
Delay	25 μs
Antenna	Omni directional
Tx power	0,6 mWatt
Rx power	0,3 mWatt
Node speed	0,8 m/s and 1,6 m/s

2.7.3 Performance Metrics

1. Packet Delivery Ratio
   Mathematically packet delivery ratio can be searched by the following equation:
   $$\text{Packet delivery ratio}(\%) = \left(\frac{\Sigma \text{ Packets received}}{\Sigma \text{ sent Package}} \right) \times 100\%$$

2. Throughput
   Throughput can be calculated by dividing the number of data packets received by the time required for data transmission
   $$\text{Throughput} = \frac{\text{The size of received data}}{\text{The total time of data transmission}}$$

3. Delay
   Delay Time is the time required by a node to send data to another node during the simulation.
   $$\text{Delay} = \text{time packet received - the time the packet is sent}$$

4. Packet loss
   Packet loss can be determined by calculating the difference between the numbers of packets sent by the number of packets received. In the calculation of the number of packet loss will result in packet loss which is a representation of the number of packets lost or does not arrive at the destination node
   $$\text{Packet Loss} = \frac{Packages\ sent - received\ packets}{Packages sent} x\ 100\ \%$$

5. Energy consumption
   Energy consumption can be determined by calculating the difference between the initial energy given by the energy remaining after the node activity.
   Energy consumption = total initial energy - the number of residual energy

3 Simulation and Analysis

Figure 6 shows the packet delivery ratio, based on the traffic scenario with a single source node without movement, low node mobility and high node mobility. Overall, the packet delivery ratio will decrease as the density of nodes in the network. Increasing the number of nodes will gradually lead to loss of quality. One is a decrease in packet delivery ratio. The decline was caused by packet collision occurs more frequently.
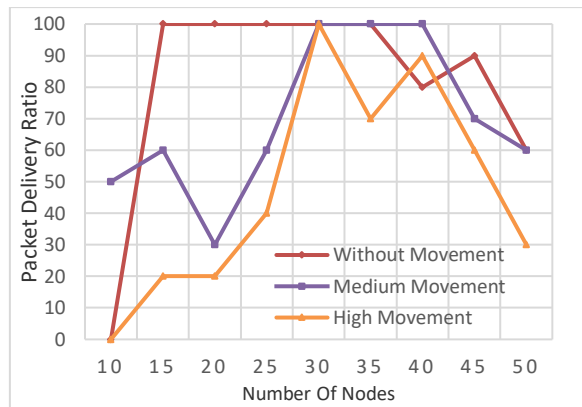
Fig. 6. Packet Delivery Ratio on traffic scenario with a single source.

Comparison of packet delivery ratio, based on the traffic scenario with multiple sources with no movement of nodes, nodes with moderate mobility and nodes with high mobility can be observed in Figure 7. In the traffic scenario with multiple sources, a decline in the success rate of packet delivery is gradually.
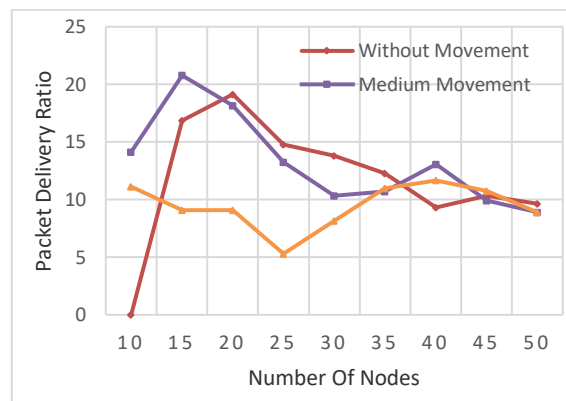
Fig. 7. Packet Delivery Ratio on traffic scenario with multiple sources.

Figure 8 shows the number of packet loss for traffic scenario with a single source node without movement, nodes with low mobility and nodes with high mobility. Packet loss is caused by several factors, including: the density of nodes in the network, the existence of voide nodes, thus causing packet drop. On the whole the more the number of active nodes in then the network packet loss will be even greater.
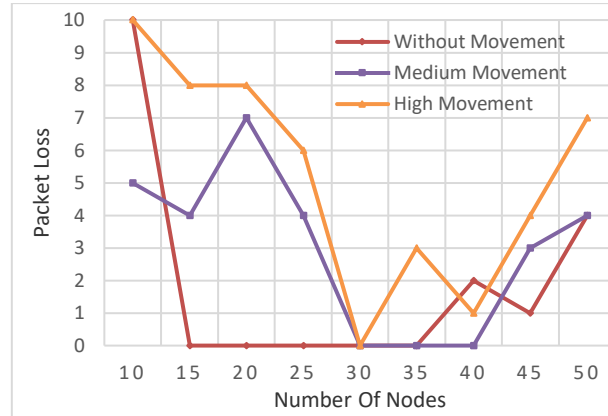
Fig. 8. Packet loss on traffic scenario with a single source.

Comparison of packet loss scenarios based on multiple sources of traffic can be seen in Figure 9. In the scenario of multiple sources of traffic increase in the number of packet loss occurs is gradually because of number of packets multiplied by the number of nodes minus 1 as the sink node which assigned only receive data, while the other served as a source node.
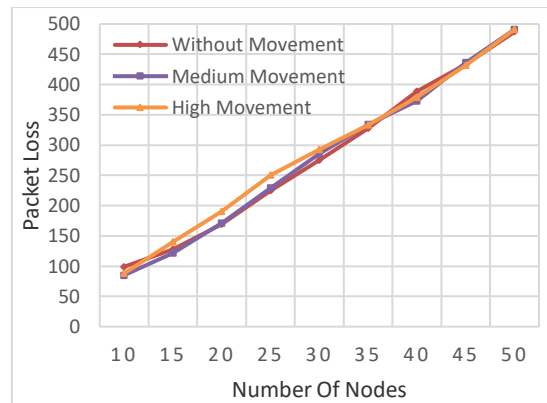
Fig. 9. Packet loss on traffic scenario with multiple sources.

Effect of node density on the throughput of network traffic based on a scenario with a single source is shown in Figure 10. Overall network throughput will increase with the increase in the number of active nodes. Network throughput for nodes without the movement of the node mobility better than low or high node mobility, because the increase is likely to be stable as the number of nodes in the network.
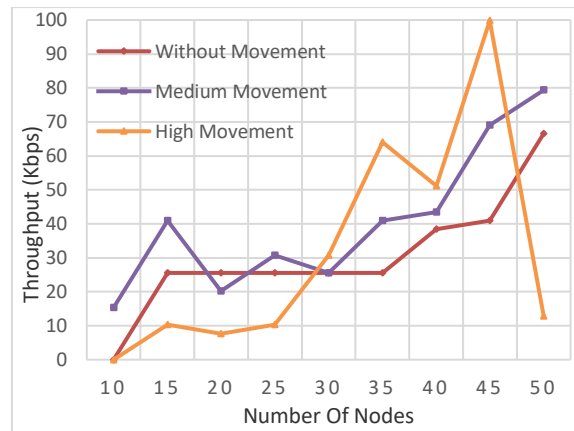
Fig. 10. Throughput on traffic scenario with a single source.

Figure 11 shows a comparison of the throughput of multiple sources of traffic scenarios. The increase in the number of nodes will have an impact on the throughput is increasingly rising.
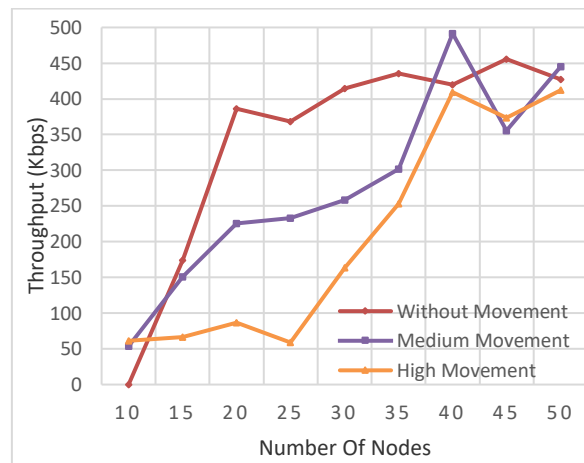
Fig. 11. Throughput on traffic scenario with multiple sources.

Delay is one of the parameters that determine the performance of a system. Significant differences between individual QoS parameters can be seen in the end-to-end delay. Delay in the network is more influenced by the existing traffic density due to the increasing number of nodes. From Figure 12 it can be seen that as the number of nodes in the network a little, delay nodes with high mobility and no movement of the lower nodes than the nodes with mobility being.
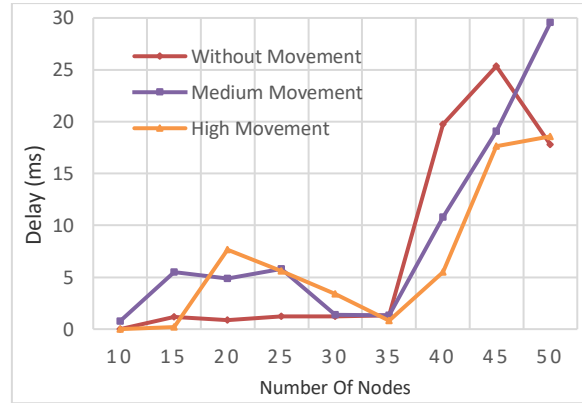
Fig. 12. Delay on traffic scenario with a single source.

Value of delay on the traffic scenario with multiple sources is shown in Figure 13. From the observations it can be seen that the average delay for nodes without movement when 10 nodes have the lowest delay value. However, when the node was 50, his highest delay.
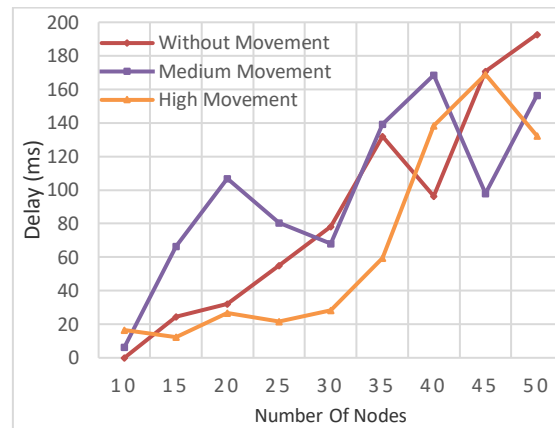
Fig. 13. Delay on traffic scenario with multiple sources.

Energy consumption is one of the parameters that determine the performance of a system. Energy consumption is important to note because power source for the underwater sensor network is difficult to recharge and more expensive. Energy consumption in the network is more influenced by the speed of the node mobility and number of nodes. From Figure 14 it can be seen that as the number of nodes in the network a little, the energy consumption of nodes with high mobility and no movement of nodes is lower than the mobility of nodes with mobility being.
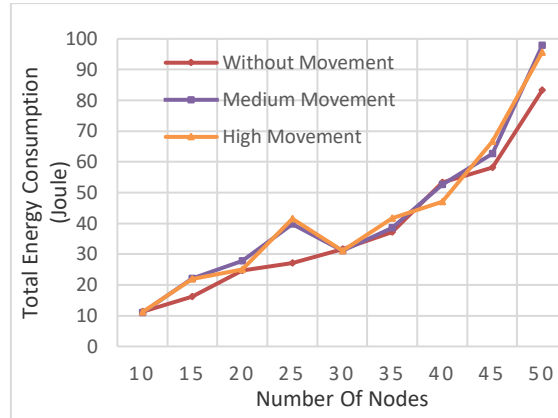
Fig. 14. Total Energy Consumption on traffic scenario with a single source.

Value of the energy consumption in the traffic scenario with multiple sources is shown in Figure 15. From the observations it can be seen that the energy consumption for nodes with high mobility requires less energy consumption compared to node without movement or low mobility.
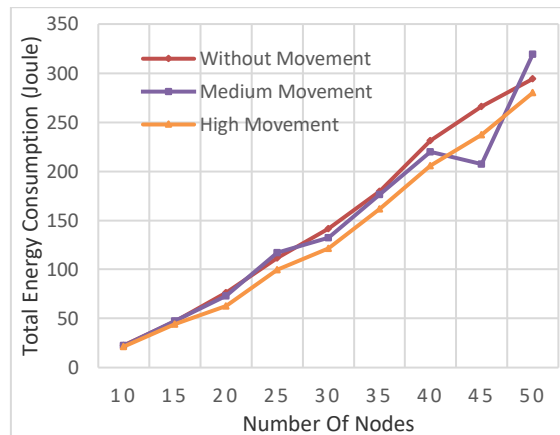
Fig. 15. Total Energy consumption on traffic scenario with multiple sources.

Based on the testing and analysis the scenario of a single source effective for 30 nodes. Because with using 30 nodes, for all mobility experiencing 100% packet delivery ratio. For the scenario to some sources, the effective number of nodes is 35 nodes, because when the number of nodes is more than 35 no significant changes its packet delivery ratio. Currently 35 nodes, nodes with no movement resulted in packet delivery ratio of 13.79%, nodes with low mobility and 10.34% of nodes with high mobility of 8.15%.

4 Conclusions

Overall, the packet delivery ratio will decrease as the density of nodes in the network. Increasing the number of nodes will gradually lead to loss of quality. One is a decrease in packet delivery ratio. The decline was caused by packet collision occurs frequently.

Packet loss is caused by several factors, including: the density of nodes in the network, the existence of voide nodes, thus causing packet drop. On the whole, the number of active nodes, the packet loss network will be even greater.

In the scenario multiple sources, the traffic increase in the number of packet loss occurs is gradually because of number of packets multiplied by the number of nodes minus 1 as the sink node which assigned only receive data, while the other served as a source node.

Overall network throughput will increase with the increase in the number of active nodes. Network throughput for nodes without the movement of the node mobility better than the low- and high mobility of nodes, because the increase is likely to be stable as the number of nodes in the network.

Delay in the network is more influenced by the existing traffic density due to the increasing number of nodes. When the number of nodes in the network a little, delay nodes with high mobility and no movement of the lower nodes than the nodes with low mobility.

Energy consumption for nodes with high movement produces less energy consumption compared to node or nodes without any movement to the movement low.

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Consumer Perceptions of Syariah Bank and Location (An Overview of Merchants Interest in Choosing Microfinance Financing for Syariah Banking in Bireuen District)

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Abstract. This study aims to determine consumer perceptions about syariah bank and location reviewed from the interest of merchants choosing micro business financing in sharia banking in Bireuen regency. Data collection method used in this research is survey using questionnaire. The sampling technique used cluster and sampling method. The population of this research is all traders of micro business located in 17 sub districts in Bireuen Regency which amounted to 2101 *traders* and samples of 100 traders that is an average of 5.9 per kecamatan. The result of research shows that consumer perception about syariah bank and location shows positive and significant influence, so that traders are interested in choosing micro business financing in syariah banking in Bireuen District.

Keywords: Perception, Shariah Bank, Location, Micro Business, Trader, Interests.

1 Introduction

The rotation of the economy wheel in a country is influenced by the participation and the role of various business sectors. Therefore, to strengthen the economic foundations the government needs to promote the business sector in various fields, so that prosperity will be realized.

The Central Bureau of Statistics launched in 2010 the number of workers reached 116.5 million people, in 2011 that is 119.4 million people, in 2012 amounted to 120.3 million people, in 2013 that is 120.2 million people, 2014 amounted to 121.9 million people, 122.4 people, and in 2016 as many as 127.8 million people [1].

From these data can be seen employment absorption shows an increase in every year. The largest absorption of energy is in the MSME sector, on average per year UMKM can open employment opportunities for 8,396,823.5 people, or 64.23% of the total number of business actors in Indonesia.

This fact indicates that MSMEs can create jobs, so it can help the economy in terms of reducing the number of poverty, distribution of income distribution and economic development in an area.

In general, this sector of MSMEs business is in the trade sector, in the economic activity of traders have various considerations. The merchant's consideration is related to the determination of the consumption choices and the determination of the costs used to meet the factors of production. Financing for traders is necessary in order to support the smoothness in the provision of stocks of merchandise, because one of the supporting factors required by traders in building a business that is fund or known as financing.

In Indonesia, small-scale businesses have the support of the government. One indication of government support is the presence of ministries dealing with microeconomic growth, where the base is a small community.

In addition to the government, also needed support from various parties, especially financial institutions, such as banking sector, and non-bank institutions. If all parties are committed to assist UMKM, then prospective traders need not be confused to become micro entrepreneurs because of lack of capital.

So far, the limitations of capital severely limit the movement of small traders in running and increasing their business. but with a variety of access to finance institutions, especially the current sharia financing with all the weaknesses and advantages that exist into consideration for traders in determining the choice.

Capital for business can be obtained from two sources namely own capital and from outside among other financial institutions, namely Islamic financial institutions and non-sharia financial institutions. Sharia financial institutions are one of the instruments used to regulate the rules of Islamic economics.

The provision of business capital loan from sharia financial institution is of course temporary, as a stimulus to conduct production activities, so it is expected to increase the income of small businesses. With the increase in income then the welfare and justice of society is expected to be realized.

Sharia financial institutions include Syariah Bank, Syariah People's Financing Bank, Sharia Cooperative, Baitul Mal wat Tamwil and so on. As part of the economic system, the institution is part of the social whole. Therefore, its existence must be viewed in the context of the whole society as well as the values prevailing in society.

Sharia financial institutions have improved since the issuance of (Law No. 20 of Indonesia, 2008) on sharia banking. The law contains the laws relating to Bank Indonesia as the Central Bank and the laws that form the legal basis for all kinds of banking activities.

Sharia financial institutions as part of the sharia economic system in conducting business and business can not be separated from sharia sieve. Sharia financial institutions also will not finance the efforts in which contained things that are forbidden and with the existence of Islamic financial institutions are expected to overcome or reduce the practice of illegal banks (loan shark) Amid the community, especially traders.

Sharia banking is a banking system that operates based on sharia principles. With the main principles of partnership and togetherness in the system of sharia both the bank and customers get keutungan, because the activities undertaken do not use the system of interest but with the system of profit sharing. Consumer perceptions of all information held such as various products / services are very useful for banks that operate by using sharia system, understand the consumer is very important because what is purchased, where to buy, when to buy and how much is purchased will depend on the consumer knowledge -that matter. Consumer

perceptions about sharia banking will have an impact on consumer behavior to choose sharia banking.

By seeing the increasingly tight competition in the banking world, the syarah banks must have the right strategy to win the competition, Islamic banks must constantly make various innovations, including designing various products, both fund raising and financing as attractive as possible, in addition to various factors must be considered among other information about the products / services of Islamic banks so that the consumer knowledge of Islamic banks and on the strategic location, customer convenience, and the breadth of the network and so forth. Acehnese in particular in Bireuen district are dominantly Muslim but still limited knowledge of sharia banking by taking loans to loaners who ask for interest in each loan given according to the nominal amount given.

2 Literature Review

2.1 Understanding Islamic Banking

Bank is a financial intermediary financial intermediary. That is, the bank institution is an institution that in its activities related to the issue of money.

Bank Syariah according to (Indonesia Law Number 21 of, 2008), is a bank that conducts its business activities based on sharia principles and according to its type consists of Sharia Commercial Bank and Sharia Rural Bank. Islamic banks in general are financial institutions whose main business is providing financing and other services in the traffic payments as well as money circulation which operate in accordance with the principles of sharia.

So it can be concluded Islamic banks are financial institutions whose main business provides financing and other services in the traffic payments and circulation of money that operate in accordance with Islamic Shari'ah principles that operate with the principles of Islamic sharia.

2.2 The role of Sharia Bank

Concerning the functions and roles ofsharia banks, according to (Muhammad Antonio Syafii, 2001:25) are as stated in the opening accounting standards issued by Accounting and Auditing Organization for Islamic Financial Institution (AAOIFI), as follows:
1. Investment manager, sharia bank can manage customer fund investment.
2. Inverstor, sharia bank can invest its own funds and customer funds entrusted to him.
3. Providers of financial services and payment traffic, Islamic banks can perform banking services activities as usual.
4. Implementing social activities, as a feature embedded in Islamic financial entities, Islamic banks are also obliged to have the obligation to issue and manage (collect, administer, distribute) zakat and other social funds.

Viewed from several aspects in the role above shows that the role of Islamic banks is very useful for consumers who want to choose a sharia bank to conduct banking transactions.

2.3 Definition of Financing

According to (Law No.10, 1998) No. 7 of 1992, financing is the provision of money or equivalent claims based on borrowing or borrowing purposes between banks and other parties requiring the borrower to repay the debt after a certain period of time plus a certain amount of interest, or the sharing of the results between the investor and the manager.

Meanwhile, according to (Kasmir, 2008:102) Financing (Financing) in conventional banking known as credit terms.

The definition of credit in accordance with Law Number 10 Year 1998 [6] is "Provision of money or claims that can be equalized, based on a loan agreement or agreement between the bank and other parties that require the borrower to repay the money after a certain period of time." If someone uses credit services will be charged.

So it can be concluded that financing is the provision of money based on an agreement between banks with other parties, with the agreement the borrower returns his loan in accordance with the agreement to increase the profit sharing according to the contract agreement.

2.4 The Role of Micro Enterprises

The role of micro enterprises according to Sincere, (2009: 45) is a micro business is a business that has an important role in economic development, this is due to the relatively higher labor intensity and smaller performance. So that micro businesses are more flexible in dealing with and adapting to market changes. This causes the micro business not to be severely affected by external pressure, as it can reduce imports and have a high local content. Therefore, the development of micro business can contribute to economic diversification and structural change as a precondition of long-term stable and sustainable economic growth. In addition, the rate of job creation is higher in micro enterprises than in large corporations.

2.5 Understanding Interest

According to (Sofjan Assauri, 2011:141) interest is a sense of love or pleasure and a sense of interest in an object or activity without any one telling and usually there is a tendency to search for objects that are liked. Interest is better known as the use or purchase decision of a particular service / product. Purchase decision is a decision-making process of a purchase that includes determining what will be purchased or not making a purchase and the decision is derived from the previous activities of the needs and funds owned.

2.6 Understanding perception

Perception according to (Jalaluddin Rakhmat, 2008:51) is the experience of objects, events or relationships obtained by concluding information and interpret the message.

Meanwhile, according perception is a process of sensory clues (sensori) and relevant past experiences organized to give us a structured and meaningful picture in a particular situation. Similarly, Atkitson and Hilgard argue that perception is the process by which we interpret and organize stimulus patterns in the environment. Gibson and Donely explain that perception is the process of giving meaning to the environment by someone else's other characteristics.

3. Result and Discussion

3.1 Validity Test Results

Test validity is a reliable data to measure the validity of whether or not the item question or measure the truth in accordance with reality. the authors analyzed the results of processed SPSS version 18.

Level validity is done with terms above 0.05 and by comparing the value of r arithmetic with r table value, r value calculated from SPSS output in Correlated Item-Total Correlation column. While the r-table value can be obtained through df (degree of freedom) = n-k so 100 - 12 = 88, then r-table = 0.1745.

From 12 items the question can be concluded that the question stated is all valid, because all correlation values are above 0.05 and the value of r-count> r-table. So in this study all items in the instrument meet the validity requirements and can measure precisely and accurately.

3.2 Test Reliability

Test Reliability shows the results of variable reliability measurement. Reliability test is done by using Cronbach Alpha technique, where an instrument can be said reliable reliably if have reliability coefficient or alpha has value> 0.70 then the value of reability is high.

Table 1 : Test Reability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.773	0.789	12

The output of SPSS shows the result of Reliabiliy Statistic table that is 0.773 It has been seen before in reliability test material that is if alpha is between 0,70 - 0,90 then high reliability. Viewed from Cronbach's Alpha is 0.773 between 0.70 - 0.90 then for this test reliability is said to be high.

3.3 Classic Assumption Test Results
3.3.1 Normality Test Results

Normality test aims to test whether in the regression model, the dependent variable and the second independent have a normal distribution or not. A good regression model is one that has a normal or near-normal distribution of data. Normal data distribution will form a straight line diagonal and if the data is normally distributed, then the data distribution shown will follow the diagonal line groove.

Normality testing performed using Normal P-Plot Regression Standardized Residual, Histogram and Kolmogorov-Smirnov. The processed results SPSS version 18 on the test of normality is as follows:
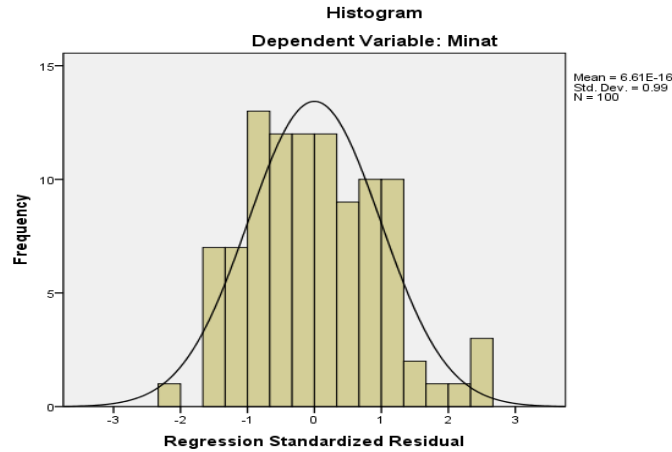
Figure 1: Histogram Chart

Based on Figure 1 above, shows a bell-shaped histogram of zero, the curve does not deviate to the left or deviates to the right (the left and right sides are the same width), it can be said to be normal. Therefore, a normal P-Plot graph is used which illustrates the presence of dots around the diagonal line shown in Figure 2 as follows:
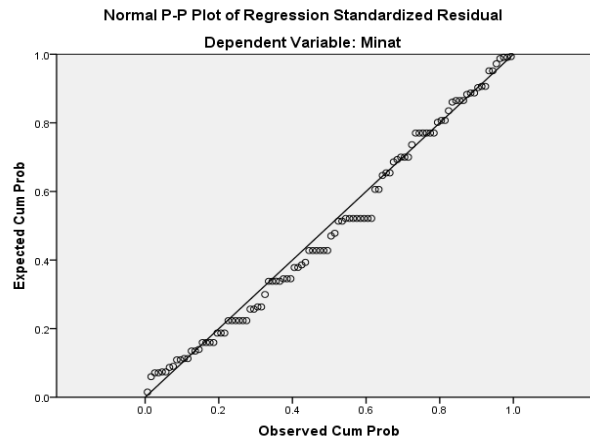
Figure 2: Data Normality

Based on the graph above, the residual data shows the normal curve seen at the points spreading around the normal line (diagonal line), as well as its spread following the direction of the diagonal line. Then the regression model is appropriate for predicting customer satisfaction based on the input of the independent variable or regression model fulfilling the normality assumption.

Another way to do in the classical assumption to know whether the data is normally distributed or not is by the One-Sample Test Kolmogorov-Smirnov test. The result of this

normality is done from significant value> 0,05 means show regression model has fulfilled normality assumption.

3.3.2 Multicollinearity Test

Multikolineritas is a test whether in the regression model found a correlation between independent variables. A good regression model should not be correlated between independent variables. To detect the presence or absence of multicollinality in the regression model can be seen from the tolerance and variance inflation factor (VIF). If the tolerance value ≤ of 0, or equal to the VIF value ≥ of 10, then indicates the presence of multicollinearity and vice versa if the tolerance value ≥ 0.1 or equal to the VIF value ≤ of 10 then the regression model is free of multicolinearity.

VIF (Variance Inflation Factor) and Tolerance. The guideline of a multicolinearity-free regression model is when it has a VIF value below 10 and has a tolerance rating of not less than 0.1. It can be seen that the VIF value on Perception is 1.116 and Location 1.116 is <10, it proves that the regression model model is free from multicollinearity. Similarly Tolerance> 0,1 is Perception which is 0,896 and Location is 0,896. Thus it can be concluded that the regression model does not occur multicolinearity, so the regression is legitimate to use.

3.3.3 Heteroscedasticity Test

Testing whether in a regression model, there is a variance inequality of the residual from one observation to another. If the variance of the residual from one observation to another observes remains, then it is called Homoscedasticity. And if the variance is different, it is called Heteroscedasticity. To detect the presence or absence of heterokedastisitas in the regression model can be seen from the pattern formed at the point contained in the sccaterplot.

The basis for decision making is as follows:

1. If there are certain patterns, such as points (points) that exist in the form of a certain pattern that regular (wavy, widened, then narrowed). Heterocedasticity has occurred.
2. If there is no clear pattern with dots spread above and below zero on the Y axis, no heteroscedasticity
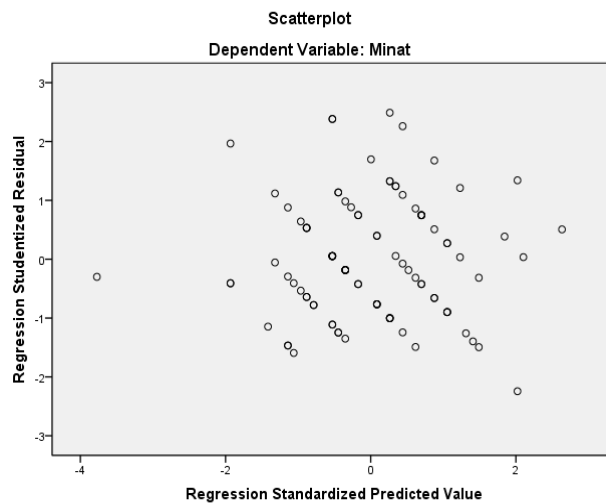
Figure 3: Heteroscedasticity Test Results

From the Scatterplots graph it appears that the dots of the data spread randomly and spread out either above or below the zeros on the Y axis and form a certain pattern. It can be concluded that there is no heteroscedasticity in the regression model or the data is homoscedasticity, so the regression model is feasible to be used to analyze consumer perception about syariah bank and location to the interest of the merchant choosing the micro business financing on the syariah banking.

4. Conclusion

Based on the results of research conducted it can be taken the following conclusions:

1. Perceptions (X1) and Locations (X2) simultaneously affect the Interest of Traders Selecting Micro Business Financing on Sharia Banking in Bireuen (Y).
2. Perception (X) is partially positive and significant influence on the Interest of Merchants Selecting Micro Business Financing on Sharia Banking in Bireuen Regency.
3. Location (X2) partially has a positive and significant effect on the Interest of Merchant Selects Micro Business Financing on Sharia Banking in Bireuen Regency.

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Image Qualiy Improvement Using Algorithm Spatial Median Filter And Adaptive Fuzzy Contrast Enhacement

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Abstract. This study aims to increase the image quality in terms of contrast and noise removal, it is necessary to do processing on the image in order to be interpreted in accordance with the desired. Image in question is a static grayscale images with 8-bit PNG that have low contrast and noise levels above 10% ie 15% -50% at intervals of 5%. The author uses algorithms Median Spatial Filter (SMF) to reduce noise and Fuzzy Adaptive Contrast Enhancement Algorithm With Details Serving (AFCDP) for enhancing the contrast, where the two algorithms are combined. This technique is excellent in image enhancement, where the results of tests performed combination model can improve the image of the highest quality at 15% the percentage of noise with PSNR = 26.417 and SE = 0.0387.

Keywords: Image quality, Image processing, Noise reduction and Contrast enhancement, and a Combination SMF AFCDP.

1. Introduction

Improving the quality of the image (Image Enhancement) is an interesting thing with the challenges inherent in image processing, this also applies to the contrast enhancement or image quality improvement [1]. Some of the images may decrease the quality to be darker even damaged can be caused by noise or because of damage to the recording device cause the object in the image becomes unclear, making it difficult to be processed again [2] [3]. Type gaussian noise and impulse noise, better known as salt and pepper noise in the form of black or white dot is the noise that is often found in the image[4][2], In addition the level of contrast of the image also becomes important because it affects the image quality, especially the content of the image, making it lookthe need for a deeper study to increase image quality in terms of contrast and noise removal [3][4][5].

Some of the existing research, apply image enhancement separately between noise removal and contrast enhancement. Kohli and Kaur doing research by comparing the two algorithms eliminate the salt and pepper noise with Spatial Median Filter algorithm (SMF) and Adaptive Noise Reduction, obtained SMF algorithm capable of reducing noise with better outcomes [6].

Rajesh Kumar [6] also conduct research to compare with Spatial Filter Spatial Mean Median Filter with three scalar colors and varying noise levels obtained Spatial Filter Median give better results. Improved image quality in addition to improvements to the salt and pepper
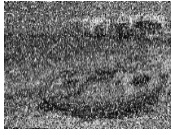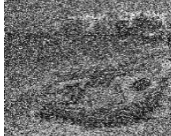
noise as well as contrast enhancement. Similar research has been done to improve the quality of image contrast by using Fuzzy Adaptive Contrast Enhancement Algorithm With Details Preserving (AFCEDP) compared to using the same algorithms Adaptive Contrast Enhancement Algorithm difference without using fuzzy [6] obtained AFCEDP get better results without significantly reducing image information [6], Increase the contrast by using brightness and details preserving give better results [7]. In addition there are also applying image contrast enhancement with Fuzzy Method are also able to enhance the image contrast nicely compared with the method of fuzzy sets enhancement, NINT, Pal-King, fuzzy-rule-based, *fuzzy Quantitive Measure, Local Fuzzy Enhancement* [5],

   Based on the reference, the combination of SMF algorithm for noise removal salt and pepper and AFCEDP for enhancing the contrast has never been tested, so we need a more in-depth study in the hope that more will be found ideal models to cope with noise and low contrast with the quality of the relatively better. Ingeneral, the study was designed as follows: In the first image dataset will be tested in two models, the first one; eliminate noise followed by peningkatanan contrast, second; contrast enhancement first, followed by the removal of noise to get the model better testing by comparing the results of which will be the process of calculating the change in the image of the noise removal using the Mean Signal Error (MSE) and Peak Signal To Noise Ratio (PSNR) and for enhancing the contrast using Shannon Entropy (SE) and Contrast Improvement Evaluation (CIE). To get relatively better results, further testing needs to be done so it can be the best algorithm combination model that measured both in terms of data,

2. Method
2.1. Method of collecting data

   The data used is the data set in the form of pictures PNG 8-Bit 5 pieces with levels of low contrast and the percentage of noise salt above 10% ie 15% - 50% at intervals of 5% to be tested each with content images used varied without referring to certain things. Here is an example of a low contrast image of the image data and noise above 10% as varied as shown in Figure 2.1 below.

imagery noise	imagery With roar	Noise image	imagery With roar
15%		35%	
20%		40%	
25%		45%	
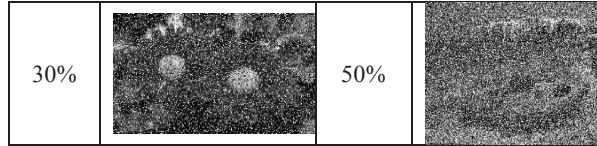
Figure 2.1: Data Image Noise 15% -50%

2.2. Stages Analysis

Image by noise salt beforehand inputted and then will be the process of improving the quality of the image by a combination of noise reduction algorithm using SMF and the contrast enhancement algorithm using AFCEDP a different order depending on the 5 pieces of the image with the percentage of noise 15% - 50% to get the best image of the by PSNR, Shannon Entropy (SE) and Contrast Improvement Evaluation (CIE).

The following stages of the process by the noise reduction and contrast enhancement using SMF AFCEDP:

2.2.1. Spatial Algorithms stages Median Filter (SMF)

Working procedure of the Spatial Median This filter can be described as shown in Figure 2.2 below:
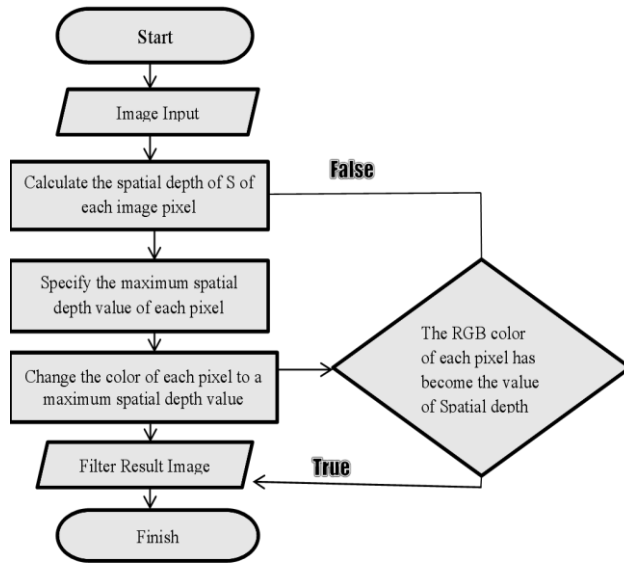
Figure 2.2: Flowchart Process Median Spatial Filter

a. Image input.
   Suppose the input image size of 3 x 3 with the pixel color as table 2.1 below:

Table 2.1. Image Measuring 3 x 3

150	130	80

88	90	38
210	280	128

b. Calculate the spatial depth of the S of each image pixel.
   For each pixel in the image, calculating the value of spatial depth. Suppose specified mask size is 2 x 2 so that N = 4 by using the following formula:

$$S_{depth}(X, x_1, \ldots, x_N) = 1 - \frac{1}{N-1} \left\| \sum_{i=1}^{N} \frac{X - x_i}{\|X - x_i\|} \right\|$$

c. Specify the maximum spatial depth value of each pixel.
   After the calculated depth value of each pixel, then there will be the value of spatial depth max pixel selected from the Red value.
d. Change the color of each pixel to a maximum value of spatial depth.
   If the red color of the first pixel is not a selected depth value, then replace the pixel values are selected to the first pixel.
e. The same thing will be repeated for all other pixel after the color RED all the pixels are processed.
f. If all the red has been processed, will be repeated back to GREEN and BLUE color of all pixels.

2.2.2. Algorithm Process Stages AFCEDP

The original image which is inputted in the form of a grayscale image. The image will be processed by algorithms Fuzzy Adaptive Contrast Enhancement algorithms with Preserving Details as for the process consists of four stages of processing are:
1. Determine the membership function of each entity.
2. Calculate the degree of membership and reference intensity values.
3. Defines 3 functions plateau and computing Clipping limit.
4. Doing Clipping and histogram equalization.

AFCEDP image algorithm results will be compared with the initial image by using Shannon Entropy and methods Improvement Evaluation Contrast this to show improved contrast and image detail preservation happens after repairs on the initial image, can be described as follows. Suppose the original image to be processed measuring 4 x 4 pixels, like the figure 2.3 below:

97	100	103	79
108	86	97	103
144	135	121	145
169	85	153	50

$$p(k) = \frac{H(k)}{N}, \text{ for } k = 0, 1, \ldots, L-1$$

Figure 2.3. Example of First image

a. *Membership Function Determination and Calculation of Degree of Membership*
   The initial image will be sought degree of membership for each pixel in the image. The technique used to divide the membership function for each pixel in the image below.

$$\mu_{low}(k) = \begin{cases} 0 \\ \dfrac{95-k}{20} \\ 1 \end{cases} \qquad \mu_{low}(k) = \begin{cases} 0 \\ \dfrac{95-k}{20} \\ 1 \end{cases}$$

$$\mu_{mid}(k) = \begin{cases} 0 \\ \dfrac{k-75}{20} \\ 1 \\ \dfrac{180-k}{20} \end{cases} \qquad \mu_{mid}(k) = \begin{cases} 0 \\ \dfrac{k-75}{20} \\ 1 \\ \dfrac{180-k}{20} \end{cases}$$

$$\mu_{high}(k) = \begin{cases} 0 \\ \dfrac{k-160}{20} \\ 1 \end{cases} \qquad \mu_{high}(k) = \begin{cases} 0 \\ \dfrac{k-160}{20} \\ 1 \end{cases}$$

The end result of this process will form the membership function μlow 3, μmid, and μhigh. Penggelempokkan process as follows.
1. Pixel-1 (Gray = 97), then
   μlow for pixel-1 is 0 (Gray> 95),
   μmid for pixel-1 is 1 (Gray ≤ 95 ≤ 160),
   μhigh for pixel-1 is 0 (Gray <160)
2. The same calculation is done up to the last pixel or pixels-16

b.   *Analysis Intensity Reference Value Calculation*
   Reference intensity values obtained from the following formula.
   λ= (Low_part × 43) + (mid _part × 128) + (213 × high_part)
c. *Defining Analysis Function Three Plateau and Compute Clipping Limit*
   The third search function can use the following formula plateau.

$$level_{low} = c_1 + \max(pdf)$$
$$level_{mid} = \text{mean}(pdf)$$
$$level_{high} = c_2 + \text{mean}(pdf)$$

The third search function searches plateau starting from pdf (probability density function) which can use the formula.
   Where the value of H (k) means many occurrences of pixels with gray-k can be seen in table 2.2.

Value of gray	P(k)	Value of gray	P(k)
50	0.0625	108	0.0625
79	0.0625	121	0.0625
85	0.0625	135	0.0625
86	0.0625	144	0.0625
97	0125	145	0.0625
100	0.0625	153	0.0625
103	0125	169	0.0625

Table 2.2 Calculation results p(k)

C1 and C2 value used in the algorithm ranged between [-0015, -0005] and [0.005,0.007] sequentially. In this context the value of c1 and c2 used are -0.01 and 0.007 respectively. Thus, the value levellow, levelmid, levelhigh are:

levellow = -0.01 + 0.125 (the highest value of the pdf) = 0.115
levelmid = 1/14 (the average value of the pdf) = 0.0714
levelhigh= 0,007 + 0.0714 = 0.0784.

d. Clipping Analysis and Histogram Equalization

At this stage, carried out in the histogram equalization, to the value of H (k) and PDF are already received earlier in Table 3.1 and Table 3.2 respectively. The next step yajni pdf search new value using the following formula: new_p (K) = min (p (k), σ (k)), for k = 0, L -1
   1. Gray = 50
      new_p(50) = MIN (0.0625, 0.0714) = 0.0625
   2. The same calculation is done until the final gray value in the image
   Calculation continues to find the value of c (k) by using the formula:

Histogram smoothing is done using the following transformation function in order to obtain a new intensity value.

$$new\_f (K) = X 0 + (XL-1 - X 0) \times (c (k) - ½ p (k))$$

X0 and XL-1 refers to the lower limit and the upper limit of the histogram.Value X0 and XL-1 used in this example is 0 and 255.
   1. Gray value = 50
      $new\_f (k)$ = 0 + (255-0) * (0:07 - (0.5 * 0.07))
                  = 8925 (rounded to 8)

New gray value will replace the previous gray value so as to form a new image that has been in the histogram equalization. Pictures of the final image can be seen in Figure 2.4.

82	100	121	26
138	62	82	121
192	174	156	210
246	44	228	8

Figure 2.4 Final image after histogram equalization

2.3. Parameter Testing
a. *Fidelity*

To determine the magnitude of the change and the quality of the image will be compared with the results of the initial image using the Mean Square Error (MSE) to determine differences in error and Peak Signal to Noise Ratio (PSNR) for measuring the quality of the image.

- *Mean Square Error* (MSE)
   MSE is always inversely proportional to the value of PSNR. If the small MSE value it will generate a large PSNR value and vice versa. Usually the value of MSE is measured in percent (%).
- *Peak Signal To Noise Ratio* (PSNR)
   PSNR is usually measured in decibels (dB), the PSNR value falls below 30 dB indicates a fairly low image quality due to the low initial image quality due to noise and low contrast. For good quality and high value should PSNR of 40 dB or higher [7],

b. Details Image Information

The next test parameter is detail information of the image after increasing the contrast, using an algorithm *Shannon Entropy* Contrast Improvement and Evaluation robustness intends to determine the level of the amount of change in the image information.

3. Results

In the process of improving the image with a combination algorithm, the results obtained from the combination of the best algorithm can be seen in Table 3.1:

Table 3.1 Percentage Noise image with contrast and image combination results

$$c(k) = \sum_{i=0}^{k} new\_p(i), \text{ for } k = 0,1,\ldots,L-1$$

imagery noise	Image With Noise	Combined Results SMF+AFCDP
15%		
20%		
25%		
30%		
35%		
40%		
45%		
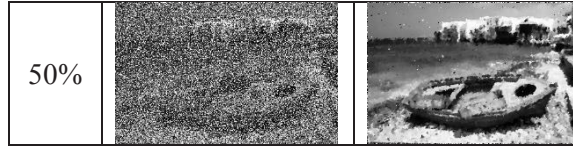
The results of each test performed image enhancement can didekripsikan best image enhancement test results of each persetasenoise15%, 20%, 25%, 30%, 35.40%, 45%, 50% into a graph, in this case a combination of *Median Spatial Filter (SMF) and Fuzzy Adaptive Contrast Enhancement Algorithm Preserving With Details* (AFCEDP). Can be seen in Table 3.2 and Figure 3.1.

Table 4.11 Decryption of any image enhancement noise persetase

Percentase Noise	MSE	PSNR	SE
15%	148.3689	26 417	0.0387
20%	368.6323	22.4648	0.17495
25%	419.2204	21.9063	0.1855
30%	477 652	21.3396	0.1819
35%	554 604	20.6909	0213
40%	624 639	20.1745	0.2177
45%	703 832	19.6561	0.2181
50%	789 317	19.1582	0.2457

From the results of the above table can be drawn to suah chart as shown below 3.1
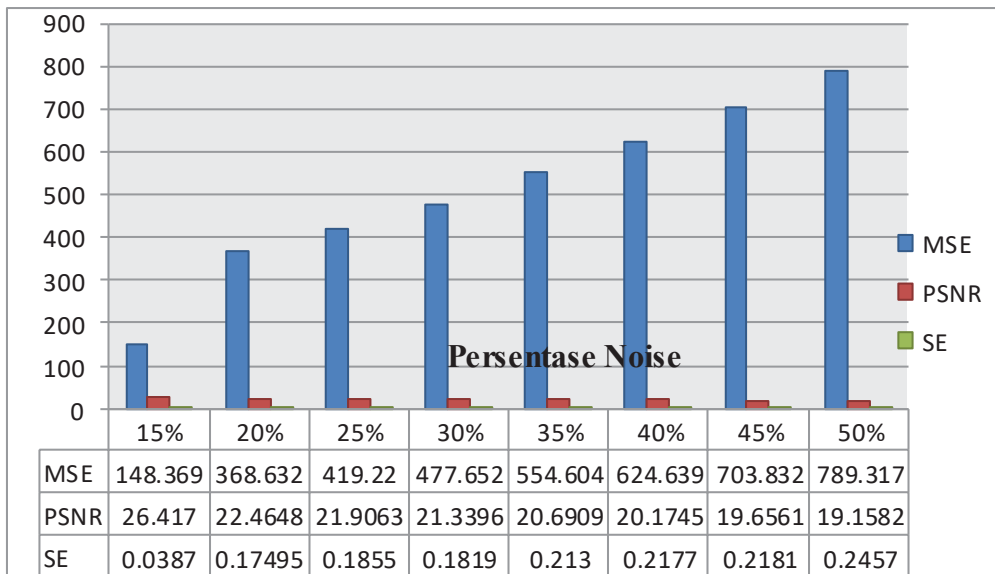
Figure 3.1 Chart Improved results from any percentages image noise.

4. Conclusion

Based on an analysis of all test obtained a combination of increased maximum possible image quality by eliminating noise salt in advance using Spatial Median Filter (SMF) and then increase the contrast using Fuzzy Adaptive Contrast Enhancement Algorithm With Details Preserving (AFCEDP) than vice versa.

Highest image quality enhancement obtained at the noise percentage to 15% with PSNR = 26 417 dB and SE = 0.0387

This combination is becoming the new model in a manner that the image quality improvement do not breathing and able to improve the image quality of the results above 30 db.

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Integrated Water Level Control System Using Fuzzy Logic

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Abstract. This paper presented the design of fuzzy logic control system to control water level on two water gates in an integrated manner. The system was designed on a prototype scale, which consists of a water gate and a control system part. The control system used two fuzzy logic controllers. The input of fuzzy logic controller was error signal and water level delta error, while the control output was the active time of the water gate motor (between 0-2 seconds) to adjust the opening size of the sluice gate. The quantities of inputs and outputs were grouped into five membership functions, with the defuzzification process using the Centre of Area (COA) method. The test results showed that the water level on the water gate 1 could reach a reference value of 10 cm with an initial level of 0 cm in 90 seconds, with the opening of the water gate 1 at 10% condition and the water gate 2 at 0% condition. For the water gate 2, the system response could reach the reference value within 340 seconds with the sluice gate of the water gate 2 up to 10% and the gate 1 reached 0%. The system could run on the water gate 1 and on the water gate 2, although there was a disturbance.

Keywords: Water level control, Water gate, Integrated, Fuzzy logic.

1 Introduction

Water level control at river gates is done by arranging the width of water gates. The control of water gate opening are made so that the water level upstream (before) of the water gate is maintained at the desired level, and the flow of water coming out of the water gate is also maintained. This aims to prevent the overflow of water from the river to the area around (river) river that can lead to flooding.

In most of the existing water gates, the process for increasing or reducing the sluice gate is done manually. Various studies have been conducted regarding the automatic of water level control at the sluice gate. Researches related to water level detection method on dam to prevent flooding has also been done, one of them by using image processing [1].

In the journal Alfatah (2016) was discussed about the automatic open-close system at the dam water gate to adjust the Arduinobased water level. The system is designed to detect changes in water levels, in input or output of rivers and also dams [2].

In addition, the research on the use of fuzzy logic algorithm for water level control had also been done, as in Dharamniwas, Aziz, Redhu, and Gupta (2012) that discussing fluid level control techniques using logic fuzzy [3]. In addition there are also papers presented by Farooq, Rafiq, F., Abbas, G., and Asad, (2016) and Mushtaq, Tayyaba, and Ashraf(2014)on fluid level control systems with fuzzy logic and simulation with Matlab [4], [5].

More specifically, the use of fuzzy logic on water level controls at sluices or dams had also been done. As in the paper M. Abbas, M. Saleem Khan (2011) that described the construction design of hydro-power DAM control using fuzzy logic. In this paper, the input of fuzzy logic controller is water level and flow rate, and the output is out-flow valve and opening of drain valve. Each input and output mapping in five triangular membership function, and deffuzification use center of average (C.O.A) method. The proposed design is verified using Matlab simulation. Simulation result show the drain valve control output can be utilized further for land irrigation according to the need [6].

While on paper Kusuma and Kurniawan(2016)it was explained about fuzzy logic gate control on the dam system. Ultrasonic sensor as the input of the system to be processed on the microcontroller and DC motor as the output of the system that will move the floodgates on the dam. At the opening of the water gate by DC motor with the output value of fuzzy logic at test 1 resulted in high value of the flood gate with an average of 0.936 cm, the second test resulted in a high-value water gate with an average of 1.716 cm, and on test 3 produced a high-value water gate with an average of 3.02 cm [7].

From the reference paper as described above, the water gate control is done in one condition which is the open-close water gate. Based on those above, in this paper, the design of water level control system on two water gates is integrated based on fuzzy logic.

2 System Design

The block diagram design of the level control system on two water gates is shown in Figure 1. The system design done is the design of the water gate system prototype (Figure 2) and the design of the control system.
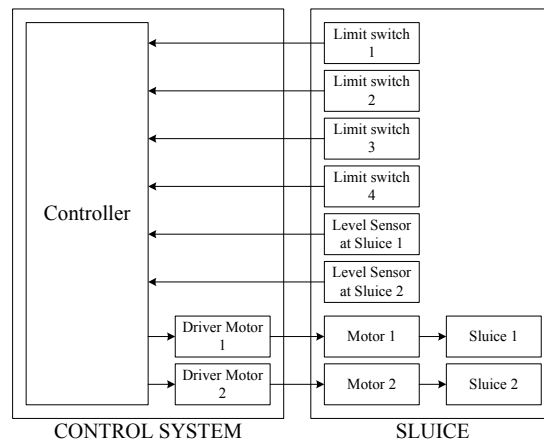
Fig. 1. Block diagram of a level control system on two integrated water gates.

2.1 Prototype Design
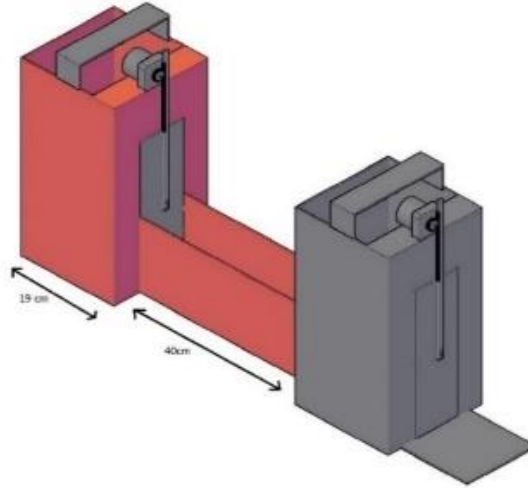
Fig. 2. The prototype design of the water gate system.

In the prototype design of water gate, there consists of two water gates (water gate 1 and water gate 2), the engine of the open-close door (motor 1 and motor 2), the level sensor at the water gate 1 and the level sensor at the water gate 2using the ultrasonic sensor HC-SR04 (Figure 3), and 4 switch limits for detecting the openings position of the water gate. While on the controller, there consists of a series of controllers using Arduino Mega2560 module (Figure 4) and motor driver circuit with L298 module (Figure 5).

(a)
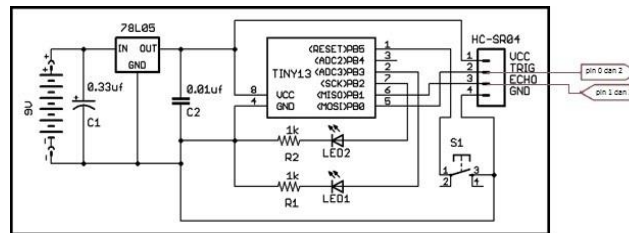
(b)

Fig. 3. Water level sensors (a) Ultrasonic sensor HC-SR04 series, (b) Schematic diagram of HC-SR04 series.
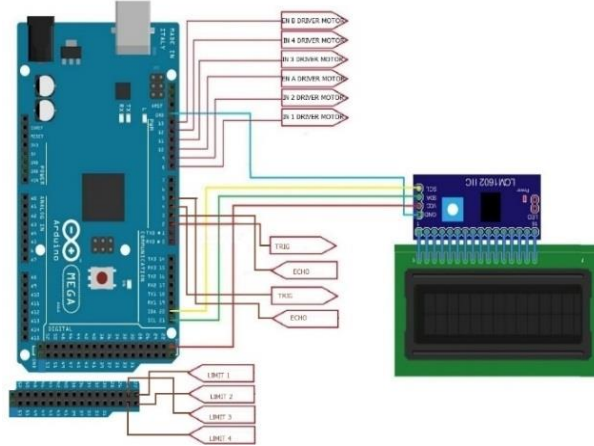
Fig. 4. The series of system controllers.
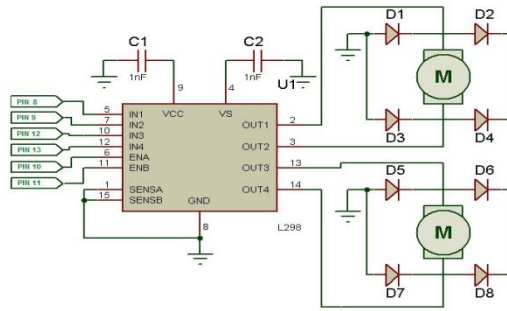
Fig. 5. Motor driver circuit.

2.2 Fuzzy Logic Control System Design

The Fuzzy Logic Controller is a controller which in the process uses the approach of thinking, experience, and human knowledge, without having to model plants in complex mathematical equations. In general, the system configuration with fuzzy logic controller is shown in Figure 6.
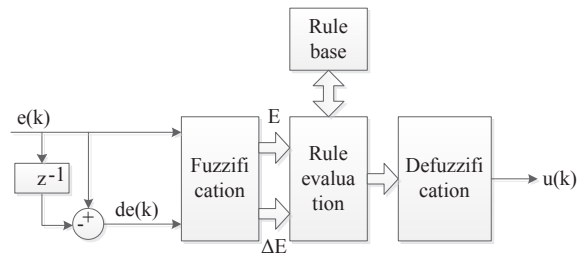
Fig. 6. Block diagram of the FLC system.

One of the fuzzy inference systems that can be used is Mamdani method (Max-Min Method). This method divides the fuzzy process in four stages, namely the formation of fuzzy set (fuzzification), application of implication function, rule composition (rule evaluation), and affirmation (defuzzification). Figure 7 shows a fuzzy logic controller implementation for an integrated water level control system on two water gates.
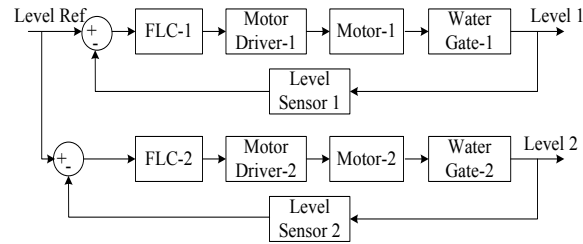
Fig. 7. Implementation of fuzzy logic controllers for water level control systems on two integrated water gates.

The fuzzy logic controller is designed using Mamdani method, the control input is the error signal and the water level delta error. In the fuzzification stage, each input is grouped into five membership functions. In this stage there is a quantization process, i.e. converting error and delta error signals to quantized signals, with the quantization level shown in Table 1. Similarly for output, the membership functions are expressed in discrete functions as shown in Table 2.

Table 1. Quantization level of error and delta error.

Error	Qerror	d_error	Qd_error
≥ 20	9	≥ 2	9
$18 \leq ... < 20$	8	$1.8 \leq ... < 2$	8
$16 \leq ... < 18$	7	$1.6 \leq ... < 1.8$	7
$14 \leq ... < 16$	6	$1.4 \leq ... < 1.6$	6
$12 \leq ... < 14$	5	$1.2 \leq ... < 1.4$	5
$10 \leq ... < 12$	4	$1 \leq ... < 1.2$	4
$8 \leq ... < 10$	3	$0.8 \leq ... < 1$	3
$6 \leq ... < 8$	2	$0.6 \leq ... < 0.8$	2
$2 \leq ... < 6$	1	$0.2 \leq ... < 0.6$	1
$0 \leq ... < 2$	0	$0 \leq ... < 0.2$	0
$-2 \leq ... < 0$	-1	$-0.2 \leq ... < 0$	-1
$-6 \leq ... < -2$	-2	$-0.6 \leq ... < -0.2$	-2
$-8 \leq ... < -6$	-3	$-0.8 \leq ... < -0.6$	-3
$-10 \leq ... < -8$	-4	$-1 \leq ... < -0.8$	-4
$-12 \leq ... < -10$	-5	$-1.2 \leq ... < -1$	-5
$-14 \leq ... < -12$	-6	$-1.4 \leq ... < -1.2$	-6

-16≤...<-14	-7	-1.6≤...<-1.4	-7
-18≤...<-16	-8	-1.8≤...<-1.6	-8
<-18	-9	<-1.8	-9

Table 2. Definition of input membership function.

	-20	-18	-16	-14	-12	-10	-8	-6	-2	0	2	6	8	10	12	14	16	18	20
PB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	1	1
PK	0	0	0	0	0	0	0	0	0	0	0	0.5	0.6	1	0.6	0.5	0.3	0	0
AZ	0	0	0	0	0	0	0	0.3	0.7	1	0.7	0.3	0	0	0	0	0	0	0
NK	0	0	0.3	0.5	0.6	1	0.6	0.5	0	0	0	0	0	0	0	0	0	0	0
NB	1	1	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Based on the quantitation process shown in Table 1 and Table 2, the form of the membership function of the input and output of fuzzy logic controller is shown in Figure 8, Figure 9, and Figure 10.
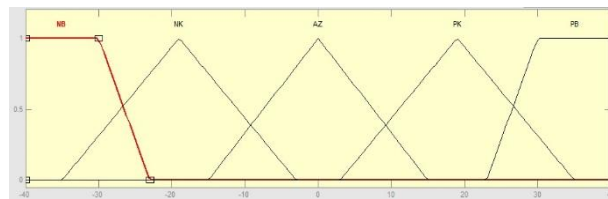
Fig. 8. Fuzzification of input error.
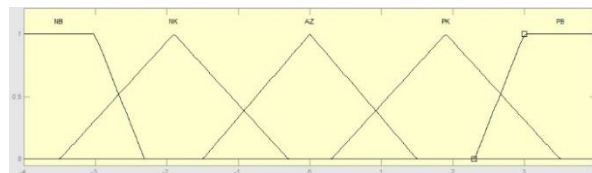
Fig. 9. Fuzzification of input delta error
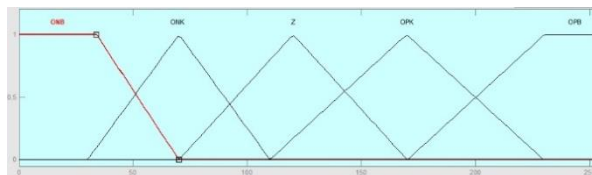
Fig. 10. Fuzzification of output.

With both inputs and each input grouped into five membership functions, then the number of fuzzy rules to be applied is as many as 25 rules, as shown in Table 3.

Table 3. Fuzzy rules.

Operator AND		Error				
		NB	NS	Z	PS	PB
DeltaError	NB	NB	NS	AZ	PB	NB
	NS	NS	NS	NS	NS	NS
	Z	AZ	AZ	AZ	AZ	AZ
	PS	PS	PS	PS	PS	PS
	PB	PB	PB	PB	PB	PB

The third stage is the defuzzification process. In this research, defuzzification process used conducted by using Center of Area (COA) method. This method is articulated by equation 1 [4] as follows:

$$Z_o = \frac{\sum_{i=1}^{n} Z_i \mu_{out}(Z_i)}{\sum_{i=1}^{n} \mu_{out}(Z_i)} \qquad (1)$$

where Z_o is the value of crisp value, which is the motor's active time span (0-2 seconds), n is the quantization level (i = 1,2, ..., n), Z_i is i element, and $\mu_{out}(Z_i)$ states the stage membership of elements in i fuzzy set. Then, there designed algorithm program to be embedded in microcontroller in Arduino module. The program algorithm consists of the main program and the fuzzy logic controller program, with the flowchart shown in Figure 11 and Figure 12.
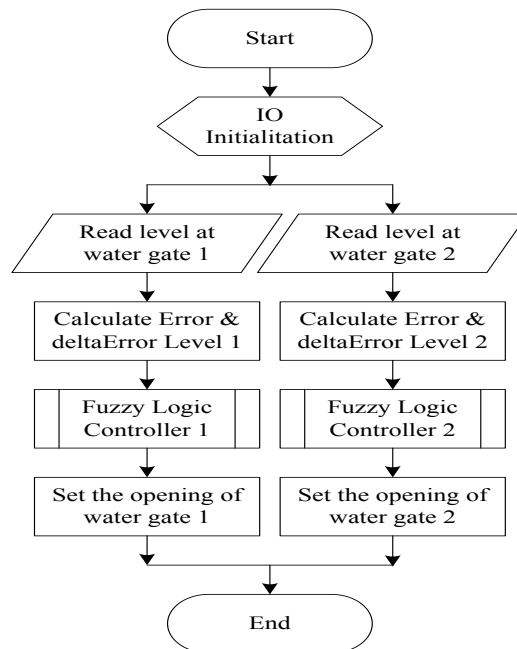
Fig. 11. Algorithm main program.
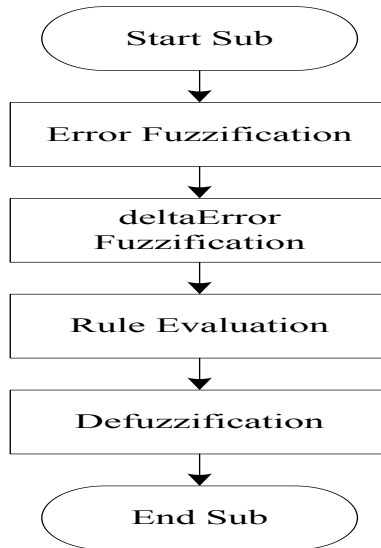
Fig. 12. Algorithm of fuzzy logic controller sub-program.

3 Result and Discussion

Figure 13 shows the prototype of the system design. System test is done by giving the reference level of 10 cm and the initial level 0 cm. The test results are presented in Table 4 with the system response shown in Figure 14 and Figure 15.

Fig. 13. Prototype system.

Table 4. System test results with reference level 10 cm and initial level 0 cm.

No	SP (cm)	Water Level 1 (cm)	Water Level 2 (cm)	Water Gate1 (%)	Water Gate2 (%)	Test Time (sec)
1	10	12	5	0	0	0
2	10	12	5	0	0	5
3	10	8	8	20	0	10
4	10	8	8	20	0	15
5	10	8	8	20	0	20
6	10	7	7	20	0	25
7	10	7	7	20	0	30
8	10	7	7	20	0	35
9	10	7	7	20	0	40
10	10	7	7	20	0	45
11	10	7	7	20	0	50
12	10	7	7	20	0	55
13	10	7	7	20	0	60
14	10	7	7	20	0	65
15	10	7	7	20	0	70
16	10	8	8	20	0	75
17	10	8	8	20	0	80
18	10	8	8	20	0	85
19	10	8	8	20	0	90
20	10	8	8	20	0	95
21	10	9	9	20	0	100
22	10	9	9	20	0	105
23	10	9	9	20	0	110
24	10	9	9	20	0	115
25	10	10	10	20	0	120
26	10	10	10	20	0	130
27	10	10	10	20	0	140
28	10	10	10	20	0	150
29	10	11	11	20	0	160
30	10	11	11	20	0	170
31	10	8	8	40	20	180
32	10	8	8	40	20	190
33	10	7	7	40	20	200
34	10	7	7	40	20	210
35	10	6	6	40	20	220
36	10	6	6	40	20	230
37	10	5	5	40	20	240
38	10	5	5	40	20	250
39	10	4	4	40	20	260
40	10	4	4	40	20	270
41	10	3	3	20	20	280
42	10	3	3	20	0	290
43	10	3	3	20	0	300
44	10	4	3	0	0	310
45	10	4	3	0	0	320
46	10	5	4	0	0	330
47	10	6	4	0	0	340
48	10	6	4	0	0	350

49	10	7	4	0	0	360
50	10	7	4	0	0	370
51	10	8	4	0	0	380
52	10	8	4	0	0	390
53	10	9	5	0	0	400
54	10	9	5	0	0	410
55	10	10	5	0	0	420
56	10	10	5	0	0	430
57	10	11	5	0	0	440
58	10	8	8	0	0	450
59	10	8	8	0	0	460
60	10	7	7	0	0	470
61	10	7	7	0	0	480
62	10	7	7	0	0	490
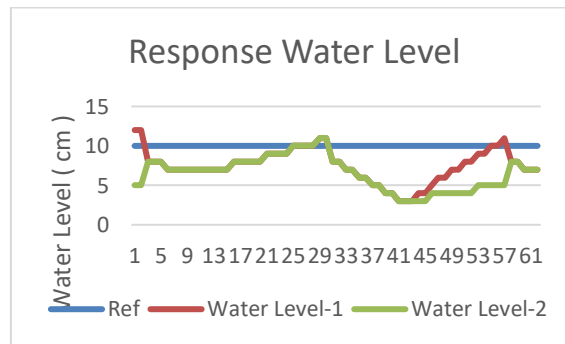
Fig. 14. Graph of water level response at water gate 1 and water gate 2 with reference level 10 cm and initial level 0 cm.
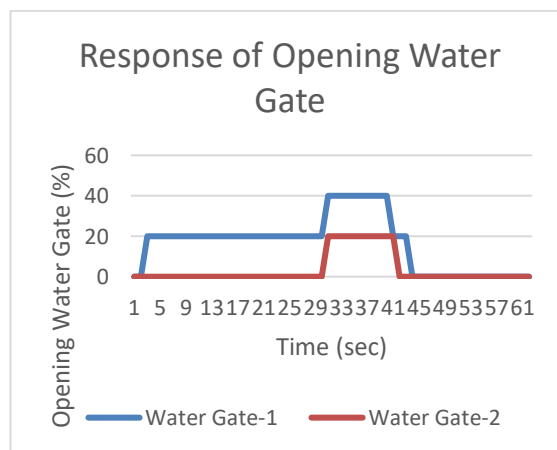
Fig. 15. Graph of the response of water gate 1 and water gate 2 when the reference level 10 cm and initial level 0 cm.

From the test results on the water level control system device, it can be known that the system time in steady state (ts) on the water gate 1 for 120 seconds to reach set point 10cm. Steady state lasted for 30 seconds with the water gate open up to 40% and at gate 2 reached up to 20%. The system can run on the water gate 1 and on the water gate 2 perfectly despite disturbance occurs.

The next test is the value of the reference level of 10 cm and the initial water level on the water gate 1 at 11 cm position and the water level on the water gate 2 at position 15 cm. The result of the system test is shown in Table 5 with the system response shown in Figure 16 and Figure 17.

Table 5. System test results with reference level 10 cm and initial level 11 cm.

No	SP (cm)	Water Level 1 (cm)	Water Level 2 (cm)	Water gate 1 (%)	Water gate 2 (%)	Test Time (sec)
1	10	11	15	0	0	0
2	10	11	15	20	40	5
3	10	10	14	20	40	10
4	10	10	13	20	40	15
5	10	9	12	20	40	20
6	10	9	11	20	40	25
7	10	9	10	20	40	30
8	10	8	9	20	40	35
9	10	8	8	20	40	40
10	10	7	8	20	40	45
11	10	7	7	20	40	50
12	10	6	7	20	40	55
13	10	6	6	20	40	60
14	10	5	6	20	40	65
15	10	5	5	20	40	70
16	10	4	5	20	40	75
17	10	4	4	20	40	80
18	10	3	4	0	20	85
19	10	3	3	0	20	90
20	10	5	3	0	20	95
21	10	5	2	0	20	100
22	10	6	2	0	0	105
23	10	6	3	0	0	110
24	10	7	3	0	0	115
25	10	7	3	0	0	120
26	10	8	3	0	0	125
27	10	8	4	0	0	130
28	10	9	4	0	0	135
29	10	9	4	0	0	140
30	10	10	4	0	0	150
31	10	10	4	0	0	160
32	10	10	4	0	0	170
33	10	10	4	0	0	180
34	10	10	4	0	0	190
35	10	11	4	0	0	200
36	10	11	4	20	0	210
37	10	7	7	20	0	220

38	10	7	7	20	0	230
39	10	7	7	20	0	240
40	10	7	7	20	0	250
41	10	8	8	20	0	260
42	10	8	8	20	0	270
43	10	8	8	20	0	280
44	10	8	8	20	0	290
45	10	9	8	20	0	300
46	10	9	8	20	0	310
47	10	9	9	20	0	320
48	10	9	9	20	0	330
49	10	10	9	20	0	340
50	10	10	9	20	0	350
51	10	10	10	20	0	360
52	10	10	10	20	0	370
53	10	11	10	20	0	380
54	10	11	10	20	0	390
55	10	12	11	20	0	400
56	10	12	11	40	20	410
57	10	11	10	40	20	420
58	10	11	10	40	20	430
59	10	10	9	40	20	440
60	10	10	9	40	20	450
61	10	9	8	40	20	460
62	10	9	8	40	20	470
63	10	8	7	40	20	480
64	10	8	7	40	20	490
65	10	7	6	40	20	500
66	10	7	6	40	20	510
67	10	6	5	40	20	520
68	10	6	5	40	20	530
69	10	5	4	40	20	540
70	10	5	4	40	20	550
71	10	4	3	40	0	560
72	10	4	3	40	0	570
73	10	3	3	20	0	580
74	10	3	3	20	0	590
75	10	3	3	20	0	600
76	10	3	3	0	0	610
77	10	4	4	0	0	620
78	10	4	4	0	0	630
79	10	4	4	0	0	640
80	10	4	4	0	0	650
81	10	4	4	0	0	660
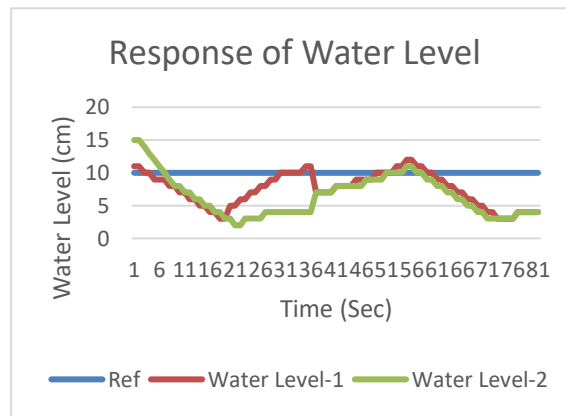
Fig. 16. Graph of water level response at water gate 1 and water gate 2 with reference level 10 cm and initial position level 11 cm.
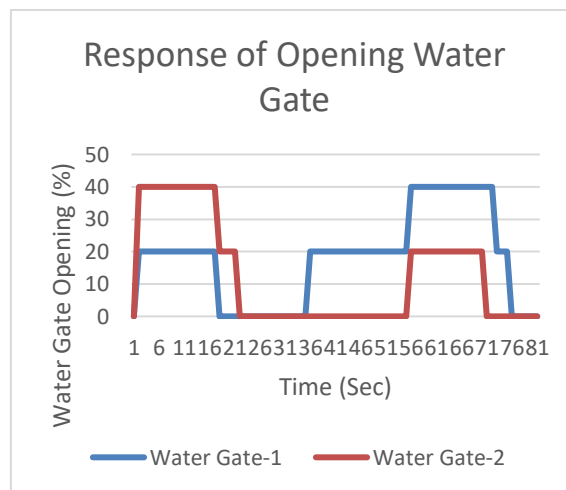
Fig. 17. Graph of the response of water gate 1 and water gate 2 when the reference level 10 cm and initial level 11 cm.

From the test results, when it was given the reference level of 10 cm and the initial level of 11 cm, it can be seen that the system response reached the steady state on the gate 1 within 150 seconds. The steady state lasted for 40 seconds with the opening of the water gate 1 up to 20% and the opening of the water gate 2 at 0%. The system could run on the water gate 1 and on the water gate 2 perfectly despite any disturbance occurs.

4   Conclusion

Based on the results of system testing, it is known that when given a reference level of 10 cm with an initial level of 0 cm, on the gate 1, the system was able to reach a reference value within 90 seconds. The steady state lasted for 20 seconds with the opening water gate at 10% and in water gate 2 at 0%. For the water gate 2, the system response could reach the reference value within 340 seconds. The steady state of the gate 2 lasted for 30 seconds with the opening gate 2 reached 10% and the water gate 1 at 0%. The system could run on the water gate 1 and on the water gate 2 although there was a disturbance occurred.

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The Static Fluid Animation (Macromedia Flash) to Improving Student's Physics Learning Outcomes

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Abstract. The lower learning outcomes of students and the activities of teachers and students is a fundamental problem in Peusangan State Madrasah Aliyah (MAN). This study aims to determine: 1) improvement of student learning outcomes; 2) teacher and student activity; and 3) student responses through the application of static fluid animation media (Macromedia Flash) on the concept of static fluid at Peusangan State Madrasah Aliyahs (MAN). This study uses a qualitative approach to the type of classroom action research.The subjects of this study are all students of class X IPA[1] Peusangan State Islamic school that is 25 students in the even semester of the academic year 2016 / 2017. Data collection is done by tests, observations, and questionnaires. Data analysis techniques using percentages.The results showed that: 1) the improvement of students' learning outcomes by applying the media of static fluid animation (Macromedia Flash) in each cycle.2) The activity of teachers and students of class X Peusangan State Islamic schoolon the concept of static fluid has shown very good category and has increased, ie cycle I was 78.33% and cycle II increased to 95%; 3) response result indicated that most of student were very happy with application of media of static fluid animation (Macromedia Flash) that is 78,8%.

Keywords: StaticFluid Animation, Macromedia Flash, Learning Outcomes,

1 Introduction

The education cannot be separated from the role of teachers, professional teachers are expected to present education with creative so that the impact on the birth of various high-thinking ability of learners. Ability to present the material of a lesson well will be able to provide encouragement and motivation to learn to students to continue to learn by utilizing facilities and infrastructure owned by the school. So it is with the subject of physics as one of the subjects that collaborate between conceptual and practical knowledge. Low of teacher ability to present the concept of physics well, causing students less enthusiastic and passive in learning. Development of science or physics learning in principle provides a great challenge for teachers in teaching. The most important challenge must be able to face by science teachers or physics teachers are teachers should be able to place itself as a motivator for students, students are able to invite to engage directly in science practice, students must also

be able to invite to engage in scientific investigation either in the form of ideas or ideas and techniques of inquiry as well as developing the concept in a structured way [1].

The teachers as educators and educational innovators should be able to make improvements and changes in the learning system especially related to the innovation of teaching and learning process in the classroom. The system is expected that students are much more active in interacting in the classroom either with teachers or with other students. Improvements made by a teacher can be the application of innovative learning models that exist today. The hope of each teacher can give impact which is positive for the ability and the willingness of students to learn the results of student learning in schools is increasing. A teacher should pay attention to the level of student learning outcomes and overcome the problems that cause low student learning outcomes, therefore teachers need to implement a new learning program that can attract the attention of students and motivate students to be more enthusiasm learn. Teachers should also reduce the conventional methods by utilizing the media and not too pressing students with a lot of formulas that can invite student saturation in learning.

Based on observations and interviews with physics teacher at Peusangan Islamic School revealed that one of the problems in the school is the lack of interest and motivation of students to the lessons, especially physics so that the learning outcomes are still low. Therefore, based on existing problems, this research has problem formulation that is 1) How to improve student learning outcomes by using animation fluid media static Macromedia flash, 2) how the activity of teacher and student using media of fluid animation of static (Macromedia Flash) on students Islamic school, 3). How is the student's response through the application of static fluid animation media (Macromedia Flash) on the concept of static fluid at Islamic school ? Furthermore, the purpose of this study is to determine 1) improvement of student learning outcomes; 2) teacher and student activity; and 3) student responses through the application of static fluid animation media (Macromedia Flash) on the concept of static fluid at Islamic school .

The low of student learning outcomes in the cause of teachers less able to bring students to the world of students is learning while playing. The concept of play in the intent can be an animated or interactive multimedia media which will involve the advanced cognitive ability of students to design and construct their knowledge through multimedia presented by the teacher [2]. The active role of teachers to monitor and run the learning also still must be run along with the use of multimedia learning. According Brennan [2] Teachers should be able to become facilitators and guides learners activity. Brennan's presentation provides an illustration that the role of teachers and the function of teachers in the classroom is crucial to the success of learning in the classroom.

Furthermore, researchers will apply a medium of physics learning as a solution to the low ability of physics students, which multimedia is expected to be able to motivate students to learn physics, especially on static fluid material for student learning outcomes are more increased. The use of instructional media is very supportive of a teacher in explaining the concepts of physics so that the learning process is better and more effective. The use of learning media with technology gives a very positive impact on the ability and willingness of students to follow the learning process. One of the learning media that can be tested is using Macromedia Flash which is one of computer software used to design animation [3]. Further Brennan [2], stated that students who actively involved to design interactive media, will be more enthusiastic to explore and be motivated for creative learning.

Furthermore, it is still related to the media, Sadiman et al. [6] reveal that "The characteristics of the media are viewed in terms of economics, the scope of the target that can

be covered, and ease of control by the wearer. Media characteristics can also be seen by its ability to stimulate all senses". this knowledge of the characteristics of learning media is very important for the grouping and selection of media and can be adapted to specific learning situations. Furthermore, Wiyono, et al [12] gave his opinion related to interactive multimedia ie the use of interactive multimedia in physics learning will greatly assist students in understanding abstract concepts.

With the learning process using Macromedia Flash students not only imagine, but students can see directly the concept described by the teacher. This is certainly able to attract students 'attention in teaching and learning activities in the classroom and can improving students' motivation and learning outcomes. The consequences of technological innovation in Islamic schoolnow require schools to prioritize digital media as a learning media tool that will motivate to students for active learning [10].

Interactive multimedia (Macromedia flash) as a form of digital technology can serve as a substitute for teaching methods less attractive teachers, digital technology can also create active learning conditions for students and able to build cooperation between students with students and between teachers with students, therefore in the application of interactive multimedia as one of the teaching solutions in the classroom, the teacher must still act as the controller, director and responsible [9]. Thus the researcher intends to conduct further research on the problem.

2 Methods

This research was conducted at Peusangan Madrasah Aliyah School is in of Bireuen Regency. This research was conducted on the students of class X IPA 1 in the even semester of the academic year 2016/2017. Started from April 5, 2017, to April 19, 2017. Subjects in this study were students of class X IPA 1 Peusangan Islamic schoolamounting to 25 students. Factors studied in this study is the ability of student learning outcomes in the measured with items about the test results of learning, teacher activity, and students are measured by using questionnaire activity, and student responses are measured by using a questionnaire response students.

This research was conducted by the qualitative method by following the Classroom Action Research design. Therefore, this research is carried out by following the following stages: planning, implementation, action, observation, and reflection. This research takes two cycles with four actions. Sources of data obtained through questionnaires of teacher and student activities, test items as well as questionnaire responses of students. The test items that are prepared in the form of multiple choice items are given at the end of each cycle.

Further data obtained have been analyzed by using some equations, that is:
1. Calculating the improvement of student learning outcomes was analyzed by calculating the absorption for each cycle using the equation as follows:

$$\textbf{Absorption} = \frac{Number\ of\ Students\ Completed}{Number\ of\ Students}\ X\ 100\%$$

[1].

The results of calculation of absorptive power, then in use the criteria mastery in classical and invidual set by Peusangan Madrasah Aliyah School namely: individual mastery if students get the value of ≥ 75, while the mastery of the classical if the absorption reaches 85%.

2. Calculate teacher and student activity and calculate student response analyzed by using percentage, that is:

$$P = \frac{f}{N} x100\% \qquad [8]$$

3. Students Response

To find out student response by presenting answer from questionnaire given to student with descriptive statistic as follows:

$$P = \frac{f}{N} x100\% \qquad [8]$$

Symbol Description:

P : Percentage calculated
f : Correct answer frequency
N : Number of questions

Table 1.Criteria for student response

No.	Achievement Score Total	Category
1.	86-100	Very good
2.	70-85	Good
3.	60-69	Enough
4.	< 60	Less

3 Result and Discussion

In this study, the researchers conducted four stages of classroom action research that is planning, execution, observation, and reflection. This research consists of four cycles. The research begins by doing planning activities by preparing various learning tools, namely Teaching Implementation Plan (TIP), Media animation, Student's Worksheet (SW), the test is given at the end of the cycle, questionnaire observation, and response questionnaire. Static fluid animation media with Macromedia Flash is used when teachers teaching. This animated media is designed to make it easy for students to understand the material presented. The animation media is prepared for every action from cycle I to cycle II.

3.1 Cycle I

Implementation of action in cycle I is implemented with two actions that are actions 1 and 2 to students of class X IPA$_1$ on Peusangan Islamic schoolSchool which amounts to 25 students. The material presented is static fluid. Classroom learning begins by motivating students by displaying some real-life video related to the concept of static fluid. Vidio impressions are continued with the activity watching the media animated display of hydrostatic pressure concepts that have been prepared by the researchers. Furthermore, teachers form a study group assigned to perform simple experimental activities about the concept of static fluid. Each representative of the group was asked to demonstrate through the experiment, and experimental data were made into group discussion activities. The next step the teacher asks several groups to present the results of the discussion about the concept of

static fluid. Master rewards praise to the group that works well in the group. In closing activities, the teacher together with the students concluded the learning outcomes with the students. At the end of the teaching, the teacher shared the final test of the cycle I to students to see student learning outcomes as a whole.

Teaching that took place in the classroom was observed by two observers who observed teacher activity in the implementation of student actions and activities in the teaching and learning process of students of class X IPA$_1$ static fluid material. Observation results conveyed by the next observer by the teacher with the team of observers to discuss and reflect on learning activities that have been going on. Student's learning outcomes at the end of the cycle are obtained by providing a written test item. The test item is set up with multiple choice of 10 questions. The result of the final test of the cycle I can be seen in Figure 1 below:
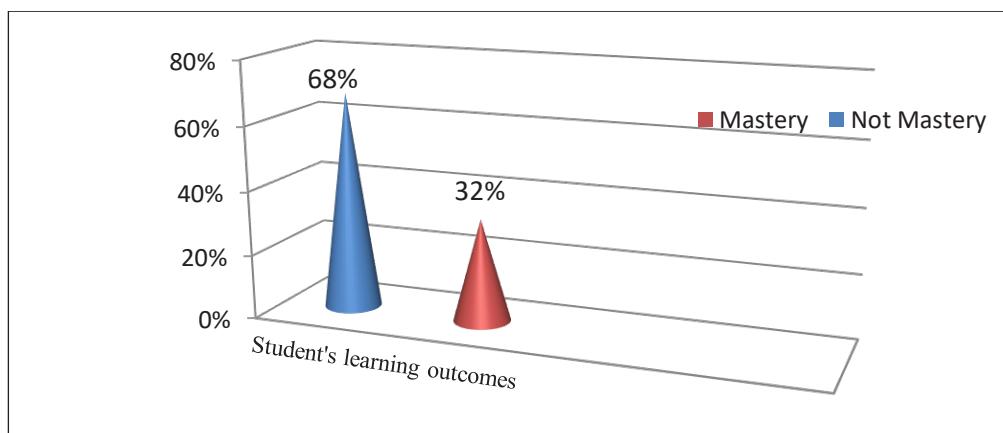
Figure 1. Results of Student Test of Cycle I

Based on the Figure 1 above can be seen that the number of students who have meet the criteria of student's learning outcomes in the school is only 17 students or equal to 68% of the total number of students treated by using static fluid animation media with Macromedia Flash. While the number of students who have not meet the criteria of student's learning outcomes is as many as 8 students or 32%. Thus, the result of student learning outcomes in the first cycle has not met the criteria of student's learning outcomes individually and in classical. Observations made by two observers indicate that in the implementation of teaching and learning process

in the class I cycle, teachers and students still have some weaknesses so that the achievement of learning outcomes is not maximal or has not fulfilled the minimum mastery criteria either individually or classically. As for some weaknesses in the implementation of cycle I, namely:

a). At the introduction stage, only 40% of students are motivated to be actively involved in learning and answering some teacher questions.

b). In the demonstration and discussion activities students are less involved to conduct demonstration activities and discussion between groups, students seem busy with their own activities so that the concepts being studied are not able to be mastered by students well.

c).Teachers are still less than optimal when directing and guiding students in the process of discussion group, so that some students are unable to work together in groups to complete the task.

d).The use of time at each learning stage is less effective in use by teachers.

Findings on these points are similar to the results of data processing on the questionnaire of teacher and student activity observed by the observer team. The results of the processed data showed that on the core activities of teachers only meet the criteria of "enough", while the preliminary and closing activities indicate the criteria of "good". The following is a presentation of the results of data processing on the questionnaire of teacher and student activity in cycle I.

Table 2. Teacher Activity and Students of Cycle I

| No. | Stages | Activities of Cycle I | | | | | Category |
		Observer 1	Observer 2	Averages	Max Score	%	
1	Introduction activities	4	4	4	5	80%	Good
2	Core activities	15	15	15	20	75%	Enough
3	Closing activities	4	4	4	5	80%	Good
	Total	23	23	23	30	78.3%	Enough

Some of the weaknesses found by the observer team and the results of the analysis of the questionnaire of teacher and student activities indicate that the researcher must make some improvements in teaching and learning process. This is done by researchers in the next cycle, which is cycle II. The researcher must maximize the effort to optimize the application of instructional media by using the media of static fluid aiming (Macromedia Flash) with start by giving motivation to the students, directing and guiding the students during discussion activity, building cooperative principle in group to finish the task.

3.2   Cycle II

The cycle II is implemented based on the results of reflection in cycle I, which indicates that the need for implementation of cycle II. Implementation of this cycle II is held on 19-20 April 2017 with floating material and the law of Archimedes. Implementation of cycle II is also done with two actions that are actions 3 and 4. Researchers activities in cycle II begins with the re-planning activities by preparing Teaching Implementation Plan, Media animation, Student's Worksheet, preparing observation sheet of teacher and student activity, sheets of student responses and prepare the test items of cycle II. Furthermore, the researcher conducted the initial activity by motivating the students and apperception by asking why the needle could sink while the ship in the ocean could float, the researcher tells the students the material to be taught is the law of Archimedes by applying the media of static fluid animation with Macromedia Flash.

The learning process is done by forming a learning group. The researcher guides and directs the students to be active in their respective groups ie to experiment according to the steps in the Student's Worksheet. Then the researcher asks the students to conclude the observed data from the experiments that have been done for subsequent of presented. For each group who are active and can present the results of the experiment in the award of praise.After the learning process by using macromedia flash animation media is done, to all students in giving the final test of cycle II to see student learning outcomes in cycle II.

Based on the Figure 2 above can be seen that the number of students who have meet the the criteria of student's learning outcomes in the school is only 22 students or equal to 88% of the total number of students treated by using media animation with Macromedia Flash. This has shown a significant increase between the results of cycle I with the results of the test cycle II. And 3 students or by 12% of students still do not meet the criteria of student's learning outcomes. This indicates that the criteria mastery at least both individually and classically has achieved.The test results for 10 questions given to students are as follows:
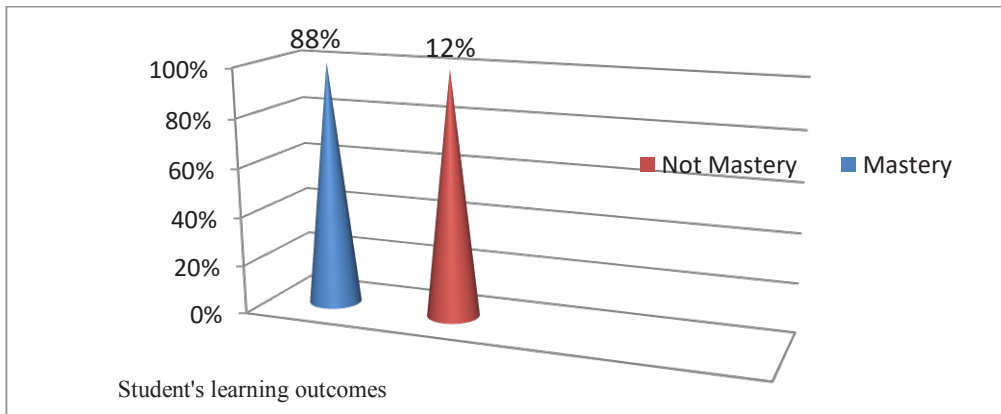
Figure 2. Results of Student Test of Cycle II

The attainment of minimum the criteria of student's learning outcomes is also seen from the results of the analysis on the questionnaire of teacher and student activity. The results of the analysis indicate that in teaching and learning process teachers and students have performed their respective functions well. Master has been very capable of bringing students to fully engage in the learning process from beginning to end. The result of activity analysis of teacher and student in cycle II is as follows:

Table 3. Teacher Activity and Students of Cycle II

No.	Stages	Activities of Cycle I					Category
		Observer 1	Observer 2	Averages	Max Score	%	
1	Introduction activities	5	5	5	5	100%	Good
2	Core activities	17	17	17	20	85%	Enough
3	Closing activities	5	5	5	5	100%	Good
	Total	27	27	27	30	95%	Very Good

The above table shows that after the teacher conducted teaching learning activiesusing static fluid animated media (Macromedia Flash) and the result of data analysis on teacher and student activity questionnaires, the influence of teacher action during the learning activities took place. This can be seen from some successes of teachers and students, namely:

a). Teachers are able to apply the media of Macromedia Flash animation for learning well

b). The motivation that the teacher has given is effective.

c). Students have been actively involved in the learning process.

Based on the success that has been achieved, the researcher and the observer team decided not to continue learning in the next cycle. After the execution of cycle, I and II finished in carrying out, at the end of the meeting the researchers provide a questionnaire response to all students. This response questionnaire is intended to find out the students' responses to the learning process by using static fluid animation media with Macromedia Flash. The results of the analysis of the questionnaire response have been distributed is that there are 78.8% of students are very happy to study the physics of the concept of static fluid using static fluid animation media with Macromedia Flash, then 16.4% of students express happy. This percentage indicates that students respond very positively to the application of static fluid animation media with Macromedia Flash. Students feel enthusiastic to follow the process of physics learning.

The presence of static fluid animation with Macromedia Flash is also very helpful for students to understand the activities of physics practicum fluid static concept in accordance with the direction of Student's Worksheet and their teachers. Students appear to be more enthusiastic and more creative in practical activities. This is very plasticity in cycle II which is marked by the achievement of minimum completeness criteria of student learning outcomes. Thus it can be said that the process of teaching and learning by using Macromedia flash animation media can improve students learning results of class X IPA$_1$ on the concept of static fluid in Peusangan Islamic School.

Based on findings of the researchers can be said that these findings are in line with research ever conducted by Sumarni, et al [9] with the title "multimedia-based learning to Improve mastery of chemistry concepts and thinking skills of students". The study found that the application of MPK based on interactive multimedia can improve the mastery of chemical concept of integrated high-thinking thinking ability of chemistry teacher candidate up to high level of N-Gain category for critical thinking ability,creative, decision-making ability and problem solving". with research conducted by Wiyono, et al [12] who found that the use of interactive multimedia-based learning style is more effective than conventional learning in improving the mastery of the concept of physics solid introduction.

4   Conclusions

Based on the results of the discussion of research activities by using the media of static fluid animation with Macromedia Flash which is implemented in the class X IPA$_1$ Peusangan Islamic School can be concluded that:

1. There are increased student learning outcomes of class X Peusangan Islamic School on the concept of static fluid using static fluid animation media (Macromedia Flash), this is evident from the results in the first cycle (68%), and the second cycle increased to (88%). The results fall into very good categories.
2. The activity of teacher and students of class X Peusangan Islamic School on the concept of static fluid has shown very good category and experience improvement that cycles I am 78,33% and cycle II increase to 95%.
3. Response students class X Peusangan Islamic School against the use of media animation Macromedia Flash, in general, that is 78.8% expressed very happy and want to learn again with media animation of Macromedia flash.

Suggestion

1. Researchers suggest for further research, should the creation of animation media for students of madrasah aliah especially for lesson IPA preferably animated media that is designed is a direct simulation of the lab that they will do in the classroom.
2. This research only observes and analyzes the students 'learning outcomes, for further research can be developed observation on high thinking ability of students such as critical thinking skill or students' creative thinking skill.

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Identifying Irregularities Usage of Smart Electric Voucher using Support Vector Machines

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Abstract. This paper applies machine-learning approach in identifying the irregularities of customer behaviour to the purchase transaction of smart electric vouchers. The Support Vector Machine (SVM) is used as the classification machine learning to identify the irregularities usage into two classes. The performance of the classification system is evaluated using the 10-fold cross-validation technique. Validation results are measured using accuracy, precision, and recall values. Our implementation results showed the use of SVM method gives very good performances in classifying the electrical consumption behaviour. Experimental results with different amounts of data testing indicated that the SVM method has high degree of accuracy, precision, and recall of 99 to 100%.

Keywords: The Irregularities Usage, Smart Electric Voucher, Vector Machine

1 Introduction

Smart electric voucher is a more convenient and controlled product since the electricity consumption is fully controlled by the customer. The use of smart electric voucher in Indonesia is intensively encouraged in order to replace the postpaid electrical consumption in which customers will pay utility bills each month in accordance with their electricity consumption [1]. Despite the ease of smart electric vouchers that have been provided by energy providers, there are still many customers found and indicated to have electricity theft in the field.For instance, the customer changed the wiring pattern on kWh meter indicator and connected the power cable without going through the indicator[2], [3].

Supervision of the customer is very minimal done by the company. This happens because the company no longer conducts the recording and manual checking services of each month.In order to monitor the misuse of electrical energy usage transactions, the electric energy company filters the token/voucher purchase transaction period. However, this method still has the disadvantage such as the nominal shortage can still be considered as a reasonable use, e.g., if the customer only make token/voucher purchase transaction with a nominal value of IDR 20,000 and the transaction amount is only once a month even though the target of IDR 100,000 usage in a month is not fulfilled then the customer is considered to have reasonable transaction by the company. Therefore, to overcome this problem, this research proposes to also filter the number of transactions and nominal purchase of token/voucher of the customers.

There have been many related works on the abuse of electrical energy usage has been proposed by previous researchers as follows. Babu, et al., in[4]used FCM to investigate non-technical loss detection by monitoring the profile of irregular customer consumption in power distribution systems. Their Fuzzy based classification method detected non-technical losses with accuracy of 80%.Depuru, et al.,in [5] proposes the detection of electricity theft through energy consumption patterns of some customers involved in the theft. They used classification method using Support Vector Machine (SVM) with kernel rbf, and the resulted accuracy was 98.4%.The further research in [6] proposed a comprehensive top-down scheme based on the Decision Tree (DT) and SVM to detect and locate real-time power theft at any power level in transmission and distribution. DT is used to calculate the energy consumption that has been used by the customer based on the value of the attribute. Then the results of this calculation will be used as input on SVM to classify normal or abnormal customers in the use of electrical energy. The combination of both methods has an accuracy rate of 92.5% and a very low false positive of 5.12%.Another computational technique for fraudulent classification in electricity consumption through a power consumption profile has been posed in [7]. The method used Fuzzy C-Means (FCM) to group the customers who have the same pattern from within database and then process the customer classification that is not normal. Classification based on Fuzzy C-Means was classified using 2 metrics namely Assertiveness and Sensitivity. The accuracy of both metrics is 0.745 and 0.100, respectively.

2 Literature Review

2.1 Customer Electricity Usage Behaviour Problems

Currently, the supervision system of electricity usage by electrical energy companies to customers is very minimal because it no longer uses the service of recording and manual checking each month. Thus, the electric energy company conducts monitoring on the customer indicated to abuse the transactions of electrical energy usage that is considered unfair by filtering the token/voucher purchase transaction period. However, the filters that the company does still have many weaknesses and the manual checks are time inefficiently and costly [6].

Some actions of unreasonable customer behavior are putting the magnet above the kWh meter to reduce disc rotation, the customer connecting the power cord without going through the kWh meter and changing the wiring pattern at kWh meter[2], [3], [5]so the counter on kWh does not work and the kWh meter keeps working even though the remaining credit token/voucher has run out.

The impact of the electrical energy misuses for consumers are; the power shared by other consumers is reduced, power outage is often happened, and fire may occur due to short circuit. The influence for the company is financial loss reaches millions and even billions of rupiah due to power loss [5].

2.2 Identification of relevant variables

In case of transaction history of purchase pulses, there are several variables are used to identify irregularities of electricity usage of each customer as follows.

- *Customer ID* identifies how many customers make credit purchase transactions in a month.
- *Installed Power* (kWh) identifies the power consumption of customer's use based on their installed power.
- *Total credit in voucher* is thenumber of kWh quota in the voucher by the customertransaction.
- *Total power consumption* is the difference between maximum and minimumelectricity utilizationsof the amount usage in a month.
- *Duration of voucher usage* is the duration of voucher usage by the customer during a certain period.
- *Status* is the dependent (response) variable defines proper or improper usage classification of the power consumption usage of customers utilizes vouchers.

These five independent variables (or predictors) are considered to represent each customer in identifying usage patterns in order to support the analysis of electrical data as well as to detect the morbidity of existing systems. The usage data is one-month span data which consist of 10,000 customers in order to minimize the losses in the company since the electricity payment by the customer is done monthly and the transaction of the customer's credit purchase by the company is done also per month. Therefore the determination of this time span is very relevantfor the process[7], [4].

2.3   Identification of relevant variables

Identification of irregularities is a technique of searching data to find an object that does not meet certain criteria when compared with other objects. These criteria can be known through the attribute value of an object. An object is said to be unnatural if the value of an attribute possessed by that object does not meet certain criteria compared to the attribute values of another object that meets the criteria. Therefore, to determine the imperfection of an object must select the appropriate attributes [3].

Identification of irregularities can be done by detecting a fraud or theft. In the case of electric theft, irregularities can be identified by looking at the usage patterns of electricity consumption for customers who have above average usage of actual usage targets. Customer behavior patterns of electricity consumption can be seen in the historical data of energy consumption. In large-scale companies, historical data is used to identify customer usage patterns that are considered to have an unnatural transaction in electricity consumption. Based on the morbidity, the company can indicate the theft or electric fraud committed by the customer[8], [9].

2.4   Classification techniques

Support Vector Machine (SVM) can process data sets with high dimensions and it can also use kernel technique to map original data from its original dimension to another relatively higher dimension. The data on the contributing SVM is called support vector.Based on the training data vectors $x_i \in R^n, i = 1, 2, \ldots, l,$ in two classes of vectors $y \in R^l$ as $y_i \in \{1, -1\}$, support vector classifier is used to solve the following primal optimization problems:

$$\min_{w,b,\zeta} \frac{1}{2} w^T w + C \sum_{i=1}^{l} \zeta_i$$

Subject to

$$y_i(w^T \phi(x_i) + b) \geq 1 - \zeta_i$$

$\zeta_i \geq 0$, i = 1, ..., l, where$\phi(x_i)$is a kernel maps$x_i$into the high-dimensional space and $C > 0$.

Equation$y_i[w^T\phi(x_i) + b] \geq 1$consists of two constraints, the first is$w^T\phi(x_i) + b \geq +1$if$y_i = +1$, and the second is$w^T\phi(x_i) + b \leq -1$ if$y_i = -1$ where$\zeta_i$is a slack variable that may occur during a misclassification of an unequal set[2].

Data training which is used when constructing the SVC model in reality mostly cannot be separated linearly. To resolve the classification problem linearly, some slack variables will be mapped into high dimensions using the RBF and Polynomial kernels in SVM so that errors and disturbances during dataset training can be reduced[2]. Linear, RBF (radial basis function) and Polynomials kernels which are used in this paper as follows[10].

- Linear:$K(x_i, x_j) = x_i^T x_j$.
- Polynomial: $K(x_i, x_j) = (\gamma x_i^T x_j + r)^d, \gamma > 0$
- Gaussian:$K(x_i, x_j) = \exp\left(-\gamma\|x_i - x_j\|^2\right), \gamma > 0$
- Sigmoid: $K(x_i, x_j) = \tanh(\gamma . x_i^T + r)$

where$x_i$is support vector and$x_j$is the data value of the attribute and$\gamma$is the kernel parameter. The main purpose of this kernel is to make the best decision limit when doing the classification of training sets into two parts[6].

2.5   Performance Evaluation

In general, the confusion matrix is used to measure the performance of the classification method. The confusion matrix is a table used to display performance results from the classification of normal and abnormal data. Confusion matrix also called contingency table can be seen in Table I[11]

Table I. Confusion matrix

Actual class	Actual class prediction	
	Normal	Abnormal
Normal	TP	FN
Abnormal	FP	TN

$$Accuracy = \frac{TP + TN}{TP + FN + TN + FP}$$

$$Precision = \frac{TP}{TP + FP}$$

$$Recall = \frac{TP}{TP + FN}$$

where, TP is the amount of normal data that is correctly predicted as a normal class, FN is the amount of normal data that is predicted as an abnormal class, TN Is the amount of abnormal data that is correctly predicted as an abnormal class and FP is the amount of abnormal data that is predicted as a normal class.

Accuracy is a comparison of the correct classification results of the total classification. Precision is the correct comparison of normal data classification of the total classification of mismatch. The recall is a classification comparison detecting an irregularity to total impropriety. If the model shows a high recall value, then this model is reliable. This is because the model rarely makes a mistake in diagnosing normal data to an abnormal class. Whereas if the recall value shows a high value, then the model's performance is very good because the model has a high accuracy in diagnosing normal data of morbidity.

3   Results

The first paragraph after a heading is not indented (Bodytext style)In this study, using the dataset history of purchase transaction pulses obtained from the company PT. PLN (State Electricity Company) Mamuju, West Sulawesi, Indonesia. The transaction history dataset of the pulse has a real-type attribute with a total of 10000 lines of data consisting of 7783 fair transactions and 2217 unusual transactions and has 4 attributes and 2 classes. The dataset will be divided into 10 sections using k-fold cross validation as data validation, consisting of 9 sections will be used for training data and 1 part will be used for data testing.Experimental research results are processed using an ASUS laptop with an Intel® Core i5 processor CPU M 460 @ 2.53 GHz, 4.00 GB of RAM, and the Linux operating system 64-bit Ubuntu version 6.10. While the software to develop applications is Python version 2.7.The classification method to be used in this research is Support Vector Machine.

Kernel	Performance	Percentage of data testing			
		20	40	60	80
Linear	Accuracy	1.00	1.00	1.00	1.00
	Precision	1.00	1.00	1.00	1.00
	Recall	1.00	1.00	1.00	1.00
Rbf	Accuracy	1.00	1.00	1.00	0.99
	Precision	1.00	1.00	1.00	0.99
	Recall	1.00	1.00	1.00	1.00
Polynomial	Accuracy	1.00	1.00	1.00	1.00
	Precision	1.00	1.00	1.00	1.00
	Recall	1.00	1.00	1.00	1.00

Table 1. Accuracy, precision, recall using SVM
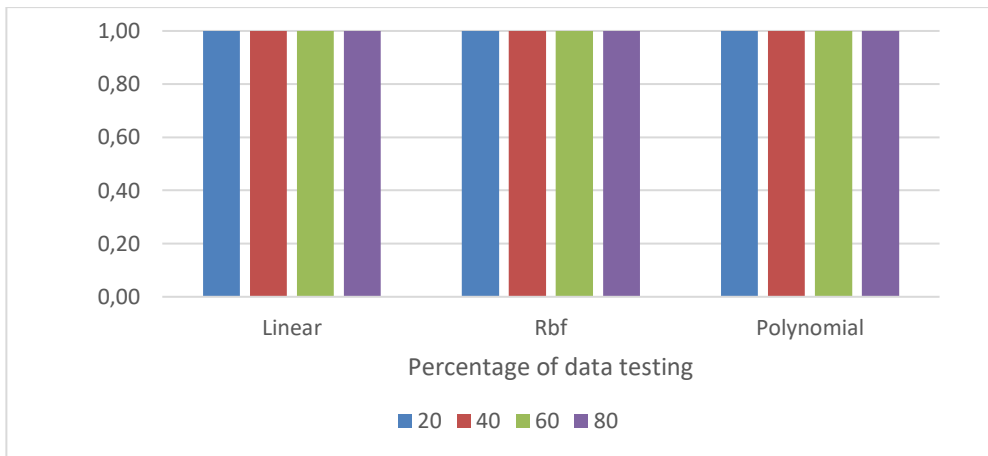
Figure 1. Result of accuracy Linear, Rbf, and Polynomial of SVM
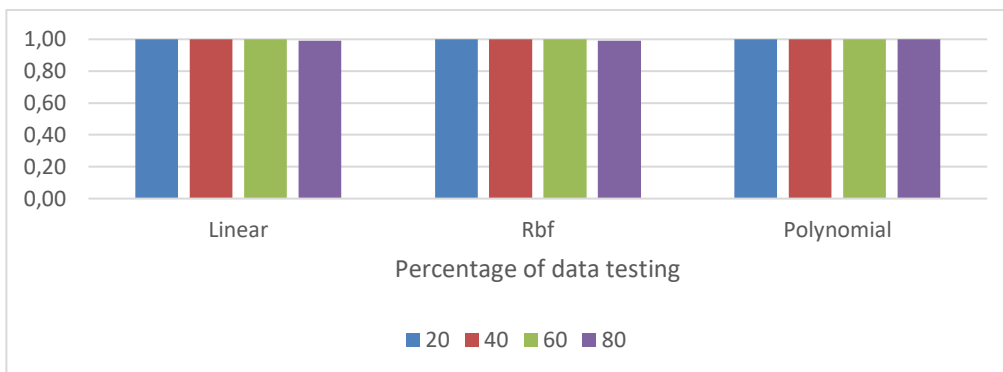
Figure 2. Result of precision Linear, Rbf, and Polynomial of SVM
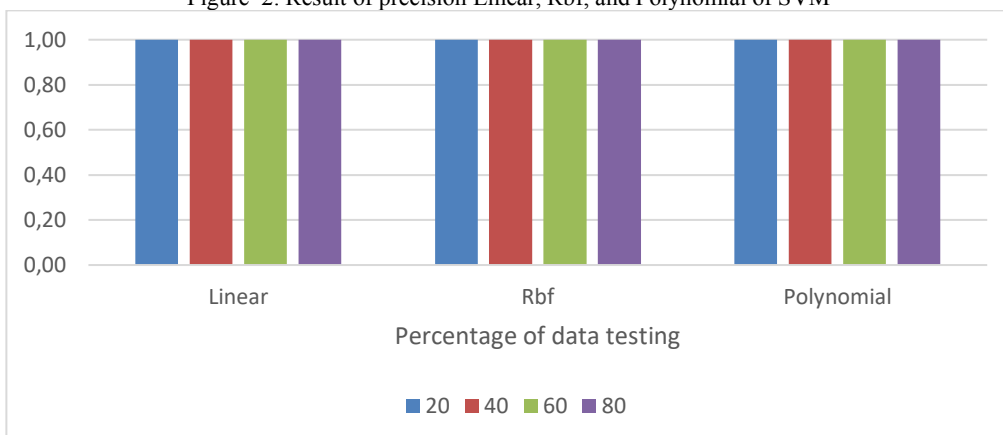
Figure 3. Result of recall Linear, Rbf, and Polynomial of SVM

Table I, Figures 1, Figures 2 and Fig. 3, show that in predicting the morbidity of purchase transactions of electric vouchers, the amount of test data used does not affect the accuracy,

precision and recall value of Linear and Polynomial kernels. The value of accuracy, precision, and recall obtained are all 100%. This shows that with the addition of test data, the value of False Positive and False Negative remains 0. Thus, in each addition of precision value test data, accuracy and recall do not change. However, in the RBF kernel, the accuracy and precision value decreases as the number of test data increases. This is because the value of TN has decreased. While the recall value does not change that is equal to 100%. It can be said that the SVM method can predict morbidity accurately.

4   Conclusions

In this paper, the proposed model uses machine learning techniques. The classification method that has been used to measure the level of classification accuracy is the Support Vector Machine (SVM) method. The results showed that the SVM method using Linear and Polynomial kernels has 100% accuracy, precision and recall. Kernel RBF has accuracy and precision of 99 up to 100%, while the recall value of 100%. However, in order to know which method with the best accuracy between the two methods, further research is needed with more data simulations.Based on the experiment results, we found that the accuracy by using SVM in classifying the behavior of smart electric voucher customers through the purchase transaction history has a good degree of accuracy.

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Combination of Adaptive Thresh old Algorithm, Watershed and Top-Hat Transform on Image Segmentation Uneven Lighting

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Abstract. In the previous Saini and Dutta research, there is still a lack of perfect segmentation in the form of window shadows and by examining Cheng and Jun's research, where segmentation on illuminated imagery that has uneven illumination can produce perfect segmentation. In this research, a combination of Adaptive Threshold, Watershed and Top-Hat Transform algorithms is used to segment the image that has uneven lighting. The result of the image segmentation test which has uneven illumination with Adaptive Threshold, Watershed, Top-Hat and Combination algorithm obtained that the smallest value of MSE is in Segmentation result of Combination algorithm and the largest one is in Adaptive Threshold algorithm while the smallest PSNR value is in combination algorithm and the largest is on the Adaptive Threshold algorithm.

Keywords: Image Segmentation, Adaptive Threshold, Watershed, Top-Hat Transform.

1 Introduction

Image processing process is closely related to the removal or degradation reduction in the image that occurs due to image acquisition process. The degradation includes noise which is an error in pixel value or optical effect such as blur due to a camera that is not in focus or because of camera movement. Image restoration techniques include neighbourhood operations as well as the use of processes in the frequency domain [1].

In Saini and Dutta [8] research conducted that segmentation for uneven lighting image using Adaptive Threshold and Dynamic Window Growing based on incremental window incremental approach. In this proposed method, uneven lighting condition problems have been addressed with the Dynamic Window Growing approach. The algorithm is based on an incremental window increment approach using entropy-based selection criteria. The window specified by the selection criteria is considered as a sub-picture and each sub-image has been segmented by using a minimum deviation standard based on thresholding to improve the result of segmentation.

In Cheng's research, W. W & Jun, CX [1] performed image segmentation with uneven illumination by the proposed method based on Homomorphic filtration i.e Top-Hat Transformation and Watershed algorithm. With Homomorphic filtration, it can weaken low frequency components and amplify frequency components high on the frequency domain that makes the image illumination evenly. Top-Hat transformation is adopted to remove a large section of the target image background. The experimental results show that the proposed method is simple and effective that makes uneven illumination image correction achieve satisfactory results. But with a sample of images that have bad adhesion particles, the results of this algorithm process will have border effects and how to improve the adaptability of these algorithms will be the focus of future research.

Based on the research that has been described shows that image segmentation is a very important thing, by dividing an image into homogeneous areas such as color, texture and intensity, it needs an algorithm to change the image representation, therefore this research takes focus on a segmentation problem in which a better approach is required to make uneven illumination images more meaningful and easy to analyze using a combination of adaptive threshold algorithms, top-hat algorithms and watershed transforms.

2   Methods

2.1   Digital Image

The image is formed from a collection of light intensities arranged in two-dimensional plane. This set of light intensity is expressed in a continuous function f (x, y) where x and y represent the space coordinates and the intensity value of the light gives the color information and the brightness of the image [4].

Digital Image has several formats that have their own characteristic. The format in this digital image is generally based on the type and mode of compression used in the digital image [6].

There are four digital image formats that are often encountered, among others: First Bitmap (BMP), is the most common image format and is a standard format of windows. File size is very large because it can reach the size of megabytes. This file is an uncompressed format and uses the RGB color system (Red, Green,Blue) where each pixel color consists of 3 R, G, and B components mixed together.

Furthermore, there is Joint Photographic Expert Group (JPEG / JPG), JPEG format is the most famous format until now. This is because of its small size (only tens / hundreds of KB only), and is portable. This file format is often used in the field of photography to store image files from analog recording to digital converter (ADC)

The three GIF (Graphics Interchange Format) formats, GIF files allow the addition of transparent colors and can be used to create simple animations, but currently the GIF standard is only 256 colors maximum.

Lastly PNG (Portable Network Graphics), PNG-formatted Image was developed as another alternative to GIF, which uses patents from LZW-compression algorithms. PNG is an excellent image format for internet graphics, as it supports transparency within browser and has its own beauty that can not be shown GIF or even JPG

2.2 Image Enhancement

The operations performed to transform an image into another image can be categorized based on the purpose of transformation as well as the scope of operation performed on the image [6]. Based on the purpose of image processing operations transformation categorized as follows: 1. Improved Image Quality (Image Enhancement) Image enhancement operations aim to improve certain features of the imagery. 2. Image Restoration: The image recovery operation aims to restore the image condition to a previously known condition due to an interruption that causes image degradation.

Especially for image repair methods with image binarization methods, J. Sauvola et al [5] proposes an adaptive binarization method that can separate well the text, background, and image components of a document image. With the determination of the local threshold value, Sauvola successfully overcome the main problem of document image damage caused by noise and different illumination levels. A review of the comparison of different types of thresholding algorithms to separate the text and background portions of a complex document is given by G. Leedham et al [2].

Graham provides a comparison review for five algorithm: The Niblack algorithm, the Mean Gradient technique, the background substraction method, the QIR (Quadratic Integral Ratio) method, and the Yanowitz and Bruckstein methods. To improve the performance, it should doa combination of algorithms according to different document types. Surveys of thresholding techniques on images with quantitative performance evaluations were also performed by M. Sezgin et al [7].

Before doing image processing, firstly done the reading and calculation of Pixel value. The pixel value reading is performed on each color component (RGB) using the formula:

Value of R = c and255 $\qquad$ (1)

Value of G = (c and 65,280) / 256 $\qquad$ (2)

Value of B = ((c and 16,711,680) /256)/25 $\qquad$ (3)

2.3 Calculating Grayscale Image Value

The color image matrix is transformed into grayscale image by calculating the average colors of Red, Green and Blue. Mathematically the calculation is as follows.

$$f_0(x,y) = \left(\frac{f^R(x,y) + f^G(x,y) + f^B(x,y)}{3}\right) \qquad (4)$$

2.4 Adaptive Threshold Algorithm

Thesholding is done by dividing the image using multiple sub-images. Then in each sub image, segmentation is done by using different threshold [9].

In the Adaptive Thresholding method, the threshold value of the image can be calculated by the following formula:

$$T = \frac{\sum_{(x,y)} \sum \in W \, f(x,y)}{N_W} - C \qquad (5)$$

Where,
- W is a processed block,
- NW is the number of pixels in each block W,
- C is a constant which can be determined freely, if C = 0, then the threshold value is equal to the mean of each pixel in the block.

The AdaptiveThresholding process with adaptive window selection based on sharpness level measurement. Here are the steps:
1. Digital image input.
2. Divide the image into sub images according to the window size.
3. Find the image sharpness value on eachwindow (sub image).
4. Create a feature f '(x, y), where the window is pixel and the image sharpness value is as a result of its value.
5. Calculate the value of thresholdT 'with value f' (x, y) as the pixel value of the image.
6. Pixel intensity segmentation in a window (sub image) that has a sharpness value> T '.
7. Check if the whole window (subcitra) has been segmented. If yes, then stop.
8. Find and save the number of windows that have an image value ≤ T '.
9. Save the number of window values ≤ T 'to a variable that is the number ofwindows.
10. Create and initialize variables i = 0.
11. Grow and calculate the value of sharpness level in window (i).
12. Check if the window size (i)> sizeimage. If yes, then go to step 14.
13. Check if the sharpness of the image window (i) ≤ T '. If yes, then go to step 11.
14. Pixel intensity segmentation in window (i).
15. Increment i.
16. Check if i ≤ jumwindow. If yes, then go to step xi.
17. Do a merge window (sub image), so it becomes a complete image.
18. Stop

2.5 Watershed Algorithm

Watershed is one of the methods used for image segmentation. The concept contained in Watershed is able to visualize an image in three 3D dimensions.
Below are the steps of the Watershed algorithm.
i. Determine the region (region) by representing the object and the background that has a value of 0.
ii. Conduct a dilation on the area using the 3 x 3 element structure.
iii. Form the dam at the position where the two areas are connected.
iv. Repeat step (3) until all areas are joined.

Considered M1, M2, M3, ..., MR is a collection of point coordinates within a regional minimum of a picture g (x, y). There is a C (Mi) which is a collection of coordinates on the catchmentbasin and corresponds to the minimum area Mi. Min and max notation is used to mark the minimum value and maximum value of g (x, y).

Then it is considered T [n] is the set of coordinates (s, t) where g (s, t) <n, so it can be defined:

$$T [n] = \{(s, t) \mid g (x, y) < n\} \tag{6}$$

Geometrically, T [n] is the set of coordinates of the point located at g (x, y) and lies below the plane of g (x, y) = n. The topography will be flowed with an integer addition starting from

n = min +1 to n = max +1 . At each addition of n, the algorithm needs to know the number of points that are below the flow depth. Generally, the area under g (x, y) = n is given a black or a value 0 and above it is white or a value of 1. Then it is assumed Cn (Mi) is the set of point coordinates in the basin catchment corresponding to the minimum Mi which is included in the stage n. Cn (Mi) can be seen as a binary image by using the equation:

$$C_n(M_i) = C(M_i) \cap T[n]$$

In other words Cn (Mi) = 1 lies in the location (x, y) if (x, y) ∈C (Mi) and (x, y) ∈T [n], besides that the value of Cn (Mi) = 0. Next, it is assumed that C [n] is a composite of the flow in the catchmentbasin at stage n:

$$C[n] = \bigcup_{i=1}^{R} C_n(M_i)$$

and C [max + 1] is a composite of all basin catchments:
C [n-1] is a subset of C [n] and C [n] is a subset of T [n] then C [n-1] is a subset of T [n]. From here it is found that each connected component of C [n-1] is present on one connected component of T [n]. The algorithm for finding the first watershed line is initialized with C [min + 1] = T [min + 1].

The algorithm will be processed recursively with the assumption at stage n then C [n-1] has been formed. The procedure for obtaining C [n] from C [n-1] is as follows. Assume Q is a collection of connected components in T [n]. Thus for each component connected to Q∈Q [n], there are three possibilities:
a. q ∩C [n -1] is empty
b. q ∩C [n -1] has 1 connected component of C [n-1]
c. q ∩C [n -1] has more than 1 component connected from C [n-1]

2.6 Top-Hat Transform Algorithm

Top-hat transformation is the result of input image subtraction with image that has undergone operation opening i.e difference between original image and image after experiencing opening operation.

Combining measurements with an opening account will result in Top-hat transform. Top-hat Transformation gray scale image f is defined as the least of the opening:

That (f) = f- (f 0 b)   (7)

Top-hat transformation is used for bright objects in dark backgrounds. An important use of top-hat transformation is to improve the effect of uniform illumination, because good illumination plays an important role in the process of extracting objects from the background. This process, called segmentation, is one of the first steps to be done in automated image analysis.The opening process serves to eliminate small objects but retains their original size. Opening process is a processerosion with dilation image.

F (x, y) o SE = (f (x, y) θ SE) ⊖ SE   (8)

2.7 Combination algorithm

The combination algorithm is acombination of image segmentation algorithmsamongAdaptiveThresholding, Watershed and Top-Hat algorithms where AdaptiveThresholdingsegmentation image is reprocessed with Watershed Transformation algorithms as well as Top-Hat to obtain a clearer image as a result of a combination transformation. The Combination algorithm steps can be seen in points 2.4 to 2.6.

2.8 Data Set
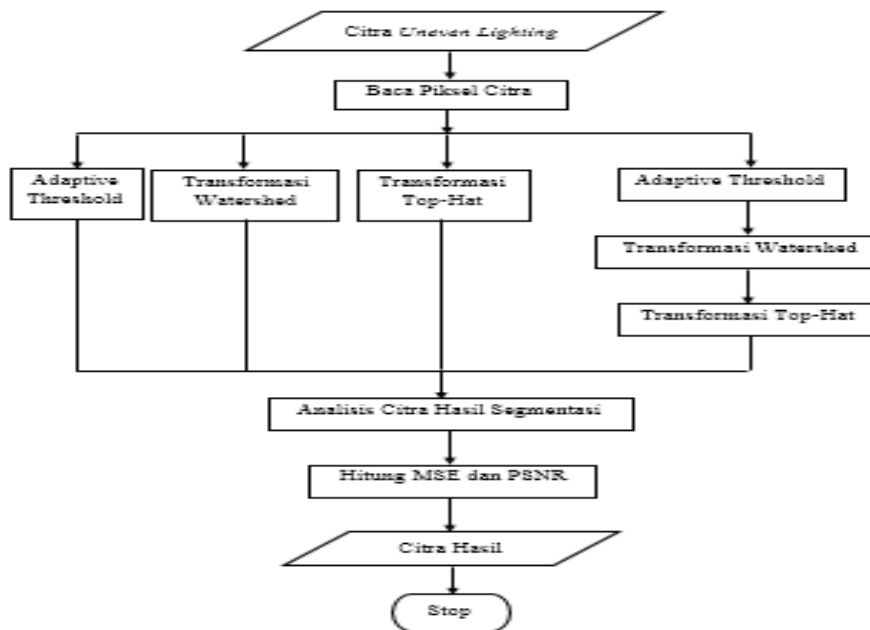
Figure.1. Research Framework

2.9 Research Framework

In this research the original image in the form of uneven lighting image is done by reading the value of pixel value for each image area. The process of segmenting the Adaptive Thresholding algorithm is done by forming a window whose size is adjusted to its threshold value. In segmentation with Watershed transformation algorithm and Top Hat, segmentation is done by performing calculation of pixel value by Watershed and Top Hat transformation. In segmentation with the combination algorithm is segmentation is done by Adaptive Thresholding algorithm and Watershed transformation as well as Top Hat. The final stage is done by image analysis of the results of segmentation with the calculation of the value of MSE and PSNR and by comparing the original image with the image of the visual segmentation results.

3 Result

The results of segmentation testing with Threshold Adaptive algorithm is a test with image dimension 400 x 300 pixels that produce the value of MSE, PSNR and image of the results of its segmentation. Value of MSE and PSNR Image Segmentation Threshold Adaptive
Table.1:Value MSE and PSNR ThresholdAdaptive Segmentation

No.	File Cover	Size (Kbyte)	Parameter	
			MSE	PSNR
1	Image-1	9.6806	6998.6882	9.6806
2	Image-2	13.5094	2898.2498	13.5094
3	Image-3	11.0306	5128.9004	11.0306
4	Image-4	18.2266	978.1784	18.2266
5	Image-5	8.3547	9497.5385	8.3547
6	Image-6	13.3592	3000.2876	13.3592
7	Image-7	19.0384	811.4112	19.0384
8	Image-8	16.7968	1359.557	16.7968
9	Image-9	16.2132	1555.1164	16.2132
10	Image-10	11.8712	4226.3037	11.8712
Average			**3645.4231**	**13.8080**

Table.2. Value MSE and PSNR The Result of Watershed Segmentation

No	File Cover	Size (Kbyte)	Parameter	
			MSE	PSNR
1	Image-1	158	1203.6833	17.3258
2	Image-2	25.6	2226.5365	14.6545
3	Image-3	45.8	644.9799	20.0353
4	Image-4	89.5	1229.8864	17.2322
5	Image-5	46.3	1245.3107	17.1781
6	Image-6	31.2	859.4761	18.7877
7	Image-7	34.5	2763.7301	13.7159
8	Image-8	42.5	6498.3365	10.0028
9	Image-9	33.1	431.5203	21.7852
10	Image-10	41.4	1246.7857	17.1729
Average			**1835.0246**	**16.7890**

Table.3: Value MSE and PSNR The Result of Top-Hat Segmentation

No	File Cover	Size (Kbyte)	Parameter	
			MSE	PSNR
1	Image-1	158	4830.1963	11.2912
2	Image-2	25.6	2319.7229	14.4764
3	Image-3	45.8	3664.324	12.4904
4	Image-4	89.5	67.9101	29.8115
5	Image-5	46.3	7698.0512	9.2670
6	Image-6	31.2	2011.0876	15.0965
7	Image-7	34.5	112.8382	27.6062
8	Image-8	42.5	185.6022	25.4450
9	Image-9	33.1	765.4475	19.2916
10	Image-10	41.4	2859.885	13.5673
Average			**2451.5065**	**17.8343**

Table.4: The Result of Combination Segmentation

No	File Cover	Size (Kbyte)	Parameter	
			MSE	PSNR
1	Image-1	158	1182.622	17.4024
2	Image-2	25.6	487.6495	21.2497
3	Image-3	45.8	901.159	18.5828
4	Image-4	89.5	154.6979	26.2359
5	Image-5	46.3	1674.2872	15.8925
6	Image-6	31.2	488.6608	21.2401
7	Image-7	34.5	158.8865	26.1200
8	Image-8	42.5	229.0542	24.5314
9	Image-9	33.1	273.9042	23.7563
10	Image-10	41.4	712.4302	19.6034
Average			**626.3352**	**21.4614**

4 Discussion

The segmentation test is performed on 10 image color images with Adaptive Threshold, Watershed, Top-Hat and Combination algorithms, the result is shown in Table.5

Table.5. The Result ofSegmentation Algorithm Adaptive Threshold, Watershed, Top-Hat and Combination

No	Algorithm	Average MSE	Average PSNR
1	Adaptive Threshold	3645.4231	13.8081
2	Watershed	1835.0246	16.7891
3	Top-Hat	2451.5065	17.8343
4	Combination	626.3348	21.4614

From Table.5 Adaptive threshold, watershed, top-hat segmentation and combinations for unevenly illuminated images are obtained that the smallest MSE values exist in the combination algorithm segmentation and the largest in the adaptive threshold algorithm, the smallest PSNR value in the adaptive threshold algorithm and the largest on the combination algorithm.
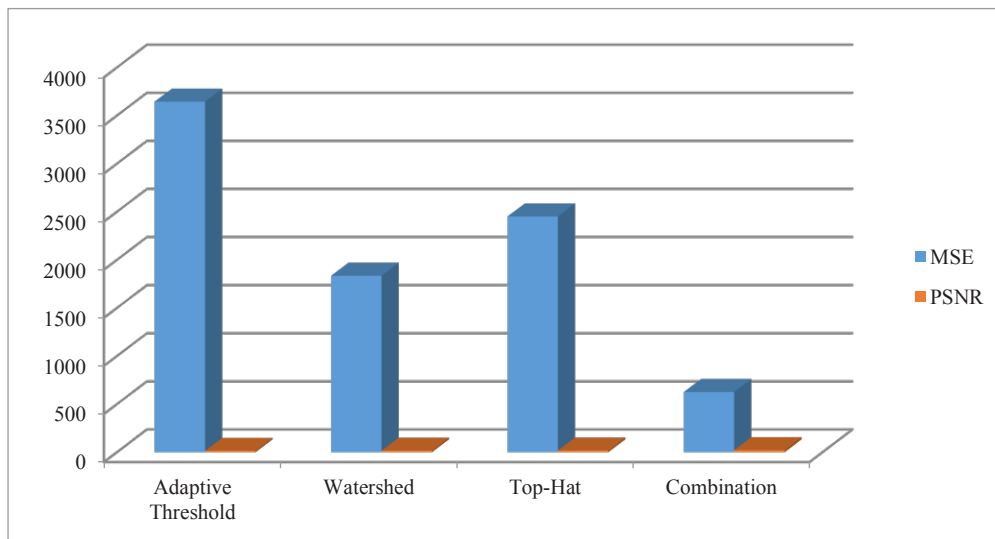
Figure.2. Graphic of The Result ofSegmentation Algorithm Adaptive Threshold, Watershed, Top-Hat and Combination.

5 Conclusion

From the results of image segmentation testing with Adaptive Threshold, Watershed, Top-Hat and combination it can be seen that the combination method is able to segment the image that has uneven illumination well. It is seen that in the image that has been combined better segmentation than the image of Adaptive Threshold and Watershed and Top-Hat combined image. This can be seen also by decreasing the value of MSE and increasing the value of PSNR in the combination algorithm. The decreasing value of MSE and the increasing value of PSNR shows that the segmentation in an image is getting better.

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Analysis of Iterative Dichotomiser 3 Algorithm Uses Fuzzy Curves Shoulder as a Determinant of Grade Value

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Abstract. Data mining is a process that combines statistics, artificial intelligence, mathematics and machine learning to extract data on a large scale in the database. Data mining is always able to analyze the data so as to find the relevance of data that has a meaning and have a tendency to check large-scale data stored in the database to find a meaningful pattern or rules. The increasing availability of data is often not utilized to provide new knowledge so that large data accumulate is meaningless. The purpose of this research is to extract the information so as to produce knowledge through the decision tree and show the accuracy or influence of Iterative Algorithm Dichotomiser 3 which is used to predict a situation. The classes or attributes in the Iterative Algorithm Dichotomiser are continuously broken into relative categories. Fuzzy Curve Shoulder will be used as a function to form the categories of each attribute value. Using a fuzzy shoulder curve, the dataset is processed using a decision tree that is useful for extracting large amounts of data and searching for hidden links between multiple potential input variables with a target variable. The results of this study are decision trees that will provide predictive data with Iterative Dichotomizer (ID) Algorithm 3.

Keywords: Data mining, Fuzzy Curve Shoulder, Iterative Dichotomizer Algorithm.

1 Introduction

Knowledge Discovery in Database (KDD) is a method to gain knowledge from existing databases. In the database there are tables-tables related to each other. The knowledge obtained in the process can be used as a knowledge base for decision making purposes.

Data mining concerns theories, methodologies, and in particular, computer systems for knowledge extraction or mining from large amounts of data. Data mining is a method to extract the knowledge and information from a large number data such as incomplete, noisy and random [1]. Data mining explorers data from within the database to find hidden patterns, searching for information to predict data. Data Mining techniques are used to examine large databases as a way to discover new and useful patterns.

The decision tree is considered one of the most popular approaches. In the decision tree classification consists of a node that forms the root [2]. Decision tree can describe the

relationship between the factors that affect each other a particular problem and find the best solution by taking into account the factor. The existence of a decision tree that is able to analyze the value of risk and value of an information can produce an alternative solution to a problem. Decision trees are also useful for exploring data, finding the hidden relationship between a number of potential input variables with a target variable. Because decision trees combine data exploration and modeling, decision trees are excellent as a first step in the modeling process even when used as the final model of some other technique [3].

The root node in the decision tree is the top node in a decision tree. The decision node is a node to test the attributes of each branch representing the result of the test process on the decision node whereas the leaf node is the last node labeled classification class.

The ID3 algorithm is a recursive procedure, where in at each step there is an evaluation of a subset and creation of decision node, based on a metric called Information Gain, until the subset in evaluation is specified by the same combination of attributes and its values. ID3 algorithm creates a tree by using top-down approach by using the given set of values by checking each attribute at every node. Information gain is used as metric to generate tree to select the best attribute at each step [4], [5].

The fuzzy set theory was introduced by Lofti A.Zadeh, as a mechanism for representing the vagueness and imprecision of the concepts used in natural language[6]. In the analysis of condition these vague concepts equipment type is alse presented. Our reasoning is based on information, it must consider the linguistic form as a variable, whose values can be expressed in terms of natural language. Fuzzy sets were defined as an extension of the classic sets that allows modeling the imprecision of the concepts that manages specialist inductive equiptment, the fundamental change proposed bt Zadeh is to introduce a membership degree(compliance), it is expressing the comformity of an element to a set as a real number in the interval 0 and 1 [7], [8]. In this case, the fuzzy value grouping uses the membership function of the shoulder curve. each class value will be grouped into three values that is good, enough or bad. As time goes by, the availability of data in an agency or system gets bigger. Data that has been processed, often not utilized to provide a new science so that large data is piled up and has no more meaning. From the concept of data mining techniques can be shown that data mining analysis runs on data that tends to continue to enlarge and the best techniques used then oriented to the data is very large to get the conclusion of even the most feasible forecasting.

2 Method

One of the main advantages of decision trees is the ability to generate understandable knowledge structures, i.e., hierarchicaltrees or sets of rules, a low computational cost when the model is being applied to predict or classify new cases, the ability to handle symbolic and numeric input variables, provision of a clear indication of which attributes are most important for prediction or classification [9]. The adoption of the decision tree algorithm for a tree-based prediction model for RSWs with real manufacturing datasets collected from industry [10]. For this research, we use the Decision Tree algorithm to classify data and to extract the rules from the welding dataset. The decision tree resembles a tree structure. Tree is a hierarchical organization of collecting nodes and links, where each node, except the root node, has one incoming link. Each node is a predictive feature and the link represents the value of each conditional variable.Decision rules, decision trees and tests can be considered as a way of

knowledge representation, can be used for feature selection and for construction of classifiers. Based on decision trees and based on tests can construct decision rules [11], [12].

ID3 does not guarantee an optimal solution. It selects the best attribute from the given set. It then splits the dataset in each iteration. ID3 can overfit to the training data. As a solution to this, instead of larger trees smaller trees should be preferred. Though this algorithm specifies a solution, it does not always guarantee an optimal solution. A feature of this algorithm is that it is difficult to apply on continuous set of data. When the values of the attribute are continuous, it is harder to split the dataset into one specific point. Thus, searching for the best value to split becomes a time consuming job [13].

2.1 ID3 algorithm

Iterative Dichotomizes 3 (ID3) performs a thorough search (greedy) on all possible decision trees. The ID3 algorithm tries to build the decision tree top-down, starting with the question: "which attribute should first be checked and placed in root?" This question is answered by evaluating all the existing attributes by using a statistical measure (widely used is information gain) to measure the effectiveness of an attribute in classifying a data set of samples [5], [13].

ID3 method works by determining the weight value of each attribute, then proceed with the selection process of the best alternative from a number of alternatives, in this case the alternatives in question are the proposals that are entitled to follow up on the basis of the criteria specified. The process will continue to be used for the same process (recursive) and will later form a decision tree [9]. If an attribute has become a branch (node) then the attribute is not included in the calculation of the value of the information gain. This process will stop when all data from a branch has been included in the same class or if all attributes have been used but still remain in different classes.

2.2 Fuzzy

The fuzzy set is based on the idea of extending the range of characteristic functions such that the function will include real numbers at intervals [0,1]. The membership value indicates that an item is not only true or false. Value 0 indicates wrong, value 1 indicates true, and there are still values that lie between true and false. If x has a fuzzy membership value $\mu A\ [x] = 0$, then x is not a member of set A, also if x has a fuzzy membership value $\mu A\ [x] = 1$ means x becomes a full member in set A.

The term fuzzy logic has various meanings. One of the meanings of fuzzy logic is the expansion of crisp logic, so it can have a value between 0 to 1 [14].

Membership function is a curve that shows the input point into its membership value. To obtain a membership value can use the following function approach: Linear Representation, Representation of Triangle Curve, Representation of trapezoidal Curve, Shoulder Curve Representation, Representation of Bell Curve [15], [16].

2.3 Dataset

Dataset has 1724 records of data with 6 classes, namely Grade Point Semester I (IPSI), Grade Point Semester II (IPSII), Grade Point Semester III (IPSIII), Grade Point Semester IV

(IPSIV), Grade Point Semester V (IPSV) and Grade Point Semester VI (IPSVI). This data source will be used as the material of the analysis.

2.4 Tool

In this research, we apply ID3 algorithm in Rapid Miner open source application because it supports several data mining methods such as preprocessing data, clustering, regression classification, visualization and feature selection.

2.5 Research Framework

In this research data available will be noise data training. Before the dataset is processed with ID3 algorithm, the data is first in transformation. The data that has no information such as data that has no value, will be omitted. After the noising process is complete, the value of each class should be changed to a value dictated. In this case, the data must be categorized into good value, enough and less. To avoid random categorization, and expected to have a fairly accurate result, then categorization is done by processing with Fuzzy Shoulder Curve.Class values that have been grouped will be analyzed by ID3 algorithm to form a decision tree. To make predictions, the test data will be tested using the ID3 decision tree.
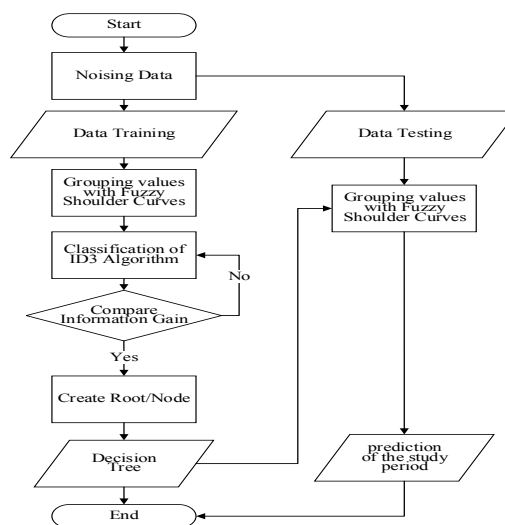
Figure 1. Research Framework

In general, the increasing availability of student data has an impact on data collection. Record student grades can be used as a reference to provide a new science that can be used to predict the accuracy of the study period. ID3 algorithm is machine learning method to classification. Our main goal in this study is to classify the class values in the dataset which is then analyzed with the ID3 Algorithm, get the accuracy of the prediction.

3 Results and Discussion

This research uses the data source of students as much as 1724 sample which will be divided into two parts, that is training data and test data. Student grade point data is used as a criterion by extracting the value of each semester based on the value of the group. The value of each semester class is grouped into good, sufficient and bad, using the fuzzy membership function of the shoulder curve.The area located in the middle of a variable that is represented in triangular form, on the right and left side will go up and down. But sometimes one side of the variable does not change. The fuzzy set of "shoulders", not triangles, is used to terminate a fuzzy region variable. The left shoulder moves from right to wrong, so the right shoulder moves from wrong to right. Representation of membership functions for shoulder curves is as follows:
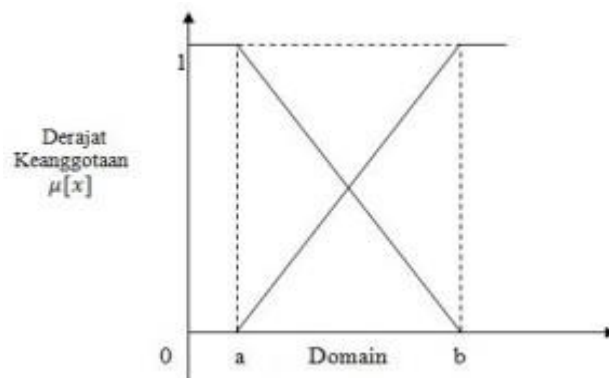
Figure 2. Representation of membership functions

The representation of the shoulder curve formula is:

$$[x, a, b] = \begin{cases} 0; & (x \le b) \\ \dfrac{(b - x)}{(b - a)}; & a \le x \le b \\ 1; & x \ge a \\ 0; & x \le a \\ \dfrac{(x - a)}{(b - a)}; & a \le x \le b \\ 1; & x \ge b \end{cases}$$

With the formula of the fuzzy function, all values of each class / attribute are categorized to be good, sufficient or bad. Training data is processed by using ID3 Algorithm to generate decision tree. Data training will be processed using the ID3 algorithm decision tree to derive predictions of student study classification and method accuracy.

Table 1. Class of Student Dataset

No	Name of Class	Code of Class
1	Grade Point of Semester I	IPSI
2	Grade Point of Semester II	IPSII
3	Grade Point of Semester III	IPSIII
4	Grade Point of Semester IV	IPSIV
5	Grade Point of Semester V	IPSV

6	Grade Point of Semester VI	IPSVI

Calculation Method of ID3 Algorithm can be done with steps as follows:

1. Calculating Overall Entropy Value

   Entropy is a measure of information theory that can know the characteristics of the impurity and homogeneity of the data set.

   $$Entropy\ (S) = \sum_{i=1}^{n} -p_i log_2 p_i$$

   Where: S: case set,

         n: number of partitions S,

       pi: the proportion of Si against S.

   There are 1724 student data and it is known that the number of data on Graduate on Time (LTW) is 1323 people and the amount of data of Graduated Late (LT) is 401 people. Entropy for a collection of S data samples is

   Entropy (S) = - (1323/1724) log2 (1323/1724) – (401/1724) log2 (401/1724)

                     = 0.782514

2. Calculate the entropy and information gain values of each attribute. Can be assumed attribute accuracy of study = "LTW" is a sample (+) which describes pass time, and attribute accuracy of study= "LT" is sample (-) which describes late pass. So the result of calculation node 1.1 as follows:

Table 2. The Result of Calculation Of Node 1.1

GPSI	LTW	LT	TOTAL	Inf.Gain
Good	896	278	921	
Sufficient	419	117	696	0.098861
Bad	8	6	107	
GPSII	LTW	LT	TOTAL	Inf.Gain
Good	769	219	988	
Sufficient	536	177	713	0.000696
Bad	18	5	23	
GPSIII	LTW	LT	TOTAL	Inf.Gain
Good	737	233	970	
Sufficient	568	158	726	0.001439
Bad	18	10	28	
GPSIV	LTW	LT	TOTAL	Inf.Gain
Good	817	255	1072	
Sufficient	500	146	646	0.001465
Bad	6	0	6	
GPSV	LTW	LT	TOTAL	Inf.Gain
Good	690	233	923	0.001868

Sufficient	620	164	784	
Bad	13	4	17	
GPSVI	LTW	LT	TOTAL	Inf.Gain
Good	958	308	1266	
Sufficient	350	89	439	0.001305
Bad	15	4	19	

From the results in Table 2 it can be seen that there is one attribute with the higest gain is GPSI. So the selected aattribute becomes the root node. The result of calculation with the Iterative Dichotomiser 3 algorithm can be indicated by the decision tree as follows :
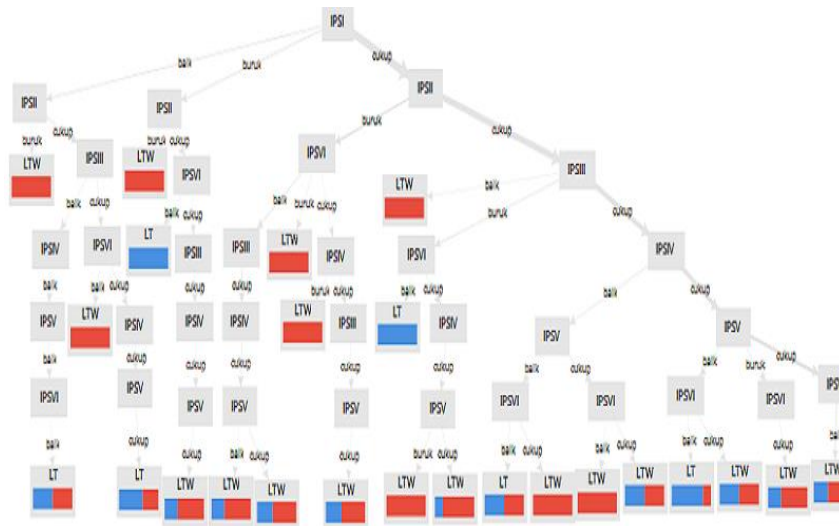
Figure 3. Decision Tree

Table 3. Table Matrix Configuration Testing Sample

	True LTW	True LT	Class Precision
Pred LTW	95	5	95%
Pred LT	0	0	0%
Class Recall	100%	0%	

Accuracy $= \frac{95+0}{100}$ x 100% = 95 %

The construction tree The ID3 algorithm is tested by inserting the testing data into the construction tree. Test sample size in this test is as much as 100 samples. The configuration matrix table in the test sample is as follows: Prediction results obtained using Iterative Algorithm Dichotomiser 3 (ID3) has an accuracy of 95%.

4 Conclusion

Accumulation of data can be processed into data learning in terms of forecasting. The value of each class on the student dataset can be categorized into either, either, sufficiently or poorly using the fuzzy membership function of the shoulder curve. Iterative Dichotomiser 3 algorithm has discrete attribute value, so used fuzzy curve of shoulder to help categorization not be done randomly. In the calculation using Iterative Dichotomiser 3 (ID3) produces the decision tree. Decision tree used for test data. With the result data and test data using. To forecast data/prediction.

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Yagi Biquad Antenna Design for 4G LTE in 2100 – 2400 MHz Frequency Band

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Abstract. Long Term Evolution (LTE) technology is the latest standard of mobile network technology. The results showed that LTE was able to provide downlink speeds up to 100 Mbps and uplink speed up to 50 Mbps. In Indonesia, especially in Jabodetabek area, there were already provider of 4G LTE service. In practice, 4G LTE service was not yet stable, there were some areas that had not been reached 4G internet signal. This because of 4G signal that was easily influenced by the surrounding conditions, such as the presence of high buildings, trees, or rooms which block 4G signals. To solve this problem, an additional antenna for LTE 4G modem was required as a means to increase coverage areas that were not getting 4G LTE signal. One of the antenna made in this research was Biquad Yagi type antenna. The basis of this study, which aimed to create yagi antenna with biquad inside the director, used a working frequency of 2100 MHz – 2400 MHz. With a good Reflection Factor (S11) value used (<-10 dB) to provide additional signal coverage of 4G LTE. The designed system parts consisted of PCB, copper wire, and RP-SMA Connector. The design of this antenna was first simulated by using WIPL-D software and after the expected result obtained, then it was fabricated by using part of the designing system. The antenna worked by connecting the modem with the antenna as an external antenna of 4G LTE modem.

Keywords: yagi-uda antenna, biquad antenna, WLAN antenna, HSDPA, 4G LTE.

1 Introduction

The name 4G is widely used to cover several types of broadband wireless access communication systems, not just cell phone systems [1].

LTE is a 4G Wi-Fi broadband technology developed with reference to the previous generation of 3GPP [2],[3].

In Indonesia, especially in Jabodetabek area, there are already operators who provide 4G LTE service. In practice, 4G LTE service is not yet stable, there are some areas that have not reached by 4G internet signal. This is because the 4G signal is easily influenced by surrounding conditions, such as the presence of high buildings, trees, or rooms that block 4G signals.

To solve the above problem, an additional antenna needs to be made on 4G LTE modem as a means to increase coverage areas that are not getting the 4G LTE signal [4]. One of the antenna to be discussed in this research is biquad yagi antenna type. With its advantage of having a good directivity diagram antenna as well as the design of two squares (Biquad) on each antenna director, it is expected to enlarge the maximum bandwidth and reduce the decrease of radiation pattern at higher frequencies. From those advantages of yagi antenna, the

design of yagi antenna will use the frequency bands between 2100 – 2400 MHz where the frequency is benefitted by the operator x in 4G LTE service.

1.1 Waves Electromagnetic Waves

Electromagnetic waves are waves that have electrical properties and magnetic properties simultaneously. Radio waves are part of the electromagnetic waves in the radio frequency spectrum.

Waves are characterized by wavelength and frequency. The wavelength (λ) is related to the frequency (f) and the fast light velocity (c) as shown in Equation 1. [5]

$$\lambda = \frac{c}{f} \tag{1}$$

where:
λ = wavelength (m)
c = fast light velocity (m/s)
f = frequency (Hz)

One of the frequency spectrum of electromagnetic waves is radio waves. This radio frequency spectrum is required to know which bands enter in the design of yagi biquad antennas. The distribution of the radio frequency spectrum is shown in Table 1.

Table 1. Radio Frequency Spectrum.

Name of Band	Abbrevi-ation	ITU Band	Frequen-cy (f)	Wavelength (λ)
Extremely Low Frequency	ELF	1	3 – 30 Hz	10.000 km – 100.000 km
Super Low Frequency	SLF	2	30 – 300 Hz	1000 km – 10.000 km
Ultra-Low Frequency	ULF	3	300 – 3000 Hz	100 km – 1000 km
Very Low Frequency	VLF	4	3 – 30 KHz	10 km – 100 km
Low Frequency	LF	5	30 – 300 KHz	1 km – 10 km
Medium Frequency	MF	6	300 – 3000 KHz	100 m – 1 km
High Frequency	HF	7	3 – 30 MHz	10 m – 100 m
Very High Frequency	VHF	8	30 – 300 MHz	1 m – 100 m
Ultra High Frequency	UHF	9	300 – 3000 MHz	100 mm – 1 m
Super High Frequency	SHF	10	3 – 30 GHz	10 mm – 100 mm
Extremely High Frequency	EHF	11	30 – 300 GHz	1 mm – 10 mm

1.2 Important Quantity of Yagi Antenna

The maximum range of yagi antennas is largely determined by Driven, Reflector, and Director. Here is the important quantity of yagi antennas:
a. Driven is the supply point of the antenna cable. The formula for calculating the total length of yagi biquad Driven is as follows:

$$\mathbf{L = 1/4 \ x \ K \ x \ \lambda} \tag{2}$$

Where:
λ = the wavelength in air (m)
L = the length of Driven Element (m)
K = the velocity factor in the metal taken for 0.95 [6]

Modifying the Driven sections will cause changes in the frequency of reception power, maximization of the capture power is determined by metal material of this section.

b. The reflector is the back antenna that acts as a signal reflector, with a physical length of 7% longer than Driven Element.
Modifying the Reflector section will affect the signal capture direction, this will serve to reflect the signal to the Driven section. Modification in this section can be done by widening the area, but in the expansion, it needs adjustment by adding the length of the director also.

c. The director is which directing the antenna. Adding the director rod will increase the antenna gain, but it will make the antenna alignment pattern narrower. The more number of directors, the narrower the direction. The length of the director is 5% shorter than the Driven Element.

d. The boom is a driven part of the drive, the reflector, and the director. The boom is a metal or wooden rod that runs along the length of the antenna.

1.3 Parameter of Yagi Antenna

The parameters of Yagi antenna are as follows:
a. Radiation Patterns
The antenna radiation pattern is as a quantity to determine the angle in which the antenna emits its electromagnetic energy.

b. Polarization
An orientation description of electric field in the propagation direction. Polarization can also be interpreted as a form of electric field movement over time. The polarization of an antenna informs the direction in which the electric field has an orientation in its propagation

c. Gain
One of the important parameter to measure the antenna quality is gain. A gain of antenna is one of important quantity and characteristics in designing an antenna.

d. Reflection Factor
The reflection factor (return loss) is the ratio of the amplitude of reflected wave from the amplitude of transmitted wave. The value of a good return loss is below -9.54 dB, this value is obtained for VSWR ≤ 2 so that it can be said that the reflected wave value is not too large compared to the transmitted wave or in other words, the transmission line is matching. The value of this parameter becomes one of the reference to see whether the antenna has been able to work at the expected frequency or not.

e. Voltage Standing Wave Ratio (VSWR)
VSWR is the ratio between the maximum and minimum voltage on a standing wave due to the reflection of the wave caused by the difference of its antenna input impedance with the feeder channel. In general, the value of VSWR which is still considered to be good is VSWR ≤ 2.

f. Antenna Bandwidth
The bandwidth of an antenna is defined as the frequency interval, in which the antenna works in accordance with which specified by the given specification.

2 Antenna Design

In designing Biquad Yagi antenna, there will be some important steps that will be conduct to create an antenna that matches the expected specification. Some of the steps are described in the design flow diagram and the fabrication of Biquad Yagi antenna that will be used in this research as shown in Figure 1.
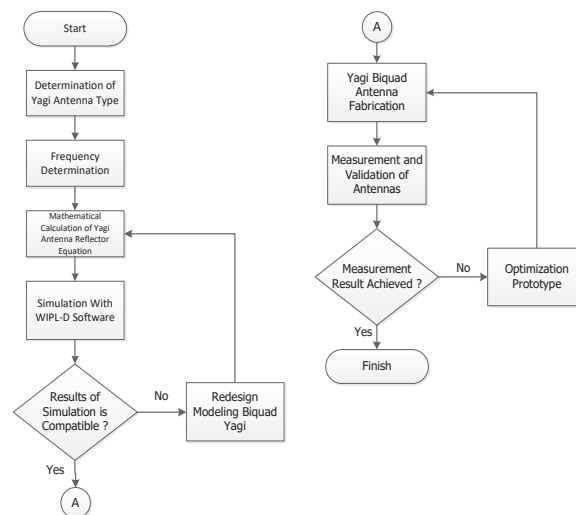
Fig. 1. Flowchart Design and Fabrication of Yagi Biquad Antenna.

2.1 Determination of Yagi Antenna Type and Specification

In the determination of this yagi antenna type is including the number of yagi antenna elements to be create and the shape of the antenna. It is intended that the antenna is made in accordance with the working frequency of 4G LTE 2100 – 2400 MHz. In designing this yagi antenna, 7 elements will be used consist of reflector, driven element, and 5 director by using type biquad with length of element λ / 4.

The Biquad Yagi antennas that will be create is in the following specifications:
❖ Frequency   : 2100 MHz – 2400 MHz
❖ Impedance   : 50 Ω

❖ VSWR : ≤ 1.3
❖ Radiation Pattern : Bi-directional
❖ Polarization : Linier (Vertical)
❖ Gain : ±10 dB

The material used in creating Yagi Biquad antenna is copper wire, which has the following specifications:

❖ Goods relitivity s (εr) : 1
❖ Wire thickness : ± 1.5mm

2.2 Determination of Work Frequency of Yagi Biquad Antenna

In Indonesia region, the work frequency of 4G LTE which is currently held by the government is at frequency of 2300 MHz. Thus on this design the frequency 2100 – 2400 MHz will be made.

2.3 Mathematical Calculations for Determining Wavelength and Yagi Biquad Antenna Dimensions

Before conducting further design, at first determine the λ (wavelength) value, which can be obtained from equation (1) with the value of c (3 x 108) and f of 2100 MHz.

$$\lambda = \frac{c}{f} = \frac{3.10^8}{2,1.10^9} = 0.14 \text{ m} = 14 \text{ cm}$$

where:
λ = Wavelength in air (m)
c = fast light velocity (m/s)
f = frequency (Hz)

In creating antenna Yagi Biquad, each side of the antenna has a length of l/4. According to Antenna System Engineering book (2013: 104) on the Yagi antenna, it can generally be summarized as follows:

a. Driven Element on biquad type has a length of ¼ λ (lambda). To calculate the total length of a Yagi Driven Element, it can be found using equation (2).
   L = 1/4 x K x λ
   where:
   λ = the wavelength in air (m)
   L = the length of Driven Element (m)
   K = the velocity factor in the metal taken for 0.95 [6]
   Thus the length of Driven Element is:
   L = ¼ x K x λ = ¼ x 0,95 x 14 cm = 3,325 cm

b. Reflector length is made approximately 7% longer than Driven Element. Thus the length of Reflector is:
   L + (7% x L) = 3,325 + (7% x 3,325) = 3,55 cm

c. The length of Director 1 is made 5% shorter than Driven Element. Thus to create Yagi that has more than 3 elements, the next Director (Director 2) is usually cut a little shorter than Director 1. Similarly with Director 3, Director 4, and so on.

Hence, the length of Director 1 – 5 is as follows:

Director 1 = 3,325 – (5% x 3,325)   = 3,2 cm
Director 2 = 3,325 – (7% x 3,325) = 3,1 cm
Director 3 = 3,325 – (9% x 3,325) = 3 cm
Director 4 = 3,325 – (11% x 3,325) = 2,9 cm
Director 5 = 3,325 – (13% x 3,325) = 2,8 cm

To determine the distance of each element is as follows:

- To obtain the greatest gain is if the distance between Driven Element with Reflector is about 0.2 λ - 0.25 λ
- To obtain a good coupling between Driven Element with Director 1, then Director 1 should be placed as far as 0.1 λ - 0.15 λ from Driven Element.
- For Director 2 is placed as far as 0.15 λ - 0.2 λ from Director 1.
- For Director 3 is placed as far as 0.2 λ - 0.25 λ from Director 2. And so on for Director 4 and 5.

Table 2. Length of Each Yagi Element Based on Calculations.

Element Name	Symbol	Length of Element (cm)	Distance Between Element (cm)
Reflector	R	3,55	1,9
Driver Element	DE	3,325	1,7
Director 1	D1	3,2	1,7
Director 2	D2	3,1	1,7
Director 3	D3	3	1,7
Director 4	D4	2,9	1,7
Director 5	D5	2,8	1,7
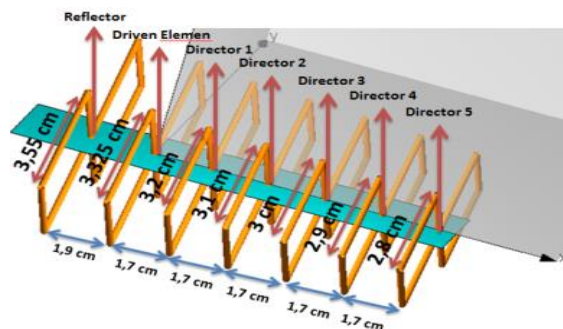
Fig. 2. The Dimensions of Each Yagi Element Based on the Calculations.

2.4 Simulation of Biquad Yagi Antenna with WIPL-D Software

In the initial design according to Table 2, then it compares to several different element length and spacing elements. It is necessary to determine the element's length and distance of the element based on the measurement of best reflection factor. In Table 3 there are four simulations of different elements lengths.

Table 3. Simulation Table of Yagi Biquad Antenna Calculations.

SIMULATION 1				SIMULATION 2			
Element Name	Symbol	Length of Element (cm)	Distance Between Element (cm)	Element Name	Symbol	Length of Element (cm)	Distance Between Element (cm)
Reflector	R	3,55	3,5	Reflector	R	3,55	1,9
Driver Element	DE	3,325	2,1	Driver Element	DE	3,325	1,7
Director 1	D1	3,2	2,8	Director 1	D1	3,2	1,7
Director 2	D2	3,1	3,5	Director 2	D2	3,1	1,7
Director 3	D3	3	3,5	Director 3	D3	3	1,7
Director 4	D4	2,9	3,5	Director 4	D4	2,9	1,7
Director 5	D5	2,8	3,5	Director 5	D5	2,8	1,7

SIMULATION 3				SIMULATION 4			
Element Name	Symbol	Length of Element (cm)	Distance Between Element (cm)	Element Name	Symbol	Length of Element (cm)	Distance Between Element (cm)
Reflector	R	3,8	1,9	Reflector	R	4	1,9
Driver Element	DE	3,6	1,7	Driver Element	DE	3,6	1,7
Director 1	D1	3,4	1,7	Director 1	D1	3,3	1,7
Director 2	D2	3,3	1,7	Director 2	D2	3,3	1,7
Director 3	D3	3,2	1,7	Director 3	D3	3,3	1,7
Director 4	D4	3,1	1,7	Director 4	D4	3,3	1,7
Director 5	D5	3	1,7	Director 5	D5	3,3	1,7
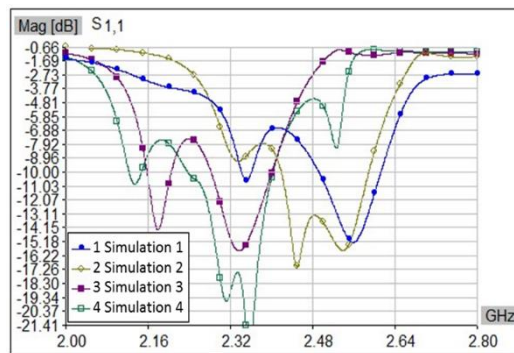
Fig. 3. Comparison of return loss simulation of Yagi Biquad antenna.
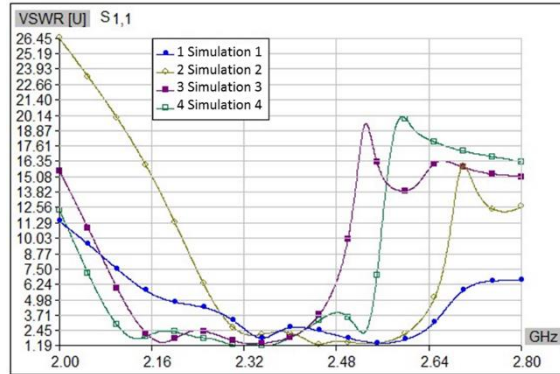
Fig. 4. Comparison of VSWR simulation of Yagi Biquad antenna.

The simulation results in Figures 3 and 4 show that from the simulation of the four types of Yagi Biquad antennas, the best return value and VSWR at 2100 – 2400 MHz are available in simulation 3 and simulation 4, this is because the return loss value <-10 dB and VSWR <2 at the work frequency that will be used. From the simulation result of the radiation pattern in Fig. 5, the most stable emission is found in simulation 3 with the gain as author's specification is ± 10 dB.
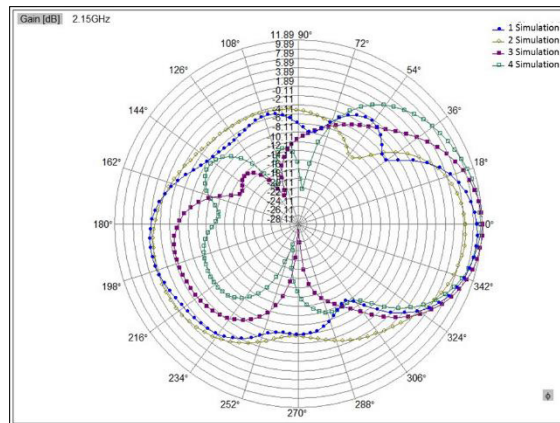
Fig. 5. Diagram of Yagi Biquad radiation at 2.15 GHz frequency.

Here is obtained the detail size of the Yagi Biquad antenna simulation in the *wipl-d* application
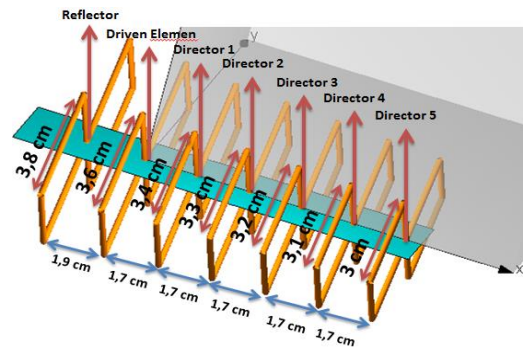
Fig. 6. Yagi Biquad Antenna Design on WIPL-D Viewed from Top.

2.5 Fabrication of Yagi Biquad Antenna

The design will then be fabricated with copper type material. Selection of copper material because it is good enough in terms of conductor and also resistant to rust. Other equipment for fabrication of this antenna is PCB as antenna boom and RP-SMA connector as feeding of an antenna.

This fabrication is done according to the size of the simulation results 3 in Table 3. The preparation of this antenna is done several stages:
1. Making Boom with 3mm size as media of Yagi Biquad placement
2. Creating Element, Reflector, and Director Driver based on the simulation size with four-sided shape like parallelogram, after that the copper pieces are soldered in boom which already made.
3. . Preparing the hole before the reflector for a feeding with size 3 mm.

The results from the antenna fabrication from the top side and side are shown in Figure 7.
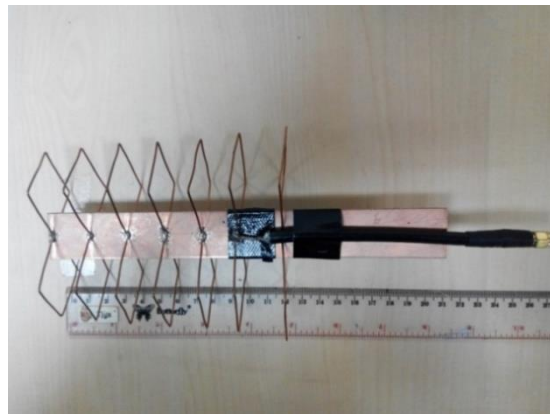
Fig. 7. Yagi Biquad Antenna from The Upper Side.

3 Test and Analysis of Yagi Biquad Antenna

3.1 Measurement of Return Loss and VSWR

The measurement data is obtained by measuring yagi biquad antenna by using spectrum analyser, while the measurement step is as follows:

a. Calibrate the spectrum analyzer along with the coaxial cable used with the calibration kit so that the return loss value is close to zero for all frequencies. This calibration step is very important to get the validity of measurement value as possible, without being affected by the presence of cable attenuation,

b. Connect the yagi biquad antenna to port 1 spectrum analyser using 1m jumper cable.

c. Displays each parameter that wanted to know through the format buttons, then note and record the graph of the measurement results.
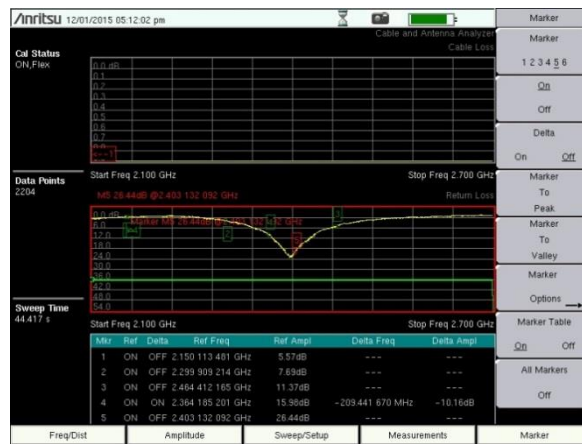
Fig. 8. VSWR Measurement Results of Yagi Biquad Antenna.

Similarly, the measurement of return loss, in Figure 8, a good value of VSWR according to the standard is <2 which at the working frequency of 2364 MHz up to 2464 MHz. The result of return loss measurement and VSWR on Yagi Biquad antenna as a whole is recorded in table 4.

Table 4. Table Measurement of Return Loss and VSWR

	Measurement Standard	Actual Measurement				
		2150 MHz	2300 MHz	2364 MHz	2400 MHz	2464 MHz
VSWR	<2	2,68	3,22	1,51	1,27	1,79
Return Loss	<-10 dB	-5.57 dB	-7.69 dB	-15.98 dB	-26.44 dB	-11.37 dB

3.2 Measurement of Antenna Gain

In this Measurement, the antenna used as a reference antenna is a 4cm dipole antenna that is assumed to have a large gain on isotropes on a conversion value of ± 1.5 dB. The method used in this measurement is referred as the method of comparison with the reference antenna which is using two antennas such as the dipole reference antenna which has a known gain and its antenna to be tested. This test is conducted in Indosat. The antenna gain measurement scheme is shown in figure 9.
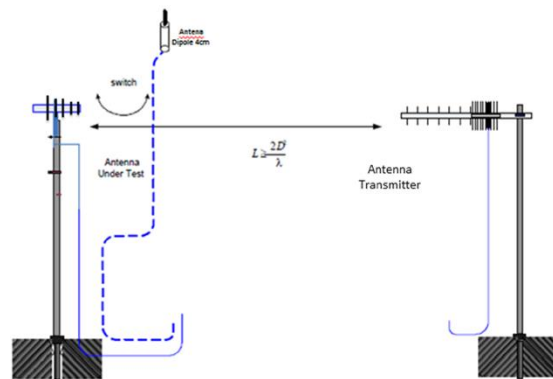
Fig. 9. Gain Measurement Scheme.

Measurement steps of antenna gain:
a. The test antenna is placed as a receiver in the interference-free or lowest interference area. Navigate to the main axis of the radiator pattern. Record the power on the spectrum analyser (dB).
b. Replace the test antenna with dipole antenna as a reference antenna. Record the power on the spectrum analyser.
   Compare the two results, then the measured result of the antenna gain is calculated by using the formula:

GAUT (dBm) = P_{AUT} (dBm) – P_{REF} (dBm) + 1.5 (dB)
(4.1)
where:
$G_{AUT(dbm)}$ = gain of the measured antenna
$P_{AUT(dbm)}$ = AUT power level received
$P_{REF(dbm)}$ = power level received of the reference antenna

Table 5 is the result of recorded gains that analyse 10 times to obtain more accurate results. The gain is 9.23 dB, which is in a simulated gain is 11.80 dB. This is possible due to the measurement is not on the anechoic chamber.

Table 5. Measurement Results of Gain.

Sample	AUT	REF
1	-35,47	-44,33
2	-34,88	-42,25
3	-35,23	-43,66
4	-36,24	-44,18
5	-36,17	-43,73
6	-37,33	-42,55
7	-36,17	-43,82
8	-35,67	-43,24
9	-35,5	-43,58
10	-35,23	-43,93
Average	-35,789	-43,527
Gain = P_{AUT} (dBm) - P_{Ref} (dBm) + 1.5 dB		
Gain = 9.23 dB		

3.3 Analysis of Measurement Result

In the above measurement results, it is obtained the reflection factor is in accordance with the standard that the working frequency is 2364 MHz - 2464 MHz where the return loss value of 11.37 dB – 26 dB with a good VSWR value of 1.27. From the actual measurement results, there is change in the frequency simulation, this is caused by several factors such as:

1. Cable impedance, this input impedance value is very important to achieve a matching conditions when the antenna is connected to a voltage source, so that all signals sent to the antenna are properly transmitted.

2. Differences in the distance between elements that have different millimetres and solder in each element to the boom is not neat and clean.

3.4 Yagi Biquad Antenna Testing

The test conditions are performed on an empty field to find out how far the reach increase of a portable modem after using yagi biquad antenna by pairing a yagi biquad antenna to an external antenna port on a portable modem. The modem used in this test is the Huawei E5372s Bolt modem. The test scheme can be seen in Figure 10.
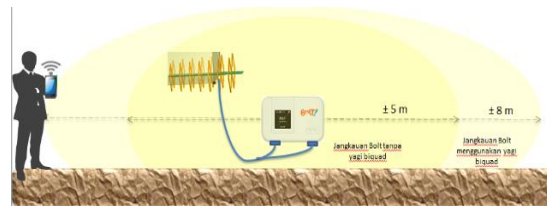
Fig. 10. Scheme of Yagi Biquad Antenna Testing.

Figure 10 shows a range increase of ± 3 m, this method is taken by making the handset or laptop as a medium to know the quality of Wi-Fi on the modem by using the application speed test and shift the place until the handset or laptop device does not get Wi-Fi signal from the modem. In Figure 11 shows the difference in the quality of data rates between modems that do not use yagi biquad antennas and those using yagi biquad antennas.

Fig. 11. Comparison of Data Quality Speed.

The result of range and data quality increase is not very significant because the antenna is working at 2364 MHz – 2464 MHz, while the working frequency of the modem tested is at 2300 MHz frequency with 15 MHz bandwidth.

4 Conclusion and Suggestion

4.1 Conclusion

From the whole process of planning, simulating, making and measuring yagi biquad antenna by using copper wire, hence it can be concluded as follows:
1. Simulation results for working frequency 2100 MHz – 2400 MHz slightly differ from actual measurement result that is 2364 MHz – 2464 MHz. This is because the fabrication is done manually, so the installation distance of Biquad wire on the antenna boom is not soldered in neat and cleanly.

2. Return loss obtained is at 2400 MHz frequency of -26.44 dB with VSWR 1.27 and gain 9.23 dB which the measurement results are better than the standard reflection factor <-10 dB and VSWR <1.5.

3. Installation of yagi biquad antenna as external antenna on portable modem can increase signal range ± 3m with speed improvement data quality download at 3.64 Mbps and

upload at 0.89 Mbps. The result of range and data quality increase is not very significant because the antenna is working at 2364 MHz – 2464 MHz, while the working frequency of the modem tested works at 2300 MHz frequency with 15 MHz bandwidth.

4.2 Suggestion

To get a good enough antenna performance, there are some things that can be used as a suggestion for future development: Conducting fabrication by using the qualified services to obtain maximum results in which accordance with the simulation. The antenna testing can be done in the anechoic chamber in order to get better results.

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Concept of Sustainable Housing Design and Material construction in the Tropics

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Abstract. Currently environmental conditions at the local to international levels, are experiencing poor quality degradation. The development of construction materials that continue to be produced around the world, became one of the causes of environmental degradation. Current construction materials tend to be used throughout the world, requiring a lot of natural resources to be explored on a large scale. The balance of nature is disturbed due to the exploration of vast natural resources. This study aims to obtain alternative design and construction materials for housing in the tropics that can reduce the problem of environmental degradation. The solution in obtaining residential design in a sustainable tropical region uses the principles of green architectural concepts that unite the philosophy of local building tradition with little modern material

Keywords: mix and match, traditional, sustainability, modern construction, housing.

1 Introduction

Sustainable Architecture is architecturein which the design and construction system, can continue to be used from time to time. The architectural design and construction materials may differ in regions with different geographical and sub-natural conditions [1].

Architecture of housing in Indonesia, especially after independence Indonesia, shows that building for residential purpose are not based on regional and social needs. Studies indicate that some new development housing was left by inhabitant because floods, no match façade orientation with livelihood, type of house and/or different habit of new housing space. It is tending towards modern construction and architecture due to that the old and historical architecture is being replaced by modern building.

The consequences of centralization regulation urban development housing show that the houses were built with the nearest available material, and often tradition and/or culture govern construction-materials. So that whole towns, areas, countries or even states/countries built up of one main type of material.

In the tropics area likes Indonesia, it is particular different settlement. Traditionally wood has been used as major element of building construction. The type, shape, structure, ventilation and waste disposal depend upon many factors, depending upon the culture, regional area, religion, topography, geographical conditions. The development of new building material, methodologies and technologies not only costly but also sometimes doesn't match the tropic. Looking cost and environmental factors, more attention need to be drawn to

develop some optimization of use of combination traditional and modern construction technology so that, not only sustainability may be attained in building construction but traditional architecture can also be maintained. But optimization of mixing traditional and modern construction should be done based upon the natural disaster like earthquake, flood, volcano and fires which frequently occur in the wide spread region of the country. Traditional buildings are not costly and environmental friendly but sometimes they are not able to resist the natural disasters occurring in this region. The extensive uses of natural resources are unbalancing the natural ecosystem equilibrium, which result in environmental degradation, globalwarming, ozone depletion and rapid growth ingreenhouse gases.

Fig. 1 & 2. Flood in Jakarta, February 2007. For about
60% Land use in Jakarta closed by floods.

History shows that in Indonesia natural disasters such as earthquake, volcanic eruption, floods, landslides, dryness, or the forest fire has been periodically occurring in the region. The example of one of the worst natural disasters in the last 10 years was the flood which came in Jakarta, in February 2007. About 60% land and building in Jakarta were affected. Residential and other buildings were also badly effected from partially to fully damage. In some regions likes Ciledug Indah Village water reached up to the height of 4 meter from the ground.

Fig. 3 & 4. Destruction under Earthquake in
Bantul,Yogyakarta (May-2006)

Another example of natural disaster is Earthquake occurred in Bantul, Yogyakarta (May-2006). Even though the intensity of earthquake is not too high but death toll counted nearly 6000 causalities. Most of the people were buried under collapsed building. The building collapsed during earth quake was brick made with low strength (quality) cement-sand mortar. These structures were absolutely not resistant to earthquake. In many of the regions the buildings too dense, this multiplies the impact of earthquake. This also shows the ill planning in housing sector with ignorable regulation of building department. There is also need of restructuring of building code [2].

According to the Chief of public housing of Indonesian Cares (MP3I), Dr. Eng. Aca Sugandi, to save this country from natural disasters we have tomaintain the environmental and ecosystem at its natural balance. On the other hand, it is also required to revive the countryside and urban area housing planning [3]. Prof. Dr. Ing. Uras Siahaan lic.rer.reg (2006), said that the traditional housing settlement culture conserved resources, environment and natural ecosystem. The geographical condition gave birth to the housing forms that fit to the condition of regions. The natural condition of Indonesia is often threatened by the earthquake, volcano eruption, floods and floods waves on the strand, so that construction form and development system of the building have to able to handle them [4].

The practice of modern architectural development leads to environmental and social crises around the world. Hence the concept of "Sustainability" emerged in the early 1970s in response to the phenomenon.Sustainability represents a balance that accommodates human needs without diminishing the health and productivity of natural systems [5]. According to AIA (American Institute of Architecture) sustainability is the ability of society through exhaustion or overloading of the key resources on which that system depends [6].

2 Research objective

- To discuss the matching concept of traditional housing in Indonesia with sustainable architecture concept.
- To generate a relationship between traditional and modern housing (architecture) so that a balance can be obtained in terms of ecosystem, natural resources used, environment friendly construction.
- To discuss the acceptability of innovated mix and match techniques of traditional culture and modern technology of construction to provide more safer, economical, sustainable and comfortable solution.

3 Research Methodology

Formulation of problem used Formal Analog, because the topics problems come from previous theory and research. Formal Analog is a problems invention taken from dissimilar science and applies it to research area. Pursuant to research operational system, research type used by The Descriptive Survey Method, the research hit data obtained from observation. Pursuant to procedure of research step, method of research usage is qualitative, with Deductive Empirical method.

Fig. 6. Map of Indonesia showing different provinces and islands.

This Research aspect is sustainable traditional housing settlement in the tropics area concerning in Indonesia. Population used is going concerns about traditional housing in Indonesia. The variables are concern in sustainable construction, material, structure, form of building and comfort, on traditional and modern technology.

Analysis method is for knowing standard of Sustainable Housing for Tropics area by innovated mix and match techniques of traditional culture and modern technology.

4   History of Indonesian architecture   .

Indonesia is the largest archipelago country in the world, has 17,508 islands, 11,508 islands are still uninhabited and only 6000 islands inhabited by the inhabitants [7]. These islands are spread all over the equator. Java, Sumatra, Kalimantan (Borneo), Papua, and Sulawesi are the five largest islands in Indonesia. Indonesia is bordered by Malaysia located on the island of Kalimantan, Papua New Guinea on the island of New Guinea, and East Timor on the island of Timor. As a large country, tropical climate, and geographical conditions, biodiversity levels in this country occupy the second highest position in the world after Brazil [8]. 60% of Indonesia is Forest [9]. Indonesia has 300 tribesand 742 different languages and dialects, each growing with cultural differences over the centuries, the country is also influenced by the Arabs, Chinese, Malays, and Europeans [10].

The diversity of Indonesian Architectural forms isa reflection of the cultural, historical and geographical influences that make up the whole of Indonesia. Prominent changes in style and engineering of buildings, many influenced by invaders, merchants, invaders and missionaries.Traditionally, the most significant influence has been Indian, but Chinese, Arab, and more recently. European influences which have been important.

There are three vital impacts seen on the Indonesian architecture listed below.1. Religion 2. Regional   3. Colonial

Traditional Indonesian architecture is influenced by many factors of religion and belief. For example, in the 8th to 14th centuries the traditional architectural style was mostly Hindu-style architecture, this was due to the influence of the Hindu-Buddhist kingdom which was the greatest kingdom of the time.

In the fifteenth century, Islam has become the dominant religion in Indonesia, especially in the two largest islands of Java and Sumatra. Foreign influences in Islamic architecture, absorbed and interpreted into Javanese / Indonesian. The mosque was built at that time, many featuring ornament that has a Hindu style, Buddhist is also Chinese. For decades, during Indonesian Independence the mosque in Indonesia was then built in a style taken from global Islamic forms which is a reflection of the tomb.

Indonesia's climate condition is a humid tropical climate. It has high rainfall, so traditional buildings generally have steep roofs and long overhangs. The houses stand on wooden and stones pillars (1 to 4 m) for air circulation and reduce the high humidity factor. Against high / hot temperatures throughout the year the house, built with a long overhang on the roof.

Fig. 7. This pre-war Bandung home is an example of 20th century Indonesian Dutch Colonial styles.

The 16th and 17th centuries saw the arrival of European buildings in Indonesia, is to use the stone in the system of construction. The construction system in Indonesia has always used wood and its supporters, except for forms that except for the forms that follow the religion and the buildings of the Royal palaces. In the 17th - 18th century, the first large settlement of the Dutch (Colonial) period, Batavia, used brick in its construction system.The colonialists did not adapt the European architectural style to the tropical climate in Indonesia, for nearly two centuries. In Batavia, for example, they built low waterways facing small and poorly ventilated, poorly ventilated, mostly Chinese-Dutch hybrids. Although, the series houses, drains and closed walls were first considered as protection against tropical diseases originating from the tropical air. Years later the Dutch learned to adjust their architectural style with local building features (long roofs, porches, porticos, large windows and ventilation holes) [11].

One of the first buildings in Indonesia that combine elements of Indonesian architecture with colonial, and try to adapt to climate is, Indo-European hybrid villa in the 19th century. The basic form is Javanese architecture, such as the longitudinal space and the use of Joglo and Limasan roof structures, but incorporates European decorative elements such as the neo-classical columns around the inner verandas. In the 20th century developed Indo-European houses, in fact it is a European-style Indonesian house. The trend that developed at the time was Modern Art Deco style, expressed by European buildings that incorporate some traditional Indonesian decorations and elements (examples of high roofed buildings with Javanese ornament details). Practice Hybrid Indonesia - Europe that existed previously is to respond to the climate of Indonesia, especially the hanging roof, windows and ventilation on the larger wall.

5 Matching Concepts of Green Architecture Traditional Housing in Indonesia with Sustainable Architecture .

Sustainable architecture applies techniques of sustainable design to architecture. It is related to the concept of green building (or green architecture). Green Architecture can be

described as the architectural development and environment that has many typologies of architecture which could conserve resources, environment and natural ecosystem [6]

Characteristics and classifications of Traditional housing in humid tropic climate like Indonesia, have matching concept with sustainable architectural concept, among others:

1. Use Natural Material and Local material
2. Keep cool the house with raised-floor construction, Steep Roof and long over hang
3. Lay out plan increasing a sun lighting
4. Small is beautiful and Energy efficiency

5.1 Use Natural Material and Local material

Traditionally in Indonesia, wooden buildings have been constructing. The type and use of wood are lies in wide range from hard wood to bamboos. The use of extensive wood in housing sector is the main cause of deforestation in the country which caused frequent floods and erosion of top soil in to river system. The traditional construction was fit for earth quake resistance, because of their resistance to horizontal loading (earthquake waves). Example of a five meter high traditional warehouses and barns made of bamboo and sugarcane leaves in the badly hit Bantul district in Yogyakarta has put here, which still stands in its original position after the earthquake (May, 2006) while modern buildings in the same region were ruined [12]. However, bamboo is not only strong and flexible material, it aesthetically appealing.

The material was easy to obtain and easily replaced when aged or damaged by weather condition.

Fig. 8. Traditional warehouse in Bantul which is highly resistant to the earthquakes.

Fig. 9. 35 year old roof in Surabaya.

Indonesia traditional houses use a lot of iron wood shingle or known as shingle, as a roofing material. Shingle comes from Borneo and has been used for hundreds of years by locals. Dutch colonists who see and know the power of this material then introduce the wider community throughout the archipelago. The shingles that come from Ulin wood are introduced in the name of Iron Wood, is the wood that has the longest and strongest stamina in the world.The Dutch colonials introduced them to the rest of the archipelago and they are now found on many large government buildings as well as high class houses. It has a serviceable lifespan of at least thirty years. Alang-alang thatching has been used in Indonesia for hundreds of years on the islands of Bali, Lombok, Sumbawa, Timor and Sumba as a traditional system of roofing. There are slight variations in the application of the material throughout these different places but by far the neatest and strongest form is found in Bali [13].

5.2 Keep Cool the House with Raised-floor Construction, Steep Roof and Long over Hang

Climate condition is Humid-Tropics Climate which the high temperature all over the year. A House with raised-floor construction can control the room temperature to keep its cool usage natural ventilation system. The raised-floor construction, make add space behind the floor. The air circulation can flow and influence a house temperature to keep cool. More advantage can find if floor is using by wood material. So that, wind will acquire the sixth side of house and reduce high temperature that influence from around the village.

Almost all of Architecture Traditional housing in Indonesia especially Sumatra, Sulawesi, Aceh, Kalimantan, Riau and Betawi use raised-floor construction. The first floor is functions especially for breeding animals, wild animal, climate condition and disaster. The construction of living space there are two alternatives; either the beams of the raised floor are mortised through posts reaching up to the roof – H frame- or alternatively, the foundation elements do not reach above floor level and carry a box frame/ construction (ex:Toraja House, Sulawesi house, Aceh House shown by Figure 10 & 11 [14].
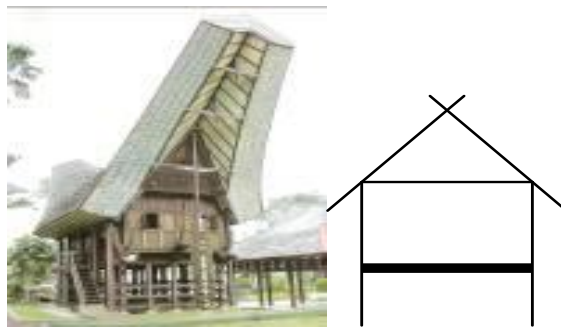
Fig. 10 & 11. Sulawesi Tenggarahouse, H frame construction.

Again two alternatives; either the beams of the raised floor are mortised through posts reaching up to the roof – H frame- or alternatively, the foundation elements do not reach above floor level and carry a box frame/ construction (ex:Toraja House, Sulawesi house, Aceh House) shown by Figure 10 &11 [14].

On the other hand, traditional house roof in Indonesia also varies by form. All varies also construction by wood. Varies roof from Java are Kampong Trajumas roof, Kampung Doro gepak roof, Limasan roof and Joglo roof. Against heavy Rainfall, it has steep roof and long overhang. The high humidity will be reduces through good air circulation.

Kampong Trajumas roof, have open air circulation for ventilation in front to back the house. Kampung Doro gepak roof have steep roof and open air circulation also in front to the back house, but less than trajumas. Limasan roofs,   has closely roof and no open air circulation. Joglo roofs have steep roof andopen air circulation from inclination of steep and sloping roof.

5.3   Lay out Plan to Increase the Effect of the Sunlight

The main arrangement of Javanese houses is to use the principle of centrality and linearity. Pendopo or open center space represents the concept of centrality, which is focused in the middle.

Fig. 13. Pawongan from the Panglipuran village house, one of traditional housing in Bali.

Fig. 14. Bali traditional house in Tenganan village basically formed of open wall architecture, which consists of a wall compound and court yard.

Overall the house, the duality of the pavilion and the residence is connected to the hallway. Dominant linearity with respect to the ultimate place in the house, located in the middle behind the dwelling, like a bed, a dining area and a kitchen. A further distinction between the public and private spaces of residence is the existence of an open pavilion where guests are formally welcomed. Around the basic structure of this house, other rooms such as kitchens, bathrooms, living rooms and dining rooms can be found. All units are encircled by fences.

Fig. 15. Bali traditional house in Panglipuran.

Building orientation of Javanese houses is to fit in with point of the compass, North and South or West and East. North and South are upstream towards the sea. West and East are upstream towards the mountain. In the East there are Semeru and Merbabu mountains, whereas in the West is Merapi mountain.

Orientation direction to East and West is influenced by the people in habitant livelihood as afarmer. They use in front and the back of the house to dry their rice-plant. North and East orientation are influenced by their traditional beliefs with the goddess, especially Nyi Roro Kidul from East.

Balinese residence is also a form of architecture that has many buildings. The orientation of the front of the house overlooking the sacred mountain of Mount Agung, has an important meaning [15]. This direction is considered sacred, while the opposite is dirty (not sacred). The area of the house is divided into two sides and three sections, the first side to the mountain (head), ground (body), and sea (feet), and, on the other side to the sun, rise (head), peak (body), and setting. This combination of both sides produces nine directions where the combination of mountains / sunrise (head / head) is the most sacred and sacred-oriented mountain. The combination of sea / sunset setting (feet) is the profane. This means that the house of Bali is dominated by anthropomorphic and cosmic principles combined in gradations from the sacred to the profane. (Nas 1995).

However the Javanese and Bali house are basically formed by open wall architecture, which consists of the wall compound and have an open space. Centrality room and open space can give the sunlight entirety of a house. The orientations of traditional houses usually have connected with their fences and livelihood and to fit in with point of compass.

5.4 Small is Beautiful and Energy Efficiency

The uniqueness of housing in Indonesia is to have many buildings (pavilion) consisting of several small units with different functions, such as places to receive guests where to eat, sleep temps, kitchens and baths, for example there are at home Bali and Java. Some of the housing on the other island consists of an elongated building.

Building a house consisting of several small building units, the goal is to avoid humidity and circulation, it is suitable for humid tropical climate like in Indonesia. Cross ventilation and maximizing sunlight are the main goals of building small buildings in the home. Sunlight can heat the four sides of the wall to the maximum, thus preventing moisture. Small buildings also mean material efficiency that can help reduce environmental problems. In addition, in general the advantage is to facilitate the treatment.

Fig. 16. Toraja house is compound system.

Fig. 17. A view of modern architecture style of
Indonesian Architecture.

6 Unity the Concept of traditional and modern technology towards Sustainable Architecture Housing in Indonesia .

Traditional architecture are disappearing and being replaced by modern civilization. Following Indonesian independence, a number of government-funded major projects were undertaken in the modernist style, particularly in the capital Jakarta. Figure-19 shows the modern view of Indonesian architecture. Reflecting President Sukarno's political views, who were civil, engineer by himself, which the architecture is openly nationalistic and strives to show the new nation's pride in itself. *"Let us prove that we can also build the country like the Europeans and Americans do because we are equal"* Soekarno [16].

Native architecture was arguably more influenced by the new European ideas than colonial architecture was influenced by Indonesian styles; and these Western elements continue to be a dominantinfluence on Indonesia's built environment today Economic stability and growth in the 1970s, 1980s and 1990s saw large construction booms and major changes to Indonesian architecture.

According to Prof. Dr. Ir. Hasan Purbo (2006), translations and combinations of traditional architectural concepts into modern technology could be described below:

- Modern architecture technology as a mean of construction system
- Concepts of traditional architecture are applied as the meaningful and spiritual design concept.
- The decision making in the form, hierarchy, pattern, and the role of design will be taken from the traditional concepts.
- The spatial system will be reformed, adjusted with nowadays needs. But the reformation shouldn't opposite the traditional architecture concepts of space.

The following are considered in during construction of Modern house in Indonesia.
- Compatibility to tropical environment
- Durability, Safety and Comfort
- Thermal Comfort
- Resistant to Natural Disaster
- Cost factors
- Traditional and Spiritual values

Now modern housing needs technology for comfortable housing and increasing the quality of life. The concepts of traditional green architectural housing in Indonesia have also its weakness. Compounds building which consist of several building needs more space and large area. At present the land value is expensive and needs much money to pay the larger land area for houses. Using natural material can't save the forest, because it is the main cause of deforestation in the country which has caused frequent floods and erosion of top soil and in to river system.

The key areas to be considered have to adopt mix and match techniques for sustainable building construction. Sustainability in architecture and building construction can be obtained by improving the:
- Structure and architecture design
- Energy consumption during construction and operation phase
- Geometry and orientation of building
- Construction material

- Construction process
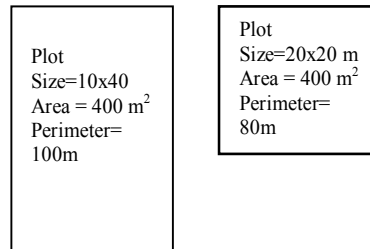
Fig. 1**8.** Shapes of plot affect the cost ofconstruction.

Looking the history of the region for earthquake and other natural disasters, building designs need to be refined and updated according to new type of loading (earthquake loading), which was considered previously negligible. But at present we have to use the horizontal loading and the factor of safety applied to these loads in the designing purpose will be dependent upon the statistical analysis of the historical earthquake data in the regions.

Geometry matters a lot in sustainability and over all construction cost of the building construction. . If a housing scheme is going to be constructed and instead of rectangular plot, square plot are given then the covered area remains the same but perimeter of square is 20 percent lesser. In this case overall cost of construction may be reduced by the 30 percent shown in Figure 20 below.

Building incurred by horizontal effect of earthquake have tendency to shift direction level off and rotate. So that, it is important to separate buildings being two part or more in form building lay out and constructions. In order to the times of earthquake, each share vibrates according to its time.This concept can mix with traditional green architectural concepts. The house will be safer and lesser cost. Lesser cost means the house can build part by part, according to their needs. Examples lay out shown in figure 21 below:
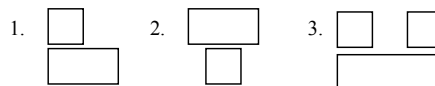
Fig. 19. Form building layout with consist of
severalbuildings will be safer and lesser cost

Two story houses give the lesser cost compare to single unit. The construction cost and use of raw material can be further reduced by reducing the story height.

Perceive with floods disaster and also keep cool the house naturally, raised-floor structure and construction can use to the modern housing. Energy efficiency also can reach to the house with raised-floor construction. Besides that, mixing concept raised-floor construction on single storey building is make ventilation in the bottom and up the wall. It will maximally the cross ventilation inside the house.

Raised-floor construction also can give result for humidity problem in humid tropic area like Indonesia. (Figure 23) Humid tropic climate have much water in the air. Building always to absorb water from the air especially that was used from brick and tile brick.
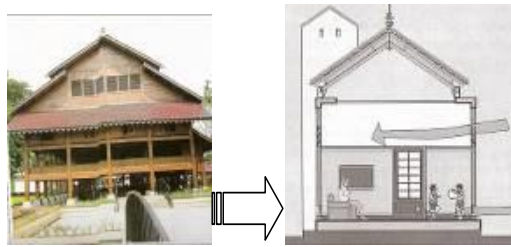
Fig. 20. Mix and match concepts form from traditional to modern house single story building.

House that stands up directly to the earth will to penetrate water into the wall. The moistness will influence the room if the wall was satiated with water, to result in grown of mushrooms in the wall. Construction phase is mainly dependent on design and the workmanship on site. Construction phase may be made more sustainable and efficient by improving construction methods and improving the process of construction.

The design process impact on the material type of material selected for construction. During construction phase a lot of energy is wasted during transportation of materials from longer distances. Therefore a lot of energy and resources can be saved by avoiding transportation of building material from longer distances and using locally available building material, which appeared in the Use of Natural Resources.

The wood used in most of the traditional construction, which can be adopted in the modern construction after recycles. Wood, already used or weathered by weathering agent can be easily recycled. The ones of local / traditional material construction, beside wood which had proved tolerance with earthquake is bamboo. However now in the world, there are many buildings construction from bamboo in modern technology. Mixing construction concept between bamboos with modernengineering technology is according to sustainable architecture principle.

Substitute material is the material which it can substitution natural materials. Use the substitute material in the right place will take an advantage of this material. Material composite is the material substitution that at presents is solution to mixing the traditional and local material with modern technology. The example materials are gypsum, plywood, glass fiber reinforced cement (GRC), calsiboard, glass fiber reinforce plastic (GFRP), fiber reinforced polymer (FRP), etc. Composite materials are having flexibility in design, energy efficiency, easy in assembly, mass product and low cost.

Introduction of composite structure members can be used to increase the strength and working capacity of material. E.g. wood beam with iron patches in the centre of the beam to increase the resisting bending moment of the wood and that way cheaper wood can be utilized with improved structure characteristics. .

Indonesia compromising of the islands and most of the population are in the coast region where the speed of wind is higher than the inner part of the islands. Therefore advantage of wind energy is to convert that in electrical or other form of energy that can be used by the housing sector. As the system is costly and extensive research is needed to find the wind

velocity to locate location of wind turbine stations. Therefore experimentally, it can be introduces in comparatively bigger islands like Java Sumatra and Kalimantan.

Solar energy can be used for conversion of electrical energy by using photovoltaic cells arrangements on inclined roofs. It is no doubt costly in the start but will going to save 10 times more during its operations phase of the building.Orientation can be optimized depending upon site conditions and over all topography of the region.

Traditional insulation techniques are more economical and efficient used in tropics therefore traditional insulation techniques can be used in modern building construction.

7 Conclusion   .

Housing settlement with mix and match traditional & modern technology is not only cost effective and resistant to natural hazards but will also help to maintain a concept of traditional architecture in the region. The innovation in design and construction coupled with mix and match technique will leads towards the ideology of sustainable development in the housing sector. Modern Housing Architecture which is designed with mix and match traditional and modern technology is progressively required towards sustainable architectural settlements in tropics. This also requires the fully support from government as policy determinant, and integrated design from architect, engineer and planer. Governments as policy determinant have to apply national standards for planning and construction composite material which can adapted by condition and material availability, so that the industries can give amenity and efficiency in development of houses on the area.

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TheTraces of Ideological Battle in Text Coverage Case Sues Divorce Julia Perez Over Her Husband Gaston Castanno at Seleb on News MNC TV
Critical Discourse Analysis of Norman Faircloug

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Abstract. This research seeks to track the traces of ideological contention in text coverage of divorce sue case of Julia Perez over her husband Gaston Castanno at Seleb on News , MNC TV. This study uses a qualitative approach with Critical Discourse Analysis (CDA) method of Norman Fairclough and focuses on three dimensions. Those are text, discursive practices and social praxis. Journalists, reporters, and editors have full authority over the word selection to use. At the text level, the researcher studied it using framing analysis of Robert N. Entman. On its news narration, Seleb on News MNC TV brought the issue of divorce Jupe over Gaston Castano to law sphere. Gaston Castano is positioned as the cause of the problem, Julia Perez (Jupe) is positioned as a hero as well as a victim. Moral claim of happiness deserves to be fought for. Problem solving proposed by Seleb on News in news frame is that Jupe has a right to be happy, Gaston deserves to be divorced. In discursive practice, the researcher tries to dismantle the ideology or interests that the depiction of women who sued for divorce because of the violence that occurred in the household is a form of news commodification as well as strategy of perpetuating patriarchal ideology. Julia Perez's divorce phrase is told in a dramatic and moving way, selling women's sadness and tears as merchandise while perpetuating patriarchal cultural practices by showing depictions sacrificing women as weak creatures.

Keywords: Language, Ideology, Woman, News.

1 Introduction

Even though Indonesia already has Law on the elimination of domestic violence No.23/2004, women in Indonesia are still vulnerable to be victims of violence. The 2017 Annual Report (AR) issued by national commissions of woman documented several cases reported and handled by state agencies and service agencies.

There were 259,150 cases of violence against women that occurred during the year 2016. 10,205 cases of which were cases of domestic violence. Of the 10,205 cases of domestic violence, violence against wives topped 57 percent (5,784 cases), followed by violence in the racial that was 21 percent and violence against girls, which was 18 percent. The rest is violence perpetrated by ex-husbands, ex-boyfriends, and other personnel violence. The most prominent forms of violence in the domain of domestic violence were physical violence (42 percent), sexual violence (34 percent), psychic (14 percent), and economy (10 percent) [1].

The Law on the Elimination of Domestic Violence (UU PKDRT) No.23 / 2004 defines domestic violence as every act against a person, especially women, resulting in physical, sexual, psychological, and / or abandonment of households including to commit acts, coercion, or deprivation of liberty unlawfully within the scope of the household.

Ironically, someone frequently does not realize that she is a victim of domestic violence. Therefore, the socialization of the Law on the elimination of domestic violence especially among the wider community is something very urgent. This is where the function of television as part of the mass media to run its role, in addition to providing information, television also serves to educate the public in the process of distribution of information related to women's rights and gender justice.

Domestic violence can happen to anyone, both celebrities and ordinary people. Some of the artists featured in brilio.net claimed to experience domestic violence ranging from verbal abuse to beatings. Jennifer Lopez, Cornelia Agatha, Manohara Odelia Pinot, Mariah Carey, Nia Daniaty, Rahma Azhari, Maia Estianty, Oki Agustina and Sheila Marcia [2].

The highest point of domestic violence is the loss of a spouse's life. Forensic psychologist Reza Indragiri suggests a divorce is the last step taken when there is a failure in anger management [3]. Yet the decision to sue for divorce for women is not easy, especially because of the negative stigma attached by the community to women who become widows. Both in the sphere of fiction or non-fiction messages are produced by the mass media. The issue surrounding widows is constructed in such a way as to produce negative depictions that eventually evolve in society. In the sphere of fiction for example, widows are told as a figure of sexy women and teasers both on television and in cinema.

Mass media basically does not present reality, but rather defines the meaning of that reality through the words it chooses. Every word the media uses to define reality is an ideological practice.

In 2016, it was recorded 11 cases of celebrity divorce. Of the 11 cases, 9 is a divorce case where the plaintiff is a woman (wife). Thursday, May 12, 2016, for the second time artist Julia Peres officially bears Widows status. South Jakarta District Court Judge granted a divorce sue of the woman whose real name is Yuli Rachmawati for her husband Gaston Castanno. In this case the Judge also obliged Gaston Castanno to pay the livelihood to Jupe as long as Jupe was not remarried with a nominal amount of 15 million rupiah per month for having abandoned her living [4].

Infotainment is news that provides information about the lives of people who are known to the public (celebrities) and most of them work in the entertainment industry such as movie players / soap operas, singers, and so on. The news about them is also called infotainment. Infotainment is one form of hard news because it contains information that must be immediately aired. Nowadays, infotainment is presented in a separate news program and specifically displays news about the lives of celebrities [5]. Infotainment is also often referred to as a journalism couch, a type of journalism that offers sensational news, more personalized, with celebrity attention to its coverage.

Seleb on News MNC TV is an infotainment program that goes into the top 5 of the highest rating. In contrast to infotainment programs in general, infotainment program Seleb On News is in house production MNC TV under the Department News or MNC News, so it is expected to put forward the rules of journalism when preaching an event.

We often see the mass media as a neutral means of communication. Yet what really happened was not so. The mass media is in the midst of a social reality filled with various interests, conflicts. The media is also an instrument of power and means for ideological struggle.

There is a price in the news [6]. When a news edition produces a story, it selects the selection process and chooses which messages will be delivered to the audience. In the process of selection is the background and interests of individuals and interests of media organizations cannot be avoided in constructing reality. They often perform actions that ultimately benefit companies / media organizations.

For them, information market (news business) is to seek profit in the first place [7]. It should not be late, should not be preceded by the media or other television stations, avoid rating down, and etc. In this case, media coverage and all activities of the company is measured by how much the selling value that can be generated from news.

The use of language in news is not actually transparent, in the sense that a discourse is written in the news text loaded with rhetoric, manipulation and misdirection. In this case the existing discourse does not directly express the sincere intentions of the news writer.

On the other hand, our social structure that still adheres to the patriarchal system seems to provide an opportunity for media companies in building their business. The media sphere is a patriarchal sphere; the parties involved in the media are mostly male [8].

Women are often depicted in mass media with constructions that harm women. Women are depicted as weak creatures, only possessing a domestic role, and being portrayed as mere 'sweetener', and experiencing body exploitation. Exploiting women's bodies is a low-risk business for patriarchal culture. Here, the mass media has sacrificed women in its construction; hence the patriarchal culture then becomes a 'machine' suppressor after market logic.

2 Methods

This study used a qualitative approach with the method of Critical Discourse Analysis of Norman Fairclogh. Critical Discourse Analysis tries to dismantle something wrong in society, such as injustice, equality, restriction of freedom or discrimination [7].

Fairclough told there are three-dimensional methods of discourse analysis. Discourse, and any specific instance of discursive practice, is seen as simultaneously (i) a language text, spoken or written, (ii) discourse practice (text production and text interpretation), (iii) sociocultural practice [9].

The text becomes a social struggle site [7]. Through text we can trace the track of ideological struggle in order to dominate or hegemony. Here is the role of critical Discourse Analysis, i.e. to melt and track the existence of ideology.

3 Results & Discussion

To analyze the text, researchers used framing analysis techniques Robert N. Entman. Framing is a method of presenting reality where the truth is not totally denied, but rather "bending" subtly by providing a projection on a particular aspect. Aspects that are hidden by the media then become forgotten even not paid attention at all by audiences.

Entman sees framing in two major dimensions: selection of issues and emphasis or protruding aspects. In the Entman concept, framing basically refers to the giving of

definitions, explanations, evaluations and recommendations in a discourse to emphasize a particular frame of mind for discourse events.

The concept of framing of the Entman describes extensively how events are interpreted and marked by journalists. Entman divides the framing device into four elements as follows: First, to define problems. This element is the master frame (most important frame). It emphasizes on how events are understood by journalists. The same event can be understood in different ways and frames. Second, diagnose causes, is a framing element to frame anyone who is considered an actor of an event. The causes in this context could be what or who. Third, creating moral judgment. Creating moral judgment is framing analysis that is used to justify / argue for defining the created problem. Fourth, treatment recommendation. This element is used to assess what is desired by journalists and what solution that was chosen to solve the problem. The settlement is of course highly dependent on how the event was seen and who was seen as the cause of the problem [10]. A well-crafted reality will allow the opportunity of reality to be noticed and influence the audience in understanding that reality. The protrusion here is how journalists make existing information more interesting, meaningful, or easier to remember by audiences.

3.1 The Seleb News Frame on News MNC TV

Define Problem, Seleb on News defines Jupe's divorce case over Gaston Castano into the sphere of law. Everything from the news about Jupe's divorce to her husband Gaston Castano is highlighted from the side of the Law. Diagnose Causes, in the whole text of Seleb on News, defines the cause of the problem in this case is Gaston Castano, the artist's husband. Gaston is portrayed as a play boy and materialistic figure who utilizes Julia Perez. This can be seen in the following text and images:

Besides rumored to make affairs, gaston is also suspected as a womanizer who only exploits jupe starting from luxury car rewarded for gaston as a birthday gift from jupe and gaston's cost of living that are charged to jupe during their relationship or during gaston having injury causing him not to be able to play soccer /jupe is the one who is responsible gaston's cost of living.

Fig. 1. Gaston, a Womanizer [11]

The In this context, Seleb on News Seleb on News uses words as well as sentences to reinforce its message frame, like the word "making affair" that illustrates that Gaston is a disloyal man, betrayed of marriage, torturing Jupe from his psychological side. The word "Womanizer", "Exploit Jupe" "Luxury Car", "Jupe Is The One Who Fulfill Gaston's Daily Needs" is a description of the forms of domestic violence that Gaston has done to his wife. The type of violence that Gaston does in this case is the violence in economic sphere. Gaston also abandoned his responsibility as husband that should be the one who fulfill household needs.

Further Seleb on News also featured Gaston's facts as a husband who had abandoned his livelihood by quoting Jupe's statement. "During this time Gaston boasted that in his country he had no obligation to support me, he was wrong. In Indonesia men should fulfill household needs, moreover he knows how law in Indonesia works. Now he understands that the law in Indonesia respects the rights of women and he now has to pay, it is required 15 Million per month ".

The News writer also positioned Jupe as both a victim and a hero. Jupe is told in news narrative as a woman who loves Gaston sincerely. Jupe had sacrificed everything for the man she loved, though eventually Jupe was finally disappointed. This can be seen in the following news narrative:

Divorce court/dangdut singer julia perez/with an argentina soccer player/gaston castano/held again yesterday//but//unlike previously/this time artist, jupe, looks tougher than usually//offically divorced and becomes widow//jupe admitted relief and happy/because eventually she is free from her suffering this whole time//[12] Seleb on News also quoted Jupe's statement to strengthen the frame, "I do not cry, do I cry? I'm so happy. Heloo I'm the happiest girl in the world now. This is my independence day. "

In addition, besides using words, sentences and pictures, Seleb on News also use music illustration in the form of piece of song "I Want to Break Free" a song by Dewa band. The contents of the song's lyrics describe a condition or circumstance in which a person has been freed from a large burden or pressure. The news writer intends to relate the conditions experienced by Jupe as depicted in the lyrics of the song. The news writer intends to show that divorce or women who are sued for divorce are not always negative, women are entitled to struggle their happiness especially when experiences violence in the household. Jupe is described as a tough figure who dares to "fight" the culture or values that have existed in the community for a long time. Jupe prefers to be a widow rather than suffering in marriage bonds.

Creating Moral Judgment. Seleb on News contains a moral claim that happiness is the right of every human being to be fought for Treatment Recommendation. Based on the background of defining the problem, determining the cause of the problem or the victim as well as the moral claims presented, Seleb on News provides problem solving that Jupe deserves to be happy and Gaston deserves to be divorced.

3.2 Discursive Practices

Journalists live in media institutions with their own set of rules, work patterns, habits, rules, norms, ethics and routines. MNC TV is a commercial television station that lives in the

midst of the competition of the television industry. Infotainment is one of the flagship programs of commercial television stations. The perception about the lives of artists becomes the "meal" of infotainment journalists.

"Like the usual infotainment, Seleb on News also holds editorial meetings and projection meetings. First, we hold meeting and plan what we will have for tomorrow (publish what news for tomorrow, red), we raise Jupe's case is because the divorce court is running at this time and it attracts a lot of attention from television viewers". [13] The higher value of an event's news is, the higher selling price will be. It ultimately led to the fight for the high rating. Julia Perez's divorce sue against her husband contained news of conflict, human interest, prominence, impact, actual (at the time), so it is not surprising that television stations are trying to be able to broadcast the latest information about Julia Perez's divorce case. Seleb on News also made efforts to not lose in the competition among others by holding a live report from the location in order to be the first one to broadcasts and it is also for specificity reasons, which distinguishes the program from other infotainment. "There is also live. It is more updated than the other infotainments, because other infotainments perhaps will discuss Jupe only at the core of the event, but if we attend directly in the spot, it is as if viewers are presented directly from the scene "[13].

Seleb on News also take advantage of internet technology to strengthen its position in the middle of the competition.

"We would like to grab Jupe's fans, young mothers aged 20-40 years old. In Instagram, there is also Jupelicius, Jupe's fans (followers). Jupe is their idol; they want to know all about their idol, they want their idol backed up completely. So when the news gets aired, we tag all Jupe's followers to watch. We go to their Instagram, and we also have their own Instagram, Seleb on News.MNCTV. Now because of social media era, we have to participate in it as well. We have Instagram, Facebook, and twitter. We have a social media team. Before the program is aired, we posted such as streaming video trailer on twitter for promotion and the viewers will get full content of the program that day on TV program"[13].

3.3   In News Construction Jupe Is Portrayed As both a Victim and a Hero

The events presented in the news are not value-free. News is formed from the journalist's construction based on reality. Here, reporters and editors have full authority to choose what words to use. They can choose one of many rows of words that are similar in meaning but have different "taste".

"We do not want to judge him (Gaston). We want to give lesson to the female viewers that Jupe is actually weak, and Jupe is actually a person who gets hurt. Because of her journey of love with Gaston that we see, Jupe has already struggled a lot for it. Although in the end, Jupe's parents do not agree with the relationship, Jupe insisted on sacrificing for her love. However, her man betrays Jupe eventually" [13].

Associated with the position of women who sued for divorce her husband, Iswanti as producer Seleb on News argued that it was the right of women. She thought that both men and women have equal rights.

"It is really the last option. The last option after everything cannot solve the problem and other ways have been taken but the problem is not over yet. In fact we women have the right to do it [13].

3.4   Socio Cultural Practice

The idea of commodification begins with Marxist thought about mass production, about the ways in which the social relations of authority are controlled by commercial interests or economic determination [6]. News is part of the chaos of the value system and materialism. There is a price on the news. News becomes a commodity idea, because news is bought and sold through news agencies.

In media industry, commodities sold or exchanged are not goods or objects in the physical sense, but commodities are formulated in the aesthetic price presented in the form of media production. Because in the television industry, the things that are sold or exchanged are not objects or goods in physical sense. Rather commodities are formulated in aesthetic works that are deliberately displayed.

One of the strategies in dealing with competition with other television stages is to produce television programs that fit the market taste. Therefore, to raise the rating, editors of Seleb on News have several strategies to raise their rating, which is intrinsic commodities in the program, such as interesting news packaging, live report from the scene, or utilizing communication technology such as Instagram, Facebook or Twitter to promote the program.

Mass media requires journalists who are in charge of finding, collecting and processing news that will be distributed to the public. Indeed, the task of journalists is to express facts and or opinions that contain facts, convey the truth and justice. In addition, they explain actual matters and educate the community. But this work is not an easy job since there are various interests that will later participate, and eventually gives shape to the truth that will be delivered [8].

Iswanti, as producer of Seleb on News Program and as a woman, would like to defend her people. She tried to fight in the news text she produced, such as trying to portray the figure of Jupe as a tough female figure, breaking the negative stigma about women suing her husband's divorce. However, Iswanti is part of MNC TV, where the media world is currently patriarchal world since people who are involved in the media world are dominated by men. Moreover, Iswanti is also in the global patriarchal system. Patriarchate is an asymmetric relationship between men and women who place men more dominant than women.

Mass media has the power and a important role in shaping reality. The reality created by the media is a symbolic reality that is the product or engineering of the managers (editors, journalists, producers, and all the people who work on it) they choose the reality they want to show as well as hide the reality that is not supposed to support the news construction.

In the text produced by the editor of Seleb on News, it participates in solidifying patriarchal ideology whether they realize it or not. It describes women (Jupe) as a weak figure and sells suffering and tears of women. This is seen in the following text:

Besides rumored to make affairs, gaston is also suspected as a womanizer who only exploits jupe starting from luxury car rewarded for gaston as a birthday gift from jupe and gaston's cost of living that are charged to jupe during their relationship or during gaston having injury causing him not to be able to play soccer /jupe is the one who is responsible gaston's cost of living [11].

In this news text Seleb On News positions Gaston as a dominant position and Jupe is in a weak position through words and phrases such as "making affair", "a womanizer who only exploits Jupe", "a luxury car rewarded for Gaston's as a birthday gift from Jupe "," cost of living that are charged to Jupe during their relationship", and " Jupe is the one who is responsible for Gaston's cost of living.

Seleb on News also represents the figure of men as the ruling over women. In this case, media participates to perpetuate the power of patriarchy ideology. This is seen in the following news text:

Again julia perez also known as jupe is disappointed / when attends the second court/divorce sue over her husband, gaston castano / in the district court of south jakarta south / last wednesday //artists having bald head (jupe) felt annoyed / because through the social media, she has asked gaston nicely / to come to their divorce court //

Jupe's Statement: "I already posted on my twitter. I know that he is frequently active in social media. As proof, he usually posts when he goes to some places. At first (divorce court) he stated that he could not attend. And there is no news about him. Instead, he went holidays with his friends and had party on the beach. It showed that he does not respect the divorce court as well. By showing his attitude, I do hope that the judge directly grants my divorce sue and ends the divorce court. I really cannot wait. Moreover I would like to have a big party in my house as thanksgiving"[14].

All that is done consciously or not by text producers: "We do not want to judge him (Gaston). We want to give lesson to the female viewers that Jupe is actually weak, and Jupe is actually a person who gets hurt. Because of her journey of love with Gaston that we see, Jupe has already struggled a lot for it. Although in the end, Jupe's parents do not agree with the relationship, Jupe insisted on sacrificing for her love. However, her man betrays Jupe eventually" [13].

In addition to patriarchal ideology, competition with other TV stations, Seleb on News will perform various ways to attract the attention of its viewers. Viewers' attention is then recorded in rating data and it was sold to advertisers.

Taking the term of T. Titi Widianingsih, patriarchal system puts media, in this case, Seleb on News is in a state of blessing in disguise for media companies in building their business.

In the middle of highly patriarchal society, the media (Seleb on News) sacrifices women in their news texts and sells women's sorrow and tears.

Fig. 2. Jupe cries when remembersher father and Gaston [14].

4 Conclusion

Basically, the mass media, in this case television, does not reproduce reality, but defines the reality that exists through the use of words, sentences or images. Each word used in a media text shows an ideological practice.

As part of the mass media, News editor Seleb on News MNC TV is in two major pressures; economic and patriarchal cultural pressures. Through news texts, the editor of Seleb on News has made women's issue as a commodity.

Our mental structure is related to ideology through language. Language is not a neutral but ambiguous communication tool. Because through Language, certain ideologies formed us and we do not realize about it.

Julia Perez's divorce phrase is told in a dramatic and moving way, selling women's sadness and tears as merchandise while perpetuating patriarchal cultural practices by showing depictions sacrificing women as weak creatures.

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The Influence of Teacher's Role, Autonomous Learning Method And Student's Active Towards Learning Outcomes of English Lesson Case Study: Sains XI Grade, SMA PGRI 109 Tangerang

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Abstract. To create quality human resources and achievers, the learner is required to have good learning outcome. Learning outcome is the highest benchmark person achieves after a learning activity during given time. To be able to absorb the knowledge and information are very necessary ability and effort from human resources to speak foreign languages, especially English which is a universal international language in order to establish interaction and communication to exchange experiences with other countries that already have advanced knowledge and technology, specially by reading books and literatures that are the source of tknowledge. This research aims to analyse the influence of teacher's role, autonomous learning method and student's active towards learning outcomes of english lesson. This study was conducted with quantitative. Descriptive research design was conducted in Class XI Science SMA PGRI 109 TANGERANG with population as many as 120 people and ssample as many as 92 people. Sample randomly selected proportional by formula of Slovin. Collecting data in this research use a questionnaire as the instrument. The result of descriptive analysis is showed that the teacher's role has significant impact on learning outcome of students class XI Science SMA PGRI 109 TANGERANG, the result of overall analysis showed that together three independent variables, namely teacher's role, autonomous learning method and student's active on learning outcome.

Keywords: Teacher's Role, Autonomous Learning Method, Student's Active, Learning Outcome.

1   Introduction

Education is one of the efforts to deliver students to the process of maturity in various aspects of life. Education is a process of teaching that aims thoroughly, either in the form of knowledge transformation, appreciation and the formation of attitudes or behavior. In line with the national education objectives contained in Law no. 20 Year 2003 on SISDIKNAS (National Education System), that education aims to develop the potential of learners to become human beings who believe and piety to God Almighty, have a noble, healthy, knowledgeable, capable creative, independent and become citizens of a democratic and to be responsible.

Education is basically an effort to provide certain knowledge, insight, skill, and expertise to individuals to develop themselves so as to be able to face any changes that occur. Many factors cause the emergence of learning problems. These factors include interal factors and

external factors. Internal factors are factors that arise from within students, such as the level of intelligence and personality. While external factors are factors that arise from outside the student self, such as teacher role factors, teaching methods and student activeness.

Education within the scope of the family is the first and main educational institution. The core family members, the elderly and other members of the family who first teach the child the knowledge of God as the one God, the experience of human interaction, and the obligation to develop responsibility, responsibility for oneself as a religious being, responsible As a student, is responsible as a social creature that lives in a society and is responsible as a citizen, and is responsible as a child against parents and others.

1.1 Formulation of the problem

Based on the background and limitations of problems that have been identified then the authors formulate related to the research or thesis that will be prepared by the author as follows:
1. Is there any influence from teacher role to learning result of student of class XI IPA SMA PGRI 109 Tangerang?
2. Is there any influence of the independent learning method to the students' learning outcomes of grade XI IPA SMA PGRI 109 Tangerang?
3. Is there any influence of students' activeness toward learning outcomes of English grade students XI IPA SMA PGRI 109 Tangerang
4. What is the factor of teacher's role, independent learning method, and student activeness simultaneously toward English student learning result of grade XI IPA SMA PGRI 109 Tangerang?

1.2 Learning outcomes

Learning process culminates in student learning outcomes or student performance. As a result then with the performance, the learning process stopped temporarily. And there was an assessment. With the assessment in question is the determination until something is considered valuable, qualified, or valuable. The size of something of value, worth, or quality comes from others. Teachers are key learners. Teachers design learning, implement learning and assess learning outcomes.

To be called learning, then the change must be relatively steady, must be the end of a long period of time. How long that time period lasts is difficult to determine with certainty, but that change should be the end of a month or years. This means that we must exclude behavioral changes caused by motivation, fatigue, adaptation, sharpness of attention or sensitivity, usually only temporarily. Behavior that changes due to learning concerning various aspects of personality, both physical and psychological, such as changes in understanding, solving a problem / thinking, skills, skills, habits, or attitudes.

1.3 Independent Learning Method

The paradigm shift in the learning process that was centered on the teacher becomes student-centered learning (Student Centered Learning) is expected to encourage students to be actively involved in the learning process. In the SCL process, students have the opportunity and facilities to learn independently, and ultimately can improve the quality of students. Innovative learning with the method of Student Centered Learning has a diversity of learning models that require the active participation of students.

1.4 Student activity

Active students are students who are intellectually and emotionally involved in learning activities. According to Amir (2009), active students are students who are involved continuously both physically and mentally in learning [1]. According Balcikanli (2010), Active students are students who are physically, psychologically, intellectually and emotionally involved continuously in the learning process [2]. According to Benson (2001), the four conclusions can be concluded that the active students are the students who are involved continuously both physically, psychologically, intellectually and emotionally that form the process of compiling the subject matter received [3].

The activity of the students in the learning process is not only the involvement in physical form such as sitting around, doing things, but also in the form of process of analysis, analogy, comparing, appreciation, all of which are students' involvement in psychic and emotion [4].

1.5 Research Hypothesis

1. Allegedly there is influence of teacher role to learning result of student of class XI IPA SMA PGRI 109 Tangerang.
2. Allegedly there is influence of independent learning method to English student learning outcomes class XI IPA SMA PGRI 109 Tangerang.
3. Allegedly there is influence of student activeness to learning result of student of class XI IPA SMA PGRI 109 Tangerang.
4. Allegedly there is influence of teacher role, independent learning method and student activeness simultaneously to result of learning English student of class XI IPA SMA PGRI 109 Tangerang.

2 Methodology

The population in this study includes class XI in SMA PGRI 109 Tangerang. Based on the existing population then determined a number of research samples. Determination of the number of samples is calculated by the Slovin formula [7].

3 Result And Discussion

Validity Test Results Criteria used in this study is to compare the value of r arithmetic and r table. If r arithmetic> r table then an item can be considered valid. R value table can be obtained by df (degree of freedom) = n - k, where n is the number or samples, and k is the number of grains statement. The level of significance or Alpha (α) used is 0.05. All the variables in this study have passed the validity test.

Reliability Test Results

In each study, there are often considerable measurement errors. One method of calculating reliability is the method developed by Cronbach, the Alpha Cronbach coefficient (α). In this study the coefficient is obtained from data processing using SPSS version 21.0. According to

Kaplan and Saccuzzo (2008) reliability coefficients of> 0.7. An instrument is said to be reliable if the respondent's answer to the research instrument is consistent or stable.

Normality test

Inferential statistical analysis (good regression/correlation model) must meet several requirements, in addition to data must be interval scale, also requires data to be normally distributed [5],[6]. For that the data need to be tested normality.

Multicollinearity Test and Heteroscedasticity Test aims to test in the regression model there is a residual variance inequality from one observation to another. The result of all test as bellow:

Table 1. Result test.

Variabel	Hipotesa	Koefisien	T hitung (Parsial)	T hitung (simultan)	F hitung	R2	Adjusted R Square	Conclusion
Teacher's role (X1)	$Ho : \beta1 = 0$ $H1 : \beta1 \neq 0$	0,326	15,522	3,071		0,732	0,729	Ho : refused H1 : accepted
Autonomous Learning Method (X2)	$Ho : \beta1 = 0$ $H1 : \beta1 \neq 0$	0,276	14,807	2,855		0,714	0,710	Ho : refused H1 : accepted
Student's Active (X3)	$Ho : \beta1 = 0$ $H1 : \beta1 \neq 0$	0,328	14,674	3,665	118,7 15	0,710	0,707	Ho : refused H1 : accepted
Teacher's role (X1), Autonomous learning method (X2), Student's Active (X3)	$Ho : \beta1,2,3 = 0$ $H1 : \beta1,2,3 \neq 0$					0,805	0,799	Ho : refused H1 : accepted

3.1 Discussion The first hypothesis

To test the first hypothesis stating that there is influence of teacher role to learning result of student of class XI IPA SMA PGRI 109 Tangerang is done partial regression test between technological variables with learning result variable which produce calculation where coefficient determination 0,732 and value t count equal to 15,522 at significant level 1% greater than ttable value so Ho is rejected and H1 accepted.

From the analysis of aggression, it was found that teacher role variables have positive and significant influence on the learning result of the students grade XI IPA SMA PGRI 109 Tangerang. This can be shown from the magnitude of regression coefficient marked positive is 0.326. This means that if the role of teachers improved, it will result in increased student learning English results with the assumption of other factors are constant.

3.2 Discussion The second hypothesis

To test the second hypothesis stating that there is a positive influence of independent learning methods on the results of students' learning grade XI IPA SMA PGRI 109 Tangerang conducted partial regression test between independent learning method variables with learning result variable that produces calculations where the coefficient of determination 0.714 and the t count

of 14,807 At a significant level of 1% greater than the t table value thus Ho rejected and H1 accepted.

From the analysis of aggression, it was found that the variable of independent self-learning method had positive and significant influence on the learning result of the students' grade XI IPA SMA PGRI 109 Tangerang. This can be shown from the magnitude of regression coefficient marked positive is 0.276. This means that if the positive self-learning method is improved, it will result in increased student learning English results with the assumption of other factors are constant.

3.3 Discussion The third hypothesis

To test the third hypothesis stating that there is a positive student activity influence on the result of learning English class XI IPA SMA PGRI 109 Tangerang done partial regression test between environmental variables with learning result variable that produces calculation where the coefficient of determination 0, 710 and the value of t count 14.674 at a significant level of 1% greater than the t table value thus Ho rejected and H1 accepted.

From the analysis of aggression, it was found that the positive student activeness variable had a positive and significant influence on the students' learning outcomes of grade XI IPA SMA PGRI 109 Tangerang. This can be shown from the magnitude of regression coefficient marked positive is 0.328. This means that if the activity of positive students is improved, it will result in increased student learning outcomes with the assumption of other factors are constant.

3.4 Discussion Fourth hypothesis

From F test known that simultaneously teacher role variable, independent learning method and student activeness influence student english learning result. This means that if the role of teachers, independent learning methods and student activeness is improved simultaneously then significantly will be able to improve students' learning outcomes grade XI IPA SMA PGRI 109 Tangerang.

Furthermore, the extent to which the influence of the role of teachers, independent learning methods and student activeness affect student learning English results can be known from the adjusted R square (R2) of 0.799. This figure shows approximately that 79.90% students learning English grade XI IPA SMA PGRI 109 Tangerang can be explained by teacher role variables, independent learning methods and student activeness. While 20.1% is influenced by other factors.

Thus the final discussion of the results of this study where the first hypothesis to the fourth that states that there is influence of the role of teachers, independent learning methods and student activeness of English students learning outcomes class XI IPA SMA PGRI 109 Tangerang, both partially and simultaneously been tested.

4 Conclusions

Based on the results of analysis and research and hypothesis testing can be taken as follows:
• Descriptive analysis results show that the role of teachers give a significant effect on the results of learning English grade students XI IPA SMA PGRI 109 Tangerang of 73.2%.

- Descriptive analysis results show that the independent learning method gives a significant effect on the learning outcomes of students in grade XI IPA SMA PGRI 109 Tangerang of 71.4%.
- Descriptive analysis results show that students 'activity influences the students' learning outcomes of grade XI IPA SMA PGRI 109 Tangerang of 71.0%.
- The results of the whole analysis show that simultaneously the three independent variables are the role of teachers, independent learning methods and student activeness to give effect to the learning outcomes of students in grade XI IPA SMA PGRI 109 Tangerang for 79.9%. The remaining 20.1% is caused by other variables not involved in this research.

4.1 Suggestion

With the influence of the role of teachers, independent learning methods and student activeness of Learning Outcomes inggrius language, then some suggestions that can be given include:

- For students need improvement and positive use for the role of teachers because appropriate teacher role can improve learning outcomes. Students should strive to adjust and know the appropriate role of teachers in the classroom while learning takes place.
- The importance of self-learning methods for the implementation of teaching and learning process in this case is of course on the supervision of teachers, because we know that science is not only obtained from books alone, but through the role of teachers and independent learning methods are interesting, children will be more enthusiasm to learn.
- The importance of providing a child's direction to do the best, always giving more support and attention to the child. And provide opportunities / involving students activeness in determining the learning that will take place in the class. Because this can stimulate and stimulate children always think clearly and positively.
- Need for cooperation between teachers, parents and community, in order to create a comfortable atmosphere for learning children. Because the learning process does not only happen at school, but in the environment where the child is located. Therefore we must work together to create a conducive, positive atmosphere.

4.2 Recommendation

Based on the results of the above research then some related recommendations that can the authors convey in this study are:

- Given the role of teachers influence the students' English learning outcomes, then the role of teachers in the field of education is maintained and applied as a source to increase knowledge.
- Given the independent learning method influences the student's learning outcomes, let us as a member of education direct the children and guide them so that the child always has a positive thinking, perspective on something and we direct and give examples in the application. So automatically the child will behave well in the act and bertuturkata.
- Given the activity of students influence the student learning outcomes, it is necessary cooperation between parents, teachers and the community to always involve students in determining decisions in the learning process so that students will feel themselves needed and important, stimulate them to be interested in learning.

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Development of Roaster Control System Based on Arduino

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Abstract. This research develops roaster control system using Arduino as central to processing data that provides a reference for machine operations. Development of this system as an alternative to use of thermostat as a conventional contactor at roaster that is less detailed, easily damaged, less sensitive and effect to productivity. The research was conducted by the design and implementation method that is by choosing and connecting the appropriate sensor components to Arduino, making algorithm protocol, making programming, doing the installation to roaster machine and test the system. This system works when the thermocouple read and transmits temperature data for processed and used as a reference to execute the machine. Arduino as the central processing for all data input and output. Testing carried out on small-sized roaster after being modified using Arduino control systems. The test results show that under conditions of no load, the control system requires 38 minutes operate until the temperature reaches 450° Celsius, whereas when given HS coffee, the system requires ± 1-hour with 10-minutes delay until the color of coffee is black and ready for the milling process. Control system of roaster machine with Arduino produces the better black color of coffee, more fragrant and better quality.

Keywords: control system, roaster, Arduino, thermocouple.

1 Introduction

The roaster is one of the appropriate technologies that are used as roasters various types of grains with the frying technique without oil. The grains may include nuts, coffee, corn and soybeans. The roasted method provides several advantages, namely affecting the quality, price and quality of the fried grains [1], helps preservation, provides a distinctive taste of processed products and optimize the treatment process [2],[3].

There are a variety of grainsroasting machines according to user needs. There isroasterfor2 kg, 5 kg, 10 kg, even>50 kg which has been equipped with a thermostat temperature sensor for ON-OFF effect on the switch. The thermostat is a device that can disconnect and reconnect electrical current at the time of detecting changes in temperature. Thermostat divided into two types, there are Mechanical and Electronics. Mechanical

Thermostat is a Contact Temperature Sensor, which uses the principle of Electro-Mechanical, while Electronic thermostat using an electronic component to detect temperature changes [4]. Some of the roastershaveimplemented the temperature control system using fuzzy logic concept for reducing the frying time from 1.5-3 hours to ± 35 minutes and use solar reflector concept [1],[3],[5],[6],[7].

Because the thermostat is easily available in the market at a low cost and utilized in roasting machines, it affects the quality of the grain fried processing result, because the thermostat as a conventional contactor works based on the temperature sensor in the roasting tube. The poor sensor quality also provides a less stable of value reading to the thermostat so the contactor also works inaccurately. In addition, the conventional of the thermostat causes the mechanical contactor to be more easily damaged, lead to energy waste and affect the production [8].

In line with the development of electronics technology, starting from the application of analogelectronics, digital and a microprocessor, almost all instrumentation system control uses a microprocessor/microcontroller in their implementation, such as DC/AC motors, liquid level control system and measurements instrumentation of temperature, pH and conductivity. The use of microcontrollers, which are mostly due to the advantages of the electronic components that already have internal memory, the I/O unit, processing bits and bytes and has a command/program is directly related to the I/O. The microcontroller which used in control system applications that are found on ATmega 328 in Arduino.

Arduino is a control board based on ATmega328 microcontroller that has 14 I/O digital pins (6 pins as PWM outputs), 6 analog inputs pins, 16 MHz crystal oscillator with USB connection type to thecomputer. Arduino compatible with electronic/other components sensors through the I/O pins and can be combined to control the behavior/properties of a machine/tool/equipment or natural phenomena that occur around humans, either real-time or delayed. Some applications of Arduino, including for the development of early warning system for earthquakes, combined with the vibrating sensor [9],[10], the indicator of the care and maintenance of the machine [11], the floodgates on farmland in combination with sensors and other applications that are appropriate and practical in people lives [12].

Based on several weaknesses of thermostat utilization above and the development of microprocessor technology, it is necessary to develop another control system in roaster machines which with ATmega 328 microcontrollerin Arduino.

This research has developed a control system of roaster by utilizing Arduino as a central processing and thermocouple as a temperature sensor. This control system also utilizes an LCD display to show the roasting process, buzzer foralarm and a motor driver to controlling the electric motors that move of theroaster.

2 Method

Roaster control system based on Arduino developed by design and implementation method This method is chosen because the corresponding of sensor components are available on the market (including Arduino) andanaverageofcomponents are compatible with Arduino as central processing. The selection of component adjusted to the needs of the voltage and data corresponding to the Arduino. While the adjustment, cooperation and process of data transfer between components is determined by the programming structure created and uploaded to Arduino

The design method is done by 3 stages, namely component selection and interconnects to Arduino, making of protocol algorithm system, making program structure based onanalgorithm, insertingaprogram into Arduino and interconnect system control to roaster machine. While the implementationmethod is done by providing a voltage source to the control system created, run the system to control the frying process simulation and taking the test data to be processed.

The Design of roaster control system is given in Figure 1 as follows:
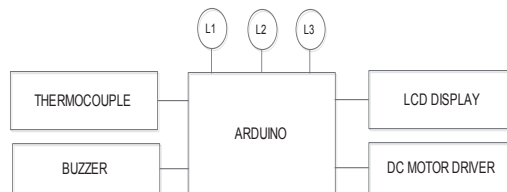
Fig. 1. Design of roaster controlsystems.

Control Systems in Figure 1, consists of a thermocouple, buzzer, LED, LCD displays, motor driver and Arduino asthecentral processing of data. A thermocouple attached to the wall of the tube roaster to read the temperature. Relay as a switch to turn on and off the heating source. Temperature data fromthe thermocoupleis a parameter by Arduino to give the order to turn on and off the relay as the main breaker switch at roaster. Buzzer as the alarm when thermocouple reading the certain temperature value. Led is additional indicator along buzzer that would abuse according to user needs. There are 3 LED used is the L1, L2 and L3 with different roles. Other components used in the control system is that LCD display to show the temperature value. Protocol software from roaster control system designed to work in three phases, namely standby, running and stop. Standby is the phase when the roaster starts the engine bychangesthemain switch to ON position. When the main switch is ON, the control system will perform the initialization of all components connected tothemicrocontroller ports, which then continued by reading the initial temperature of thetube at 0° Celsiuspositions. LCD display at this stage, show the status of preparedness and start reading the temperature from thetube. The algorithmof thecontrol system shown in Figure 2.
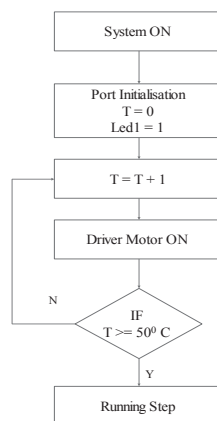
Fig. 2. Algorithm of thecontrolsystem on standby phase.

The control system algorithm in Figure 2 will begin toread theportsinitializing that connected each other when the main switch isturned ON, LED1 will be ON and the LCD displays a certain status that can be seen by theuser. Temperature tube that legible ranging from zero degrees (0° Celsius) in stages according to theheat of the roaster tube and sent by thermocouple to Arduino. The motor driver receives a command to drive an electric motor that connected from the I/O port driver. If the temperature reads50° Celsius valuable, then the tube roaster ready to put the material (grains) and the system switches to the runningphase as the next process. The running phase is given in Figure 3.

```
        ┌─────────────────┐
        │   Led1 = 0      │◄──────────┐
        │   Led2 = 1      │           │
        │   LCD = Process │           │
        └────────┬────────┘           │
                 │                     │
        ┌────────▼────────┐           │
        │    T = T + 1    │           │
        └────────┬────────┘           │
                 │                     │
        ┌────────▼────────┐           │
        │  Driver motor ON│           │
        └────────┬────────┘           │
                 │                     │
            ◇────▼────◇   N            │
           ╱   IF      ╲───────────────┘
           ╲ T == 450⁰ C╱
            ◇────┬────◇
                 │ Y
        ┌────────▼────────┐
        │   Finish Step   │
        └─────────────────┘
```
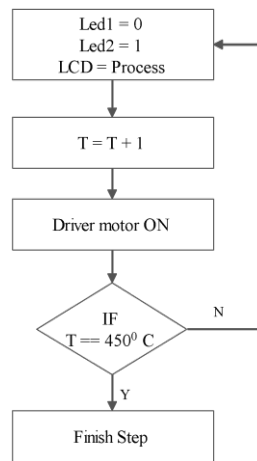
Fig. 3. Algorithm of control systems on running phase.

The frying process(running phase)in Figure 3, will be work when the tube temperature reaches ± 50° Celsius and LED2 is ON. Material that inserted into the tube will experience a stirring roaster according to roaster round tube. Round power supplied by the motor driver depending on motor rotation speed [13], as shownmathematically follows equation (1).

$$N = \frac{V_{to} - I_a.R_a}{K.\emptyset} \tag{1}$$

Equation (1) consist of N is the speed of DC motor rotation, V_{tm} = Voltage Terminal, I_a and R_a are currents and obstacles anchor, K is a constant of the motor, and $\emptyset$ is the magnetic flux. Implementation of N on the roaster control system is set up in L298N double H bridge motor driver chip, which works at 5-35 volts voltage and operates at 2 Ampere maximum current. With regulator combination of 7805 and other electronics components, the motor driver module is compatible with Arduino thus setting the rotation motor load connected through L298N drivers can be made through the C programming language on Arduino.

If the temperature of the tube has shown of 450° Celsius, thefried material has matured and the system will move to finish phase. At this phase, the main switch of roaster will be OFF, the flow of current is also OFF and roaster stopped working.

3   Results And Discussion

Interconnection port of Max6675 thermocouple with Arduino using 5 I/O pins as seen in Figure 4 as follows:

Max6675 Thermocouple	Arduino
Vcc	5 Volt
Gnd	Gnd
SO	pin 4
LCK	pin 5
CS	pin 6
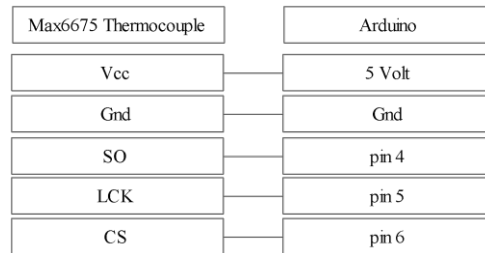
Fig. 4. Interconnection max6675 thermocouple module with arduino.

In Figure 4, the voltage source of max6675 thermocouple utilizes 5V voltage from 5-volt pinArduino. SOpin is connected to pin 4 at Arduino,LCK pinconnected to pin 5 Arduino and CS pin is connected to the pin 6 Arduino.Relay serves as a switch to turn ON and OFF a heat source that connected to roaster tube. Temperature data received from max6675 thermocouple becometheparameters to change the relayto ON/OFF.Relay module used in this system is a 2-channel relay to activate the heating source. Buzzer apply twice sound as an indicator of alarm signal, that is when the tube temperature had reached 50° Celsius indicating that the tube roaster ready for charging material and when the temperature had reached 450° Celsius with a 10 minutes delay as an indicator that the frying process has been completed,

LED apply as an indicator additional along thebuzzer.When the temperature reaches 50° Celsius, LED1 will be ON that means that the material is readily inserted into the tube. When the temperature greater than 50° Celsius, indicator LED2 ON that means that the roasting process has occurred with a load of material already inside the tube roaster. Then, when the temperature has reaches 450° Celsius with 10 minutes delay, then frying process has been completed, LED3 ON, LED1 and LED2 will be OFF. A0 pin from Arduino connected to LED1anodepin, A1 pin connected to LED2 anodepin, A2pin connected to LED3 anodepinand output GND of Arduino connected to cathodepin of LED1, LED2 and LED3.

The function of LCD is to display the temperature values that read by thethermocouple. Interconnectionof LCD with Arduinois given in Figure 5 below.

LCD Display	Arduino
6	11
11	2
12	3
13	8
14	9
2, 15	5 volt
1, 16	GND
3	Potensiometer
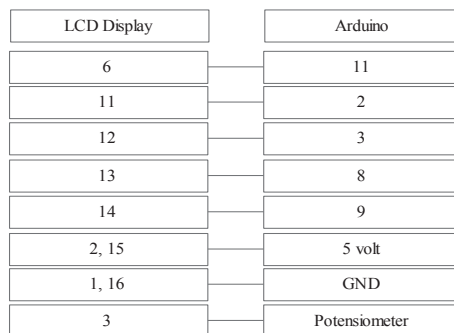
Fig. 5. Interconnection lcd display module and arduino.

At interconnections like as Figure 5, includes GND pin Arduino connected to pin 1 LCD, 5V pin Arduino connected to pin 2 LCD, 3 pin of LCD connected to the input pin of potentiometer, the positive pin of potentiometer connected to the 5V pin of Arduino, negative pin potentiometer connected to the output GND Arduino, Pin 11 of Arduino connected to pin 6 LCD, pin 2 of Arduino connected to pin 11 on LCD, pin 3 connected to pin 12 LCD, pin 8 connected to pin 13 LCD, pin 9 connected to pin 14 LCD, pin 5V Arduino is connected to pin 15 LCD, GND pin Arduino is connected to pin 16 LCD.

Based on the pattern of interconnection, then the roaster control system developed by Arduinois given in Figure 6.
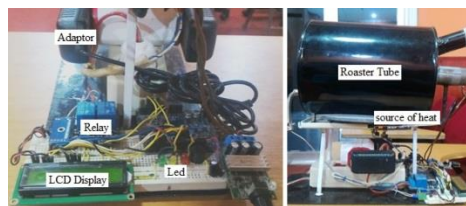
Fig. 6. Result of roasted machine control system.

There are 2 displays in Figure 6, each front view and a side view. From the front, look Arduino microcontrollers with other sensor components that have been integrated into the control system, complete withapower source, while from the side, seen aroasted tube with elements as a source of heat.The next process is making programming system and inserted into ATMega328 microcontroller on Arduino by using theUSB cable.

Programming process on roastercontrol system is built using the C programming language in Arduino version based on logic algorithms have been designed. The reading process of 50° Celsius and 450° Celsius in C programming, as given in the script below.

```
temp_c float;
temp_c = thermocouple.measure (TEMPC);
if (temp_c<= 50)
{  digitalWrite(Led1, LOW);
digitalWrite(Led2, HIGH);
digitalWrite(Led3, HIGH);
 }
```

At temperatures is smaller than 50° Celsius, the system will activate led1 (ON) as a sign that the system has worked, there are heating and the tubes are rotated. But when the temperature exceeds 50° Celsius, led1 will be OFF, led2 will be ON that indicates that the tube has been sufficiently hot and ready to accept the grains (coffee).

```
if (temp_c> = 50)
{digitalWrite (LED1, LOW);
    digitalWrite (LED2, HIGH);
    digitalWrite (LED3, LOW);
digitalWrite (Buzzer, HIGH);
 }
```

The frying process will continue until the tube temperature reaches 450° Celsius. In such conditions, the system will activate led3 and give 10 minutes delay to shut down the

system.When led3 ON, led1 and led2 will be OFF, buzzer also gives a sign that the roasting process has been completed.

```
if (temp_c> = 450)
{digitalWrite (LED1, LOW);
digitalWrite (LED2, LOW);
digitalWrite (LED3, HIGH);
BUZZER ();
delay (100000);
digitalWrite (element, LOW);
 }
```

The test of thecontrol system is done in 2 stages. The first stage is activated without grains, while the second stage, by using the grains (the tube filled with coffee)

Performance testing of roaster control system with a Max6675 thermocouple as temperature sensor placed on the roaster tube without grains gets the results as Table 1.

Table 1. Results of temperature testing from thermocouple without grains.

Time required	Temperature
0 seconds	0° Celsius
33 seconds	30° Celsius
1 minute 46 seconds	40° Celsius
2 minutes 32 seconds	50° Celsius
6 minutes 20 seconds	70° Celsius
9 minutes 31 seconds	100° Celsius
15 minutes 10 seconds	140° Celsius
17 minutes 00 seconds	180° Celsius
20 minutes 06 seconds	210° Celsius
23 minutes 45 seconds	260° Celsius
26 minutes 14 seconds	330° Celsius
30 minutes 10 seconds	370° Celsius
33 minutes 07 seconds	400° Celsius
38 minutes 09 seconds	450° Celsius

Table 1 shows the changes in temperature that occur during the heating processwithoutgrains. Temperature changes occur in accordance with the increase in tube heating time. When it starts to heat up the tube, the temperature beginning at 0° Celsius and requires 38 minutes 09 seconds to reach 450° Celsius. When the system is ON, the relay activates heat source and OFF at temperature of 450° Celsiuswith 10 minutes delay. Test results in Table 1 show that in no-load conditions (no grains), the system control reads the change of roasting machine temperature less than 40 minutes until reaches the 450° Celsius. In this test, the rotation of the tube and ignition are considered fixed (unchanged). The control system works well and stables in accordance with the protocols programming created.

Table 2 shows the condition of thealarm system whenrelay turns to ON and OFF. When the system is ON, the relay activates heat source and give effect to LEDs and buzzer. This situation continues after reaching 450° Celsius with 10 minutes delay.

Table 2. Testing alarm system when relay changes.

Temp (celsius)	Led1	Led2	Led3	Buzzer	Conclusion
0°	on	off	off	off	match
40°	on	off	off	off	match
50°	off	on	off	off	match
80°	off	on	off	off	match
100°	off	on	off	off	match
160°	off	on	off	off	match
200°	off	on	off	off	match
240°	off	on	off	off	match
300°	off	on	off	off	match
320°	off	on	off	off	match
370°	off	on	off	off	match
400°	off	on	off	off	match
450°	off	off	off	on	match

For testing with grains, LED1 is ON when the system is ON as designed. Led1 will off and led2 ON when the temperature reaches 50°Celsius.The heating process continues until the temperature reaches 450°Celsius marked by led3 and buzzer ON.The test results in Table 2 show that the control system has worked in accordance with the designed of protocol algorithm in the Arduino. The activity of indicators (led and buzzer) gives a signal to the user that the control system starts to work when Led1 ON until the temperature of the tube roasting machine reaches 49° Celsius. The status of the roasting machine tube is ready to receive the grains when the temperature reaches 50° Celsius and the frying process ends when the temperature reads 450° Celsius.

The next test is to run a system to control the frying coffee process. The grains coffee used in thetestis 1 kg in the form of dried HS coffee. The machine is restarted and the system control works. When given the grains (coffee), the roasting process becomes longer than the no-grains. Increased roasting time due to the load contained in the tube permeates the temperature change of the tube. It took about 10 minutes for a temperature change from 50°Celsius to 140°Celsius. Overall the test results of roaster control system when the roaster is workingare given in Table 3.

Table 3. Result of control system roaster when roaster is working withgrains.

Time	Temp (Celsius)	Specification
0 m	0°	Initial Condition
2.30 m	50°	Before coffee included
3 m – 7 m	41°.	After coffee included
20m -34 m	140° - 200°	Status third
37. 25 m	250°- 300°	Starting delay of
45.07 m	350°- 400°	
58.34 m	420°	Ripe coffee beans
+ 10 m	450°	System off

Table 3 shows the results of tests performed by the system when frying the coffee beans as a sample. When the system is ON, Arduino will be instructed to rotate the tube through DC motor connected. The heat source will be activated and heats the tube that characterized by

indicator LED1 active. When the temperature tube reached50° Celsius, indicator LED2 will be active, LED1 will be OFF and the roaster is ready to receive coffee grains asasample. For a few times, the temperature decreases to 41° Celsiusbecause of the heat absorption to the coffee. The heat absorption process takes about 6 - 10 minutes before back to normal. After coffee fried to 90° C, then LED2 will be ON and when the temperature had reached 450° Celsius, the system will give a delay for about 10 minutes before the overall system OFF.Total testing time of 1-kg HS coffee processing to temperature reaches 450 ° Celsius is ± 1 hour.

From the test results in Table 3 illustrates that when frying the HS coffee, the control system works normally to change the coffee beans from brown to black based on the temperature changes that occur in the tube. Although the time required to reach the final temperature (450° Celsius) becomes longer, with steady motor rotation and fire provides a better maturity level of coffee. The black color of coffee is more evenly distributed and the aroma is stronger when compared to the same test using a thermostat roasting machine. The temperature readings are always stable, different than conventional contactor systems. Comparison of coffee processing using microcontrollerroasted with thermostat roasted is shown in Figure 7.

(a) microcontrollerroasted   (b) thermostatroasted

Fig. 7. Processed coffee from microcontroller and thermostatroaster.

From Figure 7 there are 2 copies of HS fried with a roaster machine. The coffee in part (a) is fried with a roasting machine based onamicrocontroller, while part (b) is fried using a roasting machine based onathermostat. The amount of coffee is 1 kg of dried HS coffee. The results show that at approximately the same time, with the same engine and fire, coffee (a) produces coffee in a more black and evenly distributed color than coffee (b). In addition, the aroma generated from the two coffee products is also different where coffee (a) is more fragrant than coffee (b).

4   Conclusions

The roaster control system can be developed using Arduino as a central processing withamax6675 thermocouple as a temperature sensor. Activator tube roaster utilizing L298N double H Bridge as a motor driver who works at 2 amperesmaximum current. In the no-load condition, the control system requires ± 38 minutes ofoperation until it reaches 450°Celsius. Meanwhile, in the load condition, the system requires ± 60 minutes with a 10-minute delay to reach the coffee ready to be processed at the milling stage.The control system on the roasting machine works when the engine starts, receives the voltage from thevoltage source and activatethe heat source. The thermocouple sensor placed inside the roasting tube will start reading the temperature and send the data in voltage form to the microcontroller to be

processed and displayed to the LCD display as information totheuser. Compare between the microcontroller roaster with thermostat roaster is the microcontroller system has advantages in data resistant, readings and data processing more detail because it uses programming, easier to repair when the disturbance, more easily developed from the hardware and software, the color and aroma of after roasting is better.

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Isolating Deoxyribo Nucleid Acid (DNA) as The Basic for Inquiry Learning to Improve Science Process Skill (SPS)

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Abstract. This study aims to determine the ability of students in inquiry learning to improve students' scientific process skills. This research involves 7th semester students of a university in Bandung who took biotechnology course with concentration on DNA isolation in 2016. The research method used in this research is experimental with observation sheets, questionnaires, and tests were used as data collection instruments. From both the control class and the experimental class, significant difference of in terms of students' scientific skills are identified.The observation sheet shows the difference of the student's knowledge level which has the average value of 31,97%, the result of student questionnaire is 18, 65%, and result. Aspects of the process of scientific processes that assess the ability to make observations, application of concepts, experimental design, interpretation, prediction, questioning, formulation of hypotheses, experiments, use of tools, application of concepts and communicate with some students who still have trouble laboratory practicum. Further research should be developed and conducted on students from different study programs.

Keywords: Inquiry, science process skills, DNA isolation.

1   Introduction

Since the 21st century begins science has undergone many developments including the field of biological sciences. The focus of biological studies has changed significantly, not only limited to the level of organisms or cells, but deeper to the focus of the present study already includes at the molecular level or so-called molecular biology [1]. The study of molecular biology developed also quite rapidly beginning with the discovery of the chemical structure of DNA by Watson and Crick. Product development of molecular biology is the basis for the development of modern biology [2].

One study of molecular biology the genetically engineered matter is DNA isolation. DNA isolation is an important stage in molecular-based activity. According to (Ranjan, Kishore, Jadon, Bhatt, & Gupta, 2010), it appears that the content may inhibit various processes from cutting DNA, amplification, to cloning [3]. Good-quality DNA is useful for further use such as the use of molecular markers, the creation of genomic libraries, and DNA sequencing.

Teaching and learning process has long put its emphasis on teachers rather than students. It may also seem to be true in biology as (Rustaman, 2005) suggested; in that the knowledge gained by students has been delivered in various ways so that people are more fixated on science products than on the scientific process and attitude involved in the development of the product [4]. Such paradigm may create further problems as many subjects in biology require students to emphasize more on the process rather than the end product. One of the subjects in which such emphasis is essential is DNA isolation.

The study of genetic engineering related to the concept of DNA isolation should use some learning methods in the delivery of material to the students because the complexity of genetic engineering learning is in line with 21st-century learning when viewed from technological advances and guiding vision. The teaching methods presented to support learning are supported by the statement of the National Science Foundation (1995) in journal (Hariyadi, 2015) that warn against the enormous challenges to biological science as it enters the 21st century to understand the biological system in all its complexities while preserving and utilizing sustainable biological systems [2].

In fact, genetics learning processes or genetic are particularly passive in nature and most students give little or even questions [5]. The learning process tends to be one-way, because all the genetic engineering material delivered by lecturers is more accepted by the students without knowing the student understands the material or not.

The concept of DNA isolation, however, is a concept that is relatively difficult to teach if it is only delivered through conventional teaching and learning methods, which generally put more emphasis on the end products rather than on scientific process and attitude. In fact, the knowledge and skills acquired by students are expected not to be the result of remembering a set of facts but a process of self-discovery.

One learning method which might be appropriate to encourage self-process discovery is inquiry. Inquiry is one of the learning processes that sets the role of students in a lesson as a priority by enabling them to ask questions, find information and conduct an investigation. It enables students to develop their intellectual abilities associated with reflective thinking processes.

In an attempt to shift teaching and learning paradigm from product-oriented to process-oriented, this study attempts to investigate the effectiveness of inquiry in developing students' mastery of scientific process and the development of scientific attitude within students through DNA isolation

Based on the complaints and facts that occur in the teaching process, the lecturers have more difficulty in conducting a comprehensive evaluation, especially in assessing the process skills that students get immersed in the process of learning genetic engineering, the lecturer decided to start learning genetic engineering by using a practicum conducted on sub-concepts DNA isolation. The practice is expected to assess students' science process skills in understanding the general engineering concept as well as the concept of DNA isolation in particular through basic inquiry learning to assess the skills of the individual science process as a whole.

2 Research Methodology

This study employed quasi experiment with one case study design in investigating students' learning processes in isolating DNA. It involved 150 prospective teachers—7th semester students registered in biology education program—who were enrolled in the biotechnology course in the 2015-2016 academic year at a teacher training institute (LPTK) in Bandung. They were divided into 4 classes; classes A, B and C as the experimental groups and class D as the control group. Samples were taken randomly from all classes. The learning processes observed included students' observation, concept implementation, experimental design, tool use, and planning experiments.The data is then measured through observation sheets, questionnaires, and interviews, and is supported by test results that are compiled based on several indicators of scientific process skills.

Observation sheets are used when learning the process of practising DNA isolation in a biological laboratory. The observation sheets were used to observe some aspects of the science process skills that students had during the practicum work and to assess the practicum document in the form of the DNA isolation report that has been done. Assessment of the aspects of the process of science is carried out to the four classes of practice, the first class is a control class given the usual practicum learning without the giving of inquiry activities provided by the practicum lecturer, while the other three classes are classes of practicum given by the process of inquiry learning so that it can be known aspects of process skills the science obtained from the four classes.

The following is the description of the process of DNA isolation. The first step in isolating DNA was by combining the fruit as a DNA source to break the cell membrane and the nuclear membrane mechanically. The next step was to filter the fruit mixture and insert the extract into the detergent and salt solution. Salt has the same function as SDS in DNA isolation in the white blood cell genome. This provides an ionic condition for a more stable reaction [6]. The solution was stirred so as not to produce bubbles. It was also to promote larger cell particles and detergent movements for a faster reaction because detergents can break cell membranes.

After that, a solution of fruit extract, detergent and salt were inserted into the test tube, given a drop of cold alcohol to produce a white ring between the mixture and alcohol.

3 Results And Discussion

3.1 Result

The research shows that the application of inquiry learning to develop science process skills can improve aspects of scientific process skills such as observation ability, concept implementation, experimental design, predictions, make some questions, create hypothesis formulations, conduct experiments, find out how to use practicum tools, and apply and communicate a concept.

3.1.1 Result of Observation Sheet

Observation sheets were used when learning the process of practicing DNA isolation in a biological laboratory. The observation sheets were used to observe some aspects of the science

process skills that students carried out during the practicum work and to assess the practicum document in the form of the DNA isolation report that had been done. Assessment of the aspects of the process of science was then carried out to the four classes of practice. The first class is a control class given the usual practicum learning without the giving of inquiry activities provided by the practicum lecturer, while the other three classes are classes of practicum given by the process of inquiry learning so that it can be known aspects of process skills the science obtained from the four classes, then the third class of experiments obtained the average data results calculated per aspect of the science process skills as seen in the chart below.

Science Process Skill Aspect Achievement

Percentage

Science Process Skill Aspect

- Control
- Eksperiment

Description of the Process Aspects of Science Observation

1. Implementing the concept
2. Designing experiment
3. Interpreting
4. Predicting
5. Asking question
6. Formulating hypothesis
7. Playing experiment
8. Using tools
9. Applying concept
10. Communicating

Fig. 1. Graph of Percentage of achievement of science process skill aspect based on result of observation sheet

The chart shows the increase in average achievement of 31.97%. Yet, the scores of control class without inquiry learning is regarded to be relatively low in the scientific process skills. The highest score is the aspect of selection of practicum questions with a value of 59.50% while the lowest score aspects of the science process skill without inquiry learning are the aspect of applying the concept. The experimental group, however, in the learning given inquiry tends to have higher score in the aspects of science process skills (>70%). The highest value of scientific process skill is the inquiring aspect of 80,50% practice question, while the lowest aspect of science process skill is a hypotesis aspect which is 72,40%. The result of control class observation without inquiry learning act has. The highest score of control class without inquiry learning is an aspect of selection of practicum questions with 59.50% value whereas. But in the learning given inquiry itself has a high level of the process has a high (<70%). The highest value associated with that practicum. 80,50%, while aspect. The result of observation in the class that is not determined by the inquiry learning of the low teaching practice still depends on the practicum given by the teacher so that the practicum activity tends to be passive so that the practicum study is in accordance with what has been completed since the beginning without any active activity from all students who do the lab at the beginning the classes given inquiry study have a high value in the field of process knowledge, because in

that class the teacher can form the knowledge already possessed by the student in doing the practicum.

3.1.2 The Result of Science Skills Process Skills

Questionnaires are filled by all four class students based on students' perspective on the attainment of inquiry-based learning. The students' science process skills according to the questionnaire in both the control class and the experimental class showed an increase among the four classes. the average increase in the value of aspects of the science process skills seen from the control class with the experimental class according to the questionnaire obtained is worth 18.65%. Details of increasing aspects of the science process skills can be seen in the graph:

Science Process Skill Aspect Achievement

Description of the Process Aspects of Science Observation

1. Implementing the concept
2. Designing experiment
3. Interpreting
4. Predicting
5. Asking question
6. Formulating hypothesis
7. Playing experiment
8. Using tools
9. Applying concept
10. Communicating
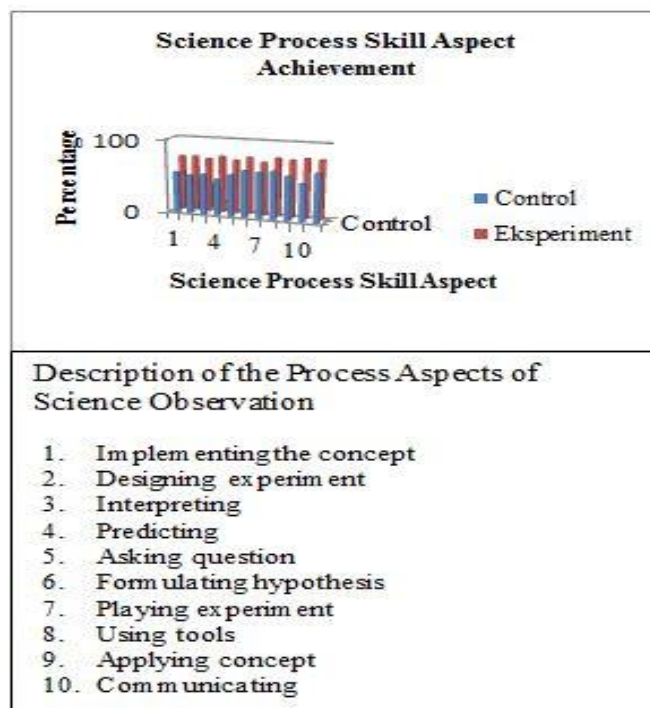
Fig. 2. Graph Percentage of achievement of science process skill aspect based on result of questionnaire

3.1.3 The Result of Science Skills Process Skills

Science process skill test is used only as supporting data to know the improvement of learning outcomes based on inquiry in improving aspects of students' science process skill. This test is done at the end of the lesson. Details of student test results to see aspects of the science process skills can be seen as follows:
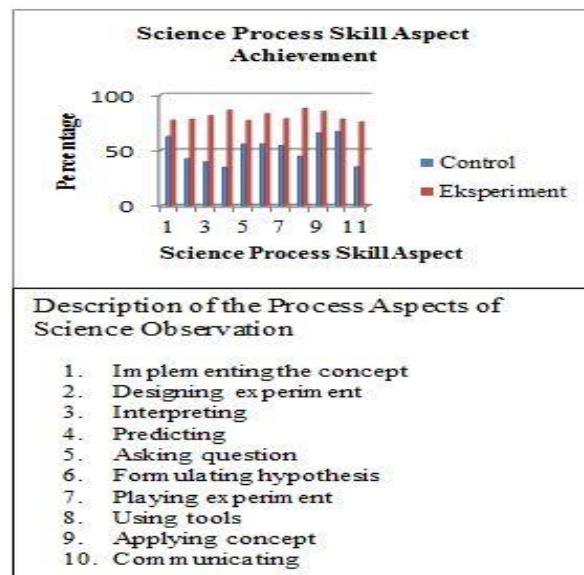
Fig. 3. The percentage of achievement of science process skill aspect based on student test result

From the graph, it can be seen that the average difference of student test between the control class and the average of the experiment class is 29,83%. The highest score of student test results in the control class is in the application aspect of the subject concept whereas the lowest value of aspect obtained in the control class based on the test result is on the interpretation aspect of the data with the detail value of 34.50%. The average value of the three experimental classes has a high enough aspect of the science-process skill, the highest score of science process skill in the experimental class is in the aspect of experimental experiments experiment with value of 87,55%, while the lowest score of skill in the experimental class there is in data communication aspect with percentage value equal to 75,50%, but all aspects of experiment class have high value range that is more than 70% (> 70%).

3.2 Discussion

Improved learning that can be seen in the control class and the three experimental classes is assessed by three instruments that can generally assess the eleven aspects of the science process skills known so far. In the process of control learning which is a conventional learning, learning practicum given by lecturers, as usual, the teacher has prepared all the things needed by students ranging from practicum tools, practicum materials, work procedures

to literature or information that may be required by students to support the lab will be done so that students tend to be passive with the process of proving the results of lab work with literature information obtained. The other three classes of classes A, B, and C which is experimental learning classes are conducted in a different way than the control classes described earlier. The experimental class on learning practicum of DNA isolation is only given the practicum tools, practicum materials, and working procedures that should be given to avoid mistakes in the experiment but this experiment class is not given any literature or learning resources to support the learning of the practicum. At the beginning of the experimental class, experiments have been making questions related to the lab that will be done so that in general experimental classroom learning with inquiry method looks more interesting than the control class. According to the results of the inquiry learning observation sheets can improve students' ability in making essential questions, because according to (Bruce, Marsha, & Emily, 2000) that the inquiry self-based model is a process of training students to investigate and explain unusual phenomena, so some questions will appear before the practicum and it is guided by the student. these questions arise from a phenomenon that exists because inquiry learning is designed in such a way that students directly perform the scientific process through the stages of scientific method and practice in a short time [7],[8]. Inquiry learning is also closely related to the improvement of science process skills Because the inquiry learning model is guided by (Wulaningsih, Prayitno, & Probosari, 2012) able to develop students' science process skills in high academic ability, moderate, low and can involve student activeness in biology learning process [9]. Inquiry study also contains a syntax that is also very suitable if we want to see the students 'science process skills according to (Özdilek & Bulunuz, 2009) inquiry learning can improve students' science process skills because the inquiry learning procedure is done by involving students in the investigation, helping students identify the concept or methods, and encourage students to find ways to solve problems, teachers play a role in problem-solving and guiding problem-solving activities [10],[11]. In addition, the results of the tests also show that inquiry learning can also enhance the conceptual understanding for students, with inquiry methods of increasing the students' cognitive learning achievement can be understood because the guided inquiry learning model focuses on thinking processes that build their own understanding based on experiences they know. The experiences that students get with teacher guidance at the stages: problem formulation, hypotheses, designing experiments, experiments, presentations make conclusions and give them reinforcement and reflection at the end of learning [12].

4 Conclusions

Based on the result of the research, it can be concluded that the application of inquiry method can improve the aspects of science process skill of students in DNA isolation. Eleven aspects of the measured science process skills show significant improvement during the inquiry learning process, whichcan be identified from experimental group's higher score (29.83%)at the end of the practicum lesson compared to the control group.

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The Influence of Fatigue Exposure Behavior of A6063-T6 Aluminum Fatigue Crack Growth Under Mixed Mode

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Abstract. This research aims to know about the crack behavior on aluminum alloy A6063-T6 under mixed mode loading. The speciments made form Compact Tension Shear and by means of loading device, the angle between the load axis and the cracked surface was varied from agelα=900(mode I), α=600 and α=450(mixe mode). Crack testing is performed by initial cracking followed by a constant fatigue load on a particular cycle through the survopulser device.The initial crack behavior and its propagation was monitored by digital microscope. Analysis of the test results gives the crack material toughness, cracking criterian, fracture toughness and fracture surface form A6063-T6 aluminum Alloy. The direction of crack propagation perpendicular to the angleof loading,in mode I the direction of crack propagates in the direction of pre crack fatty and forms ange 00from pre crack direction,in mode II andmixed mode with the height of the mode I component, the direction of each crack forms an angle of 26 0 and 420 from the pre crack direction and a fracture type friction occurs that precedes the open-type crack propagation in mode I. Observations by fractographic analysis use Scanning Electron Microscope shown the fracture surface is fatiguestriation).

Keywords: Aluminium A6061-T6, Mixed Mode, Fracture Toughness, Fatigue Crack Propagation.

1 Introduction

Parts or components of the machine [1] are often found to be failing due to the dynamic load of a voltage repeatedly. Repetitive or fluctuating stress, there will be voltage fluctuations within the components. When the fluctuations occur repeatedly as often as possible, there will be a fatic crack, although the maximum stress that occurs is still smaller than the static tensile strength of the material. Under these conditions, the mechanical properties of the material have changed [2]. Its ability to accept the maximum load will decrease as well and the analysis reveals that the maximum stress is actually still below the final strength of the material. Structural components ASM, Hand book [3] that often experience the conditions as mentioned above are: wall aircraft, ship , gear, shaft, fly wheel, clutch, and so forth.

Masanori Kikuci [4] conducted an experimental and simulated study of crack growth under mixed mode conditions with low cycle fatality in aluminum material A2017 which

results showed that crack growth in low cycle fatigue was the appropriate plastic strain distance was the dominant parameter of crack growth fatigue and hoop stress dominate crack growth in mode I. Testing of dominant fatigue crack growth under condition mode II. It was also found that the direction of crack propagation can not be predicted by conventional methods. Observation of the fracture surface is also found a three-dimensional effect that affects the strength that is its nature.

Research on the expansion behavior of A2024-T351 aluminum crack in mixed mode loading has also been carried out by L W T Say [5] conducted a study on the fatigue crack growth treatment of IN 718 and laser-annealed alloy materials in hydrogen gas which results indicate that: the effect of hydrogen on increasing crack growth. Both laser-annealed and IN 718 assays have significant mixed mode differences in tensile strain and toughness but have a low fat content form in the air. For excess, the highest fatigue crack growth rate (Fatigue Crack Growth Rate) occurs.

W.E.Krupp, D.W. Hoppner, [6] conducted a study of crack propagation in aluminum alloys in corrosive environments on aluminum material A2024-T3; A7075-T6 and 7075-T76 results show that For all of the aluminum mixtures investigated, an increasingly rapid cracking caused by corrosive environments occurs only in the early stages of fracture development. The next stage at high levels, crack speed in the air dry, moist air and in brine tend to be the same. Front-fracture rotation of crack stretching into shear fractures usually occurs after a decrease in corrosive environmental effects at the rate of growth of cracks in thin sheet material G.E. Dieter [7]. Decreased corrosive environmental effects on crack speed are common in thick sections without measurable crack rotation. The aluminum alloy 7075 is much more sensitive to changes in the corrosive and frequency environment than the 2024 aluminum alloy so that the three materials are suitable for aircraft use. Aoki, S., Kishimoto, K., Yoshida, T., Sakata, M., and Richard [8] describes the elastic with the height of the mode II component, the initial crack at frictional fracture occurs near the surface of the fracture at the end of the specimen, and the other crack occurs dimple at its thickness.

Husaini, and Kishimoto [9] describes the fracture behavior in blend mode in PC/ABS Blends under mixed mode loading with CTS specimens in which the price ratio in blend mode with the height of the mode II component, the initial crack at the friction type initially occurs at the crack tip, then the other crack occurs on the open type on its surface as well as on the cracking process of shear type, and spreads until the final failure occurs. Research on the behaviore of expansion of aluminum crack A2024-T351 in mixed mode loading by Husaini, and Kishimoto [10] has also been done, where with small holes in front of the crack tip affect the direction of crack propagation.

2 Literature Review

2.1 Material Cracking

Some types of cracks or Failure materials are; brittle fracture,ductile fracture, and due to fatigue factor crack [11]-[12]. With the presence of a crack mechanical science as applied science has shown that, material toughness, crack size and stress levels are interrelated in order to estimate the susceptibility of various failure structures Calister, Wiliam D, [13]. The above relationship can be shown as figure.1.
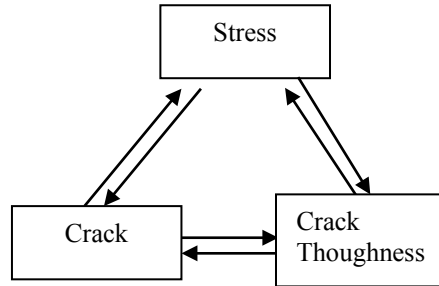
Figure 1: Crack Control Factor

With the calculation its micromecanic in crackcing process toplane, cracking criterian Jastisin limits. KI and KII its material propeties. *Stress Intensity Factor* according to Murakami (1987) to CTS spesimen trate the present with equotion :

$$K_I = F_I \frac{P_{in}}{W\,t} \sqrt{\pi\,a}$$

....(1)

$$K_{II} = F_{II} \frac{P_{in}}{W\,t} \sqrt{\pi\,a}$$

....(2)

Where:
W = width of the speciment
t = thick speciment
a = initial crack length
I and II its for mode I and mode II
F = correctionfactor : 2.85

Equation (1) and (2) can be used to obtain the fracture toughness value which is a test to measure the resistance of a material to the expansion of the crack. The various loading positions for mode I, mode II and mixed mode can be shown in Figure 3.

(Micheal Ashby, 1987) at *steady state condition*, fatigue crack growth ratethe present with:

$$\frac{da}{dN} = A\Delta K^m$$ ....(3)

$$\Delta K = \Delta\,\sigma \sqrt{\pi\,a}$$ ....(4)

$$\Delta K = K_{max} - K_{min}$$

$$K_{max} = \sigma_{max} \sqrt{\pi\,a} \quad K_{min} = \sigma_{min} \sqrt{\pi\,a}$$ ....(5)

For CTS spesiment *steady state condition*, (Agus Suhartono, n.d.) fatigue crack growth rate the present with:

$(\frac{da}{dN})$:

$$\frac{da}{dN} = \frac{\Delta a}{\Delta N} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (5)$$

Stress intensity (ΔK):

$$\Delta K = K_{max} - K_{min} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (6)$$

Murakami (1987)

Stress intensity maximum:

$$K_{max} = F \frac{P_{max}}{W\,t} \sqrt{\pi a} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (7)$$

Stress Intensity Minimum:

$$K_{min} = F \frac{P_{min}}{W\,t} \sqrt{\pi a} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (8)$$

stress ratio):

$$R = \frac{P_{max}}{P_{min}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (9)$$

3   Method and Materials

This research consists of several stages of work as follows:

a) Procurement of necessary materials and equipment, including the tests for tensile test and crack test
b) Make fatigue pre crack to every CTS speciment bevore fatigue test.
c) Setup of fatigue test equipment on servopulser as shown in Figure 1.
d) Preparation of data retrieval.
e) Testing of Static tensile test using ASTM E8 standard to result of real properties of A6063-T6 material.
f) Testing of intensity factor critical stress ststic test to result of critical stress Intensity Factor value of aluminium A6063T-6 using JSME standard CTS speciment to result of critical intensity factor value of aluminium A6063-T6 material.
g) Adjust the angle by using loading deviceas pigure 3 which angles between the load axisand the cracked surface are varied from $\alpha=90^0$ (mode I), $\alpha=60^0$ and $\alpha=45^0$ (mixed mode).
h) Testing of fatigue crack growth Davis HE, [14].
i) Data analysis of test.
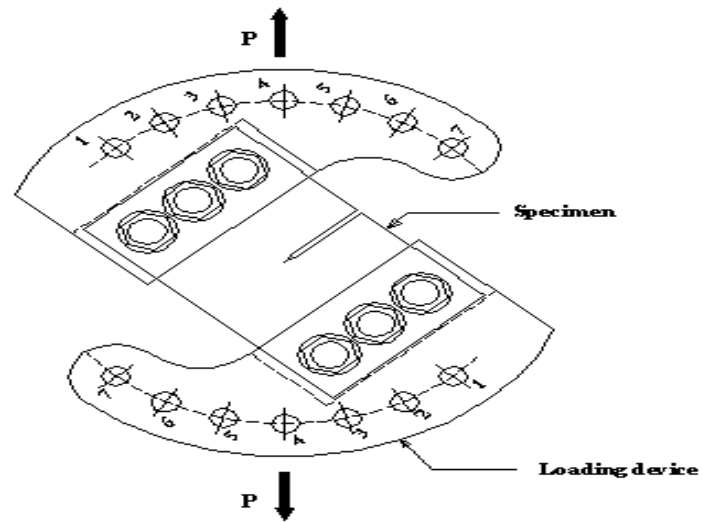
Figure 3. Loading deviceH.A. Richard Benith (1983)
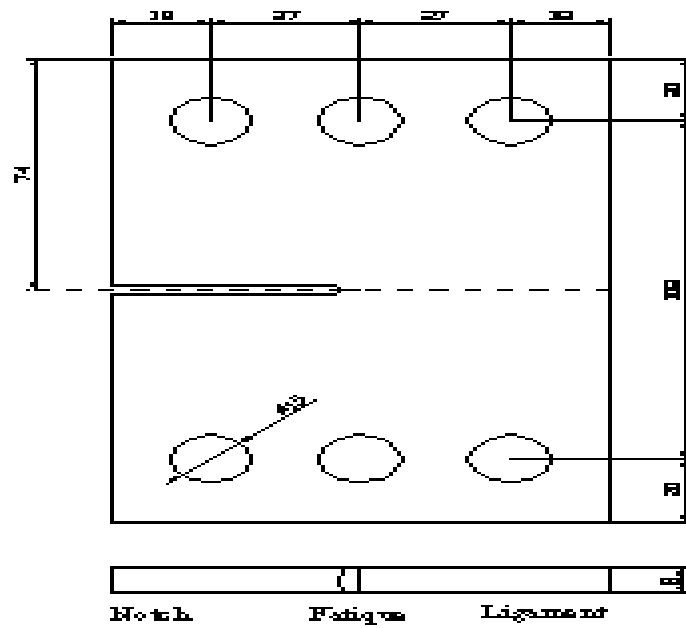
Figure 4. CTS Spesiment ("JSME Standard", n.d.)

4 Results and Discussion

4.1 Result of Tensile Static Test
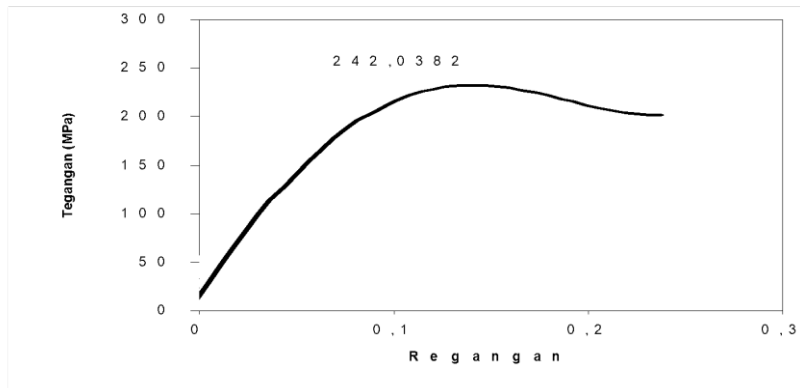
Figure 5. Graph of Stress Relation Vs Strain Speciment Tensile Test (Benner [15])
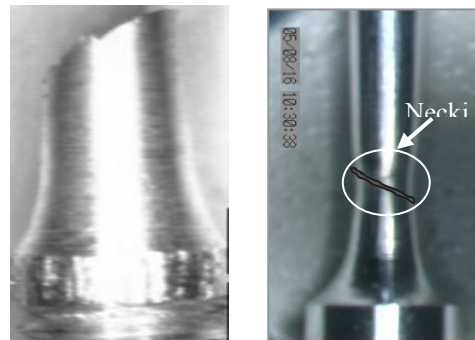
Figure 6. ASTM E8 (Roberta A. Storer, [16] Spesiment Standard After Failure

Table 1. Mechanical Properties of Aluminum A 6063-T6Result of Tensile Stess Test

Ultimate tensile stength	242.04 MPa
0.2 % Yield strength	172 Mpa
0.2 % Yield strength	172 Mpa
Modulus of elasticity	68. 3 Gpa
Shear strength	154 Mpa
Poison ratio	0.33
Elongation	16.4 %

Akhmad HW, (2009), the final failure of the specimen occurs due to the shear fracture with the surface failure uprooted to an angle of 45^0 as shown in Figure 6. This shows the ductile fracture of the A6061-T6 aluminum material. Mechanical properties of A6063-T6 material result of tensle testing as shown in table 1 and, graph of stress relation vs strain speciment tensile test (Fig. 5) Saito., [17].

4.2 Result of Critical Intensity Factor Static Test
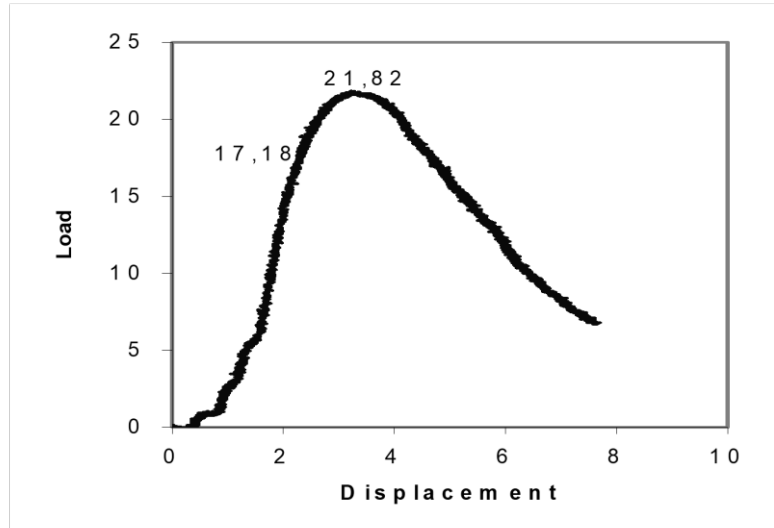
Figure 7. Graph of Static Test Result of Critical Intensity Factor at α=90^0 (Mode I)

Figure 7 shown is the result of stess intensity factor (KI) used static quation at α = 900 (mode I)as shown at figure 7and record as KIin, it is fracture toughness value of Aluminium A6063-T6,at cack initiation Pin = 17.2 KN, stess intensity factorvalue is : KIin = 25,15 $MPa\sqrt{m}$.

The final failure of the specimen occurs due to the shear break fracture with the surfacefracture uprooted to an angle of 450 as shown in Figure 6. This shows the ductile fracture of the A6061-T6 aluminum material.

4.3 Result of Fatigue Crack Gtrowth under Mixed Mode

Prior to the implementation of fatigue test in advance some of the sentiments were given axial fatigue load using Servopulser tool. This loading is carried out at a Pressure amplitudes of 380 MPa and loaded up to 107 cycles. This condition refers to the results of fatigue test against aluminum A 6063-T6 which has been reported through the previous paper. The form of crack propagation recorded on the microskop digital monitor screen. The result of fatigue crack growth under mixed modepresent as graph of the linkage rate of Propagation fracture fatigue vs range of stress Intensity for all three conditions loading: α = 900; mode I); α = 600 and α = 450 (Mixed mode) shown in Figure 11.

From the graph in Figure 7 it can be seen that for the angle of loading 900 the relationship da/dN and K is more linear and the smaller the loading angle at the end of the graph step of the forming the more upright. At the loading angle of 450 can be shown the increasing rate of crack growth (ΔK). For all three modes can be seen at Figure 8, 9 & 10.
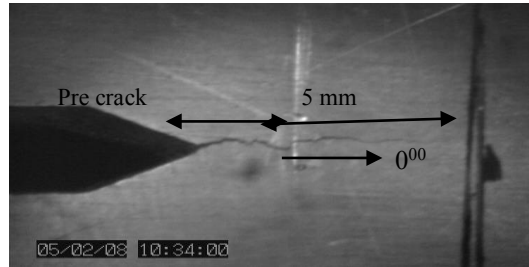
Figure 8. The direction of crack propagation Fatik $\alpha = 90^0$
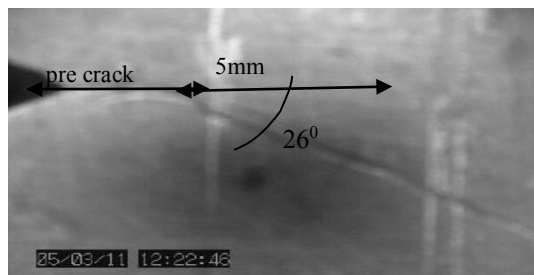
Figure 9. The direction of crack Propagation Fatik $\alpha = 60^0$
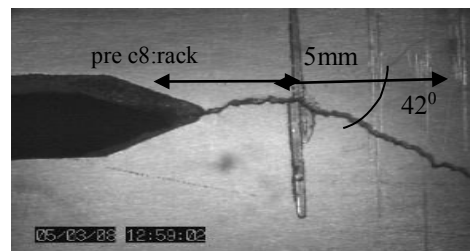
Figure 10. The direction of crack propagation Fatik$\alpha = 45^0$

From the picture 7,8 and 9 shown where the loading mode I = 900 occurs in the direction of crack propagation the makeangle 00, in the loading of mixed mode = 600 occurs the direction of growth of fatigue crack the make angle 260 and on mixed mode loading = 450 occurs the direction of growth of fatigue crack the make angle 420. This implies that the smaller the angle of loading, the direction of growth of fatigue crack (angle (0) is greater as last in the loading of mixed mode (α = 450) obtained by the direction of growth of fatigue crackthe make angle Figure 10 shows the relationship between the angle of loading angle and the direction of growth of fatigue crack (00) for various loading conditions. The crack growth of the digital and digital microscope recording shows that the crack propagation is not completely straight but twisted and serrated, it is influenced by fatigue loading and also shows the properties of aluminium material itself which is ductile. The graph of the linkage rate of propagation fracture fatigue vs Range of stress Intensity for all three conditions loading: α = 900 (mode I) 0, α = 600 and α = 450 (Mixed mode) shown in Figure 6. From Figure 10, graph of the relationship spreading rate of fatty crack Vs Intensity range stress for the incorporation

of the three loading conditions (α = 900 modes I), α = 600 and α = 450. K is more linear and smaller, the loading angle at the end of the graph step of the formation is getting more upright.
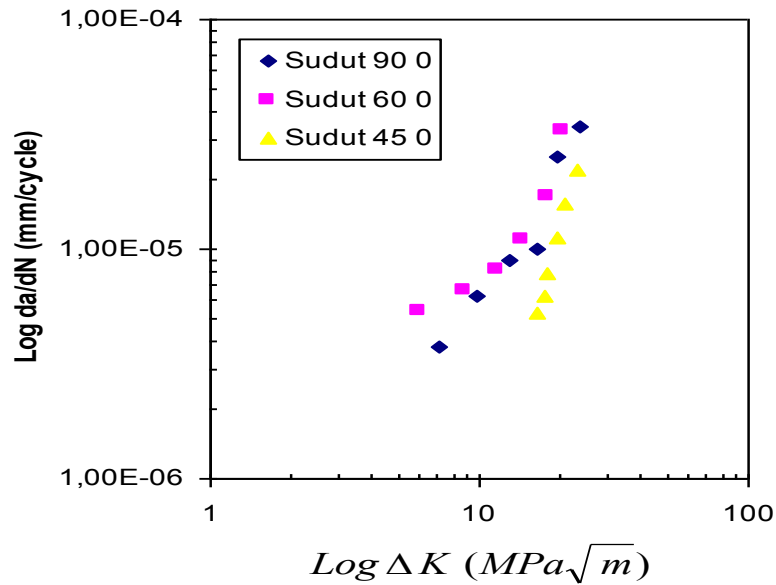
Figure 11. Graph of the Linkage Rate of of the Linkage Rate of Propagation Fatigue Fracture Vs Range of stess Intensity for all Three Conditions Loading: 900 modes I), α- 450 Propagation Fracture Fatigue Vs Range of Voltage Intensity for all three conditions Loading: α=900 mode I),α= 600 and α=450 (Mixed mode). At the loading angle ofα 450 can be shown the increasing rate of crack growth α=450 (Mixed mode) shows that for the angle of loading 900 the relationship da /dN and ΔK more linier and more small the loading angel at final testing step, the result of more vertical. At The loading angel 450shown be fatigue crack growth rate increase.

4.4 Result of Scanning Electron Microscope (SEM) Test

Surface Fracturea longfatigue crack growth which after devidet hattakea replica and it coat whith carbon and cromium, after that fractografy test using SEM with 700x enlargemenfor shown topology mikro surface fracture Marrow J, (2009). Take one foto fromper specimen atfracture zone mode I (α = 900), modeII α = 60 0, (α = 600) and mixe mode (α = 450). It photopresent inpicture 12, 13 and 14.
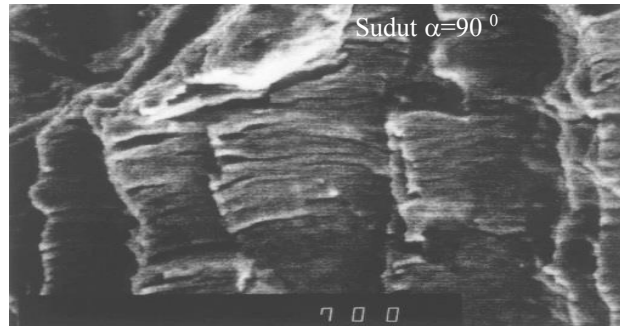
Figure 12. Fractographic Alloy Frame of Aluminium A6063-T6 Fractografy Test Using SEM with 700x Enlargement mode I ($\alpha = 90^0$)
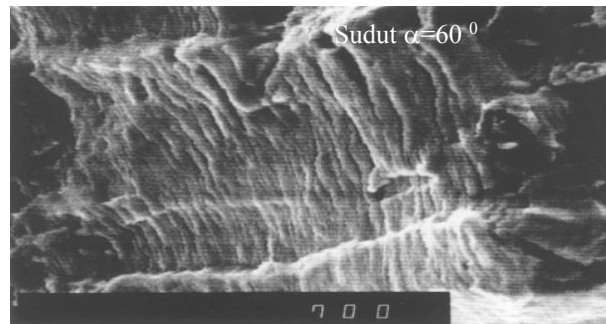
Figure 13. Fractographic Alloy Frame of Auminium A6063-T6 Fractografy Test Using Scanning SEM with 700x Enlargement for mode Campuan ($\alpha=60^0$)
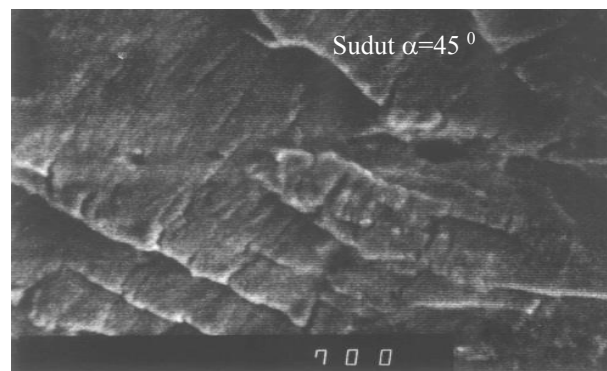
Figure 14. Graph of the Linkage Rate of Propagation Fatigue Fracture Vs Range of stess Intensity for all Three Conditions Loading: 90^0 modes I), α- 45^0

In an attempt to identify the specimen fracture form, a SEM test was performed. The result of fracture surface analysis of the specimen in the fracture area in the mode I (α= 900), mixed mode α = 600) and mode (= 450) with 700x n largement is shown in figure 12, 13, and 14.

From the fraktografy result tes of three fracture crackand three loading engle seen be striation fatigue. Which the result of cyclus stress which direction the influence by direction loading angel. Its striationgive information thatis fracture failure fracture this material aluminium A6063 T6, its production fatigue failure and its material is ductile Davis HE, [22].

5 Conclusion

From the results and discussion above can be drawn some conclusions as follows:

1. Price of critical stressintensity factor Aluminum A6063-T6: KIin $= 25{,}15\ MPa\sqrt{m}$.

2. By dominating the mode I component, the direction of the crack propagation is erect in the direction of loading, then the increase of the mode II component becomes predominantly friction type friction, the initial fracture occurs in friction type fracture, then the fracture criterion does not follow the maximum stess criterion.

3. Cracks propagate normally perpendicular to the angle of loading. The smaller the loading angle, the smaller the crack propagation angle. In the mode I ($\alpha= 90^0$) the direction of the crack propagates in the direction of the crack crack at an angle 0^0 from the pre crack fatigue direction, in the blend mode, ($\alpha= 60^0$) the direction of crack propagates to an angle of angel $=26^0$ from the pre crack fatigue direction,$\alpha = 45^0$) the direction of cracking creates an angle 42^0 from the pre-crack fatigue direction.

4. Loading stress and stree affects fatigue crack propagation, where the greater the load the material receives the smaller the cyclusts occur and the faster the crack growth rate vice versa.

5. From the fractography analysis result with SEM three angle of loading shows that the fracture is fatigue striation and the smaller the grain loading angle is caused by fracture type striation.

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The Relationship between Mindfulness and Quality of Life on Pregnant Mothers

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Abstract. Pregnant mothers tend to experience biological changes during their pregnancy. The changesin their biological conditions can cause health problems and negative impact on their quality of life. Previous research studiesindicate that mindfulness-based interventions can overcome some physical and psychological problems in pregnant women, such as nausea, pain, stress, and depression. Therefore,this research aimed to explore the relationship between mindfulness and quality of life on pregnant mothers. The result of the study can be a resource for next study on intervention for pregnant mothers in Indonesia to help them improve their quality of life. Respondents were127 pregnant mothers who were domiciled in Indonesia. This study used Five Facets of Mindfulness Questionnaire (FFMQ) to measure mindfulness, and EQ-5D5L to measure the quality of life. The results of this study showed that the dimensions of acting with awareness and non-judging have a significant relationship with several dimensions in quality of life.

Keywords: Mindfulness, Quality of Life, Pregnant Mothers.

1 Introduction

Pregnancy is a natural event and also a moment that determines the next life. Women must adapt to biological and psychological changes that occur during pregnancy.The changes that occur within the self can be the precipitating event of various psychological reactions, from mild emotional reactions to the level of severe mental disorders.Pregnant women usually feel nausea, vomiting, fever and weak. Nausea and vomitingcan be reduced until the first trimester ends. In the second trimester, the bodybegins to adapt, and nausea and vomiting also diminish. However, in the third trimester, complaints caused by stomach enlargement, anatomical changes, and hormonal changes cause the emergence of complaints in pregnant women [1].

Health problems in pregnant women, both physically and psychologically, have an impact on the quality of life. Women have a condition that can increase the risk during pregnancy, about 5-10% of pregnancies including high-risk pregnancies [2]. Women with high-risk pregnancies need to be preparedfor the unexpected situation during their pregnancies and laboring process. Through improvements in health conditions that have a direct impact on quality of life, 90-95% of pregnant women including high-risk pregnancies can deliver their babies safely and finally get healthy babies. High-risk pregnancies can be prevented and treated well if symptoms are found as early as possible [2].

A study showed improvements on the well-being of pregnant women by providing mindfulness-based interventions, particularly in overcoming pain, reducing depression, and

increasing the ability of parents to give full attention to their newborns [3]. Mindfulness is the ability to be aware of and focus on the current experience of the individual, both internal and external [4]. In contrast to other relaxation techniques, mindfulness develops the individual's ability to pay attention to the current conditions, without changing the state of [5]. Althoughrelaxation techniques can help reduce stress on pregnant women, mindfulness meditation has more benefits as it can reduce dysfunctional thoughts and distractions [6].

Research related to mindfulness and quality of life has been done in Indonesia. However, no one has examined the mindfulness and quality of life using pregnant women as a subject. Meanwhile, pregnant women and their children are still one of the focuses to be helped in Indonesia, since there are still many of them have a low quality of life. Hence, the researcher was interested to examine more about the relationship between mindfulness with the quality of life in pregnant women in Indonesia.

1.1 Mindfulness

Mindfulness is an open consciousness and a condition of attention to what is happening right now [4]. The definition of mindfulness is "awareness of present experience, with acceptance" [7]. Mindfulness is the condition ofindividual who consciously brings his experience to the current state with a full sense of openness as well asa sense of acceptance. Mindfulness brings the awareness of the individual to focus on the goal, by non-judging attitude and by not avoiding conditions that cannot be mastered [8],[9]. Being mindful means that the individual is aware of whatever his current condition is, regardless of past and future events [10].

Mindfulness in pregnant women can help reducing the stress of pregnancy, reducing pain or pain in body parts such as feet, head, muscle and help controlling nausea. Not only help during pregnancy, but mindfulness also helps pregnant women to passtheir laboring time that is full of contractions and pain. Pregnant women can also pass through the process of pregnancy and childbirth calmer and more aware [11].

The measuring tool for this researchis Five Facets of Mindfulness Questionnaire (FFMQ) developed by Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Walsh, Duggan, and Williams [12]. The FFMQ is multidimensional and has five dimensions that can be used separately or completely. These dimensions are: observing, it means to be aware of internal and external stimulus, such as sensation, emotion, cognition, sight, hearing, and smell; describing, that it mentions or mentally labels that stimulus with words; acting with awareness that is aware of the action being performed compared to acting automatically or without thinking; non-judging of inner experience that is moving away from the mind to evaluate sensation, cognition, and self-emotion; non-reactivity to inner experience is to allow the thoughts and feelings to come and go, without giving the more attention given to them.

1.2 Quality of Life

Quality of life is a balance between opportunity or limitation of life, which is the result of the process of interaction between individuals and their environment [13]. Felce and Perry (1995) suggest the quality of life as overall wellbeing comprised of objective and subjective evaluations [13]. This evaluation consists of physical, material, social, and emotional well-being, along with a person's level of development. Nagler (1996), suggests that quality of life is a general concept of superior meaning that can be applied to the life of a person as a whole. Quality of life is then defined as how perfect or superior the life as a whole [13].

Quality of life is the overall well-being of life which includes objective and subjective evaluation. Objective evaluation refers to the individual living conditions that can be seen and proven such as health, material income, quality of life at home, friendship relationships, activities, and social roles. Subjective evaluation refers to personal satisfaction with the condition of life. Both types of evaluation can be detailed in a physical, social, emotional, and material perspective. The physical evaluation includes health, safety, mobility, and freshness. Material evaluation, including finance, income, various aspects of the living environment, transportation, security, and tenure. Social evaluation- including deep interpersonal relationships- is the provision of support between himself and friends, family, and community involvement.The emotional evaluation includes stress affection, mental level, self-esteem, respect, and faith in religion [14].

Individual's quality of life depends on how he or she values whole-life experiences, positive or negative [15]. Each has a different quality of life depending on the interpretation of each. Good quality of life for some individuals is judged by work, family and [16]. It is influenced by eight factors: control, potential opportunities, resources, system support, skills, events in life, political change, and environmental change [13]. According to WHOQOL [17], the quality of life is divided into six categories, namely:

1) Physical health aspects, related to pain or pain, discomfort, energy and fatigue, sleep and rest.
2) Psychological aspects, associated with positive and negative feelings, self-esteem, thinking, memory, learning and concentration, views of body and appearance.
3) The level of independence aspects, associated with daily activities such as the ability to maintain and take care of oneself, mobility, as well as about treatment and dependence on one treatment or treatment, and work ability.
4) Social relations aspects. Included in this aspect are personal relationships, social support, and sexual activity.
5) Environmental aspects. These aspects include freedom, physical safety, security, residential environments, financial resources, opportunities for new information and skills, participation in leisure activities at leisure, physical environment (including pollution, noise, traffic), and transportation.
6) Spirituality aspects, religion and personal beliefs.

Measuring tool used to measure the quality of life in this research is EQ-5D5L developed by EuroQoL Group. EQ-5D5L has five dimensions of health status aspects, namely mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension consists of five choices of answers, i.e., level 1 to level 5, which indicates the severity of the condition. The combination of five-digit levels of each dimension establishes a person's health status. A scale to measure the health condition of the person based on his perception or self-rating is included at the end of the EQ-5D5L. The scale range is 0-100. 0 is the worst health status he can think and 100 is the best health status he can think. In this study, EQ-5D5L has been adapted into Indonesian by researchers from Padjadjaran University and YARSI University Jakarta [18].

1.3 Pregnant Mothers

The selection of pregnant mothers as the subject focus in this study is based on the notion that pregnant women are susceptible to various physical and psychological problems affecting the quality of life in their pregnancy, and pregnancy is a long-awaited period for most women, therefore it is important to keep pregnant women in healthy condition, physically and

psychologically. In Jakarta, the mortality rate of pregnant women is still quite high. Data from Maternal Health Report 2012 by Health Department of DKI Jakarta Province explained, from 6 districts or cities in Jakarta Capital City, the highest number of deaths occurred in East Jakarta, 34 pregnant women from 88 health centers.

2 Methods

2.1 Participants

Participants in this research were determined using purposive sampling technique. The number of respondents were 127 pregnant women and domiciled in Indonesia. The giving of questionnaires was done online.

2.2 Data Collection Instruments

To find out the level of mindfulness of the individual in this case as one of the variables to be correlated, the data collection tool used was FFMQ questionnaire [12]. FFMQ used has been adapted into Indonesian. FFMQ has 39 items representing five dimensions, namely observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. This scale uses a Likert scale ranging from 1 (never) to 5 (always).

Quality of life on pregnant women, in this case,was measured by using EQ-5D5L. EQ-5D5L is widely used to knowthe health-related quality of life. This scale has been adapted into Indonesian by researchers from Padjadjaran University and YARSI University Jakarta. EQ-5D5L consists of 5 questions representing five aspects of the problem on individual health, namely mobility, self-care, usual activities, pain, and anxiety. Each question consists of 5 choices of answers, i.e., no problems (level 1) until the problem is severe (level 5). Also, at the end of the scale, there is a question about how well the participant's health status is based on his perceptions. The answer option consists of a scale of 0-100. A score of 0 reflects the worst health conditions and the 100 best health conditions imaginable.

2.3 Data Analysis

The data obtained from this research were analyzed by using bivariate analysis with product moment correlation, to see whether there was significantcorrelation between mindfulness and depression inthe pregnant mother.

3 Results

3.1 Demographic Overview of Study Respondents

Here is a demographic overview of the study respondents:

Table 1. Participants' Demographic Data.

	Variable	Amount	Percentage
Age	17 – 34 years old	114	89.8%
	≥ 35 years old	13	10.2%
Work	Not Working	58	45.7%
	Working	69	54.3%
Education	Elementary School	1	0.8%
	Junior High School	1	0.8%
	Diploma 1-Diploma 3	36	28.3%
	S1	71	55.9%
	S2	16	12.6%
	S3	2	1.6%
Domicile	Sumatra	81	63.8%
	Java	32	25.2%
	Kalimantan	3	2.4%
	Sulawesi	6	4.7%
	NTB	2	1.6%
	NTT	1	0.8%
	Bali	1	0.8%
	Papua	1	0.8%
Marital Status	Not Married	1	0.8%
	Married First	124	97.6%
	Marrying Back	2	1.6%
Expense	< Rp. 1.000.000	13	10.2%
	Rp. 1.000.000 – Rp. 3.000.000	66	52%
	Rp. 3.000.000 – Rp. 5.000.000	28	22%
	Rp. 5.000.000 – Rp. 7.000.000	6	4.7%
	> Rp. 7.000.000	14	11%

The study respondents were mostly 17-34 years old (89.8%), worked (54.3%), had latest education at S1 (55.9%), domiciled in Sumatra (63.8%), lived the first marriage (97.6%), and has an average expenditure of Rp. 1,000,000 - Rp. 3,000,000 (52%).

3.2 Mindfulness of Study Respondents

Here is a picture of the mindfulness of the study respondents:

Table 2. Mindfulness Views of Participants.

Dimension	Minimum Value	Maximum Value	Mean	Standard Deviation
Observing	13	37	24.89	4.953
Describing	14	40	27.43	5.446
Acting with Awareness	16	40	28.64	4.890
Non-Reactivity	10	35	20.61	3.688
Non-Judging	13	40	25.78	5.348

The respondents had average scores on observing dimensions of 24.89, 27.43 describing dimensions, acting with awareness of 28.64, non-reactivity of 20.61, and non-judging of 25.78.

3.3 The Quality of Life of Participants

The following is a description of the quality of life of participants in this study:

Table 3. Description of the Participants' Quality of Life.

Dimensions of Quality of Life	Level*	Number	Percentages
	1	95	74.8%
	2	27	21.3%
1. Mobility	3	4	3.1%
	4	1	0.8%
	5	0	0%
	1	113	89%
	2	12	9.4%
2. Self-Care	3	2	1.6%
	4	0	0%
	5	0	0%
	1	58	45.7%
	2	56	44.1%
3. Usual Activities	3	12	9.4%
	4	1	0.8%
	5	0	0%
	1	30	23.6%
	2	81	63.8%
4. Pain/Discomfort	3	13	10.2%
	4	3	2.4%
	5	0	0%
	1	48	37.8%
	2	60	47.2%
5. Depression/Anxiety	3	14	11%
	4	5	3.9%
	5	0	0%
Combination of Five Aspects	Valuation 11111	18	14.2%

* Level: 1 = no problem, 2 = slight problem, 3 = moderate problems, 4 = severe problems, 5 = Unless / extreme problems.

Based on the data in table 3, it shows that 95% of participants have no problems regarding walking and moving from one place to another. Regarding self-care, 89% of participants can do it themselves. In daily activities, 45.7% of participants had no problems. The majority of participants (63.8%) in this study felt slight pain/discomfort, and the majority of participants (47.2%) experienced slight depression/anxiety.

There are 14.2% of participants who have no problems in all aspects. Individuals can also perceive their health condition by possessing from a range of 0-100 scores, i.e., 0 indicating that their perceived health status is very poor and 100 indicating that their perceived health status is very good. Table 4 shows that the average participant perceives his health status quite well, i.e., M = 83.06 (SD = 10.91).

Table 4. Health Description of Participants.

Dimension	Minimum Value	Maximum Value	Mean	Standard Deviation
Perception of Health Status	40	100	83.06	10.914

3.4 Relationship of Mindfulness and Quality of Life

Here is a picture of the correlation between mindfulness and quality of life of participants.

Table 5. Spearman's correlation between Mindfulness and Quality of Life.

		Dimensions of Mindfulness				
		Observing	Describing	Act with Awareness	Non-Reactivity	Non-Judging
Dimensions of Quality of Life	Mobility	-0.029	-0.108	-0.207*	-0.014	-0.151
	Self-Care	-0.014	-0.121	-0.148	-0.053	-0.036
	Usual Activities	0.122	-0.053	-0.253**	0.043	-0.265**
	Pain	0.143	-0.132	-0.263**	0.043	-0.224*
	Anxiety	-0.045	-0.144	-0.450***	-0.042	-0.353***
	Perception of Health Status	0.084	0.152	0.243**	0.132	0.214*

$* p < .05, ** p < .01, *** p < .001$

Based on the data in table 5, it shows that there is no significant relationship between observing, describing, non-reactivity dimension on the dimension of mindfulness and quality of life as well as with the health status that participants own perception. The dimensions of acting with awareness in mindfulness have significant relationship with mobility dimensions ($r = -0.207$, $p < 0.05$), usual activities ($r = -0.253$, $p < 0.01$), pain ($r = -0.263$, $p < 0.01$), and anxiety ($r = -0.450$, $p < 0.001$) on quality of life. The dimension of acting with awareness also has a significant positive relationship with the perceived health status ($r = 0.243$, $p < 0.01$). The non-judgmental dimension of mindfulness also has significant relationship with several dimensions on quality of life, i.e. usual activities ($r = -0.265$, $p < 0.01$), pain ($r = -0.224$, $p < 0.05$), and anxiety ($r = -0.353$, $p < 0.001$). The non-judging dimension also has a positive relationship with perceived health status ($r = 0.214$, $p < 0.05$).

3.5 Additional Analysis

In this research, additional analysis is done by doing a t-test on both variables based on demographic data from participants.

3.5.1 T-Test Results between Demographic Data and Mindfulness Data

Table 6. T-Test of Demographic and Mindfulness Data.

Dimensions of Mindfulness	Marital Status
Observing	0.587
Describing	0.871
Acting with Awareness	0.011
Non-Reactivity	0.062
Non-Judging	0.790

In table 6, it shows that there is a difference of score on the dimensions of acting with awareness in mindfulness-based on marital status.

3.5.2 T-Test Results from Demographic Data and Quality of Life Data

Table 7. T-Test of Demographic Data and Quality of Life Data.

Dimensions of Quality of Life	Education	Domicile
Mobility	0.029	0.056
Self-Care	0.590	0.006
Usual Activities	0.134	0.051
Pain	0.150	0.206
Anxiety	0.001	0.090
Perception of Health Status	0.000	0.346

Table 7 shows that mobility dimensions, anxiety dimensions as well as perceptions of health status have differences in score based on participant level of education. In the self-care dimension also found differences in scores based on the participant's domicile.

4 Discussion

Based on the results of the correlation, it shows that the hypothesis in this study was accepted, there was a significant relationship between mindfulness and quality of life on pregnant women in Indonesia. The results of this study are also in line with previous research conducted in Indonesia (Fourianalistyawati, Listiyandini, and Fitriana, 2017)on the subject of adults showing a correlation between mindfulness and quality of life [19].

This result supports previous research that applied mindfulness-based interventions to reduce complaints experienced by pregnant women [3]. The mindfulness interventions given in previous studies show better quality of life than before intervention [20],[21]. The higher mindfulness possessed by someone can cause himto gain higher mindfulness as well as encourages him to increase the quality of life. Furthermore, mindfulness also shows an improvement in psychological stress, positive affect and overall health of pregnant women [20].

The results of this study indicate a significant relationship in the dimensions of acting with awareness and some dimensions on quality of life. Acting with awareness is how individuals are present and focused when performing an activity and not behaving automatically or directing a focus on something else [12]. Mindfulness helps people to focus and avoid positive or negative thoughts so they can understand what is happening in the present [22]. The more a person is present and the focus on what is being done then he has no problem in moving around like walking. In mindfulness-based interventions, there are related exercises running with conscious and focus.

In addition to mobility, the dimensions of acting with awareness also relate to the usual dimensions of activities, pain, and anxiety in quality of life. The more a person presents in every activity that is being done,the more she will be able to perform daily activities with more focus. Then the person also tends to feel pain, discomfort, and depression with anxiety

will be lower. Also, a person can feel that he has better health or condition, if the dimension of acting with awareness is higher.

Non-judging dimensions are also found to be related to several dimensions in quality of life. Non-judging is how a person abstains from judging his thoughts and feelings [12]. The non-judging dimension has a negative relationship with the usual dimensions of activities, pain, and anxiety; and a positive relationship with perception of health status.

If the attitude to accept, open and compassion in mindfulness are applied by the pregnant women; then they can see the changes that occur within them as something that is not permanent and will pass. Pregnant women will have different concepts of their condition, such as having control over themselves, not easy to feel tired, happy or reduce physical pain. Thoseconcepts happen because pregnant women are more focused on the experience or the sensation they experienced without judging by using their thoughts or feelings [21]. So, the more a person accepts and does not judge against his or her thoughts and feelings, the lower the person's tendency to feel the discomfort/sickness and depression/anxiety.

The person also has a low tendency to the problem when performing daily activities. The low tendency to the problem can happen because the mindfulness helps pregnant women to regulate the negative emotions they experience. By applying non-judging to these negative emotions, expectant mothers can build better-coping skills and can reevaluate stressful factors [22]. Pregnant women become more adaptive in repressing a stressful experience [21]. With high non-judging too, a person's perception of her health condition is getting better.

In this study, it was also found the differences in scores on some dimensions of mindfulness-based on their marital status. Also, the quality of life also found differences in scores based on educational levels and also the participants' domicile.

5 Conclusions

It is concluded that there is a relationship between mindfulness and quality of life, especially in the dimensions of acting with awareness and non-judging of inner experience. These results are expected to be the basis of further research, to find the role of mindfulness techniques on improving the quality of life in pregnant women.

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Performance of AFWR Synchronous Motor as Changing from AFWR Synchronous Generator

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Abstract. The tests should be performed for the three phase synchronous generator of Axial Flux Wound Rotor (AFWR) which has been planned and constructed. The tests are also performed for the motor deriving from that AFWR generator. The behavior of the generator and the motor can be known after those testing. Hence, by using one machine, it can be operated for resulting electricity and for rotating mechanic. The load examining is applied for the synchronous machine. The electrical load can be attached to the generator after it is running and the testing output is achieved. Likewise, the mechanical load can be connected to the motor after it is supplied by the power source and the examining outcome is gained. The mesurement in those tests are executed the nominal load. From the testing output of AFWR synchronous generator at rated load having 0.5 mm air gap yielding the efficiency of 61.61% with the rotor voltage of 10.85 V. Whereas, from the examining outcome of AFWR synchronous motor with the terminal voltage 0f 380 V and the field voltage of 9.53 V is attained 73.58%.

Keywords: AFWR; generator; motor; efficiency.

1 Introduction

The electric motor is used for changing electrical energy into mechanical energy. While the generator for changing mechanical energy into electrical energy. Motor and generator can be realized on the same machine, but on the two reversed process. A synchronous motor is similar to a synchronous generator, but the direction of current flow is reversed. Meanwhile the direction of current flow in the machine is reversed, the direction of power flow in the stator of the motor may be expected to reverse also. In the motor, the three phase current flowing in the armature winding yields a rotational magnetic intensity which interrelates with the rotor magnetic intensity, creating rotating force in the machine. While in the generator, the rotational magnetic intensity from the field windings induces ac voltages of three phase into its stator armature coils.

1.1 Changing a motor from a generator

It is exciting that one electrical machine can be operated as generator or motor. The dissimilarity among the generator and the motor is related to the externally used powers are in the path of movement (generator) or contrary to the path of movement (motor). Electrically, as

the induced voltage is greater than the terminal voltage, the machine deeds as a generator, and when the induced voltage is lesser than the terminal voltage, the machine deeds as a motor [1]. When the machine operates as a motor or a generator, together induced power (motor operation) and induced current (generator operation) are appeared in any times. It is commonly correct of entirely machines the two deeds are owned, and it is merely the relative posisitions of the outside power with attention to the posistion of movement that assign if the entire machine performs as a motor or as a generator.

The elementary difference between motor and generator operation in synchronous machines can be understood either in the magnetic field diagram or in the phasor diagram. In a generator, E_A locates ahead of V_ϕ and B_R locates ahead of B_{net}. In a motor, E_A locates behind V_ϕ and B_R locates behind B_{net}. In a motor the induced torque is in the path of motion, and in a generator the induced torque is an opposite torque opposing the direction of motion. The phasor diagram related to generator and motor operation is shown in Figure 1 dan 2 respectively [2].
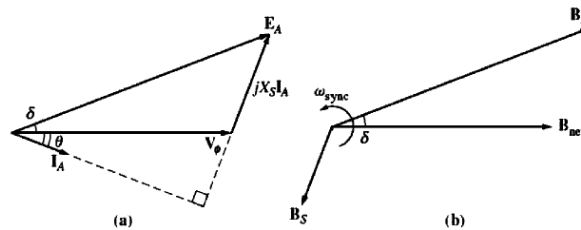
Fig. 1. (a) Phasor diagram of a synchronous generator. (b) The related magnetic field diagram.

In an electrical system, an electric machine is needed to be able to change its function as both generator and motor. The change of this function can be done rapidly as it is needed. For example, the motor used to drive an electric traction can be turned into a generator when braking. Similarly, a motor can behave as a motor in the pumped storage hydro power station and on high rise building elevators.
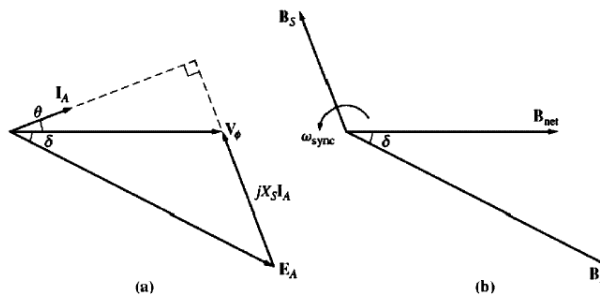
Fig. 2. (a) Phasor diagram of a synchronous motor. (b) The related magnetic field diagram.
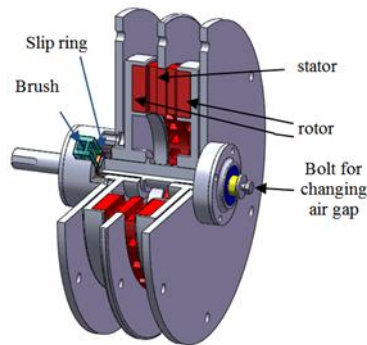
1.2 The AFWR machine

Initially, the machine designed is AFWR synchronous generator. Therefore, it is needed typical ratings of on a synchronous machine for designing. It is related to required specifications of machine operation as seen in Table 1.

The generator planned is three phase axial flux wound rotor (AFWR) synchronous generator with controlling the field current. It is small-scale capacity with terminal voltage, power and speed are 380V, 1 kW and 750 rpm respectively. The stator and the rotor are made from slotted lamination core [3].

Table 1. needed specifications of machine action.

Parameters	Values
Line Voltage	380 V
Total of poles	8
Frequency	50 Hz
Cos phi	0.83

The generator possesses one stator wound with two side of slotted iron core which inserted among two rotor. The axial flux (AF) machine commonly utilizes permanent magnets attached on the rotating part. Exchanging the permanent magnet with a coil in the rotating part, causes it might to regulate the flux by changing the power moving into the coil of the moving part [4].

Fig. 3. The designed AFWR synchronous generator.

A machine with axial flux having winding in the field is denoted to as an axial flux wound rotor. A construction of the planned AFWR machine is displayed in Picture 3. This generator contains of doubble field coils which two coils are linked to in parallel. The armature of the AFWR generator is placed among two differing field coils. The two side moving patrs is solely named double rotors with holes of winding are placed on the surfaces of the stationary part and at the lamination core of moving part.

In fundamental, the magnetic intensity plan of AFPM machines is alike to its radial flux PM (RFPM) mate to rod-shaped moving parts. One of the machines is a disc-type machine and the other is cylindrical-type machine. The axial flux (AF) machines possess a total of different benefits over radial flux machines [5].

Once fabricating all parts of the generator are completed, they can be assembled to make the AFWR generator. The AFWR generator that has been congested is displayed in Figure 4. After the generator is tested to know its performance, the generator is then operated as a motor and tests are performed on the motor. The motor is supplied by the rated voltage during the testing that is 380 V.
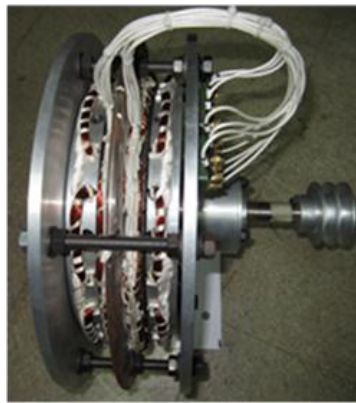
Fig. 4. The assembled AFWR generator.

2 Methodology/Experimental

2.1 The machine design

The outcome of computations become the base for constructing the generator. The stator and rotor are two part to start the manufacturing. The core, slots, brushes and slipring are portions of the stator and the rotor, whereas the the shaft and the bearing are mechanical portion. The software of Matlab can be used for computing the design. After computing, by using the software of Solidwork, the two dimensional or three dimensional drawing can be made. Two dimensional Solidworks picture can be utilized for basing the manufacturing.

The axial and radial flux machine formulas are utilized as base for computing the synchronous genrator plan. The circuit of electric and magnetic and mechanical parts are also computed by those formulas. For correctness and exactness computations are utilized the software of Matlab, while for figuring the machine and the portions are applied the software of SolidWorks.

The qualifications of the machine are utilized for initiating the synchronous generator plan. Afterward choosing materials and determining the parameter plan. The requirements of the machine that related to the optimal factors are intially supposed before treating the circuit of electrical, the circuit of magnetic and mechanics. The current output, the cosinus phi and

the terminal of voltage are projected can encounter the behavior of the machine. That is the final plan procedure.

The factor of optimization can be changed by reiterating the process of plan if the spesifications has not been encountered yet. The plan paper can be issued if the performance has been met the requirements. With the specific output power predetermined as a benchmark, then the calculation process can determine the appropriate air gap length in the engine planning.

The magnetic field lines passing through the air gap in the axial direction with the engine shaft serve as the basis for designing three phase axial flux machine. The stator and the rotor shaped and placed parallel to each other. The stator possessing two sides of the slot and is placed between two rotors. On the surface of stator and rotor having the slots are located the coils wire as displayed in Figure 4.

Basically, the axial flux machine is similar to the radial flux machine differs only in the cylinder-shaped rotors, so electromagnet theory is also alike. Nevertheless, for radial flux machines are more difficult than axial flux machine in the process of manufacture. The numbers assigned to the machine specification are the nominal value when the machine is fully loaded. The Output power, the terminal voltage (line to line), the frequency, the rotation of rotor, and the power factor are nominal quantities specified. In the generator shaft where a field coil is attached, it is rotated by prime mover, it is necessary to determine the input power and load torque. The steady state magnetic field in the rotor is resulted by the field current coming from the direct current source attached to it
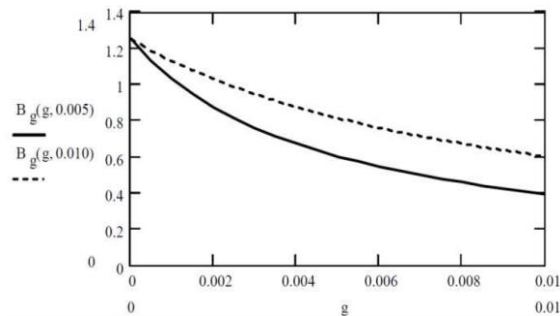
Fig. 5. Changes in air gap affecting magnetic field density.

The air gap that can be varied on the axial flux machine is one of its advantages. The unvaried permanent air gap is a disadvantage possessed by the synchronous and the induction machine of the radial flux. The field current flowing into the machine rotor coil is required larger to produce larger magnetic flux due to the larger air gap.

If the air gap gets larger then magnetic flux density will be smaller. The magnetic energy required higher when the non-magnetic air gap is getting larger. Changes in air gap affecting magnetic field densityis displayed in Figure 5.

Another advantage of axial flux machine is that its air gap can be made more than one. The testing machine here has two air gaps, one stator is located between two rotor. Equations that express the relationship between permeance, reluctance and electrical quantities on machines can be included in the design calculations.

2.2   The machine tests

After the AFWR synchronous generator is assembled, the tests are done by connecting to electrical and mechanical measuring instrument at the laboratory. Initially, the test was done to inspect the construction, coils and the output of generator. The next test was done to check the rotation of generator using an inverter 2.2 kW. Finally, the test was performed to test the full performance of AFWR generator.

To perform the tests on the generator, measuring instruments are utilized to measure the electrical and mechanical quantity. The tests performed on the AFWR generator include no load test, full load test, speed changes test, air gap changes test, short circuit test and temperature rise test. While the test performed on the AFWR motor include dc test, no load test and field current changes test.
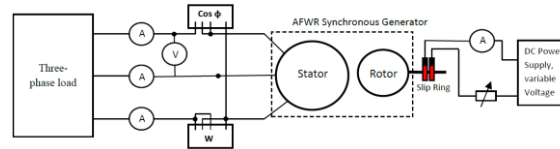
Fig. 6. The test circuit of AFWR generator.

When the generator is tested, the induction motor is utilized as a prime mover to turn the shaft of the generator. The speed of the induction motor rotation is controlled by an inverter. Electrical measuring instruments consists of dc ampere meter, dc voltmeter, ac ampere meter, ac voltmeter, and clamp on tester. While the mechanical measuring instrument consists of a tachometer, calliper and filler gauge. The test circuit and equipment utilized in the tests of AFWR generator are shown in Figure 6 and 7 respectively.

Fig. 7. The equipment utilized in the test of FWR generator.

When the generator is designed, the value of machine parameters are obtained from the calculation using MATLAB. The yield of the calculation is utilized to analyse the

achievement of the generator which is referred to the power output. The iron losses and the mechanical (friction and windage) losses is assumed to be 5% and 1% respectively from the power output. The issue is directed at the power output and the efficiency. The power output has been assigned to a certain magnitude, while the efficiency is searched for the bigest value. By varying one of the machine parameters, then its power output and efficiency will change too.

3 Results and Discussion

The exact air gap length is needed to determine the optimum machine efficiency. Table 1 shows the generator working requirement needed for design. Table 2 shows the outcome of machine achievement calculations on output power of 1 kW and efficiency 85.30%. Cosphi, stator current, line to line voltage which is another engine paremeter also changes when the air gap is changed. Examination and selection of output power and efficiency values are performed to match the rated values by spreading the length of the air gap from small to large widths.

3.1 The machine efficiency

The optimal efficiency is obtained from the above computation with 0.1 cm air gap width. The Line to line voltage at the engine terminal is 380 V with the air gap width of 0.1 cm. Figure 8 shows the effect of air gap on the line to line voltage. While, figure 9 shows the relationship between the air gap changes to the efficiency.
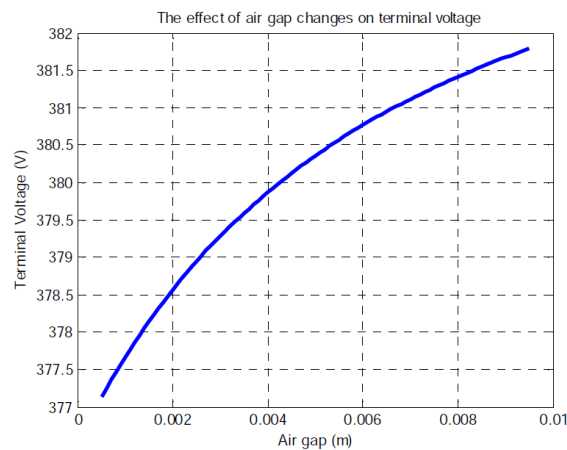
Fig. 8. The effect of air gap on the line to line voltage.

The inductive load is the dominant load connected to the generator. On this occasion also need to see how the effect on the line to line voltage on the generator.

The current, the line to line voltage, the voltage regulation and the efficiency need to be seen as a result of loading the machine with different inductive loads. Attaching Inductive load

to the machine ranging from small to large loads with an interval of 25%. The current and machine efficiency will be greater when this inductive load is higher.

But the voltage regulation is higher with decreasing line to line voltage due to the increasing inductive load. Table 2 shows the variations on current, efficiency, line to line voltage and voltage regulation due to the inductive load increase.

The result of calculation by using Matlab is obtained the efficiency of AFWR synchronous generator of 85.30%. For comparison of efficiency with other types of machines that have the same output power as this generator ie. an induction motor (copper rotor) of 82.8%, an asynchronous motor (single layer) of 71.5%, an asynchronous motor (three-phase sinusoidal) of 76.6% and a TORUS generator of 81.18%. From the above data, it is obtained that the efficiency of the four engine above lower than the efficiency of AFWR engine. The optimization parameters obtained from computing can be used for computing the above efficiency [6].

Table 2. The effect of the inductive load changes to line current, efficiency, and line to line voltage.

Load		Current (A)	Efficiency (%)	Terminal Voltage (V)	Voltage Regulation (VR)
(%)	(W)				
25	250	0.447	58.44	374.76	1.398
50	500	0.894	73.48	369.34	2.887
75	750	1.340	80.37	363.74	4.472
100	1.000	1.788	84.30	357.95	6.161

In order for the winding wire to be properly located in a stator or a rotor slot, the convention is taken for the average slot fill factor on the low-voltage machine. For rectangular wires is taken for that factor of 0.6, while, for circular wires is taken 0.4. In the computation of optimization, the size of stator and rotor is fixed, as well as the size of slots.

The slot size rule plays an important role in assigning the number of coils and the size of the wire cross section. Finally, the slot fill factor determines the dimemsion of the slot. The size of the slot fill factor of 0.3629 is gained from each stator slot having 220 wires with a wire cross-section of 0.196 mm^2. Picture 4 displays the stator and rotor slot filled by coils. The slot fill factor in which the slot is occupied by conductor wire according to the valid standard is 0.5.
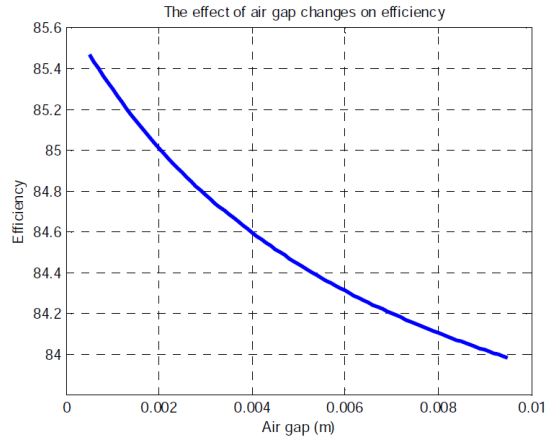
Fig. 9. Efficiency with Respect to the Air Gap.

3.2 The relationship between losses and the efficiency

To obtain the efficiency of AFWR motor based on the results of testing, the data required consist of power output, full-load current, copper losses, iron losses, mechanical losses, brush losses and miscellaneous losses (stray load losses). From the results of tests are obtained output power, stator current, the value of the stator resistance coil, the field winding resistance and the rotor current. The stator current and the stator resistance are needed to obtain stator copper losses and the rotor current and the rotor resistance are needed to obtain rotor copper losses and the brush losses [7].

From the above test results are achieved the three resistance on both sides of stator windings connected in parallel and the star (wye) of 13,085 Ω. While the resistance on both sides of the rotor windings are connected in parallel of 0,396 Ω. The stator and rotor copper losses can be computed using the equations respectively:

$$P_{scl} = 3I_1^2 R_1 \qquad (1)$$

$$P_{rcl} = I_f^2 \, R_f \qquad (2)$$

With the full load armature current of 1,60 A, the stator copper losses is 100,49 W and the current passing through the field winding of 20 A, then the rotor copper losses is 158,40 W. The core losses consists of eddy current and hysteresis losses is obtained using the equation:

$$P_{core} = 0{,}05 \, P_{out} \qquad (3)$$

The mechanical losses consists of friction and windage losses is obtained using the equation:

$$P_{f\&w} = 0{,}01 \, P_{out} \qquad (4)$$

The electrical losses on the brush is calculated using the equation:

$$P_{bcl} = 2 \, \Delta V_b \, I_f \qquad (5)$$

With the voltage drop on each brush ΔV of 0.5 V (less than 1 volt), The electrical losses on the brush is 20 W.
The miscellaneous losses (stray load losses) is calculated using the equation [8]:

$$P_{stray} = 0{,}2 \text{ x } P_{scl} \qquad (6)$$

The stator copper losses of 100.49 W, the stray load losses is 20.1 W

By adding together all the losses, the total losses in the motor is 358.99 watt. Therefore the AFWR motor efficiency with the air gap of 1.5 mm was obtained 73.58%.

In order to achieve the AFWR generator efficiency, with the same way of test and calculation on the AFWR motor, it can be seen from the following Table 3. The AFWR machine that has been made and tested has low efficiency. It is caused by the factor of electrical, magnetic and mechanical. The descriptions below explain those three factors.

The electrical factor causing the efficiency of the machine relatively low consists of electrical factor in the rotor. For the electrical factor in the rotor, that is low rotor resistance, therefore it creates high rotor current and finally an increase in copper losses. If this resistance is decreased by making the diameter of the conductor smaller, so that the copper losses will decrease.

Stator and rotor cores of AFWR machine are composed of many laminations stamped from a rolled thin steel plate. It is electrically insulated from each other in order to minimize eddy currents. When making those core, the rolled steel plates are cut or split into parts to get the lamination thickness according to the size of design calculation [9].

Table 3. The efficiency of AFWR generator and AFWR motor.

Losses / Efficiency	AFWR Generator	AFWR Motor
Stator Copper Losses	100,49 W	100,49 W
Rotor Copper Losses	181,84 W	158,40 W
Core Losses	50 W	50 W
Mechanical Losses	10 W	10 W
Brush Losses	21,43 W	20 W
Stray Load Losses	20,10 W	20,10 W
Efficiency	61,61%	73,58%

A bigger eddy current and lamination short circuit called interlaminar can be appeared in the burrs of edge caused by punching and cutting. A solid core can be resulted by the burred laminations configuration caused A solid core can be appeared as result of changing the configuration from burred laminations, because core of magnetic is affecting a burr of edge.

in the faulted area can be appeared excessive local heating cause the high eddy current of induced interlaminar [10].

The AFWR generator has two small air gaps with the size of 0.5 mm respectively. Setting two air gaps around the two rotor discs and one stator disc is needed with a high accurate setting, so that the same width of air gap can be obtained. Using the simple and manual tools in the setting may create unequal air gaps. Therefore, the higher excitation current due to wider air gap may appear in the field winding to meet the generator output requirement.

If the air gap is made smaller to 0.3 mm in order to make the excitation current smaller, so that it may create friction between rotor and stator when there is a magnetic field in the rotor. The friction appears due to inequality of air gaps or non alignment of the shaft. As a result, there is a higher mechanical losses as friction losses. Therefore, a higher input power from prime mover is needed to overcome this problem.

One of losses in the moving part of the motor is the loss of friction [11]. The friction loss is specified by the following equation:

$$P = k\, C_f\, \pi\, \rho\, \omega 3 r 4\, l \qquad (7)$$

A surface of machine having smooth area can be revealed by coefficient of roughness C_f of 1.00. The quantities like cylinder lenght l, machine radius r, velocity of rotation ω, air density ρ influence the coefficient of friction k [12].

It is complicated to determine the moving part losses. However, it is important to determine the proper losses of the machine in order to get the accurate quantities. The friction loss can not be ignored. Therefore, the friction loss makes the efficiency of machine decrease.

4   Conclusions

The generator of synchronous AFWR which has been designed and tested can be operated as AFWR synchronous motor. The dominant factor causing low efficiency is the electric factor that is large field current. It creates high electrical losses in the field winding. Making the cross section of the conductor smaller, so that the current becomes smaller and the magnitude of efficiency becomes higher. This small current could significantly raise the efficiency, because the losses is directly proportional to the power of two of the current flowing in the coil. Brush voltage drop can also significantly lower power losses on machines with smaller field currents.

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The Effect of Welding Position on the Quality of SMAW Welding Electrode Joint AWS E 7018

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Abstract. The abstract should summarize the contents of the paper and should contain at least 70 and at most 200 words. It should be set in 9-point font size, justified and should have a hanging indent of 2-centimenter. There should be a space before of 12-point and after of 30-point.This study discusses the effect of welding position on the quality of welded joints using AWS E 7018 electrode. Research was designed in two stages, using the tensile test and the bending test. The result of tensile test shows the comparison of average yield strength of vertical welding position equal to 24,30 kgf/mm2, while horizontal position 22,98 kgf/mm2 and for overhead position is 24,14 kgf/mm2. For the ultimate strength in the vertical welding position is 26.06 kgf/mm2, while for the horizontal welding position is 27.93 kgf/mm2 and for overhead welding position is 22.24 kgf / mm2. Bending test can clearly be seen the comparison of strength and durability of the material used and the position of welding used. In bending test for vertical welding position has bending strength value of 4039,67 kgf, while in horizontal welding position is 4298 kgf and for overhead welding position is 3965,33 kgf. Although in the research results obtained the value of vertical welding position better than the position of horizontal welding and overhead welding position, but other welding positions are also feasible to use depending on the needs of welders and conditions in the field.

Keywords: The Welding Position, Mechanical Testing, SMAW, ST 37, AWS E 7018 Electrode, Welding Equipment, Welding Material.

1 Introduction

Welding can be interpreted as the process of joining metals or metal alloy utilizing heat energy from the welding machine used in welding. Welding processes commonly used in the industrial world such as SMAW, GMAW, SAW, and TIG. The most widely used welding is electric arc welding (SMAW). An electric arc welding with a sealed electrode is a process of joining a material which produces a fused or growing member of the material by heating it at welding temperature, by the use of filler metal or electrode. Welding has advanced and grown with varying degrees of difficulty. Various positions of welding also addded to the values such as under the hand, horizontal, and vertical to the position of over head (over the head).

Each welding position has its own constraints, especially in terms of the comfort of the welder during welding. The position of the welding is the positioning or position of the welding electrode movement. Position taken by welder usually depends on the location of the gaps to be welded. Oftentime, welding should follow the position of the construction design such as welding ceiling or building ceiling on the corner of the building, on the floor, and so on, especially in the continuous welding process that is a construction requires fast and fast

welding with welding position vary. Given the necessity of a particular welding position, it will give different results to the strength and hardness of the weld results.

2 Basic Theory

2.1 Defining of Welding

Welding is a way to connect solid objects using heating process of joining a metal into one due to heat by the effect of pressure. The definition can be further elaborated that welding is the work of grafting two or more metals by providing heat under the liquid metal point of the mother by giving pressure or no pressure and added metal filler or not. Successful unification required several requirements that must be met, namely:

1. Metal should be able to melt by means of heat.
2. Metal involved in the welding process have suitability properties which will not weaken or thwart the connection.
3. Method of the connection in accordance with the nature of the solid and the purpose of connection.

2.2 Shielded Metal Arc Melding

The electrode welding arc welding process known as SMAW is widely used in the industry because of its wide use capability, simple equipment, and can be used both indoor and outdoor. Welding can be used in various positions. The welding method of the arc welded electrode is used metal wire electrodes wrapped with flux, an electric arc formed between the master logm and the electrode tip. Because of the heat from this arc the parent metal and the end of the electrode melt and then freeze together.

The welding method of the enclosed electrode uses electrodes as filler metal. In addition to the use of soft steel sealed electrodes also made for strong steel, heat-resistant steel, copper alloy stainless steel and hard coating. Titan Oxide Coating or Titania Lime can enhance wear resistance [1]. Standardization of welding wire according to AWS for welding of soft steel.

2.3 Welding Position

According to AWS Welding [2], welding position is positioning of welding electrode movement. The position or attitude of the welding taken by the welder usually depends from the weld or welding slit workpiece to be welded. The welding position at weld consists of 4 (four) kinds of position, namely: down hand position, horizontal welding position, vertical welding position and over head position.
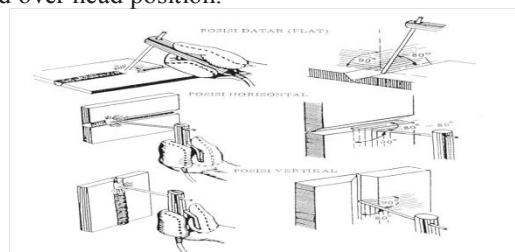

Figure 1: Types of welding positions

2.4 Tensile Testing

The mechanical properties of the material obtained from tensile testing are:
1. Tensile Strength.
2. Yield Strength.
3. Ductility.
4. Elasticity.

A voltage that occurs at the time of fracture by dividing the maximum load by the initial cross-sectional area. Tensile strength is set based on the area of the origin A, load P, and voltage δ [3].

2.5 Yield Strength

The yield strength is the voltage required to produce a small amount of specified plastic deformation. The most commonly used definition for this property is the offset yield strength determined by the voltage associated with the intersection between the strain stress curve and the line parallel to the elastic offset of the specified strain curve.

2.6 Tensile Strength

The ultimate tensile strength, is the maximum load on tensile testing that occurs until the breaking of a specimen of a tensile test object.Tensile strength is the value most often written as a result of a tensile test, but in reality it is fundamental in relation to the strength of the material. For the metal clay the tensile strength must be associated with the maximum load, where the metal can withstand axial loads for very limited circumstances.

2.7 Modulus of Elasticity

According to George E. Dieter, 1993 The modulus of elasticity, or modulus of young is the size of a material's stiffness. The modulus of elasticity can be expressed in the stress-strain curve. Voltage is a resistance to the outer forces, while the strain is defined as the force undergoing a change of shape in a specimen.Objects can be said to be perfect elastic means that the cause force of change of form is lost, then the object will return to its original shape. Many objects that are perfectly elastic have a boundary of deformation calledthe elastic limit so that if it exceeds the elastic limit, the object will not return to its original shape.

2.8   Bending Testing

Bending is a plastic deformation process of metal against a linear axis with little or no change in surface area. Bending causes the metal on the outside of the neutral axis to pull, while on the other side is under pressure. The material is said to be strong if the external load only causes deformation within the elasticity limit, the amount of deformation is determined by the type of material, the magnitude and the type of load. The type of loading (style) based on the direction of the load can be distinguished upon.

2.9   Bending Voltage Analysis

In a cross section of the apparatus it will undergo bending stress, assuming the length of the test specimen or the fulcrum = L (mm), and the fracture load F (Kgf), the thickness of the test specimen is d (mm), then the bending stress value is obtained using the formula.

3   Tensile Test Material

3.1 Tensile Test

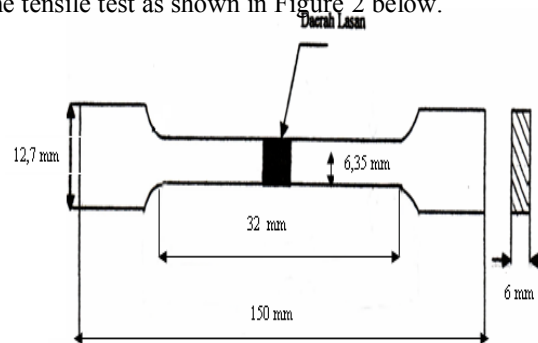The dimensions of the tensile test as shown in Figure 2 below.

Figure 2. Standard ASTM E 8

3.2 Bending Test Material

The bending test material as shown in Figure3 below
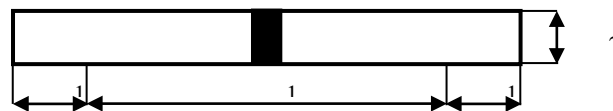
Figure 3. Dimensions of standard ASTM E 190 bending test

4   Research Result

Research results from the influence of the welding position to the strength of the AWS E 7018 electrode welding joints on the low carbon steel specimens can be obtained after passing the tensile test. From the bending test can be known bending strength, elastic modulus, bending strain, deflection and deflection angle.

4.1 Tensile Test Data

Table 1. Tensile Testing Data

No Test Object	Position of Welding	Cross Sectional Area (mm²)	Width (mm)	Thickness (mm)	Gauge Length (mm)	Length mm)
1	Vertikal	38,100	6,35	6	32	150
2	Vertikal	38,100	6,35	6	32	150
3	Vertikal	38,100	6,35	6	32	150
1	Horizontal	38,100	6,35	6	32	150
2	Horizontal	38,100	6,35	6	32	150
3	Horizontal	38,100	6,35	6	32	150
1	Over head	38,100	6,35	6	32	150
2	Over head	38,100	6,35	6	32	150
3	Over head	38,100	6,35	6	32	150

Source: Research results

4.2 Data Analysis Resultof Bending Testing

The result of data obtained after bending test, it can be determined bending voltage, elastic modulus, bending strain, deflection and deflection angle By taking one of the test specimen horizontal position welding test that is 1 (one) test specimen from 3 (three) specimen 4.2.1 Data Analysis Result of Bending Testing.

1. Yield Strength

$$\sigma_y = \frac{P_{y(offset\,regangan = 0,002)}}{A_0}$$

$$\sigma_y = \left[\frac{982\,Kgf}{38,100\,mm^2} \right]$$

$$\sigma_y = 25,77\,Kgf\,/\,mm^2 \Rightarrow 252,71 N\,/\,mm^2$$

2. Ultimate Tensile Strength

$$\sigma_u = \frac{P_u}{A_0}$$

$$\sigma_u = \frac{844\,Kgf}{38,100\,mm^2}$$

$$\sigma_u = 22,15 Kgf\,/\,mm^2 \Rightarrow 217,21\,N\,/\,mm^2$$

3. Modulus of Elasticity

$$E = \frac{\sigma}{\varepsilon}$$

$$E = \frac{30,44\,Kgf\,/\,mm^2}{6,67\%}$$

$$E = 456,37\,Kgf\,/\,mm^2 \Rightarrow 4475,46\,N\,/\,mm^2$$

4.2 Bending Test Data

Table 2: Tensile Testing Data

No. Testing Object	Position	Width (mm)	Thickness (mm)	Length (mm)
1	Vertikal	6	25	150
2	Vertikal	6	25	150
3	Vertikal	6	25	150
1	Horizontal	6	25	150
2	Horizontal	6	25	150
3	Horizontal	6	25	150
1	Over head	6	25	150
2	Over head	6	25	150
3	Over head	6	25	150

Source: Research Results

1.Bending Tensity

$$\tau = \frac{3FL}{2bd^2}$$

$$\tau = \frac{3(4399\,Kgf)(150\,mm)}{2(25\,mm)(6\,mm)^2}$$

$$\tau = \frac{1979550}{1800}$$

$$\tau = 1099,75\,Kgf\,/\,mm^2$$

2. Modulus of elasticity

$$E = \frac{FL^3}{4.\delta\,bd^3}$$

$$E = \frac{4399\,Kgf(150\,mm)^3}{4(328,71\,mm)(25\,mm)(6\,mm)^3}$$

$$E = \frac{4399.150^3}{7100136}$$

$$E = 2091,03\,Kg\,/\,mm^2$$

3 Bending Strain

$$\varepsilon_x = \frac{3 \, y \, F \, L}{Ebd^3}$$

$$\varepsilon_x = \frac{3(3mm)(4399 \, Kgf)(150 \, mm)}{(2091,03 \, Kgf/mm^2)(25mm)(6mm)^3}$$

$$\varepsilon_x = \frac{5938650}{11291562}$$

$$\varepsilon_x = 0,52\%$$

4 Deflection

$$\delta = \frac{FL^3}{48EI}$$

$$\delta = \frac{4912 \, Kgf(150 \, mm)^3}{48(2091 \, Kg/mm^2)(450 \, mm)}$$

$$\delta = \frac{4912.150^3}{45165600}$$

$$\delta = 367,04 \, mm$$

5 Deflection Angle

$$I = \frac{bd^3}{12 \, mm^4}$$

$$I = \frac{25mm(6mm)^3}{12 \, mm^4}$$

$$I = \frac{5400}{12}$$

$$I = 450 \, mm^4$$

Therefore, deflection angle can be calculated as follows:

$$\theta = \frac{FL^2}{16EI}$$

$$\theta = \frac{4219\,Kgf\,(150\,mm)^2}{16(2091,03\,Kg/mm^2)(450\,mm^4)}$$

$$\theta = \frac{994927500}{1505416}$$

$$\theta = 6,30^o$$

5   Conclusions

1. Horizontal welding position is better than vertical welding position and over head to weld result by using low carbon steel material and AWS E7018 electrode.
2. The position of welding gives a real effect on the weld result, it can be seen from the tensile test where the position of horizontal welding is 27.93 kgf / mm2, vertical welding position is 26.06 kgf / mm2 and for overhead welding position is 22 , 24 kgf / mm2.
3. On testing of this bending strength obtained the position of horizontal welding is higher than the value of other welding position, but other welding position is also suitable to be used depending on the conditions of the field.

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Policy Process As Hierarchy For Supporting Technology Upgrade of National Aircraft (Lessons of The Failure of N 250 Aircraft Program-Indonesia Aircraft Industry (IPTN))

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Abstract. This study reconstructs the framework of policy process as hierarchy for supporting technology upgradeof Aircraft which developed through technology development capability. By employing Soft Systems Methodology (SSM), this research result shows that combination between the framework of policy process as hierarchy and Global Value Chain (GVC) with typology of hierarchy includes: firstly, the relations between the three levels in theframework of policy process as hierarchy, particularly between policy level and organization level is not completely hierarchical and linear. In reality, each of the two levels sends feedback, especially in the participatory process of designing of National Development Planning. Secondly, political support from the government is also required. Thirdly, Indonesian Aerospace (IPTN/PT DI) should also strengthen product codification, production, marketing and networking with both national and international partners. The fourth finding is that in development of N 250, the relation is not completely hierarchical since active and long-term government intervention should be counterbalanced by codifiabilityand supplier competence to meet the requirements of the lead firm. The Government and Industry will obtain lesson learnt on how the strategy for supporting the aircrafts manufactured through technology development such as program of N 219 or R 80 which developed at present.

Keywords: policy process as hierarchy, technology upgrade, soft systems methodology.

1   Introduction

Since the reformation era until now, policy support, viewed from the perspective of policy process as hierarchy (Bromley, 1989) is relatively weak compared to the period of the New Order [1].

At the level of national policy, both in the Law of The Republic of Indonesia Number 17 of 2007 on the National Long Term Development Plan (RPJPN) 2005-2025 and Presidential Regulation No. 2 of2015 on the National Medium-Term Development Plan (RPJMN) 2015-2019, the policy direction of aerospace development has not been explicitly stated and prioritized. Whereas, as stated in Law of The Republic of IndonesiaNo. 25 of2004 on National Development Planning System, that the inclusion of policy direction on aerospace in RPJPN and RPJMN is a guarantee forthe sustainability of aerospace programs in national development. Especially considering that the development of the aircraft industry requires government commitment for long term, both in terms of funding and political.

At sectoral level, policy support for aerospace technology development is still very limited. The science and technology developmentplan (JakstranasIptek) 2015-2019 or National Research Agenda (ARN) 2015-2019 are not explicitly aimed at supporting of the development of aerospace sector. Even, until now, some testing labs facilities for a national program of N 219 or R 80 are not currently available, namely: Drop Test, Flight Simulator Engineering (EFS), Composite Test, Runway test, and Telemetry System.

At financial sector, government regulations governing the mortgage of aircraft as a guarantee of repayment of a debt as mentioned in Article 13 paragraph (3) Law No. 15, 1992 on Aviation has not been realized. In fact, an almost impossible if the external fund purchase of aircraft is only sourced from one financial institution alone let alone only from the institution of domestic financing (Muzakir, 2015b, a). All the more, the one of key success of air craft Y 12F produced by Harbin Aircraft Industry, China and ATR 72: 600 that respectively on the same class with N 219 and R 80 are the government supporting on financial sector [2],[3],[4],[5].

In addition, the existing of research fund such as research grant (insentif riset SIN as) and research grant for higher education under coordinated byThe Ministries of Research, Technology, and Higher Education Republic of Indonesia (MoRTHE), The Indonesia Endowment Fund for Education (*Lembaga Pengelola Dana Pendidikan*, LPDP) which organized by Ministry of Finance (MoF) and Indonesia Science Fund (Dana Ilmu Pengetahuan Indonesia, DIPI) under the auspices of the Indonesian Academy of Sciences (AIPI) did not synergy among them to stimulate the aerospace research development.At the industry level, financial condition of PT DI still weak till now.

In 2013, PT DI allocated research fund is only about 1% of the total turnover (3 Trillion Rupiah) which is about 30 Billion rupiah (PT DI Report, 2013). Though, the budget is needed into design development for R-80 is approximately US $ 300 million. Moreover, the total test facility PT DI that can be used for upgrading N 250 only a maximum 30%. Meanwhile, production capacity of PT DI is currently still very weak at only 12 aircraft per year, whereas the expected production capacity is 36 aircraft per year. On the one hand, the international market share of R-80 aircraft is about 150 aircraft per year. Even, in the period 2010-2029, the market needs turboprop aircraft with a passenger capacity of 61-120 is predicted to increase [6].

Need of engineers for upgrading N -250 to R-80 is about 1.000 people, or approximately 2 million man hours. Meanwhile, in the next 3-4 years, many engineers of PT DI will retire. Likewise, aerospace engineers are scattered in ITB, Agency for Assessment and Application of Technology (BPPT) as well as National Institute of Aeronautics and Space (LAPAN) which have been a partner of PT DI in the development of aircraft has become more limited.

A numerous policy studies on encouraging the development of the aerospace sector have been done by some researchers, including research ofJones (1999) on the WACO Aircraft Industry over the period 1919-1963. In that study, it was concluded that the role of

government in promoting aerospace industry research activities even became the first market of aircraft industry was a key determinant factor in the success of WACO Aircraft Industry.

   A comparative study of Franzis and Alex (2006) on Airbus and Boeing Industry concluded that some kind of government assistance for the aircraft industry namely: research and development funding, funding or facilitation of the construction process [8] human resources supporting, marketing, security assistance of sales contract from abroad etc. In addition, they stressed that industrial policy for the aircraft industry should be long term.
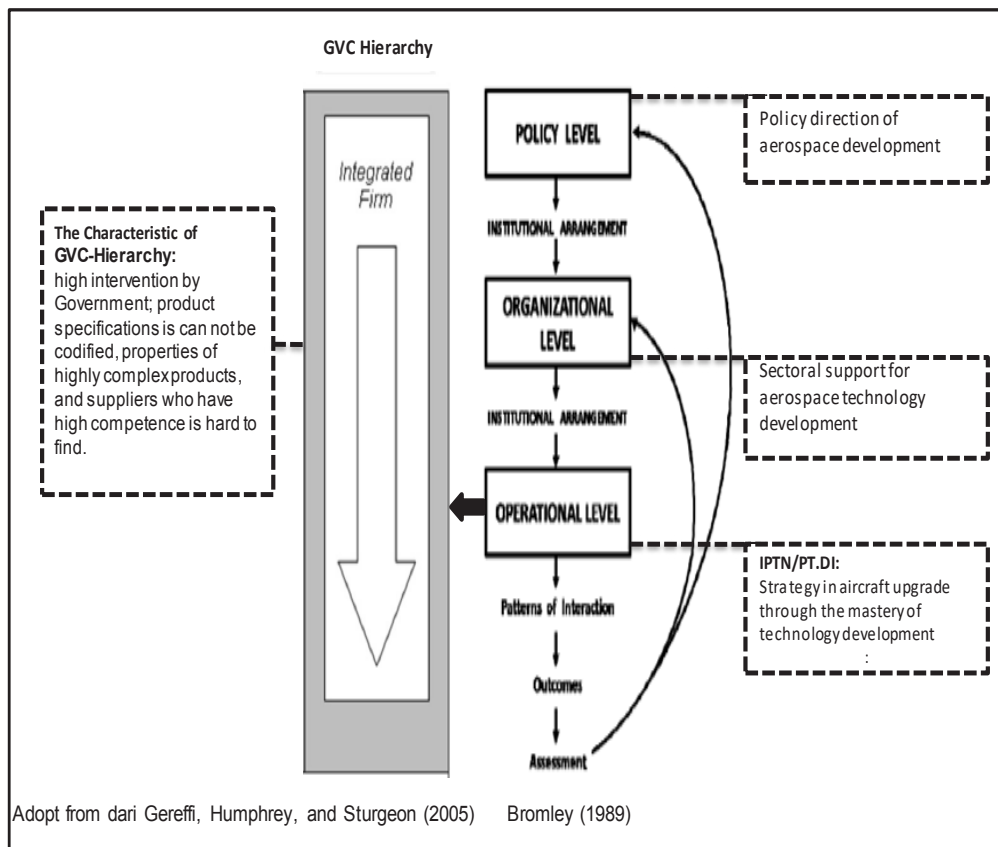
Fig. 1. Theoretical framework for Global Value Chain with typology of hierarchy and the policy process as hierarchy study
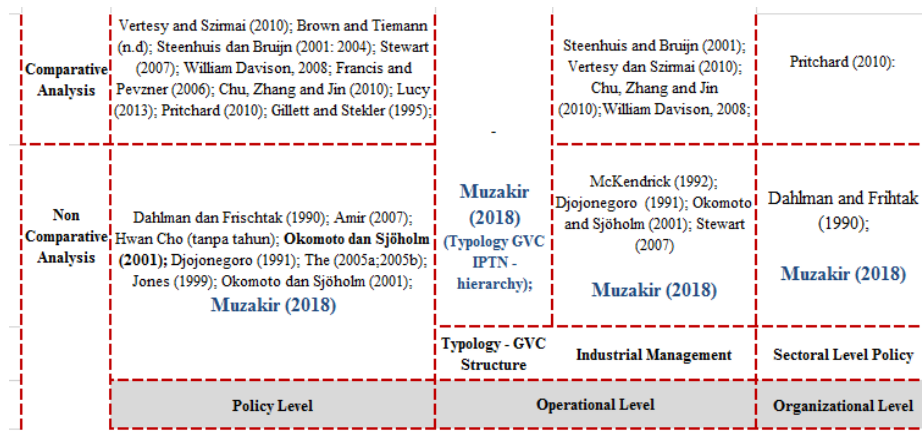
	Comparative Analysis	Vertesy and Szirmai (2010); Brown and Tiemann (n.d); Steenhuis dan Bruijn (2001: 2004); Stewart (2007); William Davison, 2008; Francis and Pevzner (2006); Chu, Zhang and Jin (2010); Lucy (2013); Pritchard (2010); Gillett and Stekler (1995);		Steenhuis and Bruijn (2001); Vertesy dan Szirmai (2010); Chu, Zhang and Jin (2010);William Davison, 2008;	Pritchard (2010):
	Non Comparative Analysis	Dahlman dan Frischtak (1990); Amir (2007); Hwan Cho (tanpa tahun); **Okomoto dan Sjöholm (2001);** Djojonegoro (1991); The (2005a;2005b); Jones (1999); Okomoto dan Sjöholm (2001); **Muzakir (2018)**	**Muzakir (2018)** (Typology GVC IPTN - hierarchy);	McKendrick (1992); Djojonegoro (1991); Okomoto and Sjöholm (2001); Stewart (2007) **Muzakir (2018)**	Dahlman and Frihtak (1990); **Muzakir (2018)**
			Typology - GVC Structure	Industrial Management	Sectoral Level Policy
		Policy Level		Operational Level	Organizational Level

Fig. 2. Map of the previous research on upgrading technology of aircraft and research contribution.

Research of Stewart (2007) on China's Industrial Subsidies Study: [9] High Technology, reported that the policy direction of aircraft Industry expressly stated well whether in a master plan for National Economic Development Plan (2006-2010) and also in the guideline for the long-term Technology Development Plan (2006-2020). In addition, they inferred that China's economic policies that encourage manufacturing of aircraft product is cross-industry subsidies for the High Tech Industry.

Pritchard (2010) examined on a number of aircraft industry namely Boeing industry of US, the Airbus industry of UE, Bombardier industry of Canada, United Aircraft Corporation (UAC) of Russia, COMAC industry of China, Embraer Industry of Brazil, Mexico Aircraft Industry and the Alenia Aeronautic Company of Italy [10]. The results of this study explained that government support either directly or indirectly is very important for the aircraft industry, especially when they launched new aircraft on the market. However, except Brazil, these studies are very less describe in detail how the shape of the government's role in each of these countries.

Research of Brown (no date) in their research on Air Bus Industry, concluded that government support is success factor of Airbus. In addition to subsidies, other government support is political will, especially penetration strategies in global markets [11].

In 2013, Suijun (Lucy) Yi done study on A Boeing Strategy to Shape a Competitive Advantage: A Phenomenological Study on Boeing Industries, recommended that Boeing should strengthen cooperation in technological innovation, especially with the US Government [12].

A study of Steenhuis and De Bruijn (2001) on *Developing countries and the aircraft industry: match or mismatch?*recommends that the national government support in commercialization of aircraft is very important [13]. In this study, they found that in the case of Avic Aircraft Industry- China, despite of the international markets is still failing, but the government of China encourages the use of aircraft for its domestic market.

Similar result was found in a study done by Vertesy and Szirmai (2010), mentioned that the lack of government supporting was a key factor the failure of some aircraft industry such as FAMA Aircraft Industry- Argentine, Romaero_Rumania and IPTN-Indonesia [14]. Moreover, they also found that the success of Embraer Brazil is because the government supporting is very high. Further, they said that even in the 1980s Embraer faced with the

economic crisis, but the Brazilian government kept to support to the company. After passing a critical period during 1990-1993, finally in 1994, Embraer back make profit. In addition, they also found that another success factor of Embraer especially for Embraer ERJ-145 aircraft was the policy of the Brazilian government which known as Programa de FinanciamentoàsExportações (ProEx). The policy give incentives for reduction of about 3.5% interest on loan for overseas buyer. According to Wall (2013), the policy of ProEx had been enforced since June 1991 [15]. Although in 1999-2000, the policy was considered illegal and eventually stopped by Word Trade Organization [16].

Based on numerous studies described above indicate that the key success factor in upgrading aircraft was not enough to rely solely on the ability of the industry level alone such as upgrading capability or codifiability of aircraft product etc. Even largely determined by harmonization of all level policies, namely policy level, organizational level and operational level or industrial management.

Figure 2 shows that the previous research on technology upgrading of aircraft only focused on separated analysis of the three level of policy process. Either, those research did not cover the combination between the framework of policy process as hierarchy and GVC. This research will full fill that gap (shown in blue colour), in addition it also enhanced with the comparative analysis especially with Embraer Brazil.

In the concept of policy, the relationship among the level of the policy is known as policy process as hierarchy concept as described by Bromley (1989). Moreover, the upgrading capability or codifiability of product is part of GVC concept as described by Gereffi, Humphrey and Sturgeon (2005); Staritz and Morris (2013); Gereffi (2012) and Kaplinsky and Morris (2000) [20]. As far as the literature review, policy studies on upgrading aircraft technology, especially integrating the concept of GVC and the policy process as hierarchy is not yet found [17],[18],[19].

However, on one hand, the classification of Aircraft Industry as GVC with typology of hierarchy is based on aspects of high intensity of government support which explained [17]. Though, on an other hand, Gereffi et.al (2005) also said that codifiabilility is character which not attached to typology of Hierarchy. But it attached to the three others of typology of GVC namely: market, modular and captive. This shows that the structure of the GVC determined not only by the level of coordination between the firm with suppliers but also because the combination with aspects of the government support level is needed.

The theoretical framework that integrating the concept of upgrading in Global Value Chain with typology of hierarchy and the policy process as hierarchy described in figure 1.

The situation problematical of policies for supporting aircraft upgrade through the mastery of technology development capabilities in Indonesia with reference to the failure program aircraft N 250 is placed on the conceptual framework that combines policy process as hierarchy (Bromley, 1989) and the GVC with typology of Hierarchy (Gereffi, Humphrey and Sturgeon, 2005) and use to improve the situation problematical faced as well as lessons learned for program of upgrading technologies that are currently being or will be taken by the government and industries, such as program of N 219, CN 235 and R-80.
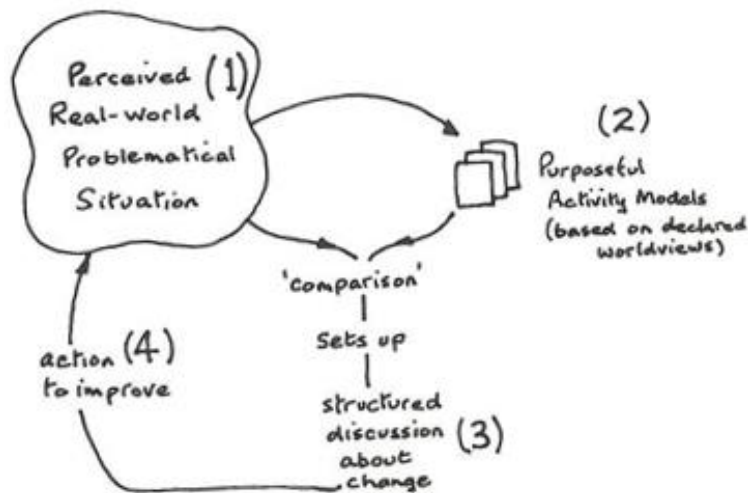
2 Method

This research has some characteristics both referring to factual problematic and conceptual problematic issues. The first characteristic is related to complexity and messy

problem situation in supporting aircraft upgrade through technology development capability of GVC with typology of hierarchy.

Second, this study focuses on Human Activities System (HAS) which is many of conflicting worldviews between actors [21],[22],[23],[24]. It is seemed in the policy process of aircraft upgrade through technology development that need support not only from various sectoral actors with different perspective, but also it needed political will for long term.

Based on those characteristics, Soft Systems Methodology will be used to reconstruct the policy conceptin supporting aircraft technology upgrade in aircraft industries with a hierarchical typology.

Fig. 3. The iconic representation of SSM's learning cycle. (Checkland and Poulter, 2006)

In order to achieve those transformations, Softs Systems Methodology (SSM) included four steps as learning cycle: (1) finding out about the initial situation which is seen as problematical, (2) model building, it includes two steps namely:formulating root definitions (RD) meeting the CATWOE requirementsand defining conceptual model. A root definition expresses the core transformation that would be "a system to do P by Q in order to achieve R". (3) Discussing or Comparative analysis of the conceptual model through debating with the theory or the best practice of Embraer Brazil, (4) Define/take the action to improve the situation [24],[25].

For doing this research, the four steps above is added with data collecting technique for each (Table 1).

Table 1. Data collecting technique.

Step	Data collecting technique
1	Review of documents, interviews with stakeholders, review of related focused group discussion (FGD) for digging factual problems of both, problem of technology upgrading process of aircraft which produced

	by IPTN such as NC 212; CN 235 and N 250 and problems in the perspective of policy process as hierarchy Bromley (1989)
2	-Review of documents, interviews to identify the transformation that is required at each level of policy process as hierarchy Bromley (1989).
	-Informal discussion, interview, and assessing documents to draw up a conceptual model in the context of the transformation that is required at each level of policy process as hierarchy Bromley (1989)
3-4	Informal Discussion, Interview, Assessing of FGD related the comparison between the conceptual model with the theory / concept, or with the best practice of other countries such Embraer Brazil

The data collection of the both interviewing and discussing or FGD for all steps of SSM accessible completely in Muzakir, M.A.I. (2015b) page. 306-322.

2.1 Finding Out

On this step identifiedthe situation both the social and political aspects. In addition defining research questions, namely:

How does the concept of the policy process as hierarchy (Bromley, 1989) to encourage technological upgrading through the mastery of technology development capabilities in the global value chain - PT DI with reffering to the failure of N 250 as lesson learnt for next similar program such program of N 219 or R-80?

2.2 Model Building

In this stages produced Root Definition, namely: The system is owned and operated by researchers in order to use the the framework of policy process as hierarchy for supporting technology upgrade of aircraft through the mastery of technology development in the Global Value Chains with typology of hierarchy PT DI with reffering to the failure of N 250 as lesson learnt for next similar program such program of N 219 or N 245 or R-80 (P) through research-based action research interest SSM (Q) to guarante the framework of policy in supporting the independence of national aircraft industry (R).
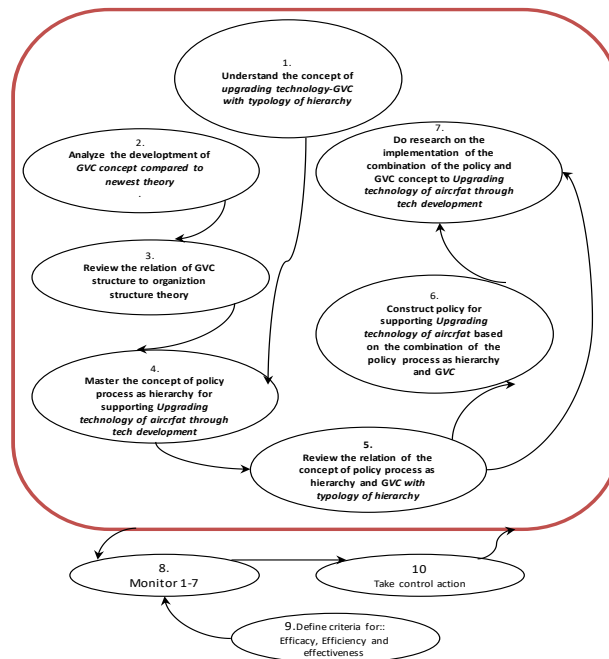
CATWOE especially transformation is monitored by three independent criterias: 1. Efficacy - to judge if T is actually working and producing its intended consequences; 2. Efficiency – T is being achieved with the minimum of resources; and 3. Effectiveness whether the transformation is strategically aligned to the higher purpose.

Root definition as mentioned above will be used to design conceptual model shown in figure 4. It controlled by CATWOE (see table.2).

Table 2. CATWOE (Controller for RD).

Code	Description
C: Customer *the victims or beneficiaries of "T"*	Researchers team, PT DI, Aircraft Industry, Government and Academia

A: Actor: *who would do T*	Researchers team
T: Transformation *the convertion of input to output*	Reconstructing the framework of policy process as hierarchy for supporting technology upgrade of aircraft through the mastery of technology development in the Global Value Chains with typology of hierarchy PT DI with reffering to the failure of N 250 as lesson learnt for next similar program such program of N 219 or R-80?
W: Weltanschaung/ *the worldview which makes this 'T'' meeaningfull*	The policy support for upgrading technology of aircraft through technology development capabiity are key success factor aircraft industry
O: Owner *who could stop T*	Researchers team
E: Environmental Constraints	Budget and time are limited

Fig. 4. Conceptual Model of Reconstructing a concept of Policy Process in Promoting technology upgrade of Global Value Chain with a Hierarchical Typology of Indonesia Aircraft Industry.

2.3 Discussing/Debating

In this step, the conceptual model shown in figure 4 will be debated with some relevan theory and/or with best practice of aircraft industries, especially Embraer of Brazil.

Taking Embraer as benchmarks in this study, due to some reasons: firstly, both IPTN and Embraer are companies founded on initiation and owned by the state, although finally in 1994,

Embraer was privatized [14],[26]. Secondly, the upgrading stage of the plane taken by Embraer is also the same as IPTN that is from the license, joint venture till technology development [27]. Thirdly, Embraer EMB-120 and ERJ 145 are respectively on the same class with CN 235/N 250 and N 2130. In addition, the development of EMB 120 just two years before of development of N 250.

This step done for acquiring any improvement or changes which are both desirable and feasible for each activity of conceptualmodel. Finally, the final conceptual model that consists of ten activities as described in figure 4will be defined for doing the transformation as stated above.

3 Results/Definig The Action

There are four research findings of combination between the framework of policy process as hierarchy and GVC with typology of hierarchy for supporting upgrading technology as shown in figure 5. It includes conceptual finding and problem solving recommendations namely: firstly, after the assessment, the relations between the the three levels in the framework of policy process, particularly between policy level and organization level is not completely hierarchical and linear. In reality, each of the two levels sends feedback, especially in the technocratic process and/or participatory process of the national development planning which are both RPJPN and RPJMN.

Secondly, in addition to support at the level of regulation in national development, political support from the government is also required. This finding actually supports the conclusion pointed out by (Grindle, 1980) which stated that political force of the program implementers will lead to the success of a program [28]. Thirdly, it is found that improvement is not only required at the policy and organization levels, but also at the operational or industrial level. The fourth finding is that in the GVC of IPTN, especially in the development of N 250, the relation was not completely hierarchical since active and long-term government intervention should be counterbalanced by codifiability and supplier competence to meet the requirements of the lead firm. This finding also criticizes the theory proposed by Gereffi, Humphrey and Sturgeon (2005) about two criteria of GVC with a hierarchical typology, namely the lack of codifiability and low level of supplier competence. In the context of upgrading aircraft through technology development, the lead firm codifiability and supplier competence are very high [17].

Compared to Embraer-Brazil, especially when they were developing EMB 120 aircraft, it is known that: first, like IPTN, Embraer-Brazil also gained much support from the government through the inclusion of aerospace policy directives in the national development plan [29]. Nevertheless, unlike IPTN, in addition to government support, Embraer-Brazil also had generous fiscal support from funding institutions for science and technology such as FINEP (Agency for Financing Studies and Projects), Pro Ex (Programa de FinanciamentoàsExportações), The Special Sectariat for Science and Technology (Pritchard 2010, Vertesy and Szirmai 2010, Dahlmanand Frischtak, 1990), and The Brazilian Development Bank-BNDES [30],[31]. The considerable support made Embraer very successful both nationally and internationally.

Secondly, IPTN and Embraer share similar stages in upgrading aircraft technology, from developing under license aircrafts, turboprop aircrafts, until jet aircrafts. However, what

distinguishes the two companies are: first, both EMB 110 and EMB 120 aircrafts as well as ERJ 145 jet aircraft only played at class 19 sheeters until below 50 sheeters [32].
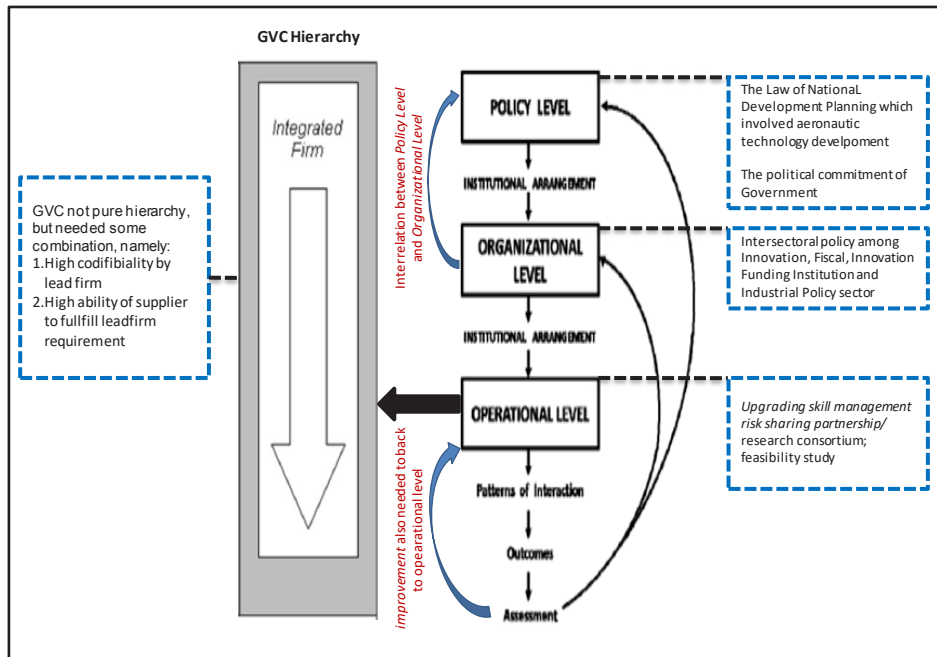
Fig. 5. Result of reconstructinga concept of Policy Process in Promoting technology upgrade of Global Value Chain with a Hierarchical Typology of Indonesia Aircraft Industry.

On the contrary, in the case of IPTN, either NC 212, CN 235 or N250 aircrafts has the capacity of 24 sheeters, 35 sheeters, and 50-70 sheeters respectively. Second, in terms of product differentiation, Embraer did not rush to use advanced technology such as fly by wire (fbw) even in ERJ 145 aircraft, whereas IPTN had installed fbw technology in N 250 aircraft. Not only the strategy boost the price of the aircrafts, it also made the certification process to be more complicated [14].

In terms of operational capability, IPTN production capacity was regarded very low, within a period of 10 years, since 1987, IPTN only managed to produce no more than 40 units of CN 235 aircraft from the target of 36-40 units per year [33]. One of causes of the low level of productivity was the company's poor management. The management style during that period is considered top-down and single-handed.

Metaphorically speaking, if IPTN was a symphony orchestra, Habibie was the conductor and also the composer. Unfortunately, the management style was not counterbalanced by the sense of responsibility from the board directors [33]. The company's poor management had caused the practice of rent seeking or opportunistic behaviour done by some IPTN employees at that time [34].

Compared to Embraer-Brazil, in 1969, when Embraer started the production of an EMB-110 Bandairente turboprop plane under Italian company licenses, the 19-seater aircraft had been produced 3,983 planes or 265 aircraft per year, mostly for the domestic market. In 1975, Embraer became sole supplier for domestic market needs.

In the period 1985-1999, EMB 120 which has same class with CN 235/ N 250 has been produced about 354 aircraft and successfully obtained the FAA certificate in 1985 and European Certification in 1986. Although EMB 120 aircraft has decreased production due to problems corporate finance which affected by global recession, but the aircraft is quite successful even fulfil a third of the total world class aircraft market.

To make sure that transformation at each level of hierarchical policy process are successful, in the conceptual model that has been arranged before, it will be involved some activities such as following: firstly, in order to incorporate science and technology policy directive into the national development agenda, related sectors such as MoRTHE, The House of Representativesof The Republic of Indonesia (DPR-RI), Ministry of National Development Planning (BAPPENAS), and the President should supporting consensus for incorporating aerospace technology development into both, RPJPN and RPJMN.

In supporting the effort, the MoRTHE should mainstreaming science and technology development, particularly the aerospace sector in the designing proses of national development planning whether through technocratic process and participatory process. In the both process must be supported by National Strategic Policy of Research, Science and Technology (JakstranasIptek) and in National Research Agenda (ARN) which also containing the roadmap of science and technology policy, especially the aerospace sector.

Still in the innovation sector, needed to harmonize among the existing innovation financing institution namely research grant (insentifrisetSINas) and research grant for higher education which coordinated by MoRTHE, LPDP which organized by Ministry of Finance (MoF) and DIPI under coordinated by AIPI. Those research financing institution should be directed as synergy to support for aeronautic technology development.

The model of synergy of those fund in aerospace respectively: Research Grant-InsentifSINas and LPDP for financing research of mastering key technology for aircraft technology. Grant of LPDP also for research of technology policy, governance, and infrastructure procurement. Research fund of DIPI for supporting matching fund that mixing between National Government Budget and International Budget for research of aerospace development especially for national aircraft development.

However, policy support at the level of national regulation is not enough. The success of Embraer Brazil in the period of 1990-1997 was because Government committed to continue to provide assistance even though the company was faced with a financial crisis as an impact of global recession. On the contrary, when IPTN was faced with the economic crisis in 1998, the government cut their political support through the sign of a Letter of Intent (LoI) between Indonesian Government and IMF which was then followed by Presidential Instruction No.3/1998 on the termination of funding support for IPTN, especially for N 250 development program. Ignoring the fact that Indonesian government had spent about USD 650 million on the program. When the program was terminated, N 250 aircraft had 800 flight hours and only required 700 hours more to achieve Federal Aviation Administration –FAA and Joint Aviation Authorities- JAA certification [35],[36],[37].

Secondly, to improve synergetic cooperation among institutions, it is necessary to reestablish synergy among institutions based on the core business of each institution. Synergetic institutional cooperation is not only limited to four major sectors, human resources and infrastructure testing sector, research and innovation sector, industrial sector, and financial/banking sector, but as a national program, it should also be a matter of concern for all sectors such as the Ministry of State Owned Enterprises and the Ministry of Transportation, they should respectively support on the development of air craft industry and facilitating the certification procedures for the aircrafts manufactured by the industry.

In addition, support from Bank of Indonesia or from Financial Service Authority in the commercial endeavor is still badly required, particularly with the issues related to leasing policy and procedure in national banks or export credit grant for overseas purchase. The leasing will aid technology-based industries such as PT DI or IPTN in marketing its products both nationally and internationally. Government regulations on the mortgage of aircraft as a guarantee of repayment of a debt as mentioned in Article 13 paragraph (3) Law No. 15, 1992 on Aviation should be realized as soon.

Thirdly, to improve business management especially strategy of technology upgrade of aircraft through technology development, PT DI should include the following activities in the conceptual model: first, PT DI should have professional board of directors who, not only understand technology, but also business management, especially in aerospace industry. Second, PT DI should have competitive market segmentation, particularly in determining aircrafts that fit for airports with unsophisticated infrastructure. Third, PT DI should be able to enhance cooperation through innovation consortia.

Fourth, to boost production capacity, PT DI should improve its marketing and minimize the risk of failure, which can be done by improving its network both with national and international industries through risk sharing partnership. To facilitate the success of business strategy implementation mentioned above, the company should support it by undertaking feasibility studies on the aircrafts to be manufactured.

4   Conclusions

By applying SSM, reconstructing the concept of policy for upgrading technology in GVC (Gereffi, Humphrey and Sturgeon, 2005) through improvement in the three-hierarchical level of policy process (Bromley, 1989) as showed in figure 6 comprise: Firstly, in addition to regulation support of the national development direction, political support from the government is also required. Second, a two-way communication is required between policy level and sectoral level, especially science and technology research sector, in the effort to mainstream aerospace technology development in the national development planning. Third, model reconstruction also demands improvement at operational level. Fourth, a GVC typology of aircraft industry which is effective for aircraft technology upgrade program is not completely hierarchical since lead firm codifiability and supplier competence in complying with the lead firm requirements are very high. Conceptually, there are two findings, first, the relations between the three levels of policy process, particularly between policy level and organization level is not completely hierarchical and linear. In actuality, each of the two levels sends feedback, especially in technocratic and participatory process of both, RPJPN and RPJMN. Second, regarding to the success story of Embraer-Brazil, in addition to support at the level of regulation in national development, political support from the government is also required. It included the government regulations governing the mortgage of aircraft as a guarantee of repayment of debt.

This study recommends in supporting technology upgrade program for the aircrafts manufactured through technology development such as N 219 or R-80 Air Craft Program, besides supporting by policy level in the Law Number 17, 2007 on RPJPN and in Presidential Regulation on RPJMN, Indonesian Aerospace (PT DI) should also strengthen its value chain, especially improving the management system in terms of product codification, production, marketing and networking with both national and international partners.
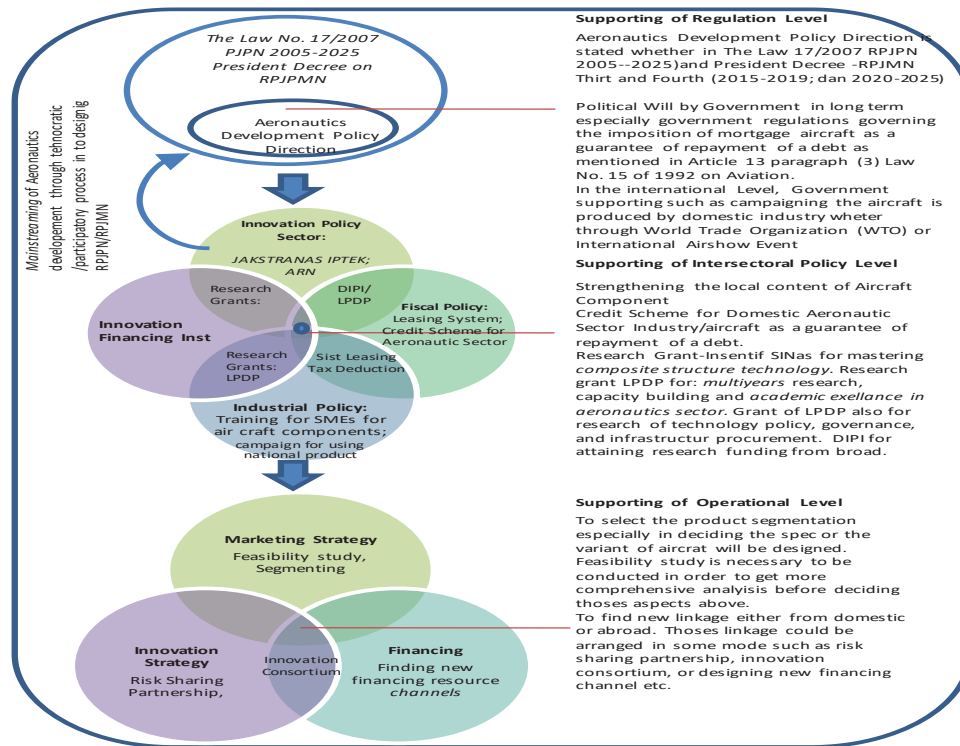
Fig. 6. Model of Policy Process as Hierarchy for Supporting Technology Upgrade Program for The Aircrafts Manufactured through Technology Development such as N 219 Air Craft Program or R-80 which is Upgrading of N 250.

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Teacher's Voice And Student Interpersonal Attractiveness

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Abstract. Student's perception of attractiveness of their teacher's appearance does not only come from the external performances such as the face or cloth, which are visible to visual senses, but also from the voice heard by the learners, which will bring out the particular perception on how they see their teacher. This current study investigated whether the influence of the pitch of the teacher's voice influenced the perception of student's interpersonal attractiveness towards their teacher. This research used quota sampling technique and was designed by manipulating the pitch of the male and female voices to rank their attractiveness from the participant. The result from this study was indicated that teacher's voice pitches were related to their interpersonal attractiveness.

Keywords: Voice Pitch, Interpersonal Attractiveness, Student-Teacher's relationship.

1 Introduction

Education is the process of forming intellectual and emotional skills to be able beneficial for nature and others. Basically, humans are born as living beings who have the sense to think. In line with the opinion of John Dewey that education is the most important thing for humans to be able to continue to hone and develop the ability possessed. Education can be obtained from the family environment, school environment, and community environment.

When it comes to education, it is closely related to a teacher and a student. Teacher has a variety of roles in teaching and educating students, teacher's diverse roles in teaching and learning processes - teacher as collector, initiator, facilitator, mentor, demonstrator, classroom manager, mediator, supervisor and elevator, teacher also has a variety of important tasks and roles, teacher plays a role as the second parent after the parent at home and the task of teacher as a profession that demands to develop the professionalism of self, according to the development of science and technology [1].

Albeit, student's interest in each teacher in terms of appearance is certainly influenced by the perception of each student. This is supported by the opinion of Berry and Hansen (1996) which stated that one of the things affecting interest in a person is the perception. Perception is someone's impression or judgment of others [2]. Yufiarti and Gumelar (2013) stated that perception is a process by the organism in interpreting and organizing sensations to produce a meaningful experience [3].

Perception, in this case, is pursed on the interpersonal perception which one of them is influenced by the appearance or physical attractiveness. This assumption suggests that the perception of interpersonal interest as a simplified picture of conclusions about others (interaction between teacher and student or between student and teacher). Interpersonal interest is among other considerations of a person in building the relationship with others, in addition to personality and other aspects, the outward appearance that can be perceived by the senses altered the perception that formed in a person about others. Individual interpersonal interest is an attitude about others, in which social psychology believes that it contains the evaluation mechanism. In other words, someone will make a positive evaluation when they feel positive and makes a negative evaluation if feels negative [4].

As social beings, humans have the need to interact with others and used it as a way to understanding others, which is an important field in the discussion of educational psychology. There are several studies that highlighting the importance of interpersonal interest and interpersonal attraction toward the successful learning processes in class.

Like for example the classic study of Lott and Lott (1965) showed that the interpersonal attraction has positively influenced student academic achievement, where pupils tends to learn faster when they were working with the people they loved [5]. Once the interpersonal attraction between students and teacher is developed, they will have better chances to establish a positive communication in a class. As a result, this effective communication can support the effectiveness of learning and teaching processes.

The perception of the teacher's physical attractiveness is not only seen from the face or something that visually engaging, but, the voice heard by the student also raises certain judgments. Voice as an acoustic signal produced by human consists of various aspects. Based on research that has been done, the aspect that most influence someone's perception is voice pitch [6]. Voice pitch is formed from the vibrations produced by a person's vocal cords, where the vocal cords result from hormones produced within the body. In the learning process, the voice of the teacher, which is also known as the language of the teacher, has an important role of successful teaching process. Voice is the main element that teacher must have because a teacher must be a good communicator by having the skills to speak so that the process of transferring information can be worked thoroughly and the learning material can be accepted by students very well [7].

According to Pisanski and Rendall (2011) tone of voice is fundamental for perception process. They suggest that voice pitch along with timbre are important elements in perceiving someone's conversation. Both elements are based on the fundamental frequency which is resulting the voice [8]. The fundamental frequency is the sum of the vocal cords vibration per second. This amount corresponds to the length and duration of the vocal cords. Someone who speaks with a rising tone, the vocal cords will thin out and shorten so does with the lower vocal as well. The fundamental frequency is usually measured in Hertz (Hz), Hz represents the number of periodic cycles per second. Pisanski and Rendall (2011) mentioned that the fundamental frequency associate with the perception of voice pitch in which determined by the speed of the vocal cords vibration. In other way, not only about frequency but also gender differences in perceive of voice attractiveness having role in human interactions [9]. According Vukovic *et al.*, (2011) women who showed a particularly strong tendency to perceive feminine voices as more trustworthy. Its may be conclude that the gender from teacher pitch have a different attractiveness from students perceived [10].

The study about differences in the voice pitch that relates to the appearance of a teacher performance is limited. Therefore this research study intended to investigate whether a teacher's voice pitch performed by the teacher affects student's interpersonal interest. This

research was conducted to elementary school students, with the age range of 7 to 12 years. The reason is at this age the student has reached the concrete operational stage where children can group or divide something into different rules or sub-rules and consider the relevance [7]. At this age, the child has one of the three major impulses that a child experiences at this age that is the mental drive to get into the world of concepts, interactions, thoughts, and symbols of adults and children at this age is required to develop attitudes against the institution or social group.

2   Method

This research was used quantitative research approach with the pre-experiment design. The study was performed through observing one major group and intervening throughout the study. There was no control group to compare with the experimental group [11]. The pre-experimental design used was the One-Group Post Test Design.

Subjects in this study were students with the age range of 10-11 years in five elementary schools located at East Jakarta. The data processed with manipulation check in order to ensure that the stimulus familiarity of respondent is free from bias.

The Likert scale was used in the measurement of this research. The scale consists of statements based on the theory of interpersonal interest. According to Baron, R.A and Byrne, (2003) interest refers to the level of interpersonal likeliness to something, where it has an evaluation aspect that would come into either positive or negative evaluation, with a range from very like to very dislike. The reliability coefficient of all items with a total of 6 items was 0.835.

The statistical test used the Repeated Measure Sphericity Assumption method to see the effect of the independent to dependent variables. The intervention used in this study was the manipulation of the recorded teacher's voice pitch using the PRAAT acoustic phonetic software with each recording manipulated by raising and lowering the pitch by ± 20 Hz (17-21 Hz). T Each record is manipulated by raising and lowering its pitch of (17-20 Hz). The process of sound manipulation was done by using the PRAAT acoustic phonetic software [12]. The manipulation should be compatible with the human auditory sense in general.

3   Result and Discussion

This study involved 150 participants where only data from 131 people which can be processed (N=131). 19 participants withdraw due to recognizing the voice stimulus provided. This can bring the effect of subjectivity which could further influence the participants' perceptions of the given stimulus. Subjects aged 10 years with a percentage of 6.87% as many as 9 people, aged 11 years with a percentage of 73.28% of 96 people, and aged 12 years with a percentage of 19.85% as many as 26 people.

To minimize bias in this study, the introduction of the stimulus from the manipulation to be used by using the question "*do you recognize this voice before?*" The answer to the subject that recognized the voice stimulus is biased because the voice stimulus will be associated with a characteristic of the foreknown teacher. Based on the manipulation check, it was found that 87.3% of participants (N=131) were eligible to continue the research process.

	low	normal	high
Boys	3,04	3,52	2,93
Girls	3,03	3,56	3,98
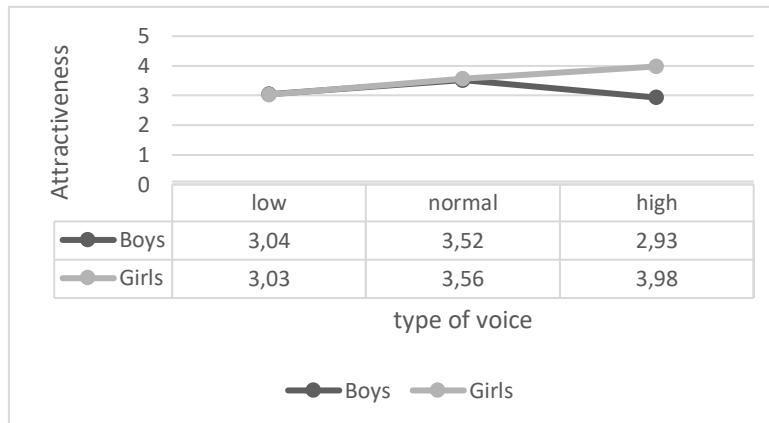
Fig. 1. Voice attractiveness among gender perspective.

Figure 1 shows the mean value of each variation of voice pitch that has been made with the female pitch variation is preferred over other 5 variations of voices. For the male voice pitch variation preferred normal voice pitch than low and high male voice pitch variations. The result shows that normal voice pitch was preferred over high and low voice pitch variations.

The following table is a result of the significance of mean scores comparison between variations using the Repeated Measure ANOVA technique.

Table 1. Repeated Measure Sphericity Assumption.

Factor	F	Sig
Voice Pitch	29.777	0.000

From the table presented above, could be seen that the result of statistical analysis of Sphericity Assumption resulting F score of 29.777 with a p value of 0.000. This result means that there was significance correlation, so it can be concluded that $p < \alpha$ which means alternative hypothesis (Ha) in this research was accepted while the null hypothesis (Ho) in this research was rejected. If used F table comparison (1; 130) with F calculation, the result of F table was 3.91 so it can be expressed F count > F table. So it can be concluded from the data of F calculation that alternative hypothesis (Ha) was accepted and the null hypothesis (Ho) was rejected, thus there is a significant influence of voice pitch variable with interpersonal interest variable.

The perception of the teacher's physical attractiveness is not only seen from the face or something that is visible to the eyes, the voice heard by the student also raises certain

judgments. Voice as an acoustic signal produced by humans consists of various aspects. Based on the research that has been done, the aspect that most influence someone's perception is voice pitch [6]. Voice is a component of the physical morphology that determines human's interest, thus the voice pitch heard by the students might raises particular judgments.

Teacher should have a nice and engaging appearance, particularly in managing the voice while teaching to ensure their student paying the attention and further enhanced learning efficiency. In accordance with the previous research in which stated that students' achievement is strongly influenced by two factors one of the factors is the external factor that is the appearance that can influence student's interest and motivation, so this research proves that there is influence between the teaching performance of civics education teacher toward student motivation.

In this current study, the attractiveness of the teacher is sourced from its voice and the results of this study suggest the voice of the teacher influences interpersonal interest. In addition, this study is also in line with the theory that a qualified teacher is the one who runs the job professionally. In other words, to master a good pedagogic competence, teacher must also have good yet clear voices, by not too fast or slow and varied [13]. In accordance with the research, students prefer medium voice pitch than voice pitch that sounds fast or slow. This is consistent with the theory that the basic skills of teaching are not only competence and science but also of the ability of the teacher to provide his or her skills in teaching, and one of the skills that the teacher has belonged to is the skill in the voice variation in order to achieve the appropriate learning targets.

Voice is the important aspect which is used as the language of the teacher to communicate and deliver learning materials. Good voices have an impact on the achievement of understanding in students and can improve the school's ranking. This is in line with Cherepanova (2002) research which mentioned that one of the external images is the voice of the teacher that can improve the quality of education and the achievement of educational goals to improve the ranking of the school. One way to be a good or ideal teacher is to have an external image or good speaking skills as well.

Teacher should be a good communicator by mastering the ability to deliver their massages efficiently, particularly through their voice.

The use of teaching styles variations including voice can enhance and nurture students' attention to the relevance of teaching and learning process, improve students' learning atmosphere, and encourage as well as motivate children to learn, in this case the variations of voice that teacher can do in the form of intonation, tone, speed and volume [1]. Teacher's gestures do not only rely solely on the pedagogical competence, but also come from the external images and variations in teaching such as their voice. With all of this in teacher's hand, they will be able to establish a dynamic interaction, improve communication between teacher and students, and can attract students' attention to the teacher. This gesture will affect the outcomes that will be achieved by the students, if the students love the teacher, the teacher also likes the students and students try to learn the best will create a relationship between teacher and child, starting from the student's interest in the teacher.

4   Conclusions

From the several variations of voice pitch presented, the results show that normal male voice pitch was more attractive for students and the second place, normal voice pitch of the

female also have an attraction when compared to the low or high pitches either in male or female students. Finally, it can be concluded that normal voice pitch both male and female have more attractiveness when compared with low and high voice pitch both in male or female voice. Referring to the research results and conclusions that have been elaborated can be proposed suggestions such as (a) the measurement of interpersonal interest can be expanded by comparing the two stimuli so that more visible preference characteristics are measured.

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The Role of The State Government In Managing and Preserving The Sasi Administration In The State of The Haruku

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Abstract. Customary law is a legal system known in the social life environment in Indonesia and other countries. Indonesia consisting of various islands and regions scattered from Sabang to Maroke from Mimar Island to Rote Island with so many cultures and customs. One of the local wisdom of the people of Maluku is Sasi lompa is a sanction for the community in terms of preserving the environment and an appropriate ecosystem and alera life alalam. This type of research is empirical juridical research, this research was conducted in Central Maluku District, Negeri Haruku Sameth. Sources of data used in this study ie primary data and secondary data, data collection techniques conducted by interview and document studies. The problematic role of the Government of the State in making a State Regulation in protecting certain ecosystems that become the value of local wisdom and economic value for the life of the community.

Keywords: Customary law; sasi lompa; state regulation.

1 Introduction

The law of a country as an equivalent which is defined as a system of behavior in regulating human beings is a form of coercion. This means that all the order reacts to certain events, which are considered as something that is not desirable because it is detrimental to society and can provide a certainty of something abstract [1]. John Austin, quoted by Soerjono Soekanto [2] argues that the law is an order from those who hold the highest power or who hold sovereignty. According to Austin, law is what is charged to regulate thinking beings, which commands are carried out by thinking beings who hold and have power. In addition to the legal authority as outlined in the introduction, in addition to the legal authority, the need for institutionalization of law in the community is to enforce the law as part of a series of processes which include law making, law enforcement, justice and justice administration. Customary law is a legal system that is known in the environment of social life in Indonesia and other countries. The source of customary law is unwritten legal regulations that grow and develop and are maintained with the legal awareness of the community. These regulations are not written and are growing, so customary law has the ability to adjust and elastic.

The term customary law was first introduced scientifically by C. Snouck Hurgronje, then in 1893, C. Snouck Hurgronje in his book entitled "De Atjehers" mentions the term customary law as the custom of recht (Dutch) which is to name a control system social (social control) living in Indonesian society. This term was then developed scientifically by Cornelis van

Vollenhoven who was known as a Customary Law expert in the Dutch East Indies (before becoming Indonesia).

Cornelis van Vollenhoven was the first to launch the idea of the division of customary law. According to him, the regions in the archipelago according to customary law can be divided into the following 23 customary environments: Aceh, Gayo and Batak, Nias and surrounding areas, Minangkabau, Mentawai, South Sumatra, Enggano, Melayu, Bangka and Belitung, Kalimantan (Dayak), Sangihe-Talaud, Gorontalo, Toraja, South Sulawesi (Bugis / Makassar), North Maluku, Maluku Ambon, Southeast Maluku, Papua, Nusa Tenggara and Timor, Bali and Lombok, Java and Madura (Coastal Java), Java Mataraman, and West Java (Sunda), while according Gerzt states that Indonesian people have 350 cultures, 250 languages and all beliefs and religions in the world are in Indonesia. The recognition of the Indonesian government against customary law has been manifested in words that become a sentence and implied in the constitution as stipulated in the 1945 Constitution of the Republic of Indonesia Article 18B paragraph (2).

Culture is regulating so that people can understand how they should act, act, determine their attitude if they relate to other people. Edward Burnett Tylor, culture is a complex whole, which contains knowledge, beliefs, art, morals, laws, customs, and other abilities acquired by a person as a member of society. The purpose of cultural preservation is also to revitalize culture (strengthening). Regarding cultural revitalization. A. Chaedar Alwasilah said there were three steps, namely: (1) understanding to raise awareness, (2) collective planning, and (2) generating cultural creativity.

The implementation of the sasi in the Haruku area, which in the original language was called "Sasi Aman Haru-Ukui". Historically based on historical stories, the implementation of this sasi began in the 1600s. The implementation of this sasi is related to the enormous natural potential in Haruku, and to safeguard and preserve and maintain all the natural resource potential contained in Haruku. The implementation process of sasi is aimed at preserving nature and its wealth both on land but also at sea. Sasi lompa is a source of one of the marine resources, namely sasi against jumping fish which has been banned by customary law to catch if the sasi has not been opened. The process of opening the sasi was marked by the beating of Tifa by Kewang as a sign of opening, then the first stocking of the nets by the King and the pastor of the sasi was opened, then only by all the residents were they free to catch the fish of lompa.

Based on the above description, the writer raises the problem to be examined are: How is the role of the State Government in shaping the state regulation in preserving sasi lompa in the state of Haruku? The purpose of this paper is to examine the role of the Regional Government in the provision of regulating legal instruments related to sasi lompa on my island.

2 Research Method

This type of research is empirical juridical research, the empirical legal research that was investigated initially was secondary data which was then continued with research on primary data in the field. This research was conducted in Central Maluku District, Haruku - Sameth State. The source of data used in this study is primary data and secondary data, primary data is done to obtain field data by conducting interviews directly with informants. Secondary data is done to obtain library data sourced from legal materials consisting of: Primary Legal Material, namely legal material that becomes the basic basis that has a binding nature, in the form of

applicable legislation governing related issues in this study . Secondary legal material, it is needed materials in the form of books, scientific papers and seminar results that are relevant to this research, tertiary legal materials or supporting legal materials that include materials that give instructions and explanations of primary, secondary legal materials such as general dictionaries, legal dictionary, which is relevant and can be used to supplement the data needed in this study.

Data collection techniques are carried out by direct interviewing the field by asking questions directly to the resource person to obtain the necessary data related to the problem. Document study is carried out to obtain secondary data, by collecting library material or other data sources. In addition, it records the quotes and reviews of the theories and legislation relating to the object of research. The technique of analyzing data collected through research was analyzed with qualitative descriptive methods, namely by analyzing data obtained from primary and secondary data sources. After that a thorough discussion was carried out, and based on the discussion a conclusion was taken as an answer to the problem under study.

3 Result and Discussion

3.1 Overview of Indonesian Customary Law

Customary law is one form of law that still exists / exists in the life of indigenous peoples in Indonesia. We also need to know that Customary Law is one form of law that applies in the life and legal culture of Indonesian society that is still valid today. We can see the existence of customary law until now through the existence of customary courts and customary law instruments that are still maintained by indigenous and tribal peoples in Indonesia to resolve various disputes and offenses that cannot be handled by police, courts, and correctional institutions. Customary law is retained today by indigenous and tribal peoples because they believe that decisions issued through customary courts against an offense that are tried through them can provide a sense of justice, and a return to balance in the lives of indigenous peoples over the spiritual shock of the adat offense.

The existence of customary law as a form of law that is recognized for its existence in the life and legal culture of the Indonesian people is contained in the 1945 Constitution of the Republic of Indonesia or for the brevity of the 1945 Constitution, namely Article 18B paragraph (2) which determines "the State recognizes and respects unity - Customary Law Society and their traditional rights as long as they are alive and in accordance with the development of society and the principle of the Republic of Indonesia State Ksatuam, which is regulated in the law ". An explanation of the recognition of customary law by the State is also contained in Article 27 paragraph (1) of the Constitution which stipulates "All citizens together with their position in law and government and are obliged to uphold the law and government with no exception", from which the provisions can concluded that both civilians and government officials are obliged to uphold the laws that apply in the life and legal culture of Indonesian society, including criminal law, civil law and customary law.

Customary law as a positive law has distinctive characteristics, namely; customary law is a law that is largely unwritten, but its values exist and apply in the lives of indigenous peoples who enforce the customary law. Customary law applies in a limited scope, that is, only I am in an indigenous community where the customary law lives or resides, and this situation allows that each indigenous community can have customary laws that differ from one another. We can find further information on customary law in the opinion expressed by Soekanto as a

jurist, in which he defined customary law as "a complex of customs which are mostly not scripted, not codified and coercive having sanctions, so having legal consequences. One sub-section contained in customary law is customary law delik (adat delicten recht) or also known as customary criminal law. We can find an understanding of the term customary criminal law through the opinion of Hilman Hadikusuma, who argued that the term customary criminal law is a translation of the Dutch term "adat delicten recht" or "customary violation law" [3], and he also stated that these terms were not known among culture. Customary criminal law generally contains legal rules which are not written in nature but have legal consequences for anyone who violates the law, within the customary law area applies [4].

3.2 Role of Local Government in Maintaining and Preserving Local Wisdom

The government is an organization that has the power to create and implement laws in certain regions. According to Suradinata, the government is an organization that has great power in a country, including community affairs, territorial affairs and power affairs in order to achieve the goals of the country.

Inu Kencana Syafi'e (2009) writes that the term government comes from the root of the command which then gets affix (peers). If the command word gets a prefix, then the word government is nothing but an elite body or organ that does the work of regulating and managing in a country [5]. And if the word government gets an ending, the word government means the matter, the way, the act, or the affairs of the ruling and legitimated body which in some basic words there are several elements, namely [6]:

- There are those who govern (the Government) and those who are governed (the People).
- The governing party has the authority and legitimacy to regulate and manage the people.
- The party ordered is obliged to obey the legitimate government.
- There is a reciprocal relationship between parties that govern and those that are governed have a reciprocal relationship vertically or horizontally.

According to W.S Sayre in Inu Kencana (2009) the government is an organization of the state, which shows and exercises its power. While Wilson said that the government is an organization of strength, not always associated with the organization of the armed forces, but two or a group of people from many groups of people prepared by an organization to realize their goals and objectives, with matters that provide information for the affairs general public affairs [7].

The administration of government in Indonesia consists of the Central Government and Regional Governments. This is contained in the fourth amendment to the Constitution of the Republic of Indonesia which states that the Republic of Indonesia is in the form of a unitary state with the principle of broad regional autonomy. The territory is divided into provinces. In Chapter I of Law Number 32 of 2004 concerning Regional Government, Article 1 paragraph (1) states that: The central government, hereinafter referred to as the government, is the President of the Republic of Indonesia which holds the power of the government of the Republic of Indonesia as referred to in the basic Law of the Republic of Indonesia Indonesia in 1945. Whereas in paragraph (2) it is stated that: The Regional Government is the organizer of government affairs by the regional government and the DPRD according to the principle of autonomy and the duty of assistance with the principle of autonomy to the greatest possible extent in the system and principles of the Unitary Republic of Indonesia as referred to in the Basic Law State of the Republic of Indonesia in 1945 [8]. Still in Chapter I Article 1 Paragraph (3) of Law Number 32 of 2004 states that Regional Governments are Governors,

Regents or mayors, and regional apparatuses as elements of regional government administrators.

In the 1945 Constitution, the results of the amendment in Chapter VI Article 18 paragraph 3 said that the provincial, regency, and municipal governments have the Regional People's Legislative Assembly, whose members are elected through general elections. Furthermore, regarding the provincial, regency, and city administrations, it was also stated that, Governors, Regents and Mayors were respectively heads of provincial, regency and city governments. In other words, regional government is a device of the government in the region along with the Regional Parliament. So, the provincial level is the Governor and the Provincial DPRD. While the regency/city government is the regent / mayor along with the regency/city DPRD [9].

The Regional Government is authorized to regulate and administer its own government affairs according to the principle of autonomy and co-administration. The granting of broad autonomy to the regions is intended to accelerate the realization of public welfare through improved services, empowerment, and the participation of the wider community. Through this broad autonomy, regions are also expected to be able to improve competitiveness while still paying attention to the principles of democracy, equity, justice, privileges and specificities as well as the potential and diversity of the regions within the Unitary State of the Republic of Indonesia system. In accordance with the mandate of the Law of the Republic of Indonesia Number 32 of 2004 which has been amended by Law Number 23 of 2014 concerning Regional Government, the Regional Government in order to increase the effectiveness of the implementation of regional autonomy must pay attention to the relations between the composition of government structures and between regional governments, regional potential and diversity. Aspects of the relationship of authority pay attention to the specificity and diversity of regions in the system of the Unitary State of the Republic of Indonesia. Aspects of financial relations, public services, utilization of natural resources and other resources are carried out fairly and in harmony. In order to be able to carry out its role, the regions are given the widest authority accompanied by the granting of rights and obligations to carry out regional autonomy in the principle of the unity of the government administration system. In general, the authority of regional government covers all matters in the field of government, except for matters that are the authority of the central government. Local government authority, according to Law Number. 32 of 2004 which has been amended by Law Number 23 of 2014 concerning Regional Government, there are mandatory and non-optional authorities.

Mandatory authority means that covers all government affairs at the regional level. While the authority that is optional is to cover all government affairs that actually exist and can improve the welfare of the local community in accordance with the conditions and characteristics of each. The Regional Government Authority that is Compulsory according to Law Number 32 of 2004 which has been discussed with Law 23 of 2014 concerning Regional Government is stated as follows [10]:

- Protecting the community, maintaining unity, national unity and harmony, and the integrity of the Unitary State of the Republic of Indonesia;
- Improve the quality of people's lives;
- Develop a democratic life;
- Realizing justice and equity;
- Improve basic education services;
- Providing health care facilities;
- Providing appropriate social facilities and public facilities,
- Develop a social security system;
- Develop regional planning and spatial planning;

- Develop productive resources in the area;
- Preserving the environment;
- Managing population administration;
- Conserving socio-cultural values;
- Establish and apply legislation in accordance with its authority; and
- Other obligations stipulated in the legislation.

Indonesia as the country that has the most archipelago from small to large, and the advantages where the country consists of various kinds of diversity of indigenous peoples and has its own characteristics.

It is appropriate that the existence of indigenous groups scattered throughout the Indonesian archipelago and in every province should be something to be proud of, this happens because the existence of indigenous peoples is a nation's wealth and can be a separate source of input for the Indonesian people. Good wealth that can generate income for the state as well as a source of knowledge for researchers from across the continent, which is clearly where one of the benefits of the existence of indigenous peoples is a contribution that can be given to the Indonesian people. Unlike some Asian or European countries that often only have one indigenous community and usually the indigenous people even as a forerunner of the country, such as American or Aboriginal Indian tribes in Australia, which has been marginalized lately.

Indigenous peoples are key to climate change issues. As inhabitants of land and sea, they are very vulnerable to the effects of climate change. Their region is often the target of large-scale industries that cause climate change. Whereas it has become common knowledge that their local wisdom helps reduce climate change and provides inspiration for humans in the face of the climate crisis.

4 Conclusion

The challenge faced by the community at this time especially the specific village community is the economic problem and a written instrument that can provide absolute certainty regarding the authority to open and close the sasi lompa in my village. This makes people more difficult to preserve the local chaos we know with Sasi Lompa, due to a lack of understanding of local wisdom (Sasi Lompa) it makes the community in carrying out its activities ignores cultural values which are relics that must be cared for and guarded as a result of which tourist spots are converted into locations or places that are damaged by the actual characteristics. The government in this case the local government up to the village government is a unified system that is inseparable from the indigenous peoples and is involved until the things that are directly related to the joints of the custom itself by the government are to play its role. Based on the research conducted, it is recommended that it is necessary to establish a State Regulation to regulate the authority to open and close the Sasi lompa. For the Government and the public to share the results of the sasi lompa fairly and also state egulation in Tourism Management.

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The Influences of Implementation of Concept's Learning Model With Scientific Approach to Students Physics Learning Achievement of Junior High School in Banda Aceh

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Abstract. This study aims to examine the effect of theapplication of conceptual learning model with ascientific approach to physics learning achievement of Junior High School students of Banda Aceh City. The design of this research is Quasi-experiment with aquantitative approach, involving 38 junior high school students. This research was conducted one experiment class and one control class at the Junior High School (SMPN 8) Banda Aceh academic year 2017/2018. The instruments used are multiple choice test questions with four options. Data collection techniques, conducted learning process using conceptual learning model with a scientific approach in the experimental class and learning science approach in the classroom control. Results of data processing obtained tcount 5.77 and ttable versus 1.68 at a significant level with degrees of freedom dk = 36. Thus thitung> ttabel. Thus it can be concluded that there is theinfluence of conceptual learning model with ascientific approach to student achievement of Junior High School (SMP) Banda Aceh. Thus it can be concluded that the learning achievement of experimental class students taught using conceptual learning model with scientific approach get higher mean value compared to control class students who are not taught using conceptual learning model with ascientific approach.

Keywords: Concept Learning Model, Scientific Approach, Learning Outcomes

1 Introduction

Education has an important role in the process of development of a nation because education can determine the decline in the implementation of nation-building in all fields. Therefore, the government continues to make efforts to improve the quality of education. One of the efforts in improving the quality of education, especially in schools by improving the teaching and learning process. An educator plays an important role in the learning process and designs a good range of learning. In addition, an educator must be able to help students in

learning by creating various circumstances that lead to the goal of learning. Teacher's duties and roles include: mastering and developing learning materials, planning and preparing lessons, controlling and evaluating student activities [1].

The determination of the material and the design of learning is very dependent on the subjects taught. In the learning process, there are various subjects taught one of them is a physics lesson. Through the lessons of physics students are expected to gain knowledge and experience in the form of reasoning ability by using various concepts and principles of physics. One of the objectives of the physics subject is to master the knowledge, concepts, and principles of physics, and to have knowledge, skills and scientific attitude [2]. For the purpose of learning, physics needs to be done learning process that can facilitate students in learning.

The learning process in schools that are still teacher-centered makes students have difficulty in learning. The percentage of students' high student learning difficulties can still be known to many students after the teaching and learning process has not reached the minimum completeness level (KKM) that has been established in the school concerned. There are still students who hear and record the subject matter given the teacher. Side recognition at the time of preliminary research prior to this study was carried out, stating that physics lessons are very difficult, too many physics studies formulas and theories. Therefore, students are less motivated to follow the less enjoyable learning process. In addition, newly received knowledge is not related to the knowledge that has been previously owned. A student has difficulty in understanding a certain knowledge, caused in the process of student learning there is no relationship between the concept given to the concept that has been owned. (Trianto, 2009). It is necessary that the model of learning applied by teachers in the classroom can make students understand by linking shared physics concepts learned with previously known concepts.

To overcome the above problems this research provides a solution by applying conceptual learning model with a scientific approach. Application of conceptual learning model with a scientific approach to answering the research question. In addition, students can make learning more effective and student-centered. In this way students can make observations, seek, and can formulate their own concept concepts that have been studied. This conceptual learning model requires students to understand the concepts they have learned. According to Suyono and Hariyanto [10] Learning concept is related to the understanding and use of concepts that have been studied. The learning process of the concept begins with recognizing the name of the concept and its meaning as a knowledge both concrete and abstract concepts, the nature of the concept, the concept function.

The concept is a cluster or a group of facts/information that have to mean [10]. The concept is an abstract pattern that can be used in expressing various factors, symptoms, and problems being studied or a collection of conclusions summarized from a set of data that characterize this in accordance with that disclosed by Sanjaya [20], the concept is the abstraction of similarity or connectedness of a group of objects or properties. A concept has a section called an attribute.

The attributes of each concept have a number of different attributes [11]. Attributes are characteristics possessed by a concept. The combination of these attributes makes the distinction between one concept and another. Further Dahar [4] states the concept is the basis for higher mental processes to formulate principles and generalizations. To solve a problem, a student must know the relevant rules and rules based on the concepts he/she obtains. So understanding the concept means understanding something abstract so that students are motivated to think deeper. The abstract of this concept can be seen from other concepts.

Learning the concept of physics by using a model of learning the concept of individual syntax. Learning conceptual learning model with scientific approach can facilitate students in understanding the various concepts of physics that teachers teach. Learning concepts concerning the understanding and use of concepts ". Concepts are symbols of thought, derived from the result of making interpretations of facts, principles, procedures or natural phenomena of relationships between facts. Nasution [17] said learning a concept is the ability of students to hold an internal representation of the surrounding world by using language. The learning process is not just memorizing concepts or facts (root learning), but trying to connect the concepts to produce a complete understanding so that the concepts learned will be understood well and not easily forgotten. Learning concepts is learning to discover for yourself the concepts he/she learns. As Dahar [4] says, learning concept is the main result of the learning process in education.

This study was conducted to examine whether there is the influence of the application of conceptual learning model with a scientific approach to learning outcomes in physics lessons. The results of this study are expected to be useful for physics subject teachers in an effort to improve the effectiveness of physics learning outcomes.

2   Literature Review

2.1   Definition of Learning

The learning is a process marked by a change in self [12]. Changes as a result of the process are indicated in various forms such as changes in knowledge, understanding, attitudes, and behavior, skills, skills, and abilities as well as changes in other aspects that exist in the learning individual.

Learning is an activity in the learning process where students connect the various concepts already in memory with new knowledge [13]. Learning is the process of building knowledge through the transformation of experience. The learning process itself is individual and contextual, meaning that the learning process occurs within the individual in accordance with its development and environment.

Learning activities include three phases. Those phases are exploration phase, concept introduction, concept application [14]. Exploration phase where students learn the concept concepts and natural phenomena around them. The introduction phase of the concept of students performs learning activities to recognize and understand concepts that have something to do with the surrounding events and the concept application phase, where students use the concept to perform various oppression that occurs in each of the other symptoms further. Various concepts that students learn are the knowledge that has its own characteristic of each concept. Many experts who say the concept is a cluster or a group of facts/information that have to mean [15].

The concept is an abstract pattern that can be used in expressing the various factors, symptoms, and problems being studied or a collection of conclusions summarized from a set of data that characterize this in accordance with that disclosed by Sanjaya [20]. The concept of an abstraction that has interrelated attributes that have certain properties underlying higher mental processes in formulating theories, laws, principles, and generalizations [4]. A student to solve a problem needs to know and understand the relevant rules that apply to the concepts it acquires. So understanding the concept means understanding something abstract so that

students are motivated to think deeper. The abstract of this concept can be seen from other concepts.

Learning concepts is a learning activity to under-stand a knowledge. The concept is a symbol of the results of thought, obtained from the results of the interpretation of facts, principles, procedures or natural phenomena that are interconnected between various facts and phenomena [16][17]. Conceptual learning can be done by students indefinitely, using language, the math of its ability to abstract various events around it. Therefore, teachers need to know and explore the concepts that students have before learning starts. Teachers need as a motivator should help students in linking newly learned concepts with the concept they had.

The learning process not only memorizes concepts or facts but needs to connect newly learned concepts with existing concepts. In this way, student students will have and understand the new concept in depth and will not be easily forgotten. Learning concept is the activity of students by finding their own and gain new knowledge from the learning result [4].

2.2 Conceptual Learning Model with Scientific Approach

The model is the design of a series of activities to achieve a particular goal. Models are usually not used to describe something complicated but are used to simplify the process so that it is easier to understand. While learning is the process of interaction of learners with educators and learning resources on a [22][23].

The learning model is a learning activity that must be done by teachers to students to achieve effective and efficient learning objectives. Learning models play a role in facilitating learners to achieve optimal learning outcomes and teachers as facilitators and students as learning objects. Learning model that is used in accordance with the material to be taught [9].

The learning model is a planning or a pattern used as a guide in planning the learning [24] Planning and instructional design is an important step for the purpose of learning to be achieved effectively and efficiently. In planning is the process of preparing the learning guide.

A scientific approach is an approach that applies skilled learning, such as observing, classifying, measuring, predicting, explaining, and concluding. In practice, teachers have a very important role. In addition, this approach makes the learner active, creative, and responsible for the knowledge gained. The steps of the scientific approach are as follows; 1) observe; 2) questioning; 3) collecting data, exper-
imenting, exploring; 4) associate; 5) communicate [26].

2.3 Conceptual Learning Model

The conceptual learning model is a series of questions given by the teacher in a particular order. A conceptual learning model designed to assist students in developing and strengthening students' understanding of their learning. A conceptual learning model that prioritizes students' conceptual understanding [23]. Therefore teachers need to make students understand concepts actively, creatively, effectively, internally and fun for students so that concepts are easy to understand and survive in the cognitive structure of students.

Concept learning models need to be used in the learning process to build, develop concepts and train critical thinking skills. In a learning that applies the conceptual learning model aims to make students able to think critically and understand the various concepts he/she studies. The conceptual learning model is designed to assist students in achieving learning goals so that students can think critically and make it easier for students to understand the various concepts they are learning [28].

The learning steps using conceptual learning model with scientific approach can be described in table 1 below.

Table 1. Steps of Concept Learning Model with Scientific Approach

Phase	Description	Scientific approach
Phase 1: Introduction	The teacher introduces the lesson and explains how the activity will be performed	
Phase 2: Example and Formulate Hypotheses	Students are given one or two examples and are not examples, students hypothesize the possibility of a concept they are learning.	Observing, Asking, Collecting data/ information
Phase 3: Analysis Cycle	Examples and non-examples are given, students remove the existing hypotheses and add new hypotheses based on the new example (non-example).	Reasoning/associating
Phase 4: The closes and Applied	A single hypothesis is separated and defined as well, additional samples are analyzed by definition	Communicate

Source: (Paul and Don, 2012),

2.4   The Learning Outcomes

The learning outcomes are everything that belongs to students as a result of learning activities that have been done or the final value of a learning process, namely the process of learning from the students do not know to know, the process from before understand to understand, and the process of mutual understanding between teachers with students. [21] says that learning outcomes are patterns of deeds, values, insights, attitudes, appreciations, and skills". As in the 2013 curriculum, achievement of learning outcomes includes three aspects, namely: cognitive aspects, psychomotor aspects, and affective aspects.

As Gagne points out in Suprijono [26]. The learning outcomes are the following: (1) verbal information, ie the capability of expressing knowledge in the form of language, both oral and written. Ability to respond specifically to specific stimuli. It does not require symbol manipulation, problem-solving, or rule implementation. (2) intellectual skills, namely the skills of presenting concepts and symbols. Intellectual skills consist of categorizing skills, analytical abilities-synthetic fact-concepts, and development of scientific principles. (3) cognitive strategy, ie the ability to channel and direct its cognitive activity. These capabilities include the use of concepts and rules in solving problems. (4) motoric skills, ie the ability to perform a series of physical movements in the affairs and coordination so as to manifest the automatism of physical motion. (5) attitude is the ability to accept or reject the object based on the assessment of the object. Attitudes in the ability to internalize and externalize values. Attitude is the ability to make values as standards of behavior.

The same thing is expressed by Thobrani [29] that learning outcomes can be verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes, Dimyati and Mudjiono [6] say, "learning outcomes are a success rate achieved by students after attending a learning activity, where the success rate is marked by the scale of the value of letters, words or symbols". Both the poor results of learning can be seen from the results of measurements in the form of evaluation that can also be used to determine the extent of the level of involvement of students in following the learning process. To state that a teaching and learning process is said to be successful, every teacher has their respective views in line with his philosophy. However, to equate perceptions, we should be guided by the current curriculum that has been

improved, such that a teaching and learning process of a teaching material is declared successful if ICT (Special Instructional Goals) can be achieved [3].

3   Methods

This research uses a quantitative approach to the experimental and survey [25]. Quasi-methods of experimental design have been used in this study. This research consists of two class groups, namely experimental class study group and control class learning group (Sugiyono, 2010).

The determination of experimental class and control class is done by random sampling. The experimental class students were given the treatment of the learning modelconcept with a scientific approach whereas control class students are not given treatment, but only taught with traditional learning models. This research variable is conceptual learning model with the scientific approach as free variable and student learning result as the dependent variable. This research was conducted at Public Junior High School (SMPN 8) Banda Aceh.

A total of 165 students of class VII at Public Junior High School (SMPN 8) Banda Acehas a population of this study and have been selected by random sampling as many as 68 students as a Sample consisting of one experimental class and one control class. Determination of research samples that are appropriate according to Sugiyono (2011) which states bring random sampling technique can be considered a homogeneous sample.

This study has been collecting data since July 24, 2017, until August 23, 2017. Data collection through the test as said by Sudjana [24] which states that the test can provide questions to students to get students' answers in the form of oral and written. The test is used to assess and measure student learning outcomes. Test items are given in the form of multiple-choice questions that match the indicators compiled in the Lesson Plans.

The test is in the form of a post-test question that students are expected to use critical thinking skills in understanding concepts and solving problems. The test given to the experimental class group is the same as the test in the control class group. The problem with this test first made a grid problem in accordance with the concept indicators to facilitate and be a clue in writing the question items. The justification of the test items item has been done before the matter is distributed to the respondent.

The data processing that has been obtained from student learning result is analyzed by using t-test. Hypothesis testing is done by tabulating the data in frequency distribution list. Sudjana [24] states that, in order to create a frequency distribution table of the same class length, it is first determined; 1) range, ie the largest data minus the smallest data; 2) the number of interval classes required.This analysis uses the Sturges rule, ie many classes:

$$1 + (3,.3) \, Log \, n. \tag{1}$$

(3) the length of the interval class by the formula:

$$p = \frac{\text{interval}}{\text{many classes}} = \text{interval(number of classes)}. \tag{2}$$

The next stage determines the average of each class by using the formula:

$$\bar{X} = \frac{\sum f_i X_i}{\sum f_i} \tag{3}$$

$\bar{X}$ = the average value. f_i = frequency according to class mark. X_i = interval class mark.

Homogeneity test was used to find out whether the two sample groups had the same variant or not (Sudjana, 2005). Before determining the standard deviation, we first analyze the variance by using the formula:

$$S^2 = \frac{(n\sum fixi^2 - (\sum fixi)^2}{n(n-1)} \tag{4}$$

To determine the standard deviation, then the equation formula:

$$S^2 = \frac{\sqrt{(n\sum fixi)^2 - (\sum fixi)^2}}{n(n-1)} \tag{5}$$

[24]

Hypothesis test used equation formula:

$$X^2 = \sum_{i=1}^{K} \frac{(O_i - E_i)^2}{E_i} \tag{6}$$

[24]

Testing the hypothesis by using the t test formula as follows:

$$t = \frac{X_1 - X_2}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \tag{3}$$

[24]

with one sample test at a significant level α = 0.05. [24]

4   Results and Discussions

The data collected were pre-test results from experimental class students and from control class students. The results of the pre-test of both groups are as for Table 2 below.

Table 2: Pre-test and Post-test of the experimental class

No.	Students ID	Pre-test of the experimental class	Post-test of the experimental class
1	8746	42	92
2	8747	33	83
3	8748	43	58
4	8749	25	75
5	8750	42	92
6	8751	25	75
7	8746	42	83
8	8747	33	75

9	8748	43	83
10	8755	33	75
11	8756	42	83
12	8757	42	92
13	8758	33	75
14	8759	25	67
15	8760	25	83
16	8761	43	92
17	8763	33	83
18	8764	17	65
19	8765	25	75
20	8766	17	67

Table 3. Post-test of the experimental class

No.	Students ID	Pre-test of the control class	Post-test of the control class
1	8706	33	42
2	8707	25	58
3	8708	33	50
4	8709	33	58
5	8710	17	58
6	8711	25	63
7	8712	17	50
8	8714	43	65
9	8715	33	58
10	8716	42	67
11	8717	33	58
12	8718	42	67
13	8719	17	42
14	8720	25	58
15	8721	17	58
16	8722	42	67
17	8723	25	50
18	8724	42	67
19	8725	42	60
20	8726	33	56

Based on the above tables 2 and 3, the normality and homogeneity analysis of the four data sets has been performed.

Test the normality of the pretest grade of the experimental class as in Table 3.

Table 3. Distribution of test frequency normality of pretest grade of experiment class students.

Value	Class Limits (X)	Z-Score	Boundaries Area	Area of Area	Expected frequency (E_i).	Frequency of observation (O_i).

Value	Class Limits (X)	Z-Score	Boundaris Area	Area of Area	Expected frequency (Ei).	Frequency of observation (Oi).
	7,5	-2,17	0,4850			
8 – 14				0,0643	1,286	2
	14,5	-1,41	0,4207			
15 – 21				0,1785	3,57	3
	21,5	-0,65	0,2422			
22 – 28				0,1984	3,968	6
	28,5	0,11	0,0438			
29 – 35				0,264	5,28	4
	35,5	0,87	0,3078			
36 – 42				0,1406	2,812	5
	42,5	1,63	0,4484			

Normality test results based on table 3 above shows that obtained X_2 count <X_2 table is 3.54 <9.49. This means that the value of the pre-test of the experimental class is normally distributed.

Test the normality of the control class pre-test values as in Table 4.

Table 4: Distribution of test frequency normality of pretest value of control class.

Value	Class Limits (X)	Z-Score	Boundaris Area	Area of Area	Expected frequency (Ei).	Frequency of observation (Oi).
	7,5	-2,34	0,4904			
8 – 14				0,0559	1,01	1
	14,5	-1,51	0,4345			
15 – 21				0,1891	3,404	4
	21,5	-0,66	0,2454			
22 – 28				0,174	3,132	4
	28,5	0,18	0,0714			
29 – 35				0,2747	4,945	5
	35,5	1,02	0,3461			
36 – 42				0,1232	2,218	4
	42,5	1,87	0,4693			

Normality test results based on table 4 above shows that obtained X_2 count <X_2 table that is 1.77 <9.49. This means the value of the normal distribution control pre-test.

Test the normality of Post-test experimental class as in Table 5.

Table 5: Distribution of test frequency normality of post-test value of experiment class.

Value	Class Limits (X)	Z-Score	Boundaris Area	Area of Area	Expected frequency (Ei).	Frequency of observation (Oi).
	57,5	-2,25	0,4878			

Value	Class Limits (X)	Z-Score	Boundaris Area	Area of Area	Expected frequency (Ei).	Frequency of observation (Oi).
58 – 64				0,0572	1,144	2
	64,5	-1,48	0,4306			
65 – 71				0,1633	3,266	3
	71,5	-0,73	0,2673			
72 – 78				0,2553	5,106	4
	78,5	0,03	0,0120			
79 – 85				0,2644	5,288	6
	85,5	0,76	0,2764			
86 – 92				0,163	3,26	5
	92,5	1,55	0,4394			

Normality test result based on table 5 above shows that obtained X_2 count $<X_2$ table is 2.00 <9.49. This means the value of post-test experiments is normally distributed.

Test the normality of Post-test control classes as in Table 6.

Table 6: The frequency distribution of the normality test of post-test value of the control class.

Value	Class Limits (X)	Z-Score	Boundaris Area	Area of Area	Expected frequency (Ei).	Frequency of observation (Oi).
	49,5	-1,60	0,4452			
50 – 56				0,1841	3,313	5
	56,5	-0,71	0,2611			
57 – 63				0,1858	3,344	7
	63,5	0,19	0,0753			
64 – 70				0,2868	5,162	4
	0,5	1,09	0,3621			
71 – 77				0,1146	2,063	1
	7,5	1,99	0,4767			
78 – 84				0,0213	0,383	1
	84,5	2,88	0,4980			

Normality test result based on table 6 above shows that obtained X_2 count $<X_2$ table is 5.77 <9.49. This means the value of post-test control classes is normally distributed.

Homogeneity test of the variance of post-test value has been done to see homogeneity obtained result with price F arithmetic is 1.38 and F table is 2.29, in other words, it can be said that F arithmetic <F table. This means both homogeneous variances.

Based on the hypothesis test, the results obtained that students who are taught with conceptual learning model with scientific approach have different learning outcomes with conventional learning model. It can be seen from the mean value of post-test of students learning result which is taught with conceptual learning model with scientific approach is 78.2, while the mean value of the post-test result of student learning taught with traditional learning model is 62.0.

Hypothesis testing on the significant level and degrees of freedom (dk) = (n 1 + n 2 -2) ie dk = (20 + 18 - 2) = 36, obtained t table 1.68 while t count 5.77. Thus t count > t table with the test criteria is: reject Ho who said there is no effect of conceptual learning model with a scientific approach to student learning outcomes in experimental class. Thank Ha who states there is influence of conceptual learning model with scientific approach to student learning outcomes in experimental class.

Referring to table 1 above, it can be seen that the grades of students class post-test taught by using conceptual learning models with science approach scientific higher than the value of students taught by conventional methods. Therefore, conceptual learning model with science approach scientific an alternative learning model that is suitable to be used in physics learning. Besides, it can also be seen the comparison of the values of the two learning models as shown in Figure 1 below.

Comparison of learning results with learning model of concepts and learning traditional

■ Nilai Postes Kelas Eksp.   ■ Nilai Postes Kelas Kontrol
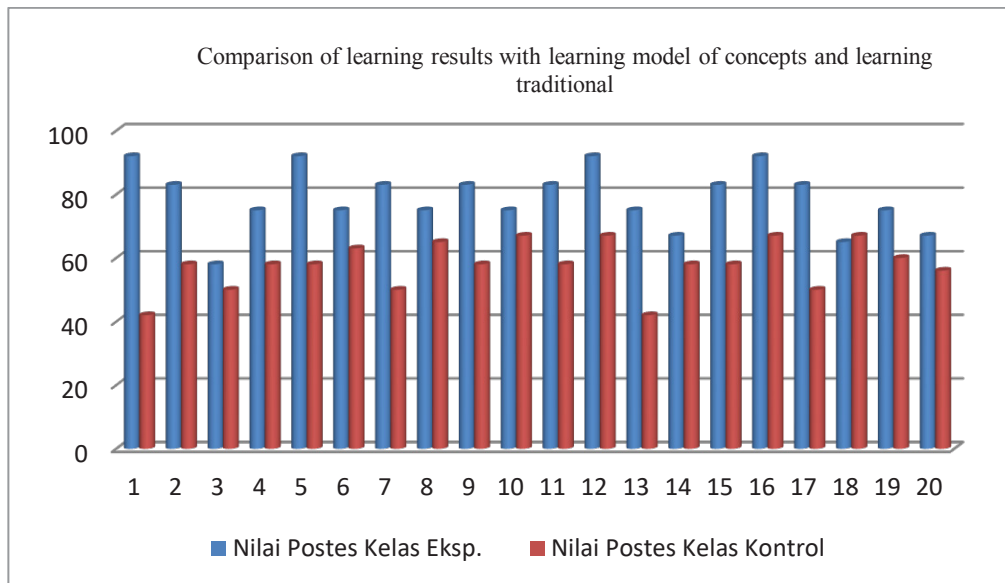
Figure 1. Learning results with learning model of concepts and learning traditional

Referring to figure 1, from two experimental class and experimental class, it is known that experimental class using conceptual learning model with scientific approach resulted in higher student learning outcomes. Improvement of learning result of experiment class student showed that the influence of using concept learning model with scientific approach.

4   Conclusions

Based on the results of data processing in this study can be described as follows.

The learning result of the experimental class students taught using conceptual learning model with scientific approach get higher mean value compared to control class which is not taught using conceptual learning model with a scientific approach. The results of Arya (2013) that the activities and learning outcomes of students in the learning process using conceptual learning model has increased. The improvement of learning outcomes obtained by students cannot be separated from the model of learning used by teachers.

Teaching and learning process will be successful if a teacher has to use the appropriate learning model in order to convey the various concepts he taught. In addition to that, teachers also need to use strategies and learning models in accordance with the characteristics of students and concepts of physics are taught. The learning model used by the teacher must be in

line with the learning objectives that have been determined. The use of appropriate learning models can motivate students and be active in learning.

Conceptual learning model with scientific approach is a model of learning that can motivate students to participate actively in learning. As the results of the research report, Rifda [18] states the conceptual learning model as a model of learning that can improve students' activity in learning. Furthermore, he said that concept learning is a structured inductive learning model consisting of several phases of the individual learning process.

The learning phase of the conceptual learning model as proposed by Dimyati and Mudjiono [4] that conception learning involves three phases. Those phases are exploration phase, concept introduction, concept application. Each of these phases has an explanation and appeals to students active in the learning process. The learning process with conceptual learning model such as this exploratory phase students learns various concepts of physics and its symptoms. In the introduction phase of the concept, students are required to think critically and actively conduct experiments to recognize the concepts he/she studies. Every concept students learn to understand and to relate to events in everyday life.

The learning process with conceptual learning model with teacher's scientific approach only acts as a motivator in every lesson of learning. Teachers as a motivator provide various questions to students that can make students look more active in learning activities. According to Hosnan (2014), a scientific approach is an approach that implements learning that involves students more actively, skillfully, observing, classifying, measuring, predicting, explaining, and concluding, and communicating. In addition, this approach makes the learner active, creative, and responsible for the knowledge gained.

The steps of the learning model with a scientific approach that needs to be developed by teachers, among others; 1) to observe, so that students can relate the various concepts that have been learned with the context of real situations in everyday life, 2) questioning, this activity is one of the processes of building student knowledge in the form of facts, concepts, principles, laws, procedures, and theories and the goal is that students have high-level thinking skills are critical, logical, and systematic; 3) collecting data/ experiment/exploration. This activity needs to be done in the process of learning concept model with a scientific approach to improve students'curiosity in strengthening the understanding of facts, concepts, laws, theory, and procedures in a knowledge. Therefore, the conceptual learning model of a model that can be used by our in the learning process to make students more active.

Concept learning model is a learning model that can streamline the learning process. To engage students more actively in teacher learning, it is necessary to apply conceptual learning models with a scientific approach. The conceptual learning model with the scientific approach makes learning more effective. With the application of conceptual learning, the model can streamline student learning activities such as; conduct observation, record, identify, express opinions, conclude, and communicate various concepts that have been studied.

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Genetic Algorithm with Baker's SUS Selection for Shift Scheduling of the Security Officers at Rawa Buntu Train Station, Indonesia

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Abstract. The increase of railway passengers in Indonesia should be balanced with security and convenience, especially at departure and train arrival stations. In ensuring passenger safety, PT Kereta Api Indonesia (KAI) provides some security officers at each railway station, including the Rawa Buntu Station. The Station Head and the Security Commander are responsible for drafting a guard schedule for 30 security officers at the station. The security schedule is divided into three shifts and eight guard locations. Manually arranged schedules often result in unbalanced work hours, clashing schedules and allowing emptiness of security officers. It is getting harder with additional rules that whenever a security guard gets a night shift, the next day must be off. In this research, we proposed a shift scheduling method based on a genetic algorithm using Stochastic Universal Sampling (SUS) selection method, double point crossover, random mutation and using generational model (elitism) for its generation update process. This research produces an application that can assist in the preparation of automatic shift scheduling of the security officers. Based on the test results, the application can arrange the schedule with the suitability level of 70% and the average time needed to generate schedule is 72.48 seconds. With this research, the process of arranging the schedule of security officers at the Rawa Buntu Station to be faster.

Keywords: Transportation, shift scheduling, GA, Stochastic Universal Sampling.

1 Introduction

In the railway transport system, the station is one of the most important facilities. The station is used as a departure and arrival point of train passengers, so it has a high level of the crowd. The crowd of the station increases during the morning and afternoon, which is the time to leave and go home for many urban workers. Data from the Jakarta Central Bureau of Statistics show that in 2015 the number of train passengers reaches 700 thousand passengers per day [1]. As one of the railway stations in Jakarta and surrounding areas, the Rawa Buntu Station is one of the most crowded stations.

With the crowd of the railway station, of course, the safety issues of the passengers should be a top priority. Currently, the Rawa Buntu Station has several security officers on duty in turn to maintain security at the station. Also, officers are also responsible for managing passenger mobility bypassing, preventing riots or commotion, preventing and arranging passengers who want to cross the railway, and setting up safety signs when railway doors are closed.

Limitations on the number of security officers require the setting up of an effective and efficient guard schedule. The Security Commander (its call 'Danru') that appointed by the Station Head is responsible for drafting the security guard's schedule each month. Currently, the schedule is arranged manually which takes a long time. Difficulties encountered include how to present the distribution of shifts evenly, balanced and fair. Within one working day, 'Danru' has to divide 30 members of the security officers to guard in the morning and afternoon shift with the number of officers each of 8 to 10 people. As for the night shift, there are at least 4 to 6 security officers. The officers who do not get shift will get a day off. If an officer has been on guard for five days, then he/she must get a day off for two days successively. Other than that, after an officer gets a night shift, he/she should not be on guard the next morning.

Many methods can be used to solve the scheduling problem. One way is to use the concept of genetic algorithms inspired by Darwin's theory of evolution. The genetic algorithm (GA) is a search algorithm based on the mechanism of natural selection and natural genetics [2],[3]. The best individuals will survive and have a higher reproductive rate when compared to the less-favored individuals. At a certain time (generation), the population as a whole will contain more organisms that have the best properties, where the properties are from good parents as well.

The genetic algorithm incorporates a persistent string structure to form a new search algorithm. In each generation, a number of new individuals are created through the strong parts of their parents. There are several terms used in the genetic algorithm. The term strings in an artificial genetic system are analogous to chromosomes in biological systems. In biological systems, chromosomes are combined to form a genetic recipe as a whole. This genetic concept is used for the formation and operation of several organisms [2],[3]. In the natural system, the entire genetic package is called genotype. In artificial systems, the whole package of strings is called a structure. In the natural system, the organism is formed by the interaction of the entire genetic package with its environment called phenotype. In an artificial genetic system, the structure is decoded to form parameter packets, alternatives, solutions or points in the solution space.

In the natural system, chromosomes consist of genes, which consist of some values called alleles. In genetics, the position of a gene is identified separately from the function of the gene.

GAs have been widely applied to solve various problems in the field of technology, business, agriculture, entertainment and other fields. Some examples of the use of genetic algorithms include optimization of scheduling, automatic programming, machine learning, economic model, immunization system model, ecological model, and interaction between evolution and learning [4]. Table 1 presents various studies related to the application of genetic algorithms, especially to solve the scheduling problem. In previous research, genetic algorithms have been widely implemented to solve the problem of scheduling in various fields. Nevertheless, no studies have applied a genetic algorithm to complete scheduling of security officers who have complexity and special rules such as at railway stations.

In this study, we applied GA to optimize the preparation of security guard shift schedule at the Rawa Buntu Station. The process of preparation of the schedule is done with several considerations: the number of security officers, shift work time, and the location of the guard. By applying the GA method, it is expected that the time required for the preparation of the security officers' shift schedule is faster than before. It is expected to be more equitable, balanced and fair. The preparation of the work shift schedule is made for the period per one month with the fulfillment of shift per day. Each work shift made has a reasonable minimum and maximum limits. Before the application is executed and the best solution is obtained, it is assumed that no security officer is applying for a day off.

2 Research Method

The main problem raised in this research is the duration of the process of drafting the security guard duty schedule at the train station. A total of 30 security officers should be divided into three shift guards, i.e., morning, noon and night. The guard area is divided into 8 locations, so at each shift ideally, there are at least eight duty officers. However, especially for the night, the security guard is only about 4-6 people because at night the density of the station will be reduced.

Based on observations and interviews with related parties, several provisions must be met in the arrangement of the guard schedule. First, if the officer has been on watch for five days, then the officer will get a day off for two consecutive days. Secondly, after an officer gets a night watch, it should not be on the morning watch the next day. Third, in one location or guard area, there is only one duty officer. In other words, there should be no clock clash.

In this study, it is proposed the application of shift scheduling guard the security guard using the concept of genetic algorithm. In the genetic algorithm, there are several basic stages of early population generation, selection, and crossover, mutation, and generation updates. The proposed selection method is the Stochastic Universal Sampling (SUS) method with zero bias and minimal spreads [5]. The SUS selection method is considered to be better and more optimal than the Roullete Wheel method because it involves only the desired number of individuals [6]. Meanwhile, in this study used the method of double-point-crossover, random mutation, and elitism for its generation update process.

Tabel 1. Related research in GA implementation.

Paper	Purpose	Method	Results
(Leksakul and Phetsawat, 2014) [7]	Nurse Scheduling Using Genetic Algorithm	GA with partially matched crossover	The nurse schedule obtained by GA could save 12% in staffing expenses per month and 13% in a number of nurses when compared with the existing schedule.
(Ardhianto et al., 2014) [8]	Scheduling automation of Final Project Exam at Informatics Department, Faculty of Informatics at Telkom University.	Genetic algorithm with Roulette Wheel and Linear Fitness Ranking selection, uniform crossover, and creep and swap mutation.	Genetic algorithms have been successfully implemented to solve the problems related to scheduling. The size of the population and the number of generations that are not too many have managed to get good results so that the required

			less process time. Experiments show an accuracy rate of 74% to 88%.
(Hariyadi et al., 2016) [9]	Optimization of academic scheduling system at university	Genetic algorithm with tournament selection.	A genetic algorithm has been successfully implemented to solve the academic schedule at the State University of Malang. It shows that GA can perform with the fitness value 0.952 in the training phase and 0.927 in the testing phase. However, the execution time is still high and still need improvement in the future research.
(Sari et al., 2015) [10]	Optimization of subject scheduling	GA with Roulette Wheel selection, one-cut-point crossover, reciprocal exchange mutation, and Elitism generation update.	From the results of the tests, the best results obtained with the highest fitness value on the number of 80th generation, number of population 60, and combination of crossover rate and mutation rate of 0.4:0.6.
(Prasetyo, 2014) [11]	GA and artificial neural network for course scheduling at FMIPA Universitas Gadjah Mada.	GA with Roulette Wheel selection, n-point crossover, and random mutation.	The combination of proper input parameters in the process of implementing GA and neural network in case of course scheduling at FMIPA UGM can produce more optimal prediction result.

Figure 1 shows the genetic algorithm process proposed in this study. In the early stages, the system will retrieve data on shift constraints, holiday patterns, periods and timing of the schedule. Next will be established initial population based on the number of available work shifts. The initial population will calculate its fitness value. If the population has met all the criteria, then the population becomes the final population. But if you do not meet the criteria, do the selection process with SUS method, crossover with double-point crossover method, and random mutation to find better population.
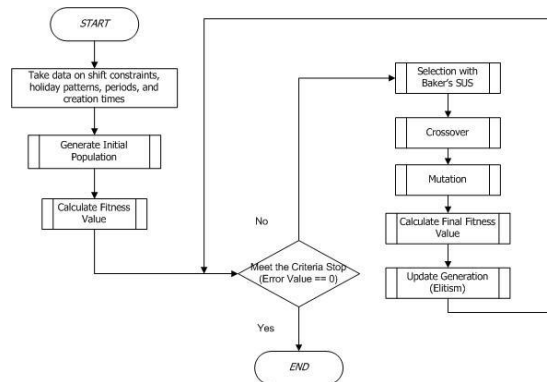
Fig. 1. The proposed Genetic Algorithm process.

3 Results And Discussion

3.1 The Application

This study produced an application to generate a security guard duty schedule by implementing a genetic algorithm. The main view of the application is shown in Figure 2. To generate a new schedule, user can fill in some parameters including schedule period, daily shift number, and holiday shift model. Furthermore, when user press the "Create" button, then the system will run the genetic algorithm and generate a schedule as shown in Figure 3.

Fig. 2. Main view of the application to create new schedule.

In addition to viewing them directly in the application, users can also save schedules that have been created into the database or save them in Microsoft Excel format.

Fig. 3. The Generated shift schedule of the security officers.

3.2 The Experiments

The test is performed on Genetic Algorithm control parameters. It aims to measure the quality of a control parameter value in the program. Also, this test is intended to find the optimum value of a combination of control parameters. The parameters include crossover probability value (Pc), mutation probability value (Pm), iteration, and some individuals. Based on the verification by the expert, the test results are divided into three categories: Not Appropriate (NA), Less Appropriate (LA) and Appropriate (A). In this test, there are three stages of testing.

Table 1. The experiment results of the number of individual and number of iteration combination.

# Individual	# Iteration	Fitness	Times (seconds)	Result
10	10	6.87	21.74	LA
10	20	9.91	28.61	LA
10	40	11.96	36.93	LA
10	50	1.06	53.10	A
10	70	1.37	72.21	A
20	10	1.04	37.28	A
20	20	1.82	101.24	LA
20	40	1.81	92.71	LA
20	50	1.89	100.54	A
20	70	1.02	138.12	LA
40	10	1.28	104.07	LA
40	20	1.76	109.93	LA
40	40	1.79	363.42	LA
40	50	2.42	223.70	LA
40	70	2.51	232.89	NA
50	10	26.36	77.11	NA
50	20	4.80	129.82	LA
50	40	9.61	321.49	LA
50	50	18.53	363.17	LA
50	70	31.02	382.45	NA

The first stage is to find the best combination of the number of iteration and individual. In this test, the number of individuals used is 10, 20, 40 and 50. Iterations of 10, 20, 40, 50, 70. The values of crossover probability parameters (Pc) and mutation probabilities (Pm) are set by 0.5. Each time five tests are done.

Based on the result of the experiment, it is found that the best number of iteration and individual that produce the optimal schedule is when the number of iterations is 10, and the number of individuals is 20. From the first stage testing it can also be concluded that 20% of the schedule produced is appropriate (A), 65% less appropriate (LA), 15% is not appropriate (NA).

The second test is to find the best probability of crossover (Pc) and the probability of mutations (Pm). In this test, the combination of the Pc and Pm's value are 0.9: 0.2, 0.7: 0.3, 0.3: 0.04, 0.8: 0.05, 0.8: 0.06 with each of 4 tests. In accordance with the optimal number of individuals and the optimal iteration obtained at the first stage of testing, the second stage of testing using the number of individuals 20 and iteration 10. The results of the second test listed in Table 3.

Table 2. The experiment results of the probability of crossover (Pc) and the probability of mutations (Pm).

# Individual	# Iteration	*Pc*	*Pm*	*Fitness*	Time (seconds)	Result
20	10	0.9	0.2	1.40	35.97	A
20	10	0.7	0.3	1.87	29.91	NA
20	10	0.3	0.04	1.18	24.33	LA
20	10	0.8	0.05	1.05	26.66	NA
20	10	0.8	0.06	1.95	66.08	A
20	10	0.7	0.5	1.43	32.44	A
20	10	0.6	0.1	3.25	27.08	A
20	10	0.9	0.4	1.29	65.96	NA
20	10	0.6	0.3	2.19	61.02	NA
20	10	0.8	0.5	3.04	82.41	A

Based on the test results in Table 3, the best combination of Pc and Pm is 0.8 for Pc and 0.6 for Pm. From the second stage of testing it can also be concluded that 50% of the schedule produced is appropriate (A), 10% less appropriate (LA), 40% is not appropriate (NA).

Table 3. The experiment results of Pc and Pm value combination.

# Individual	# Iteration	*Pc*	*Pm*	*Fitness*	Time (seconds)	Result
20	10	0.8	0.06	4.07	28.27	NA
20	10	0.8	0.06	1.57	26.95	A
20	10	0.8	0.06	1.84	67.42	A
20	10	0.8	0.06	1.26	96.91	NA
20	10	0.8	0.06	1.02	74.32	A
20	10	0.8	0.06	1.92	78.77	A
20	10	0.8	0.06	2.94	38.63	A
20	10	0.8	0.06	1.55	65.08	A
20	10	0.8	0.06	1.95	127.04	A
20	10	0.8	0.06	3.04	121.49	NA

The 3rd test is to against the number of individuals, number of iterations, Pc and Pm values. Furthermore, the repetition testing of these parameters to obtain the results at Table 4.

Based on the test results using the best parameters, we can conclude that 70% of the schedule produced has been inappropriate (A) with the expectations of the user. However, as many as 30% of the schedule is still not appropriate (NA). Based on the time of the generating shift schedule process, on average it takes 72.48 seconds. It is much faster than the manual scheduling process, which takes several days. It helps 'Danru' in the scheduling process more efficient.

After testing the program with various parameters, it is necessary to evaluate the program that has been tested. Based on the results of the trial, there are some advantages and disadvantages.

With our proposed application, the scheduling process is faster than the manual way that normally takes up to one week. We only need about 1 to 3 minutes to make the schedule. The team commanders (Danru) is made easy in setting up a shift schedule. The system is easy to use because it has a user-friendly look for users. The schedule also can be stored directly in the database and the Excel format. The level of the accuracy of the scheduling process with the parameters that have been tested by 70%.

Our proposed method also has disadvantages. The results given are not necessarily the same as the previous experiments because the Genetic Algorithm looks for a set of solutions randomly. Sometimes there are some shift errors on the part of officers. Often there is a non-conformity to the shift in the form of the same shift in a double state of 3 to 4 shifts in a row.

4 Conclusions

Based on the results of tests that have been done, it can be concluded that in general the problem of scheduling security officers at the Rawa Buntu Station can be solved by genetic algorithm method proposed. The Genetic Algorithm, in this case, is represented by an integer representation depicting the work shift of the security officer. The use of the double-point method in crossover process and random mutation method in the mutation process gives the optimal result. The next generation elitism update method generates good fitness value. Meanwhile, the form of chromosome used is adjusted by the state of the number of days in each month and the number of existing officers, making it more dynamic. The fitness value used is one divided by the (number of errors + value ε), where the value of ε (epsilon) is obtained at random. The fitness value obtained with this formula, also makes the results of the fitness of each to be more varied.

The best schedule results were obtained at the time of trial with the value of the number of individual parameters of 20, iteration as much as ten times, the probability value of crossover (Pc) of 0.8 and the probability value of mutation (Pm) of 0.06.

Meanwhile, the accuracy of the success rate of the scheduling result in shift scheduling application by using Baker's SUS selection method, double-point-crossover, random mutation, and elitism is 70%.

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Raskin Distribution In Islamic Economic Perspective

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Abstract. This research is field research (field research) with data result from observation, interview, and documentation. As for the result of the research, it was found that the mechanical distribution of Raskin in Blang Mangat sub-district was done with a flat sharing system to Target Household (RTS) which has been registered as recipient of Raskin program and to every household in Blang Mangat sub-district. The reasons are: (1) Difficulty in Establishing Target Household (RTS), (2) Culture of Togetherness, (3) Social Jealousy, (4) Lack of Socialization and Information and (5) Tradition. The practice of distributing Raskin rice in the Meuraksa settlement, Blang Mangat sub-district with a flat sharing system is not legitimate since taking the property that should be the right of the people (the poor and the needy) is haram, therefore, the practice is not appropriate according to Islamic Economics.

Keywords: Distribution, Raskin, Islamic Economic, Fakir, Poor

1   Introduction

Rice is the staple food of most Indonesians. Associated with the large number of Indonesian population in the category of poor then the government established a program that aims to improve food security for the poor who made from raw rice.The program is a raskin (poor rice) program launched by the Government of Indonesia in 2002. This program is an implementation of the consistency of the government in order to fulfill the right of the people's food as an effort to accelerate poverty reduction. This is stipulated in Presidential Regulation No. 15/2010 concerning the Acceleration of Poverty Reduction and Presidential Instruction No. 3 of 2010 on Fair Development Program. Raskin's program is to subsidize rice to poor families or low-income families to improve the welfare as set out in the Preamble to the 1945 Constitution of the fourth paragraph. In the Raskin rice government rules should be distributed to poor and vulnerable poor or more properly called poor and fakir. They are the beneficiaries of raskin called the Beneficiary Target Household (RTS-PM). Then the RTS-PM raskin was determined based on Social Protection Program Data Collection (PPLS-2011) by the Central Bureau of Statistics (BPS).

In Islam poverty is translated as faqru. Meanwhile, according to syara', meaning faqir as people who need and weak and can not be asked for anything [1]. Islam commands Muslims to help the poor as the word of God in the Qur'an Surah Al-Baqarah verse 177. Imam Abu Hanifa, and Imam Syafi'i declared that he was worse than poor. Fakir defined people who have nothing (to meet their needs), or have something but not up to 1/2 of nishab. While the poor are people who can only meet half or more than half of their needs, but can not meet all.

In the Law of RI stated that the right of the poor and the poor in receiving Raskin is the same, amounting to 15KG / KK / RTS / month with the cost of rice redemption Rp 1,600 / kg in accordance with applicable regulations. Lhokseumawe city government regulation has removed the cost of rice redeeming for poor families or Raskin a total of 7,549 households (KK). This new policy was adopted by the Lhokseumawe Municipal Government in an effort to ease the burden of poor families through the subsidy of regional funds. The city government (Pemko) also bear the cost of transporting rice from Bulog Lhokseumawe warehouse to their respective settlements [2]. However, the distribution of Raskin in Blang Mangat sub-district is not implemented in accordance with government regulations. The distribution is equally distributed to the local population and thus the poor can not meet their needs. We know that taking or taking others' rights is a sin. QS. Al-Nisa verse 29.

Research M. Dian Septian et al, states that the Raskin program is still less precise target and every year there is always a problem in the distribution of the field [3]. Therefore we do not realize that the citizens themselves are depriving the rights of the poor. Let's keep our own rights together and do not like to take the rights of others. All this can happen because of the lack of knowledge of the people, the lack of ethics in a person and not embedded Islamic Shari'a values in everyday life so that the rights of others are also his right.

2 Theoretical basis

2.1 Islamic Economics

Islamic Economics is an economic system based on the teachings and values of Islam, sourced from the Qur'an, as-Sunnah, ijma 'and qiyas.Landasan Theory. According to Anto [4], Islamic Economics is a science and application of guidance and shari'ah rules that prevent injustice in obtaining and using material resources to meet human needs and to carry out its obligations to God and society. Most Muslim economists understand Islamic economics as a theory and economic practice that avoids any transactions that contain elements of riba (interest), maisir (gambling) and gharar (speculation), avoiding an increase in the welfare of a person in a false way or harming others, emphasizing on justice aspects of efficiency, not investing and transactions on forbidden products, and striving to realize social welfare supported by zakat and other pious charities. The Qur'an gives economic laws that can create stability in the economy itself. QS. ar-Ruum: 39 and QS.al-Baqarah 27. The purpose of Islamic economics [5] is: Delivering the life of Islam in the economic field. Make us have a treasure with which we can worship such as zakat. Give solemnity to the community. To avoid sin together. To be self-sufficient. To utilize all sources of the earth so as not to waste. Paying for raw materials do not fall into the hands of the disobedient to God. Opening job opportunities to the community and addressing unemployment issues. And to be grateful for God's blessings.

2.2 The Meaning of Distribution and Its Urgency

Distribution according to the dictionary (distribution, delivery) to some people or to some places or the distribution of daily necessities (especially in times of emergency) by the government to civil servants, residents, and so on. The meaning of distribution in the Islamic economy is very broad, which includes regulating the ownership of elements of production and sources of wealth, [6]. Distribution verses are contained in the word of Allah among them

QS. al-Anfal (8): 1, QS. al-Hashr (59): 7, QS. al-Hadid (57): 7 and QS. at-Taubah (9): 60 [7]. According to Shihab [8] the intent of the whole verse above, that property should not only be the property and power of a group of human beings but must be circulated in society so that it can be enjoyed by all members of society by still recognizing property rights and banning monopoly, there is an equitable distribution with no one side or group, and the distribution process can proceed fairly. From the beginning Islam established that property has a social function. Distribution of unfair and uneven property will make the rich get richer and the poor become poorer. Thus, the distribution pattern should prioritize the priority aspect based on need assessment.

The implementation of the Raskin program involves various institutions at all levels of government, with the Coordinating Ministry for People's Welfare (Menko Kesra) as the main responsibility of the program. Technically, the person responsible for implementing the distribution of rice up to the distribution point (generally in the village office) is bulog and the person responsible for delivering rice from the distribution point to every RTS-PM is the local government. And it involves dimensions of inter-institutional and intergovernmental, financial, and administrative relationships. This is in accordance with Raskin 2014 General Guidelines (Pedum) which states that the Raskin program performance indicator is achieving the "Six Right" target.

2.3 Purpose of Distribution in Islamic Economics.

The purpose of distribution in Islamic economics can be grouped into (a). the purpose of da'wah; in QS Ali Imran: 140. (b). The purpose of education; QS at-Taubah: 103 and manifest such good morality as giving, giving and giving priority to others. Purifying from the morally disobedient, like a miser, loba and selfish (selfish). (c) social objectives; ie Meet the needs of the needy, and live the principle of solidarity within the Muslim community. QS al-Baqarah 273. Strengthens the bond of love and affection among individuals and groups within society. Eradicate the causes of hatred in society, which will have an impact on the realization of security and public order, for example that the unfair distribution of income and wealth will impact the presence of poor groups and regions, and an increase in crime rates that impact on unrest. (d). economic goals. The mode of distribution that can realize the best level of economic prosperity for the people. QS al-Baqarah: 265. In Islam, everyone is prohibited from accumulating wealth because it can impede the smooth flow of goods distribution and disrupt economic stability, as well as in excessive and greedy attitudes. (Surat al-Humazah 1-3). Similarly, to give a living, to earn a living and to spend the wealth must be done with lawful and spend the treasure in the way of Allah SWT. Some rules of the instrument of wealth distribution in Islam [9].

2.4 Fakir and Poor

Imam al-Ghaziy classified the poor into two types, the poor and the poor. The needy are unemployed who, of course, have no income or possess 20% of the property for their basic needs. The poor are people who can only meet the 70% of their life needs (at the level of the poverty line threshold). Al-Hishniy [10], defines the needy and poor as follows: Al-Fuqara, plural from the indigent. Where the limit of the indigent is the person who has no property and occupation, or has property and work but the result can not to meet his needs, such as someone who needs 10 dirhams, for example, but only has two dirhams. But Interesting is also examined, because there are poor people but must pay zakat, the trader whose turnover reaches nishab, then he must pay zakat even though at the same time he is poor. According to

Kuncoro [11] poverty is defined as the inability to meet the minimum standard of living needs. Shaykh Muhammad ibn Sholih al-'Uthaymeen illustrates the difference between the poor and the poor, "We can estimate the limitations of the poor and the poor by looking at the monthly salary. If the salary in a year is 5000 riyals (Rp 12.5 million), while the needs of 10,000 riyals (Rp 25 million), in this condition someone is considered poor. Because he is only able to meet half of his needs. If the salary in a year is 4000 riyals (Rp 10 million), while his needs in a year 10,000 riyals (Rp 25 million), in this condition he is considered fakir. Similarly, when a person does not have work, then he is considered fakir.

In the Law of the Republic of Indonesia Article 3 Number 13 Year 2011 on the Handling of Poor. The rights of poor students [12]. The right of the poor in Islam is an essential right, because God affirms that in the wealth and income of a person, there is a right of the poor and needy [13] and QS adz-Dzariyat verse 19. Islam strongly defends the poor-fakir so it gives an indication that Raskin is indeed one of the right-poor. In addition, they also have rights in welfare covering the safety and security of life. Among the principles for prosperity is the guarantee of the right to justice [14]. The poor are also entitled to a job because work is a source of income for a person to meet the needs of himself and his family next work can foster self-confidence [15]. The state is responsible for meeting the basic needs of the community, especially the poor. According to Ibn Hazm the basic needs of one's life (ibid h. 134). These basic needs, including one of human rights in Islam. If he can not afford it with his skill and income for a cause, then the state is obliged to provide it. If not enough countries can levy taxes from the rich. (ibid h.158).

2.5 Raskin Law

Legislation legislation on which Raskin is based Rasmet General Guidelines 2013. Decree of the Coordinating Minister for People's Welfare No. 35 of 2008, on the Central Raskin Coordination Team. There are several elements in Raskin, including Raskin Implementation Guidelines, Provincial Raskin Program Coordination Team, Raskin Regional Division Team, Raskin Unit, District Raskin Coordination Team, Distribution Implementation, Distribution Point, Poor Household (RTM), Deliberation Village / Village, Rice Bulog Quality Standard, Raskin Community Complaint Unit (UPM). Not all Indonesians are entitled to Raskin, only those who are poor and food insecure in certain areas have the right to receive Raskin.

2.6 Principle of Justice in Islamic Economics.

The Islamic economic system is based on the principle of justice covering all basic aspects of the economy such as production, distribution, consumption and exchange [16]. The general economic policy according to Islamic teachings is distributive justice. As the word of Allah in the Qur'an of al-Hashr verse 7. The concept of other distributive Justice of Islam is rooted in the aspect of human comfort to Allah SWT and each other. QS. Ali-Imran verse 180. And QS. al-Hadiid verse 7. Islam requires every individual and society to respect human rights and oblige the rich to help or help those who are economically weak. Like orphans, elderly people and permanent disabilities. Furthermore Islam provides the solution in the form of zakat, infak and alms. The government is responsible for the realization of a minimum standard of living for all citizens.

In Islam there are two kinds of income distribution systems [17]. The economic distribution system in Islam also recognizes the distribution of inheritance. Where the distribution system is arranged in a complex and systematic in science faraidh. While the distribution of wealth in the form of waqf, varies and is not limited by the social status of a

person, rich and poor or because of blood ties (nasab) and kinship. Sometimes waqf is in the form of public facilities. In Islamic teachings it also establishes four functions of economic activity for a person (ibid., P. 393).

3 Methods

The study was conducted in Blang Mangat sub-district, consisting of 3 settlements, and 22 gampongs. As seen in the Table 1.

In general, the livelihoods of the people of Blang Mangat sub-district from fishing and farming, but there are also working in the office, a teacher and entrepreneur but there are very few. Type of research (field research). The method used is descriptive qualitative analysis, which describes and analyzes phenomena, events, social activities, attitudes, beliefs, perceptions, individual thoughts as well as groups. The data sources used are: Primary Data Source, obtained directly from geuchik and Tuha Peut Gampong in Kecamatan Blang Mangat. Secondary Data Sources obtained from literature, documents, archives, rules, reports and others concern the Rice for Poor Family Program (RASKIN). Data obtained by collecting through three methods, namely: Observation, Interview and Documentation. The techniques in analyzing the data are: Phase Reduction, Phase Display and Phase Veritifikasi withdrawal conclusion.

4 Results and Discussion

4.1 Raskin distribution process in Kecamatan Blang Mangat.

The Raskin distribution mechanism in Kecamatan Blang Mangat was conducted with a flat distribution system where Raskin rice was distributed not only to Target Households (RTS) that had been registered as Raskin recipients but also distributed to all residents such as 225 KK registered Gampong Kuala RTS but distributed to the number of households in the gampong Kuala (281 KK), as well as in Gampong Jambo Mosque registered as Raskin recipients as many as 211 RTS but distributed to a number of families in the gampong (241 KK) and similar thing also happened in Gampong- other gampongs, so that Raskin Rice should be received per RTS of 1 sack (15 Kg) reduced to an average of 10Kg. This is clearly not in accordance with the Raskin distribution rules.

There are several reasons for Geuchik sharing Raskin equally in Kecamatan Blang Mangat, among others: (1). The Difficulty of Determining the Target Household (RTS) [18]. In reality, it is rare for the people in Blang Mangat sub-district to meet all the poor criteria of BPS. For example there are still many families who do not have adequate housing and inadequate housing facilities such as the absence of toilet facilities.

Table 1. The names of Gampong in Kecamatan Blang Mangat

Kecamatan Blang Mangat Lhokseumawe City					
Settlements Meuraksa		Settlements Teungoh/Peuntuet		Settlements Mangat Makmu	
1	Kuala	1	Mane Kareung	1	Alu Liem

2	Blang Cut	2	Asan Kareung	2	Blang Buloh
3	Jambo Mesjid	3	Rayeuk Kareung	3	Blang Weu Panjo
4	Jambo Timu	4	Blang Peunteut	4	Jeulikat
5	Tunong	5	Kumbang Peunteut	5	Blang Weu Baroh
6	Blang Teue	6	Mesjid Peunteut	6	Seuneubok
7	Teungoh	7	Ule Balang Mane		
8	Baloi	8	Keude Peunteut		

Source: Data of Blang Mangat Head Office 2017

(bathing, washing, toilet), but almost all families even each family member has a motor vehicle whose value is clearly more than Rp 500,000 , 00. Therefore, the gampong officials became difficult to determine which households really deserve Raskin. **(2). Culture of Togetherness;** The Blang Mangat sub-district community still upholds the culture of togetherness and mutual cooperation and they argue that Raskin rice should be distributed evenly so that the culture of togetherness is maintained. (3). Social jealousy; if Raskin rice is not shared evenly, there will be social jealousy and there will be turmoil or conflict between the people and the gampong officials, so that public order, calm and tranquility can not be well preserved. **(4). Lack of Socialization and Information;** The socialization of the Raskin program to the gampong officials has been done quite well. But not continued to the community in every residence in Blang Mangat District so the information received by the community about Raskin is minimal. All they know is limited to the receipt of "rice quota" given by the government and they do not know in detail about who is entitled to receive the rationed rice, and how much rice the ration is received. **(5) Tradition;** Raskin rice distribution with flat sharing system has been going on for years in Blang Mangat subdistrict and this is a tradition so to change the habit is difficult. It takes time and process long enough and sustainable in changing the paradigm of society.

In this research, Raskin's economic distribution of Islam is the author of analysis based on three aspects, namely: rights, distribution and maslahah. Rights Aspects; There are two substances of rights [19]. According to fiqh scholars, the emergence of rights is caused by five things [20]. In the process of distributing Raskin rice evenly in Blang Mangat subdistrict, the right to get the rice belongs to the right which is defined as the power of a good because the object that is the right of the problem is rice. Islam gives the freedom for every individual to exercise his rights in accordance with the will as long as it is not against the shari'ah and should not violate or interfere with the rights of others so that the protection of freedom in the exercise of personal rights must be in line with the rights of others and the general public. The process of distribution of Raskin in Blang Mangat subdistrict with a system for sharing has happened the use of rights that harm the rights or interests of others. As described in QS an-Nisaa: 29. Outwardly, people receive Raskin rice in a legitimate way and do not take the rights of others. However, when viewed from the essence of the Raskin program is to reduce the burden of expenditure of the poor and vulnerable poor then for people who are not poor is considered to have taken the rights of others. Because the rice that should be received by poor households amounting to 15Kg to be reduced which means that the rights received are also reduced. Such a Raskin distribution mechanism is not justified according to Islamic shari'ah.

In addition, most of the poor and vulnerable poor do not know in detail about the amount, price, and target according to Peduk, Juklak and Juknis Raskin. They take for granted Raskin rice which is distributed even though the amount is much less than the amount they should receive. All of this is a geuchik policy. Ignorance and acceptance of what it is certainly can not be said as an element of willingness to share rights with people who are not poor but rather as an element of compulsion. One of the principles in conducting economic activities according

to Islamic shari'ah is the principle of willingness (like the likes). If there is an element of coercion then it is forbidden to do so because it is not in accordance with Islamic shari'ah. The rules of Raskin distribution can be analyzed by looking at the right of its social aspect, to the dimension of individual rights in the state. Raskin program is a form of government responsibility to meet the basic needs of the people in the form of rice to tackle the problem of poverty that occurred in Indonesia. In Islam, the state is responsible for providing equal legal protection for all people in fulfilling basic needs, especially the poor who have limitations in meeting their basic needs. This is consistent with the Hadith of the Prophet: "Whoever abandons the property, then it is for his heirs and whoever leaves a family who can not afford, then I will be responsible" [21]. Based on the above argument, it can be seen that the right to receive basic needs is the poor. ***Distribution aspect;*** Distribution means the distribution, distribution, delivery of merchandise or goods and services to consumers by producers and governments. The word distribution is synonymous with the word dulah in Arabic. Etymologically the word dulah means to keep spinning or moving things from one place to another. While in term dulah means a process of rotation or circulation that is constant without any obstacles [22]. There are several instruments of distribution in Islam, namely zakat, infaq, alms, livelihood, waqf, testament, ganimah, and fa'i. Then, all funds sourced from these distribution instruments are stored and managed by the State (baitulmal). Then the Funds are channeled to certain groups of people according to Islamic teachings and the posts. Among the most important is the group of people who get their rights from zakat post. QS. At-Taubah verse 60. Likewise from infaq and alms, livelihood, endowments, and so forth must also be channeled according to their respective posts. In the previous discussion has been described this commitment is one form of the State in the promotion of public prosperity through poverty alleviation programs. In Islam, the state can be devoted as the head of a family or a father. Just like a father who gives protection to his family, the state or leader is also obliged to give protection to its people especially to the poor. As contained in the Hadith narrated by Muttafaq 'Alaih [23].

Aspects of al-Maslahah; Al-Maslahah comes from the word saluha, yasluhu, salahan, means something good, worthy, and useful. Al-Maslahah means all actions that encourage the realization of human goodness [24]. Every law that is sanctioned by Allah both in the form of Alquran and al-Hadith has a purpose or purpose that contains benefit to mankind. Some Muslim scholars assume that Maslahah is the aim of syara 'law which means that maslahah is equated with maqasid al-syari'ah [25] (bring in the kebakan and avoid damage)

According to al-Ghazali, as quoted by Nasrun Haroen, the benefit that can be used as a basis for legalizing the law must meet several criteria [26]. Raskin rice distributed evenly to the people has eliminated kemashlahatan and brought kemudharatan, because they should receive Raskin intact. This eliminates the benefits of raskin rice itself. So the criteria of one, two or three are not fulfilled because it does not bring kemashlahatan, but it actually brings kemudharatan for the poor. When viewed from the eyes of harmony and tranquility can be said to bring kemashlahatan because of the creation of unity and unity between communities and strengthen the ropes of brotherhood in the neighborhood of gampong community but such a way harm the other side.

Islam obliges its people to help one another, it is the main character of sharia principles. QS. al-Maidah verse 2. This life is very dangerous when we do arbitrary in seeking sustenance from God. It is unfair, if there are few people living in abundant profits, while many people are harmed. Life that is only based on personal interests or classes, will undoubtedly undermine the public order; thus fostering crime, poverty, ignorance and tyranny. What a terrible punishment God provides for those who rob people of their rights and eat their fellow's treasures in a way that

is false. Based on the above explanation of the practice of equitable distribution of Raskin rice in Blang Mangat sub-district, there has been an illegal acquisition of property by taking the property which should be the right of the poor and needy. Therefore, the practice is not appropriate according to Islamic Economics. (Surat ash-Shu'ara: 88-89) and (Surah al-Mu'min: 52). To further analyze the problem of distribution practice for the average of Raskin rice in Blang Mangat subdistrict, the writer wants to analyze it based on the distribution principles in other Islamic economies: (a). Freedom; Freedom must be based on faith in God and should not be contrary to the syara 'provisions, including not eating or interfering with the rights and interests of others [9]. *(b). Recognition of private and public ownership;* Islam recognizes individual property rights, as well as community property. However, both private property and public property rights are not absolute. Both remain bound by syara 'law to realize the benefit and avoid damage [17]. Islam recognizes the rights of individuals to have as much wealth as they can. However, every individual must be restricted and subject to the rules of the shara 'in possession of the property so as not to harm the interests of others. Taking Raskin rice by the community in Kecamatan Blang Mangat which is not poor is one way to own property that is detrimental to the interests of others because with the division the basic needs of the poor can not be met properly because the rice they receive has been reduced in number.

Justice; The concept of distribution within Islam states that distribution must be an economic condition that satisfies the demands of equilibrium and justice. Therefore, Islam does not direct the vague distribution, the location of equity in Islam is justice on the basis of Maslahah [27]. Indeed justice in Islam is putting something in its place. Taking something that is not his right is a reflection of injustice. Therefore, the distribution of Raskin does not reflect the principle of justice in the absence of proper fulfillment of rights.

5 Conclusion

The distribution of Raskin rice in Blang Mangat sub-district is evenly distributed to the gampong community in fact not in accordance with the General Guidelines, the Implementation Guidelines, and the Raskin Technical Guidelines. However, these rules are ignored due to various reasons and considerations such as: the lack of information and socialization that the community receives about Raskin, the difficulty of determining poor households by category, and the demands of people to share Raskin rice evenly in order to avoid conflict and social jealousy between communities. The practice of distribution for the average of Raskin rice in Blang Mangat sub-district is illegal according to Islamic Shariah. The reason can be seen from three aspects, namely: from the aspect of the right there is a reduction of the quota that should be accepted by the poor, from the aspect of distribution is a violation of justice because Raskin rice is not given to the people who are entitled to receive it properly in accordance with the rules and the aspects of maslahah it also did not meet the criteria kemashlahatan because with such a division it makes kemudharatan for the poor due to unmet needs for rice and of course harm them. This distribution practice is illegal (not appropriate) with Islamic economics.

6 Suggestion

All community in Blang Mangat sub-district should be collected and given detailed information about Raskin program to avoid misunderstanding in receiving information about Raskin. Furthermore, the gampong officials should be objective in determining the RTS by updating the local community data through the Raskin coordination team so as to distribute Raskin rice completely to the eligible recipients and this certainly does not lead to conflict and social jealousy.

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Construction of Philosophical Values and the Concept of Penancein Islamic Criminal Law

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Abstract. This study aims to cast light onthe philosophical values comprised in every criminal case, and the construction of punishment models in Islamic criminal law. The primary data source of this research are the verses and hadiths that contain the principles and concepts of punishment. Secondary data sources include Tafseer, criminal law, and relevant previous research results. All data is derived from document review and processed through navigation, identification, construction of punishment models, and conclusions. Based on the above objectives and research methods, it is revealed that: First, the philosophical values comprised in the criminal penalization of Islam are equilibrium, justice, humanity, reformative, restorative, preventive, preserving life, moral and repentance as a forgiving excuse. Second, the above philosophical values can be constructed into a contributory punishment model for the renewal of national criminal law. The referred punishment model is the scourging and the qisas-diyat sketch. The latter principle contains the consequences of the birth of a new paradigm in the Indonesian criminal justice system. This new paradigm places not only judges who are entitled to determine the punishment of the perpetrator, but the victim also has the right to punish or release the perpetrator from punishment.

Keywords: Philosophical Value, Construction, Criminal Concept

1 INTRODUCTION

It is apparent that the attention of Islamic law scientists to Islamic criminal law is proven to be very poor, especially with regard to the system of punishment. During this time, Islamic legal research is more oriented to the study of Islamic law in the field of worship [1], [2], muamalat [3], mawaris, munakahat [4], and other fields [5], while the study of Islamic law in the field of jinayat (criminal) is still very limited. And that too is dominated by empirical-sociological studies of Islamic criminal law [6][7], whereas normative-theoretical studies have not received adequate attention.

It is possible to conduct the review of the field of criminal law on the aspects of legal material, legal structure, and legal culture. In fact, thematerial aspects of the law are important and prior aspects before being transformed into the legal structure and put into force by law enforcer. One important aspect of Islamic criminal law material is the punishment system. It is primarily due tothe fact that it greatly affects the life, freedom, and human dignity. The

punishment system not only causes loss of soul and freedom, but also shortfall of social disability, poverty, and psychological suffering.

On the other hand, the form of prison sentence that has been put into effect in Indonesia is found to trigger a lot of problems, among them is the problem of prison's over-capacity all over Indonesia, the paradigm and material substance factors that are oriented to institutional crime (prison) and the implementation of the prison law itself [8]. One consequence is the occurrence of prisonization, an adaptation performed by inmates to a particular pain or suffering in prison. Some forms of prisonization are the deprivation of fellow inmates, homosexuals, spying, group fighting, narcotics business, differences in treatment by officers, riots, groupings by region, and the oppressive or threatening behavior of prisoners who aro known to show their loyalty to the non-criminal world [9].

It is expected that Islamic criminal law can sinificantly contribute to overcome the above problems, especially with regard to the system of punishment. Ironically, Islamic criminal law has long been seen as cruel, inhuman and contrary to human rights. Among the samples that are often pinpointed to denote the cruelty of Islamic criminal law is the embracement of the system of corporal punishment, such as hand cuts, scourgings, qisas, and stoning to death. This impression is even heightened as there are many studies examining the application of Islamic criminal law in several Muslim countries such as Iran, Afghanistan and Indonesia (Aceh). Such is particularly led by misapprehension of some Western scientists and Muslims themselves in fathoming Islamic criminal law. In their studies they take more heed on the form of corporal punishment of the normatively-textual Islamic penalization system, rather than exploring the philosophical values, and the concept of criminal prosecution contained in them philosophically-contextually. This condition is very harmful not only for Muslims, but also for mankind at large, given the fact that Islamic law plays an essential role as part of Islamic teachings with an underlying vision and mission to spread affection to the whole universe.

On the basis of the above background, this study addresses the following questions: First, what and how are the philosophical values comprised in various criminal forms in Islamic criminal law? Second, how dothe philosophical values contribute to build the concept of criminal penalization of Islam in relation to the context of national criminal law reform?

This research has both theoretical and practical significance and urgency. Theoretically, this research contributes in developing the theoretical dimension of Islamic criminal law, especially about the penal system. Practically, this research is expected to contribute to the effort of reform of the Criminal Code in particular and criminal legislation in general. It is given to the fact that the applicable Criminal Code in Indonesia and some other Muslim countries is a colonial product based on the philosophy of individualism and Western liberalism. Meanwhile, Indonesian Muslims as the largest religious adherents in Indonesia and even in the world have an interest to encourage the birth of the Book of Criminal Law which was underlied by the principles and religious values adopted by a nation.

2 THEORETICAL REVIEW

Islamic Shari'ah comes up with a primary vision of realizing the piety of human life in the world and the hereafter [10]. In realizing the aforementioned Islamic vision, the scholars formulated an Islamic mission referred to as maqāṣid al-syar"ah (the objective of shari'at), which includes the obligation to preserve religion, the obligation to preserve the soul, the

obligation to preserve the mind, the obligation to keep the offspring, the obligation to keep the property [11], and the obligation to maintain honor [12]. All the above maqāṣid al-syarī'ah are the most basic human rights extracted from the basic values (qiyām al-asāsī) of Islamic law which are also the basic values of Islam, namely tawheed, benefit, justice, equality, freedom, brotherhood, tolerance, helping each other, and excellence. The general principles (uṣūl al-kullī) are derived out of these basic values, which subsequently are formulated into a practical law (aḥkām al-'amalī) which becomes the guide and order to govern human life both as a person and society [13]. Thus, law establishment in Islam should never be in contrary to the vision, mission and basic values of Islamic law as referred.

In the context of Islamic criminal law, the formulation of the penal system should rest on this vision, mission, and basic Islamic values. In order to be able to realize the vision, mission, and basic values of Islamic law, it must be formulated based on the objectives and principles of Islamic punishment. There are four objectives of punishment in Islam, namely; first is al-jawābir (deterrence), ie as vengeance, reward, and penance. That is, punishment is regarded as a reward for evil on one side, and frees the offender from guilt or sin on the other [14]. Second is al-jawāzir (preventive or prevention), that is, how to prevent people from committing crimes and warn them [15]. Third is al-iṣlāḥ wa al-tahdhīb (rehabilitative and educative), which is the effort to educate the perpetrator of the offense to realize his mistake in the hope of raisingthe perpetrator's awareness that he keeps away from the offense not because of fear of punishment but fear of Allah SWT. Fourth is restorative justice [16] that is a process whereby parties with an interest in a particular breach collectively seek ways about how to deal with the consequences of the offense and its implications for the future. Therefore, the objective of the restorative justice process is the recovery in a secure community of victims and perpetrators post-conflict resolution between them [17].

Based on the basic values and objectives of the above crimes, it is possible to formulate the principles of Islamic criminal law which covers the principle of legality [18][19], the principle of individual responsibility [20], the principle of no crime in compulsion, the principle of no crime without error, and the principle of no criminal for self-defense. According to the principle of legality no act shall be punishable, except those already laid down in the criminal legislation before it is committed [19]. The principle of individual responsibility affirms the prohibition of transferring faults to others (Surat al-An'ām: 164, an-Najm: 38-39, al-Zalzalah: 7-8, and al-Baqarah: 286). The principle of non-criminal in compulsion emphasizes that every offense that is carried out must not be under duress, but on the willfulness and voluntary acts of the perpetrator. Furthermore, the principle of non-penalty for self-defense explains that any person who defends himself and his rights can not be criminally charged (Surat al-Baqarah: 194 and Al-Shūrā: 41). Finally, the principle of no crime without error means that an act is deemed offense if the act constitutes an error according to Islamic law [9]. These principles serve as guidance in formulating a system of punishment in Islam.
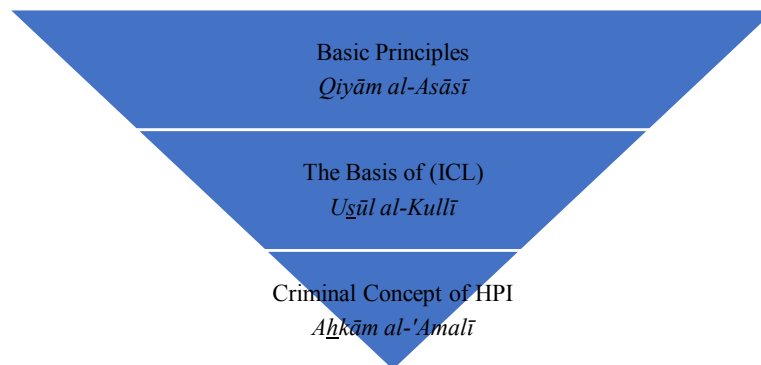
Information: ICL= Islamic Criminal Law

Fig. 1 The Hierarchy of Norm Theory

3 RESEARCH METHOD

The verses and hadiths about the crime of hudud and qisas are the primary resources of the research. In tracking the verses referred, the Qur'anic Concordance of 'Ali' Audah is applied, while to navigate the traditions the mu'jam is used as support. Secondary data sources include Tafseer, Hadith (jurisprudence), jinayat fiqh, criminal law literature, philosophy of Islamic law, and relevant previous research results. All data is derived from literature search and processed through the following steps; (1) navigation and identification of verses and hadiths of the hudud and qisas offices (2) inventory of the diversity of punishment forms (through domain analysis); (3) explore the philosophical values comprised in any criminal form (through hermeneutic analysis); (4) construct a new model of punishment that can contribute to national criminal law reform; (5) make a conclusion. The approach used in this research is the philosophy of Islamic law.

4 RESULT AND DISCUSSION

4.1 Construction of Philosophical Values in the Islamic Penal System

Below is the explanation about the philosophical values comprised in various criminal forms in the Islamic penal system. The intended form of criminal only covers hudud and qisas crime. Each includes the offense of adultery, qadhaf, robbery, drinking khamar, riddah, rebellion, and murder. Based on the results of navigation and analysis of QS. al-Nūr: 2-5; QS. al-Ma'idah: 33-34, 38-39; QS. al-Ma'idah: 90; al-Baqarah: 178-179 and the book of exegesis [21] relating to a number of offenses above the researcher reveals the philosophical values contained therein.

First is the value of balance. This is primarily shown by the bi-dimensional content in the Islamic penal system which includes; (1) the dimensions of the worldly-ukhrawi; (2) the dimension of the severity of punishment and strict of proof; (3) the dimension of the stealing prohibition-order to keep property; and (4) theological-anthropological dimension. The

dimensions of the worldly-ukhrawi elucidates that the punishment of the offender is not only from the state, but also from Allah swt. If a person is free from the punishment of the world, he will not be free from the punishment of Allah in the afterlife. The existence of the ukhrawi dimension gives birth to an extra legal awareness for society, which inhibits people from lawviolation not for fear of punishment in the world but for fear of punishment in the afterlife. The balance between the severity of the punishment and the strictness of proof is indicated by the punishment of adultery and the proof of four witnesses who simultaneously witnessed the minute action adultery when the penispenetrate the vagina. In this offense an offender may only be subject to punishment if the 4 (four) witnesses are available. A similar balance also applies to the prohibition of stealing and the order of keeping up property for the owner [21].

Second is the value of divinity. This dimension is indicated by the urge and desire to free oneself from the sins of the wrong done. This godly awareness arises from the belief that the punishment in the world will free him from punishment in the afterlife. This theological awareness raises the consciousness of the perpetrator to confess before the Messenger of Allah (PBUH) against the mistakes made [22]. Recognition is a form of repentance to Allah SWT. Repentance is the reformative and restorative step the perpetrator undertakes to repair and break free from sin. Thus, the source of legal behavior, legal awareness, the purpose of punishment, and the motivation to behave in Islamic criminal law is intrinsic because in Islamic criminal law the behavior, awareness, and motivation of law stems from the belief that the slightest mistake will be rewarded by Allah in the Hereafter. It is this ukhrawi dimension that distinguishes Islamic criminal law from secular criminal law.

Third is the enforcement of the value of justice and humanity. This value is shown by Rasulullah SAW in punishing women who have married, while she was pregnant. The Messenger of Allah (PBUH) ordered his guardian to care for the woman and her baby first before being sentenced, including to punish the corpse of the perpetrator who was serving the punishment [22]. This case introduces humanist values in applying criminal to every offender. Treating this human punishment is the philosophy of criminal practice. Thus, Islamic criminal law highly upholds human rights.

Fourth is protection and preservation of marriage institutions through the prevention of all forms of behavior that could harm household harmony or destroy family institutions. Among the prevention forms offered by Islam is the threat of severe punishment for married offenders. The severity of punishment is not intended to punish the perpetrator, but rather based on the purpose of preventing the crime from being committed.

Fifth is uphold of moral values. Because the punishment for the perpetrators of adultery muḥṣan very heavy, the Islamic criminal law tighten the proof of this offense. A detailed investigation by the Messenger of Allah (PBUH) on the perpetrators who claimed to have adultery [22] proves that in bringing down the criminal, even to the performer who consciously admits to committing adultery it is necessary to have very convincing evidence. The investigation conducted by Rasulullah SAW is not only against the perpetrator (whether he or she is sane or not and whether he or she knows or not that the action is prohibited by law), but also against the deed done. The Prophet's question to one who claimed to have committed adultery; ... [22], is a form of inquiry to obtain information about the act of the offense very convincingly. All those things are etremely necessary to be done in upholding moral values.

Sixth is the value of preventive. This preventive value is contained in many of the offenses in Islamic criminal law, including the offense of adultery. In order to prevent the occurrence of adultery, since the beginning Islam has ordered his adherents to avoid all acts that can direct the perpetrators to adultery. Such actions include, among others, approaching

adultery (Surat al-Isrā ': 32). The prohibition of approaching adultery shows that Islam prioritizes preventive principles, rather than repressive and rehabilitative. This further reinforces the view that Islamic criminal law does not desire to punish, but prioritizes the desire to prevent people from breaking the law. The preventive value contained in the Islamic penal system includes both general and special preventive values.

Seventh is the value of repentance as a forgiving reason. Repentance should be done by the perpetrator before being caught by the authorities in the case of adultery, whilst forgiveness of victims in the case of *qazaf* (accusing others of illegality without being able to bring in 4 witnesses), and the forgiveness of the victim or the heirs of victim in murder or waivers can free the offender from the threat of punishment . It contains the philosophical value that repentance builds an intrinsic awareness of the law and it also serves to preserve life.
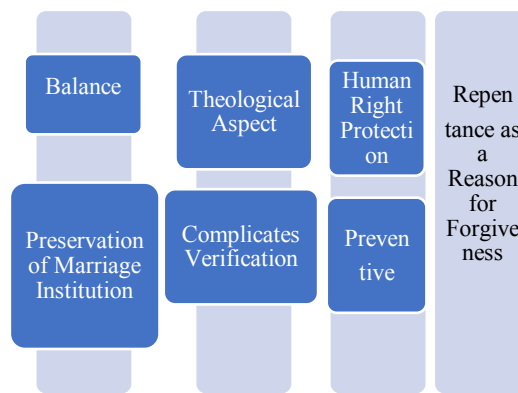
Fig. 2 Philosophical Values in the Islamic Penal System

4.2 Construction of Penalization Model and Renewal of National Criminal Law

The above philosophical values contain the ontological, epistemological, and axiological dimensions of Islamic criminal law. The dimension of Islamic criminal law ontology is indicated by the balance and theological values contained therein. Epistemological demands can be seen from the value of the preservation of the institution of marriage and complicates verification. While the axiom of dimension is found in the value of human rights protection, preventive, and repentance as a forgiving reason. Thus, the philosophical construction of the penal system in Islam can be demonstrated as follows:
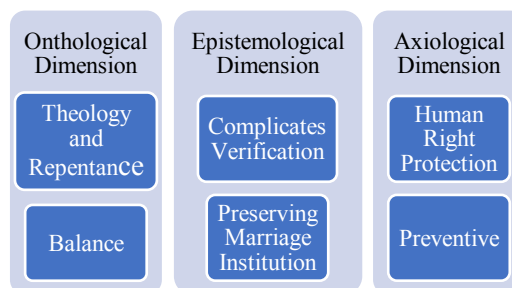
Fig. 3 Philosophical Construction Islamic Penalty

Ontologically Islamic law is of double dimension. On the one hand, the law is sacred, eternal, absolute, and divine because it comes from God; but on the other hand, it is profane, temporal, relative, and humane because it is the product of human thought and understanding of the Qur'an and Hadith. This double dimension gives birth to a balance between the dimensions of divinity-humanity and the worldly-ührawi/hereafter at the same time. This makes the Islamic criminal law in practice impacts both worldly and in here after. The derivative effect of the nature of Islamic criminal law above is related to the source of obedience, objectives and legal awareness as well as the concept of punishment. Essentially, the source of obedience in Islamic criminal law is internal-intrinsic, rather than based on the expectation of a reward and effort to avoid punishment in the world (compliance) or not by maintaining good relations with the party authorized to apply the rules of law is maintained (identification) [23]. Rather, it comes from an intrinsic theological or intrinsic drive. If the legal consciousness in a secular criminal perspective on the plains can distinguish and behave in accordance with the law or not, the legal consciousness in the Islamic perspective to the plain of consciousness asks to be punished for having violated the law. The awareness of asking for punishment is motivated by (1) the conviction that the punishment in the world is lighter than the punishment in the Hereafter, and (2) the conviction that the execution of the law in the world will liberate every offender from sin and punishment in the Hereafter. Thus, the revision of the national Criminal Draft Law based on the excavation of values sourced from religion, especially Islam is a manifestation of the formulation of criminal law in accordance with the law of living and believed by a religious Indonesian society. Criminal laws formulated based on values and laws that are believed and thrive in society will make the law effective.

An essential reference in formulating the provisions of Islamic criminal law is the basic values and aims (axiology) of Islamic law which is also the goal of Islamic criminal law, namely the benefit of human beings in the world and the hereafter. To achieve such purpose, Islam offers a framework called al-maqāsīd al-syarī'ah, a basic framework oriented that criminal provisions will manifest human good if it is based on efforts to preserve religion, soul, property, lineage [11] and honor [24].

The foregoing basic values of Islamic law are in line with the basic values of Pancasila as can be systematically abstracted from the first to the fifth; basic values of divinity, humanity, unity, populism, and social justice. While the basic norm (groundnorm) of the 1945 Constitution is not classified as part of a positive law, but transnational-logic that is above positive law. Nevertheless, the 1945 Constitution becomes the determinant of the validity of all positive legal arrangements so that the position of the 1945 Constitution becomes a touch-stone for various products of legislation in Indonesia [25][26].

In regard to the concept of punishment, there are several things to be the main ideas of research results, that is related to criminal purposes and philosophical values contained in various forms of punishment. All this time, the penal system policy seems to be highly oriented towards the offenders(offenders oriented), instead of crime victims. This is highly observable, among others, from the following objectives of punishment formulation; (1) the criminal must be able to re-populate the convicted person to be a good and useful person; (2) the criminal should be able to free his guilt; and (3) the criminal must not share and degrade human dignity [27]. In such a context, a judicial or psychological legal policy concerning the interests of crime victims as reflected in the above concept of Islamic criminal thought should be considered in order to contribute to the revision of the upcoming bill of the Penal Code to be a counterweight to an offender oriented legal policy. Thus, there is a balance between the

orientation to the offender and the victim of a crime, so that the rights of the perpetrator and the rights of the victim are protectedequally.

There are 2 (two) criminal forms that can significantly contribute to national criminal law reform, namely scourging and qiṣāṣ. The scourgingis totally foreign in the Criminal Code and the law outside the national Criminal Code. Whereas the qiṣāsfor criminal offender of deliberate murder is essentially the same as the capital punishment which is known in various regulations applicable in Indonesia. The scourgingis proven to be effective in achieving the purpose of punishment. On this subject there are several arguments that can be put forward as a basis for the imposition of caning criminal in the national Criminal Code in the future.

Firstly, it is obvious that imprisonment has caused many negative effects, such as isolating inmates from the outside world, robbing the inmates from the power to decide the important aspects of their life, making them prone to live in an oppressive and violent jail environment, and a bad environment for their health, especially for the elderly [28]. The inhumane situation in many prisons resulted in anger and destructive hatred. As a result, prisons can produce criminals who have a greater tendency to take revenge against their society upon theie breakfree.

Second, scourging can give a sense of deterrence both physically and psychologically. The purpose of the imposition of a criminal scourging for the offender is to offset the psychological factors that encourage the offense, namely to get pleasure. Psychological factors that oppose to it is a condition that leaves a former threat of misery or pain, especially spiritual pain (shame). Thus, it is expected that the criminal can prevent the perpetrator to repeat his actions [9].

Thirdly, scourgingis economically effective, because it can save state costs, especially when compared with imprisonment, because scourging does not require the provision ofprison buildings and the additional living costs for the needs of the prisoners. In addition, punishment can prevent deterioration in the productivity of the convict, because its implementation does not last long, so after serving the punishment the convicts can return to work as usual.

The next criminal form that contributes to the reform of the national criminal law is the law of qiṣāṣ. The contribution offered here is oriented towards the philosophical value embodied in it. The death penalty in Islamic law is applied to a deliberate killing offense that is not excused by the victim's family. In other words, upon the forgiveness of the victim's family, the perpetrator is not required to serve a penalty, instead, he or she will be required to pay diyat (indeminity) for the victim's family. In this provision, there are 2 (two) concepts that Islam wants to offer for qiṣās, especially qiṣāṣ for death, namely (1) the concept of equilibrium (qiṣāṣ) and (2) the concept of forgiveness.

Philosophically the purpose of qiṣāṣ is preventive and restorative. The preventive purpose is meant to prevent the crime of subsequent murder and at the same time prevent the community from 2 (two) things, namely: (1) revenge between the victim's family and the perpetrator that can result in the birth of social chaos, therefore Islam authorizes the government to enforce the law of qiṣaṣ; (2) preventing other people or the community from taking the same action (killing) at a later time, because the offense of murder is threatened with a very serious crime. This restorative goal is not only for the perpetrators and the relationship of the perpetrator with the victim's family in one social life order, but also for the society at large. Restoration or improvement of this behavior is the principle of education in order to educate a criminal to turn into a good person. Therefore, in the criminal structure of killing, the law of qiṣāṣ is the highest form of punishment. That is, it is applied as the last alternative if the victim's family or heir does not forgive the offender.

In Islam, the law of qiṣāṣ contains both criminal and civil elements. The criminal element is the qiṣās criminal penalty for any offender of deliberate killing that has already fulfilled the terms of the qiṣās offense.While the civil element is the right of the victim's family to forgive the perpetrator to be not only free from the qiṣās criminal, but also to be free from diyat payments, upon the willingness of the victim's family.

Meanwhile, according to Islam, the two types of criminal qiṣāṣ and criminal diyat above, are conceptualized as the principal punishment whose criminal imposition is left to the victim or the victim's family as the owner of the right through the verdict of the judge. Based on this, it is clearly seen that the concept of Islamic criminal law has a stronger commitment to the issue of the need for legal attention to victims of crime as those who experience the consequences of a crime. Therefore, the aforementioned concept of Islam should be considered as an ingredient to be accommodated in the review and refinement of the upcoming Criminal Code Bill. It is highly suggested to consider the Islamic Law with regard that the Indonesian criminal law in the future is designed to become a balanced and proportional law between the victim oriented and offender oriented. This also given to the fact thatat present, the vision of victimology has become a commonplace international trend which also colored the concepts of modern criminal law. Therefore, the Criminal Code Bill should ideally adapt to the international trend by adaptive reasoning as one of the basic reforms of Indonesian criminal law (Penal Code).

Thus, the qiṣāṣ-diyat criminal sketch can be offered as a model of restorative justice. In this concept it is understood that criminals and crimes are solved in a participatory manner by involving perpetrators, victims, and communities. This restorative justice aims to: (1) educate the perpetrator to acknowledge his mistakes and learn to be responsible for his (educative) mistakes; (2) recover the victims (rehabilitative or restorative); and (3) realize public order [29].

Based on some of the above, the idea to offer the values or principles contained in the form of criminal as well as alternative criminal forms of scourging and capital punishment to be included in the Criminal Code Bill is part of the norm and construction of national criminal law reform. For, philosophically, juridically, and sociologically these values or principles and criminal forms are in accordance with the values of Pancasila, the 1945 Constitution and the legal awareness that lives within the cosmos of the religious personality of Indonesian society.
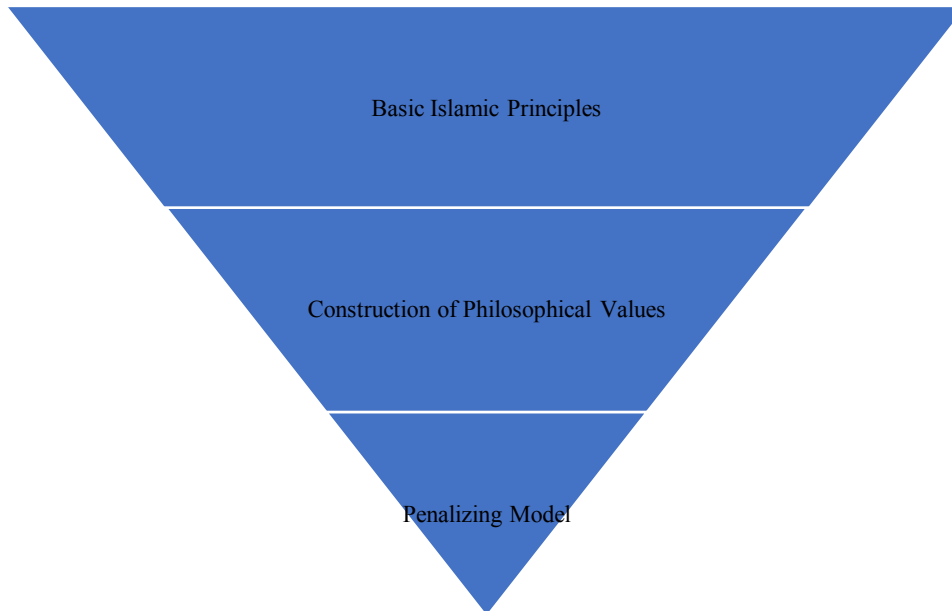
Construction of Philosophical Values and Models of Penalizing Islamic Criminal Law

5 CONCLUSION

Based on the above explanation it is possible to conclude that:

First, the true philosophical values in various forms of punishment in Islamic punishment include; (1) the balance between ilāhiyyah (theological or divine) values and insāniyah (anthropological or humanitarian), the world and the hereafter, the protection of the rights of the perpetrator and the victim, the criminal and the offense, the criminal to the offender and the obligation to close the possibility of the offense and the balance between (2) protection and upholding the values of justice and humanity, (3) upholding moral values, especially the value of honesty and responsibility, (4) the value of reformative and restorative justice, (5) protection and preservation of marriage institutions, (6) prioritizing preventive rather than repressive, (7) preserving life, (8) repentance as excuses, and (9) the greater the threatened punishment, the more strict the evidence needed.

Secondly, based on the construction of the philosophical values embodied in various criminal forms, it is possible to formulate not only a more effective and efficient punishment model but also other non-criminal and legal measures that can be offered by Islamic criminal law. With regard to the punishment model, this study finds a model of scourging and qisas-diyat sketches as one of the concepts of effective and efficient punishment because scourging has economic, psychological and social effectiveness, and better protection of human rights. The qisas-diyat sketch offers two important concepts of crime. First is being sensitive to the victim / family of the victim along with the rights attached to it. Second is the restorative justice paradigm. In addition, the study also found that in tackling future crimes it is not enough to use the juridical approach only through the imposition of sanctions, but also on economic and social policies. Thus, the state can punishevery perpetrator of theft only if it has

prospered its people because in terms of Islam, stealing because of hunger is not a crime, unless it is caused by greed and voracity.

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Development Model Of Typical Regional Product Marketing Based on Employee Development For Entering The Centralized Market

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Abstract. Opportunities for business people to contribute and promote the economy very important to enhancement the market activity that are in the area, regional economy will be weak if not supported by the strength of the opportunity businesses. The power unit of anyl businesses in the region is in anticipation to avoid Hollow Middle is a medium-sized and large enterprises that strength and weakness to go nationally and internationally. Competitive advantage typical regional products are not only influenced by the employee advantages, but is also influenced by the human resources (HR) and Operational in shaping the development of local specialty products, employee to enter the centralized market. It can be concluded that; *First*, internal factors against and employee development for centralized market negative effect. *Secondly*, the positive effect centralized market on the entering development. *Third*, external factors on entering development and centralized market influence positively. *Fourth*, the internal factors of the employee development and market centre was not significant. *Fifth*, while also not significant employee development to centralized market. *Sixth*, external factors on development of labor and significant centralized market.

Keywords: Typical model regional product marketing, employee development , centralized market

1 INTRODUCTION

The increasing establishment of shopping centers in particular modern markets is not expected to leave the advantages of industrial products and employee in Indonesia , there for not this kind of existensi employee in the global enterprises . Improved product quality is necessary to increase the volume of sales of each product is typical of the area [1]. Opportunities for business people to contribute and promote the economy can be seen by the size of the market activity that are in the area, the regional economic structure becomes weak if not supported by the strength of the structure businesses.

The prepare of speed growing trade foods caused by the position Palembang metropolitan city improve of Palembang destination located development of growth industrialized countries such as developed country, Singapore, Malaysia and Thailand. South Sumatran capital

Palembang as to be ready to capture these opportunities and can provide shopping centers representative. Palembang is nice city have many products, namely: pempek, kemplang, songket cloth and carving in the closet, this products hope to make many products improve as a superior product from outside the region and even foreign countries.

Palembang one from many City progress to destination should make ready to become international trade for economic factors, there are many business capabilities example foods should be enhancement, especially for business people who come from region of Palembang such as pempek where the majority of whom many are engaged in small industry and this opportunities to make the city will very nice, besides improving the quality of products and market expansion is very important to note.

Capability of business in Palembang city, many programs will do in this city, superior of products using traditional way, it is very different from which a many people can become entrepreneurs to enhancement other business so qualified, Japan, Korea generally someone to be an econom is prepared in advance by schools in business or entrepreneurship [2]. When the important industry to make qualified, many people do their skill prepared in such a way it can avoid many education and behavior both in terms of time, money, creativity development and market themselves.

A superior product of Palembang has a national and international market, to get cloth of songket example, we may encounter region this product domestic bungle or other nice region , there are pempek in a along the main streets in the Palembang, crackers can be need innovation product at the long streets and in the opposite ulu Ulu City Palembang, while the many carved can enhancement in the area of the Mosque of Palembang. Therefore, the location of this superior product is very difficult if we want to buy alls so market for the products of Palembang must in a narrow place, especially for innovation songket and carving the cabinets very important to make innovation so this product exclusive to sell in global market..

Centralized market need to be established for a nice product of city because its very important to growth this innovation so superior of foods coming in the market and consumers easier to find thats, besides that if a important product is a nice placed in the market to facilitate the consumers in or outside the region know and consume The product [3]. This will make the typical product Palembang still will not be abandoned despite the entry of various similar products from outside the area

The development of labor-based marketing model that is marketing model that was developed through development of employee by PT. Sosro rays which can make it easier and profitable for the seller. If the homogeneity of superior products can be developing, this is interesting for many people to coming maintain the quality of the superior product from Palembang there will be competition among traders who improve of superior products that can be reach for domestic and international market to consumersl as foreign countries, so the important to get the quality products can increase the sales volume for the product superior from Palembang.

This riset by analyzing the situation, determine seqmenting, targeting and positioning of products as well as designing a marketing strategy, strategic relations and the enhancement of employee [4], to make it easier to enter the centralized market (market center) which central the superior regional products as well to enhancement the existence of econom are growth industries and handicrafts. Product of regional from Palembang can growth quality product to entering national and international market, quality product from superior product as well as kemplang from Tailand, Kemplang do not have many water from Palembang.

This study purpose is; (1) analyze the situation of regional products to enhancement to coming national and international market (2) do the regional product segmenting position of regional products, (3) forming of the strategy, development of marketing programs, enhancement employee and operation , (4) Analyze the factors typical regional products entering the centralized market, (5) models typical regional products based development of employee.

2 LITERATURE REVIEW

Marketing model based employee development has been studied and carried out by company to analyze the situation, determine market segmentation, determining the target market positioning of products and skill of employee [4]. Analysis by company to enhancement the regional product so the quality product growth to coming at competition di global market. But in these studies doesnot studies about strategy marketing.

Development Market based employee development about market strength as the base product excellence and the actually how the people can use the quality product to win in the market global [4].
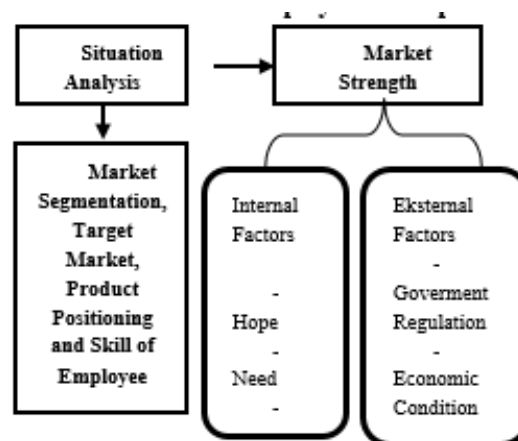
Fig. 1 Typical Regional Product Marketing Model Employee Development towards: PT Sinar Sosro Case

Products marketing model based employee development by adding the design of marketing strategies , relationship strategies and the employee development in research . its tested for validity and effectiveness of the marketing model.

The situation analysis, situation analysis conducted to determine the internal - external environmental conditions affecting the typical products of local businesses, hopes the enhancement the employee can makes the quality of regionalproduct [5].

Information in an enterprise located in the information of management system Mechanism acquisition, more specifically on information of marketing. The devices SIM there is: (a). Good system of internal business of: foods or superior product to the marketing, sales information systems, (b). Marketing Intelligence System, the important information about the

development of needs for consumers to buy many product. (c). The quality product to get competitors with business di global market so the superior product coming in national and international market [6].

Market segmentation, segmentation make the position same with the needs consumers so the quality enhancement the superior product becomes the best and qualified [7]. Kotler [8] Information of product is very important because people hope the product can make the good quality as well as customers based on characteristics. Once the group is formed, enhancement do is to identify each consumer characteristics to be used as the profile of each segment. Profile is then a differentiating factor from each segment [9].

The Target Market, Through a clear mapping of the consumer, a business will be easier to choose where the consumer segment that will be the target market. The important foods for many consumers will make targeted and needs innovation for developing, entering the market, and use many ather strategies in general,. **Product positioning**, Positioning is an activity undertaken by business units in designing the offer and image in order to get a place where esier for consumers. Perform positioning, necessary differentiation of the product offering to consumers to enhancement the quality superior product [10]. As a culture, market orientation contains guidelines that direct the behavior of people in comapnys. Narver [11] make the spesiality of product growth.**Marketing Strategy**, through the analysis of the spesiality of combine quality product to get competition in central market, to segment the market, competitor evaluation, and make the behavior of consumers choose the superior product. Important to make the designing a marketing strategy,. Establishing global marketing, and developing skill and behavior for employee to make other foods. An understanding of market conditions and competition enhancement to make innovation to superior procuct from special city. To be able to quickly anticipate these changes, the typical product business unit must quickly identify changes. Knowing what is happening and enhancement many innovation for the future.

Strategies relationship, A good relationship needs to be established between the local specialty products business unit with the end consumer, distribution channels, retailers), suppliers, competitors have the same work with business units, the qualified people of local specialty products business unit. Good relationships can encourage business units to improve its ability to satisfy the consumer and can quickly identify changes in the environment through cooperation related parties.

Development Marketing, [12] strategy marketing and development employee can make the quality superior productis a cornerstone in the preparation, implementation, and control of the company's marketing strategy, the strategy of marketing mix or marketing mix (4P for the product): : a. Product, related to the differentiation in terms of shape, features, design, and others. b. Price, relating to how to determine the price of products or services. c. Placement, consumers can easier to found this distribution channels for product from the country, its will important.

Many company in Palembang to produce superior product must be enhancement quality product from development employee. This action can make differential product so streght of product will growth to comes in global market within other product from other foreign.

Human Resources Development and Operations, development of human resources and operations taking into account in company to make many innovation and enhancement for skill and behavior employee, strategies for achieving objectives, the nature and type of activity, the type of technology used, and external factors such as government policies, development of employee [13].

Government support to promote condition of company in the country is very great contribution and dynamic growth to the development of marketing programs . Innovation product will do for the business in superior product to can competition di central market.

The Government has launched the innovation -based economy by 2025, with a seven-step improvement innovation ecosystem , turn four vehicle acceleration of the economic growth that the basic needs of the industry , creative industry, differential of product will be important to make this product in global market of the area -based industries and strategic industries. This is the basis for the development of employee as follows:
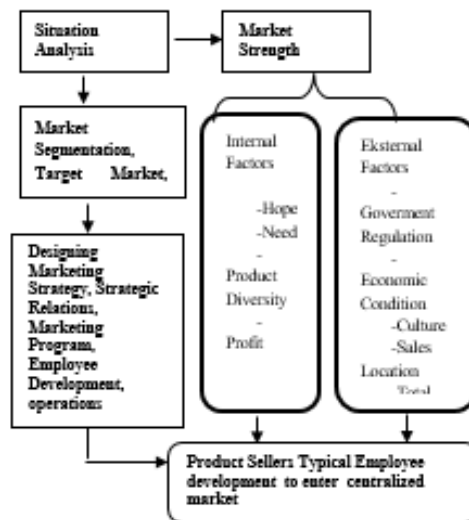
Fig. 2 Product Marketing Model DevelopmentTypical Areas Based on Employee Development

3 RESEARCH METHODOLOGY

The operational definition, the development employee in the company,.The employee development-based marketing model by analyzing the situation, determine market segmentation, target market and positioning of products and designing marketing strategies, relationship strategies and employee development

Innovation of superior product from superior its can be enhancement skill to make the company win the competition in market centre and in national or international market. Training and development as well as needs to growth quality product for innovation product in Palembang to cones market centre.

Table 1. Typical Areas shape Product Differentiation

Form of Differentiation	Name of Differentiation	Notes	Example
Product	Product Form	Size, Color, Physical Form	Logo, packaging, label
	Feature	Additional benefit from main product	Characteristic
	Performance quality	The degree to which the main characteristics of the product operates.	Typical products which have a broad market
	Conformance	specifications and the same	Songket with the onset

Form of Differentiation	Name of Differentiation	Notes	Example
	quality	manufactured products able to make quality of product can growth	thread
	Durability	Operating life expectancy of products under normal conditions or stress	Carved cabinets are durable for years of usage
	Reliability	The ability of the product to be a failure or error in a certain period	Typical products can Entering the national and international markets
	Repairability	Ease of repair products that are damaged or malfunction	Improvements to the typical regional products
	Style	The look and feel of a product	Innovation of superior products in market
	Design	Features that affect how the function and appearance of the product	Songket modified with embroideries and jumputan

Population and sample, this study is the people that they sells and consumers of superior product in Palembang city that very nice to bring there from Palembang, South Sumatra number is not known for certain (infinite). This reseach using the technique of purposive sampling to get sample that make this objective or valid to the research objectives, in this research that sellers and buyers of products superior Palembang scattered in the Ladder Tank, , Region Mosque, opposite ulu, market of 16 Ilir, cinde market, Airport Store crackers kemplang and pempek along Sudirman street have many product pempek food and kemplang, Basuki grace street have many superior food from Palembang, Radial Road have good quality product pempek and kemplang food, Colonel Iskandar street and Kapten A Rivai street is the same. The great mosque have many carve from Palembang and the staircase area have many cloth of songket

4   RESULTS AND DISCUSSIONS

Analysis for this research of one system that used to established the model as figure 3 and figure 4.

Internal factors adversely affect the based development employee -0.24. Internal factors also impact negatively on the centralized market, the path coefficient -0.05. While employee development positive effect on centralized market of 0.22. External effect positive for market centre towards development of labor, the path coefficient of 0.96. External factors also impact positively on the centralized of market, coefficient of 0.48.

Internal factor is significant to development of labor, the path coefficient -3.26. Internal factor is not significant to centralized market, the path coefficient -0.52. While based employee development is not significant to centralized of market, this showed that coefficient is 1.42.

External factor is significant influence employee development, the path coefficient 4.84. External factor the result coefficient is 2.54. One of the many business at city will biggest and important enhancement to developing skill employee to make innovation product of superior in market. Though creative ideas are supported by the availability of resources could be one of support for the business to dominate the market.
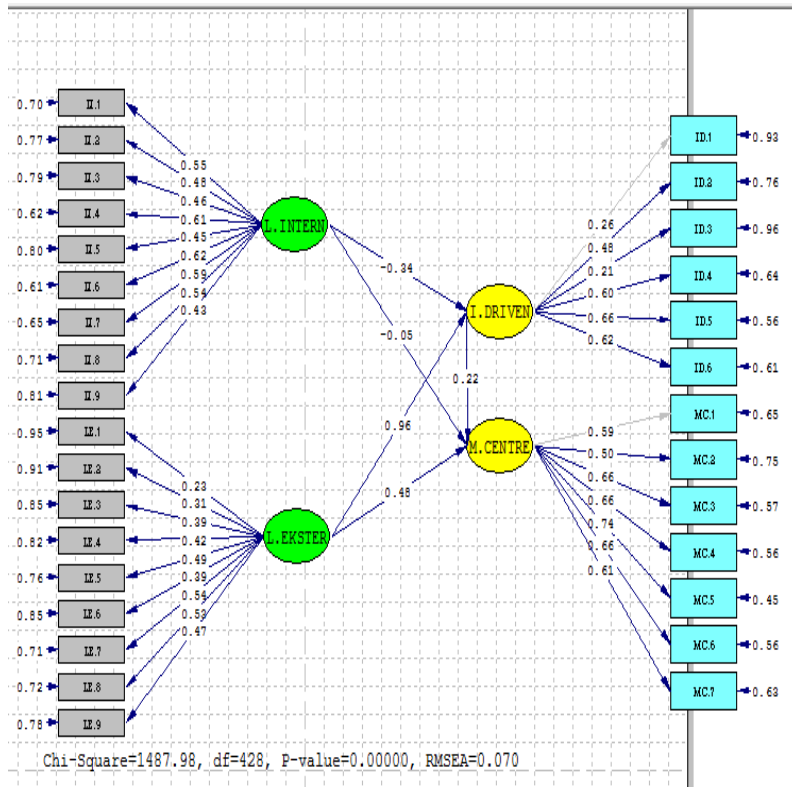
Fig. 3 Structural Equation Modeling (SEM)
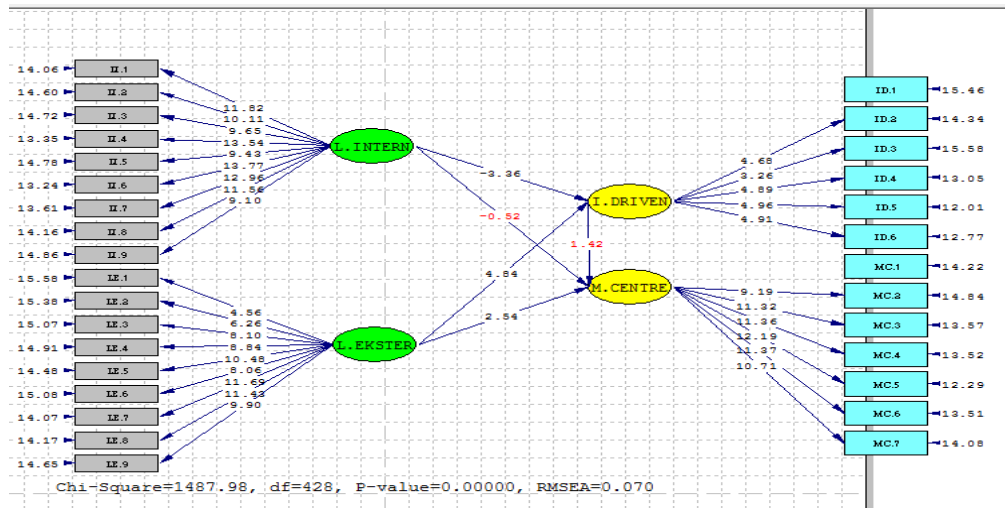
Fig. 4 Structural Equation Modeling (SEM)

Examples of local products that can compete up to the level of national and even international level. All local products with superior quality that usually starts from small businesses to reach local markets. Before preparing to compete at a higher level, optimize marketing strategies, the local market is important to gain business success.

Employee for development is major component increased competitiveness. such as the quality and trendy. Results of the application of superior foods to come in global market: (a) make the product different to customer preferences, (b) quality improvement resulted in increased prices, (c) important to enhancement quantity of production, (d) an increase in production efficiency and (e) an increase in the value added (Simatupang1991). Thus the application of employee development can produce a product that has a higher competitiveness, such as product quality improvements, improved product design, or increase production efficiency. One real satu pengaruh application of innovation in the production system is to increase production efficiency, which means that a typical product can be produced with less cost, so that the product make the good price to consumers. In addition to suppress the price, the application employee of development is also able to close the gap between the needs of labor and the supply of products by the seller. Through the application of innovation, a product can be made diverse and unique enhancement needs a new trend in the international market preferences. In applying innovation to consider the needs of customers. Adoption of innovations without regard to customer needs will only result in failure of the product when marketed [14].

5 CONCLUSION

First, internal factors against and employee development negative effect. Second , employee development positive influence on centralized market. Third, external factors on employee for development and market centre influence positively. Fourth, the internal factors of the employee of development and market centre were not significant. Fifth, while also not significant development of labor to centralized market. Sixth, external factors on employee development and significant centralized market.

Innovation with good system to make important enhancement superior products of Palembang. The role of government is needed, especially in fostering to the bottom line. Second, there should be created a competitive advantage and comparative potential to be used as a trigger to increase competitiveness. Third, good efficiency improvement measures in business and distribution of products. The use of production technologies and inputs / raw materials more efficiently need to be developed. Institutional factors (Bp lift, banking and market) that support production efficiency would need special attention. Moreover in the country need to be , and improvement of infrastructure facilities. Fourth, increase economy and consumers of the priority use of local products, especially the typical regional products. Another thing also need to do, giving the logo on the product, promotion using local and national media, sponsor local events and participate in exhibitions of local and global market.

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Analysis of Service Quality on Mustahiq Satisfaction Using Importance Performance Analysis (IPA)

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Abstract. Baitul Mal is a social institution, which is engaged in charity of zakat fund raising for the sake of socially patterned and sustainable. In its service Baitul Mal must be prosecuted to prioritize satisfaction of mustahiq, so that progress in the quality of service and able to improve the mustahiq economy and also giving a positive impact on the survival of Baitul Mal. For the purpose of researcher, this paper on the service quality will be observed by using the method of IPA model. This model is used in order to know the attributes that should be upgraded in accordance with the wishes of mustahiq. The result indicates that, these methods allow us to know the priority attributes that must be improved its performance by the Baitul Mal it is the Amil of Baitul Mal act based on islamic morality, Amil Baitul Mal Lhokseumawe solve the mustahiq problem related to zakat program on time, Amil Baitul Mal has knowledge about zakat, the zakat given by Baitul Mal has fulfilled the necessity of mustahiq, Zakat given by Baitul Mal can improve the prosperity of mustahiq and Amil Baitul Mal do not distinguish between mustahiq one and others.

Keywords: Importance Performance Analysis (IPA), Mustahiq Satisfaction, Service Quality

1 INTRODUCTION

Baitul Mal is a social institution in charity zakat fund raising. The service in the Baitul Mal is a very important thing tobe underscored. The creation of service quality will certainly create satisfaction with mustahiq. In fulfilling the mustahiq satisfaction required the quality of service as well as possible and high commitment from the amil, because mustahiq is the main target in the distribution of zakat and able to prosper the life of the mustahiq to be better.

Therefore, it is necessary to conduct research on Baitul Mal regarding the quality of services provided. It is because the quality of service will have so many positive impacts for the survival of Baitul Mal.

2 METHOD

2.1 Research purpose

The purpose of this research is as follows:
1. To know what is the main priority attributes in service quality of Baitul Mal Lhokseumawe.
2. To know the integration of Importance Performance Analysis (IPA) model in Baitul Mal Lhokseumawe.

2.2 Research contribution

The contribution in this research which can be obtain as follow:
1. It able to assist in improving the quality of services that have been applied previously.
2. It is providing insight or information about the condition of satisfaction mustahiq on service quality.

3 LITERATURE REVIEW

3.1 Definition of zakat

In terms of language, zakat has several meanings, namely al-barakatu (blessing), al-nama (growth and development), al-tharatu (purity) and al-salahu (goodness) [1].

On the behalf of jurisprudence, zakat is a number of property that is obligated by Allah to be handed over to the rightful. Zakat is part of the property with certain conditions required by Allah SWT, to be shared to the rightful to receive it, with certain conditions [2].

Zakat is māliyah ijtimā'iyyah service that has an important, strategic and decisive position, from the point of doctrine and the development of the welfare of the people (Yusuf, 1993). Zakat is included in the pillars of Islam, so it is considered ma'lum minad-din bi al-darurah (known automatically) and is an absolute part of one's religion [3]. Even in the Qur'an there are also verses that equate the level of prayer and the obligation of zakat.

There is al-Qura'an's verse of zakat in different terms. It has been mentioned by ma'rifah (zakat treasure) as much as 30 times and it is 8 times of which are in the surah makkiyyah and 22 times in madaniyyah. Then 28 verses related to the obligation to perform the prayer. This makes the position of zakat high enough and important in the Islamic Shari'ah. Zakat can also cultivate mustahiq and muzakki relationships, enhancing ukhuwah islamiyyah and reducing poverty [4].

The Qur'an also states that Zakat is the main indicator of one's obedience to the teachings of Islam, which will gain the happiness of life, gain the grace and help of Allah SWT. A person who fulfills the obligatory obligation is one who wishes to cleanse oneself and his soul from various bad qualities, such as selfishness, greed and at the same time desire to always cleanse, purify and develop his possessions (QS. al-Tawbah: 103 dan QS. al-Rūm: 39).

The people who are entitled to receive zakat consist of eight groups, namely:
1. Fakir, ie people who do not have anything or can not meet half of the needs.
2. Poor, that people can meet half the needs.
3. Amil, the person appointed to take care of zakat.

4. Muallaf, the new convert to Islam while his faith is strong.
5. Slave, the servant who has been promised his master that he may redeem himself with money or other property.
6. Gharimin, the people who have debts, the people who bear the burden of debt to improve human relations or to meet their personal needs both rich and poor.
7. Fisabilillah, it is jihad and everything needed with jihad activities, such as recruitment of war troops, the establishment of factories and the arms industry and so on.
   Ibn Sabil, it is all those who run out of life stock on the way and can not bring his needs from his village, although he is a treasure in his village.

3.2 Definition of service quality

The service quality is how far the difference between the reality and expectations of the mustahiq for the service they receive. The quality of service can be identified by comparing the mustahiq perceptions of the services they actually receive [5].

3.3 Importance performance analysis (IPA)

The Importance Performance Analysis (IPA) method was first introduced by Martilla and James [6] with the aim of measuring the relationship between the perception of mustahiq and the priority of product/service quality improvement, also known as quadrant analysis. Importance Performance Analysis (IPA) has been generally accepted and used in various fields of study because of its ease of application and display of analytical results that facilitate performance improvement proposals.
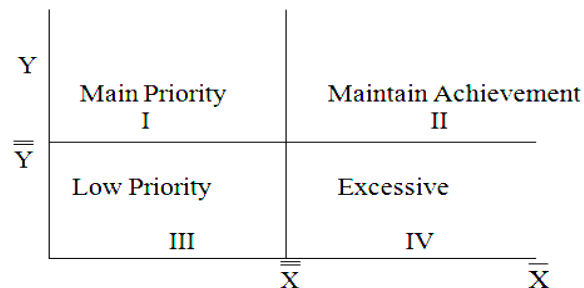
Fig. 1 Importance Performance Analysis (IPA) diagram

Figure 1 is IPA matrix which has four quadrants to analyze the performance of interests. There are th explanation for each quadrant [7].
1. Quadrant I (Main Priority)
   The first quadrant symbolized as the region that contains the factors that are considered important by the customer but the level of satisfaction obtained is still low.
2. Quadrant II (Maintain Achievement)
   In the second quadrant this is the area that contains the factors that are considered important by the customer and the factors that are felt relatively high.
3. Quadrant III (Low Priority)
   In this third quadrant is the area that contains the factors that are considered less important by the customer and in fact the performance is not too special. It is because the benefits are very small customers.

4. Quadrant IV (Excessive)

In this quadrant the area contains the factors that are considered less important by the customers and felt too excessive. Then, it is belong to this quadrant can be reduced in order to the company can save cost.

The model of *Importance Performance Analysis* (IPA) can be seen as follow:

a. Determining the level of conformity

$$\text{Tk}_i = \frac{K_i}{H_i} \times 100\% \qquad (1)$$

b. Calculates the average for each attribute

$$\overline{X}_i = \frac{\sum X_i}{n} \qquad (2)$$

$$\overline{Y}_i = \frac{\sum Y_i}{n} \qquad (3)$$

c. Calculates the average of all attributes of interest $\overline{\overline{Y}}$ and performance $\overline{\overline{X}}$ levels that limit the Cartesian diagram.

$$\overline{\overline{X}} = \frac{\sum \overline{X}_i}{k} \qquad (4)$$

$$\overline{\overline{Y}} = \frac{\sum \overline{Y}_i}{k} \qquad (5)$$

Mapping into Cartesian diagram

4 METHOD

The method used in this research is taken with case study method through interview to mustahiq which become respondent by using questioner. Sampling is done by non-random sampling technique that is procedure of selecting sample based on consideration certain characteristic which suitable and needed to answer the research questionas. The characteristics of sample taken in this research is fakir that is as much as 87 respondents. The sampling selection using Slovin formula where 90% confidence level and error term around 10%.

5 RESULT

The study was conducted at Baitul Mal in Lhokseumawe. From the results of the research, the distribution of questionnaires with the number of respondents based on slovin method formula where the 90% confidence level and error rate of 10% test Validity and Reliability performed, known all the attributes declared valid and reliable so that data can be

used as research instrument. For the average level of performance and importance of each attribute can be seen in Table: Importance Performance Analysis (IPA) Method.

Table 1. Calculation Result of Suitability Level

Attribute	Performance Score (K_i)	Interest Score (H_i)	Level of Performance	Level of Interest
TAN1	345	349	3,97	4,01
TAN2	362	345	4,16	3,97
TAN3	349	360	4,01	4,14
TAN4	334	362	3,84	4,16
TAN5	350	359	4,02	4,13
TAN6	355	372	4,08	4,28
REL7	312	352	3,59	4,05
REL8	354	337	4,07	3,87
REL9	353	332	4,06	3,82
REL10	351	352	4,03	4,05
REL11	360	346	4,14	3,98
REL12	307	343	3,53	3,94
REL13	290	344	3,33	3,95
ASS14	282	345	3,24	3,97
ASS15	329	356	3,78	4,09
ASS16	322	352	3,70	4,05
ASS17	355	355	4,08	4,08
ASS18	289	348	3,32	4,00
ASS19	291	353	3,34	4,06
EMP20	313	347	3,60	3,99
EMP21	350	349	4,02	4,01
EMP22	335	334	3,85	3,84
EMP23	307	332	3,53	3,82
EMP24	304	323	3,49	3,71
Average			3,8	4,0

For the Cartesian diagram of Importance Performance Analysis (IPA) can be seen in Figure 2.
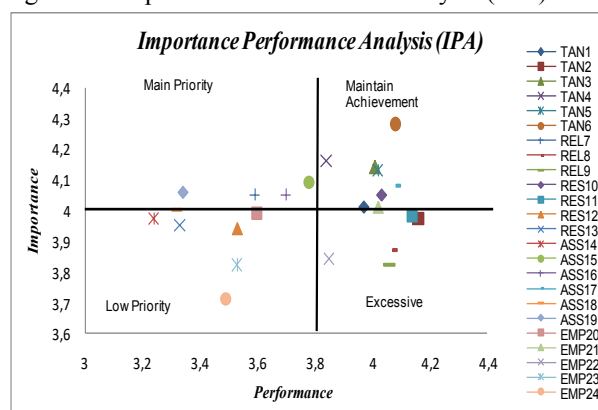
Fig. 2 Importance Performance Analysis (IPA) Diagram

Attributes that are included in the quadrant of the main priority are attributes that are considered important but their performance is still considered less that can be seen in Table 2.

Table 2. Service attributes which included in *main priority*

Dimension	Attribute Code	Questions
Reliability	REL7	Amil Baitul Mal Lhokseumawe solve the mustahiq problem related to zakat program on time
	ASS15	Amil Baitul Mal Lhokseumawe can explain the information to the mustahiq clearly
Assurance	ASS16	Amil Baitul Mal Lhokseumawe has knowledge of zakat
	ASS18	Zakat given Baitul Mal Lhokseumawe has fulfilled the necessity of mustahiq
	ASS19	Zakat given Baitul Mal Lhokseumawe can improve the welfare of mustahiq

The attributes of Baitul Mal service which are included in the category of preserving the performance and must be maintained in accordance with the wishes mustahiq that can be seen in Table 3.

Table 3. Service attributes which included in maintain achievement

Dimension	Attribute Code	Questions
Tangible	TAN1	Baitul Mal Lhokseumawe has adequate building
	TAN3	Baitul Mal Lhokseumawe has a clean building
	TAN4	Amil Baitul Mal Lhokseumawe shows Islamic morals
	TAN5	Baitul Mal Lhokseumawe has a neat building
	TAN6	Baitul Mal Lhokseumawe has a service room in accordance with its function
Responsiveness	RES10	Baitul Mal Lhokseumawe always serve mustahiq quickly
Assurance	ASS17	Baitul Mal Lhokseumawe has enough amil, so there is always a substitute if anyone is unable to attend
Emphaty	EMP21	Amil Baitul Mal Lhokseumawe does not distinguish between mustahiq with one another.

The attributes of Baitul Mal service included in low priority category with low importance level and in fact the performance is not very special with low satisfaction level that is seen in Table 4.

Table 4. Service attributes which included in low priority

Dimension	Attribute Code	Questions
Responsivness	RES12	Amil Baitul Mal Lhokseumawe is always willing to help the mustahiq who are in trouble
	RES13	Amil Baitul Mal Lhokseumawe always listen to complaints mustahiq
Assurance	ASS14	Amil Baitul Mal Lhokseumawe can explain the information to the mustahiq in detail
Emphaty	EMP20	Amil Baitul Mal Lhokseumawe is always willing to provide latest information to mustahiq

Dimension	Attribute Code	Questions
	EMP23	Amil Baitul Mal Lhokseumawe always understands what the mustahiq complained about
	EMP24	Amil Baitul Mal Lhokseumawe always understands what the mustahiq wants

The attributes of Baitul Mal service included in the category of excessive with low importance level and felt mustahiq too excessive that can be seen in Table 5.

Table 5. Service attributes which included in Excessive

Dimension	Attribute Code	Questions
Tangible	TAN2	Baitul Mal Lhokseumawe has a comfortable building
Reliability	REL8	Amil Baitul Mal Lhokseumawe is always in the office during working hours
	REL9	Baitul Mal Lhokseumawe has an easy registration procedure to become mustahiq
	REL11	Amil Baitul Mal Lhokseumawe can answer the questions posed by mustahiq
Emphaty	EMP22	Amil Baitul Mal Lhokseumawe is always willing to help the mustahiq who are in trouble

6 CONCLUSION

Based on the results and discussion that has been done, it can be concluded: For the Importance Performance Analysis (IPA) method of service attributes in the main priority which is considered important but the performance is still less satisfactory for the recipient of zakat (mustahiq) is Amil Baitul Mal Lhokseumawe solve the mustahiq problem related to zakat program on time (REL7), Amil Baitul Mal Lhokseumawe can explain information to mustahiq clearly (ASS15), Amil Baitul Mal Lhokseumawe has knowledge about zakat (ASS16), Zakat given Baitul Mal Lhokseumawe has fulfilled the necessity of mustahiq (ASS18), and Zakat given Baitul Mal Lhokseumawe is capable of improving the mustahiq's welfare (ASS19).

RECOMMENDATION

Based on the research that has been done, the authors provide the following suggestions:
1. It is expected that the Amil Baitul Mal can improve its service attribute performance based on expectations from Mustahiq.
2. This research can be continued by analyzing the factors causing the low performance of some important service attributes, so that the improvement of Baitul Mal service quality can be put forward as public sector.

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α-Glucosidase Inhibitory Activity of Ethanolic Extract Gambier (Uncaria gambier Roxb) From Southeast Aceh As Antidiabetes

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Abstract. Plants continue to play an important role in the treatment of diabetes. Gambier (Uncaria gambier Roxb) is one of the plants used for commercial product as a betel meal for the Acehnese. In this research we studied the inhibition activity of α-glucosidase enzyme toward gambier ethanolic extract as antidiabetes. The extraction of leaves, twigs and commercial gambier were performed by maceration method using ethanol solvent for 3 x 24 hour. Analysis of inhibition activity of α-glucosidase enzyme from each extract was done using microplate-96 well method, then the IC_{50} value was determined. The results showed that the inhibition activity of alpha glucosidase enzyme against gambier ethanolic extract was giving positive result, in delaying the glucose adsorption, while the highest activity was found in gambier leaves of 96,446%. The IC_{50} values of gambier leaves extract were compared to positive control of acarbose (Glucobay®) atwith ratio of 35,532 ppm which equal to 0,262 ppm. In conclusion, the gambier ethanolic extract has the best inhibitory activity against the alpha glucosidase enzyme to inhibit the blood sugar level, which can be used as one of traditional herbal medicine (THM) product.

Keywords: α-Glukosidase, Inhibitory Activity, Gambier, Antidiabetes.

1 INTRODUCTION

Metabolic disorder diseases such as Diabetes Mellitus (DM) was characterised by high blood glucose level or hyperglycemia because of insulin insufficiency and/or insulin resistance. It is predicted the affected DM people will increased from 171 million to 366 million in the year 2000 to 2030 [1]. The number of DM patients increases every year. The number of diabetics in Indonesia is expected to increase from 8.4 million people in 2000 to 21.3 million in 2030 [2]. According to the WHO [3], Indonesia ranks 4th highest in the world in number of DM patients, after China, India, and the United States of America (USA).

Among the several therapeutic approaches is retarding glucose absorption using inhibitors of carbohydrate-hydrolyzing enzymes such as α-amylase and α-glucosidase [4]–[6]. In

developing counties with inadequate source of modern treatment, plants mainly utilized for treating diabetes [7].

Uncaria gambier (gambier), was a native Southeast Asian herbal plant mainly found in Indonesia and Malaysia. It's purpose was for astringent medicine, tanning, calico printing and dyeing. *Uncaria gambier* consists mostly of flovanol monomers such as (+)-catechin, (+)-epicatechin and alkaloids [8]

In Indonesia gambier plants growth in various areas, including West Sumatra and Riau. These two areas are gambier production that have entered the export market, while the North Sumatra, Bengkulu, South Sumatra and Aceh production was only to meet the needs of local markets. In Aceh, gambier planting are very limited, due to the limited knowledge of the community about the benefits and methods of gambier processing [9]. The gambier planting in Aceh is concentrated in Southeast Aceh Regency, Darul Hasanah district with an area of approximately 200 Ha. Production centers are located in the village of Kute Panjang, Istiqamah using wet production method.

Until now, research on the inhibitory activity of Indonesian gambier as an alternative for antidiabetes is still scanty. Nevertheless, some studies of gambier as an antioxidant have been scientifically proven. According to [10] the commercial gambier from Tangerang Indonesia contains a catechin compound which act as bioactive compound with high activity for DPPH inhibition but moderate activity for inhibiting α-glucosidase in vitro. Rauf, Santoso, & Suparmo [11], have studied the antioxidant activity of gambier from Yogyakarta using three types of solvents [aquadest:ethanol (1:1), ethanol;ethyl acetate (1:1), and ethyl acetate], followed by purification using Sephadex LH-20 column chromatography. It showed that the purified gambier extracts (PGE) gave the higher DPPH radical scavenging activity and inhibition of peroxide than rutin BHT.

Even though gambier is also rich in polyphenols, it is not used traditionally in treating diabetes mellitus. Therefore, it is important to study its potential as an inhibitor of α-glucosidase - carbohydrate hydrolizing enzyme. This study will examine the α-glucosidase inhibitory activity of ethanolic extract of leaves, twig, and comercial gambier from Southeast Aceh as one of antidiabetics medicine. It is hoped that bioactive compunds from gambier would effectively inhibiting the activity of α-glucosidase enzymes and work like the mechanism of Glukobay® (acarbose) oral drugs in inhibiting blood glucose.

2 Materials and Method

2.1 Materials

α-glukosidase, Glucobay® (acarbose), etanol *p.a*, bovin serum albumin, aquabidest, DMSO, phosphate buffer, natrium buffer, NaOH, Na_2CO_3 and HCl was purchased from E-Merck.

Fresh leaves and twigs, and comercial gambier product was purchased from central production in Kuta Panjang, Istiqamah, Darul Hasanah, Southeast Aceh.

2.2 Sample Preparation

Fresh leaves and twigs of gambier was washed with running water and air dried for 7 days. The aired dried leaves, twig and gambier commercials product was then completely

dried in oven at 40°C, then grounded (AOAC 1984). The dried sample was then analyzed for moisture content. Each treatment was repeated 3 times.

2.3 Extraction of Gambier

Extraction of sample with maseration technique was done using standard method of Ministry of Health of Indonesian Republic (2009). Each sample was weighed 500 grams, ethanol solvent added p.a 1:10, kept for 2 x 24 hours, filtering was done every 24 hours, and the macerate was re-immersed with the same amount and type of solvent. The obtained filtrate is concentrated with a rotary evaporator, to obtain a concentrated or dry extract.

2.4 Analysis of α-Glucosidase Inhibitory Activity

The analysis of the inhibitory activity of the α-glucosidase enzyme refers to method developed by [12] and [13]. Each sample was dissolved in a dimethyl sulphoxide (DMSO) solvent with concentrations of 15.63, 31.25, 62.5, 125, 250, 500 and 1000 μg mL-1. The enzyme solution was prepared by dissolving 1.0 mg α-glucosidase in a phosphate buffer solution (pH 7) containing 200 mg of bovine serum albumin. Before use as much as 1 ml enzyme diluted 25 times with phosphate buffer (pH 7). The reagent mixture comprises 50 μL phosphate buffer solution 0.1 M (pH 7.0), 25 μL ρ-nitrophenyl α-D-glucopyranose (ρ-NPG) 10 mM as substrate, 10 μL sample solution in dimethyl sulfoxide, and 25 μL enzyme α - glucosidase 0.04 units mL-1. Thereafter, the reagent mixture was incubated at 37 ° C for 30 minutes. The enzyme reaction was discontinued by adding 100 μL of sodium carbonate (Na2CO3) 0.2 M and the absorbance of p-nitrophenol was measured at a 410 nm wavelength using a microplate reader.

Positive control of acarbose known as Glucobay® is made by dissolving the tablet of acarbose in phosphate buffer (pH 7) and HCl 2N. The concentration of standard 1% acarbose solution used was made from a tablet of the diluted acarbose in aquadest and HCl 2N (1:1). Ratio of acarbose tablet weight with aquadest and HCl 2N was 1:100. Then acarbose solution was centrifugated and supernatant were used as standard. The standard solution was given the same treatment as the ethanolic extract. Each treatment was repeated 3 times. Every gambier ethanolic extract tested for α-glucosidase inhibitory activity (in % inhibition), which analized using the formula,

$$\% \, inhibisi = \ (C - S)/C \ X \ 100 \tag{1}$$

C is the absorbance of the solution in the absence of the extract (control) and S is the absorbance of the solution by giving the extract from the sample.

The value of IC$_{50}$ is obtained by plotting the log of concentration versus percent inhibition using the regression equation. The value of IC50 is the concentration value that inhibits 50% of enzyme work.

3 RESULTS AND DISCUSSION

3.1 Moisture Content of Gambir Extract

Simplisia of dried leaves, twigs, and commercially gambier product were subjected to oven drying at 40 °C for 1,5 hour before tested for moisture content. Table 1. Listed the

moisture content of grounded dried gambier. The measurement was important to evaluate the effect of drying process on the removal of water content that could help the growth of microorganism such as bacteria, yeast and mold from the grounded gambier storage if they were kept for longer periods. Based on Regulation of Ministry of Health of Indonesian Republic (2009), moisture content for Traditional Herbal Medicine is maximum 10%. The moisture content for gambier leaves and twigs were below the standard, while the commercial gambier product contained 12.023 % of water because its still newly made. The moisture content couldn't totally remove even after oven drying.

Table 1. Moisture content of dried gambier

Type of sample	Moisture content (%)
Gambier leaves (DG)	3.017
Gambier twigs (RG)	3.012
Commercial Gambier (GT)	12.023

3.2 Rendements of Gambier Ethanolic Extract

Rendements of gambier extract were obtained from maceration process using ethanol as liquid solvent which repeated 3 times, every 24 hour. Ethanol were choosen because of it solubity and avaiability character. Table 2 shown the rendements of each gambier ethanolic extract, in mg/mg dried weight of gambier part. The highest rendements from commercial gambier was 6.433

Table 2. Rendements of gambier ethanolic extract

Type of sample	Rendements (mg/mg DW)
Gambier leaves (DG)	3.847
Gambier twigs (RG)	1.444
Commercial Gambier (GT)	6.433

3.3 α-Glucosidase inhibitory activity of Gambier Ethanolic Extract

Figure 1 expressed the inhibition of alpha glokusidase enzyme on ethanol extract of gambier leaves. The highest percentage was resulting at 1000 ppm was 96,446% with IC50 values 35,532 ppm.

The activity of alpha glucosidase on twigs ethanol extract was shown in Figure 2. The best inhibitory activity was 70,699% at 1000 ppm. IC values analysis resulting at 497,732 ppm. This values was inappropiate for inhibiting glucose metabolic pathway in blood as its gave values more than 150 ppm, while the maximum standard for IC values was 150 ppm.

From Figure 1 and 2 we could compared the alpha glucosidase inhibition activities of freah leaves and twigs which gave different potency of gambier ethanolic extract. The concentrations of 15.63, 31.25, 62.5, 125, 250, 500 and 1000 μg mL-1 used in enzyme preparation with DMSO gave best result of inhibitory activity only on gambier leaves extract with IC50 values of 35,532 ppm. Meanwhile, the twig ethanolic extract gave less enzyme inhibitory activity with higher in IC50 values. The alpha glucosidase inhibition activity from

fresh gambier leaves and twigs ethanolic extract has potencial appliction for inhibiting the glucose metabolic pathway, that can function as one of antidiabets. Gambier leaves better used dried as it could be saved in low moisture content for longer period.
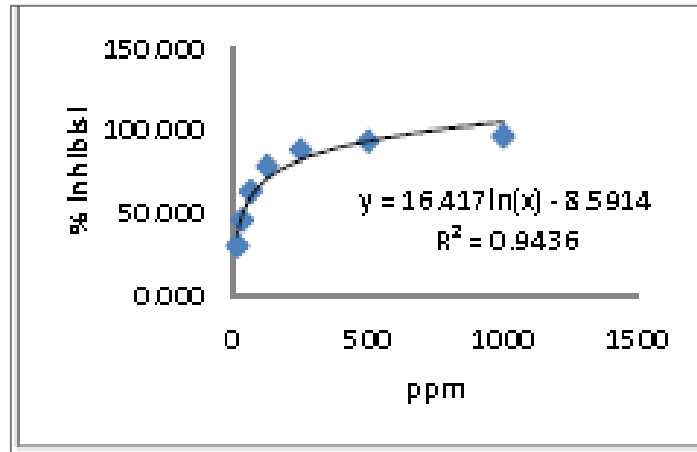
Fig. 1 Inhibitory activity of extract ethanolic gambier leaves.
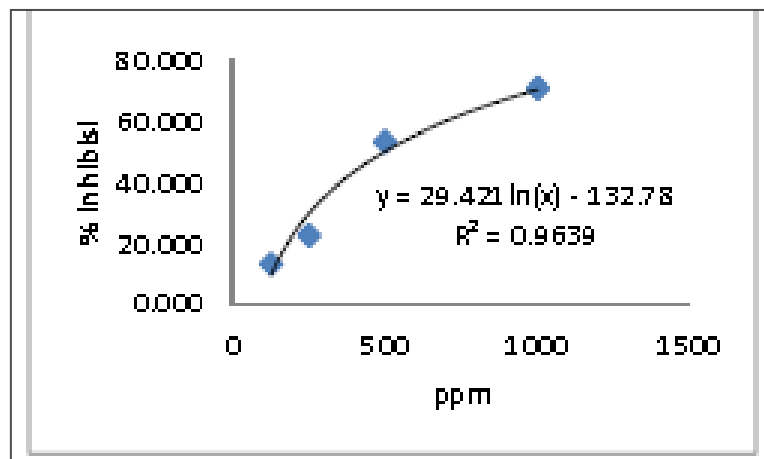
Fig. 2 Inhibitory activity of ethanolic extract gambier twigs.

These results from Figure 1 and 2 was predicted before, as from pre-experiments we got 1,444 mg/mg DW rendements of twigs ethanolic extract, while from leaves we gor rendements 3,874 mg/mg DW. The highest rendements was obtained from gambier commercials product (6,433 mg/mg DW), but it's analysis resulted minus values (Data not shown here) on alpha glucosidase inhibitory activity because the product still contained high moisture which prevent the inhibition of glucosidase enzyme.
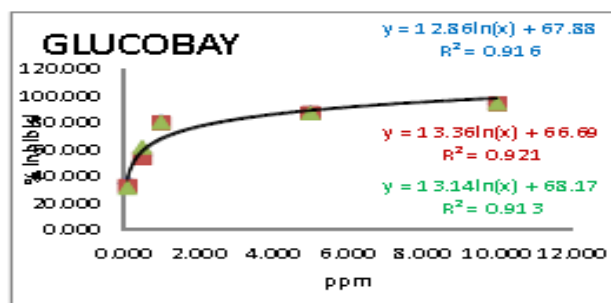
Fig. 3 Inhibitory activity of positive control of Glucobay® (acarbose).

The gambier extract was also compared with positive control of diabetics drug (Glucobay®) which contained 50 mg of acarbose in each tablets. The concentration of acarbose 10 ppm could inhibited the alpha glucosidase activity by 94,095 %. This mean that the fresh gambier leaves ethanolic extract will work the same as acarbose in inhibiting the glucose metabolic. Gambier leaves from Southeast Aceh has good potencial to be used as one of traditioal medicine for curing diabetics type II disease. The extract of gambier leaves could be kept in form of tablet of dried extract for application as herbal alternative medicine for antidiabetics and other porposes.

4 Conclusions

Based on the research that has been done can be concluded that:
1. Water content analysis on three types of leaf samples, twigs and gambier products shows the value below the quality standard that is for leaves samples and twig gambier. As for the traditional gambier water content exceeds that set above 10%.
2. The analysis of rendement shows that the yield content obtained after the rotary evaporator process is very little walaupu in the extraction process with the process of maceration has been done repetition and merging extraction results. The rendements content of the three gambier samples were DG 3,847 gr, RG 1,444 gr and GT 6,433 gr. And IC50 = 35.50 ppm
3. Analysis of alpha glucosidase inhibition is the determinant for antidiabetic studies of gambier extract, where the higher the sugar content in the blood the percent of alpha glucosidase inhibition is also increasing. This indicates that the extract of the resulting gambier ethanol has the potential of being a herbal drug inhibiting diabetes.

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Usage Tourism Websites;
An Formative Measurement on Technology, Organization, Environment (TOE) Model in Indonesia

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Abstract. The study aims to investigate the influence of TOE *(Technological Organizational Environmental)* framework among Small Medium-sized Tourism Enterprises (SMTEs) using formative measurement. The composition of TOE is formed by perceived benefit, cost, compatibility, information intensity, the conversance of the CEO, the newfangledness of the CEO, competition, the pressure of the customers or the suppliers, and support from technology merchants. An online-based questionnaire survey was organized by a-91 firm of the tourism sector. The data were analyzed by employing formative measurement model through SEM/PLS technique. The research result shows that technological and environmental aspect becomes the most significant construct towards adoption model rather than organizational aspect. Implications of these results are discussed.

Keywords: TOE, Formative, Adoption Model, SEM/PLS

1 Introduction

The usage of website in toursim sectors are identified as the fastest growing service-based industry in line with the evolvement of the information and technology of communications [1]. The majority of the tourism company including hotels, car rentals and tour operators are using the internet technology in operating their business through the company's website is believed to be able to improve the communication and create the alternative distribution channel [2][3]. Another research toward the benefit of e-tourism adoption was studied by Dargah and Golrokhsari [4] found that E-tourism can build the convenience for the tourists in term of time efficiency, purchase in whenever and wherever, and direct access information and thus created customers satisfaction. In brief, adopting website presence of the tourism industry is identified as necessity. However, the fact is the research that can be used as references is affiliated to the study of E-tourism adoption especially in developing countries which are still limited rather than in developed countries [5].

Additionally, the research findings of developed countries are not able to be applied directly to the developing countries contexts and the differences are not only from technology, organiztion but also environment (TOE) including cost, economic standpoint, political concern, environmental, social, and cultural factors [6]. Thus, any research regarding e-

tourism adoption employing TOE model is really needed to support the development of tourism industry in developing countries in the last decades, and also Internet has significantly changed many industries.

Based on the above explanation, this study is designed to examine the influence of TOE framework towards e-tourism adoption in Indonesia. In this case, Bali, Indonesia was selected as the place where the research was conducted. Bali was chosen since in the sustainable tourism and economic development planning under the corridor approach has put tourism in Java – Bali – Nusa Tenggara corridor in the focus; it means the existing development achievement in Java and Bali are going to be intensified and extended further to the East (Nusa Tenggara) [7]. This approach is meant to accelerate economic development in which tourism is considered as potential contributor. Hence, companies that run business within tourism industry in Bali may choose to complete this research.

E-tourism adoption model is developed in this research is adopted from Tomatzky, Fleischer, and Chakrabarti [8] of Technology, Organization, and Environment (TOE) framework. The framework of TOE is chosen based on certain deliberations. Inherently, the framework of TOE has been broadly noticed by previous studies as a deep-rooted framework through which to study the adoption of e-commerce ([5][6][9][10]). In the following section, TOE framework which focus on technological, organizational, and environmental in e-tourism context is presented [11].

2 Literature Review

2.1 E-Tourism

E-tourism is identified as one of the e-commerce activity in undertaking business transaction of tourism sectors [2]. There is the transformation of value chain process in tourism, culinary, hotel, also hospitality industries could be reflected by tourism transaction via the Internet. E-tourism creates the opportunity for travellers to be able accessing reliable and accurate information, as well as the possibility of making reservations or bookings in fewer time with less expenses and inconvenience than required by conventional methods [1].

Adoption of technological innovation like e-tourism application in the company is considered as a multi-stage process since it requires some changes toward the business process. Owners or managers hold the importance role as facilitators of these changes and as decision makers to adopt new technology. The adoption of e-tourism was grouped into several levels by prior researchers [12][13][14]. Rogers [13] categorized the adoption level of e-tourism based on the level of firm's innovativeness (i.e. inventors, early adopter, early majority, late majority, and idlers). Teo and Pian [12] also summarized e-commerce adoption into five levels consist of adoption of e-mail, the presence of Internet, prospecting, integration of business, and transformation of business.

2.2 Technological, Organizational, and Environmental (TOE) Framework

Tornatzky, Fleischer, and Chakrabakti [8] has been initially developed the framework of TOE. This framework includes three aspects of the context of the firms that influence website adoption such as; technological context, organizational context, and environmental context. In addition, TOE is also compatible with Diffusion of Innovation (DOI) by Rogers (1995)

focusing on the organization, and technological characteristics in identifying the new technology diffusion [15]. In short, the technological context is related to both external and internal technologies that are accordant to the certain company, since related to the organizational context, the nature and the resources of its companies. Besides that, the environmental context appertains to other parties that surround the firms like competitors, suppliers, and government as well [5].

2.2.1 Technological Context

Technological context expresses both internal and external technologies that are accordant to the firm. This encompasses the availability of internal technologies or current practice and equipment that owned by the firm and also the availability of technologies in the market [16]. Ramdani et al suggested that higher impact on e-commerce adoption in SME's derived from technological aspect [17]. This statement was supported by the finding of his research in 2013, where technological context has a high influence in e-commerce adoption. They found that every indicator of technological context – perceived benefit, compatibility and cost has significant influence on e-commerce adoption by SMEs.

Thus, based on previous studies above, the following hypothesis is stated:
H1: Technological context has significant influence on the adoption of e-tourism by companies

2.2.2 Organizational Context

The second dimension of TOE framework is organizational context. This context can be recognized affect the adoption of SME's applications and factors in organization context that look to be the primal focus of many studies in SMEs [17]. Organizational context relates to the characteristics of the firms that might affect the e-commerce adoption. According to Molla and Licker [18], when making decisions Perceived E-readiness Model (PERM) is necessary to adopt e-commerce by defining perceived e-readiness as the assessment of organization upon innovational, managerial, organizational, and environmental conditions. Similar with TOE framework, PERM model contains two types of construct: POER and PEER. POER reffered to perceived organizational e-readiness, meanwhile PEER is known as perceived external e-readiness. Molla and Licker [19] also found that there are several organizational factors especially such as human, business, and technological resources and awareness are more dominant than environmental factors in the initial e-commerce adoption.

Regarding organizational context, Ramdani et al [17] supported the finding from Molla and Licker [19] that organizational characteristics have high impact on e-commerce adoption. Also, Ghobakhloo research finding support above statement. Organizational context with indocators of information intensity, the coversance of CEO, and newfangledness significantly influence the e-commerce adoption. Thus, based on the previous studies above, this following hypothesis is stated:
H2: Organizational context has significant influence on the adoption of e-tourism by companies

2.2.3 Environmental Context

The last context in TOE Model is environmental context which refers to the arena where the organizations do the business. IT innovations do not accomodate only for an internal audience, but also to company's customers, suppliers, and business partners [20].

Organization's inclination to innovate is also triggered by environmental opportunities and threats [21]. Then another study argued that alteration toward Information System could be a respond to an event or this alteration has its causation in the pressure from customers and a prominence in imroving the efficiency, as well as the pressure from both the internal and external environment [15].

Environmental aspect can be claimed to have a high impact on SME's adoption of EA [17]. As explained above, Molla and Licker proposed PEER Model. PEER referred to the extent in which managers believed that the market forces, the governmrnt, and other supporting industries were all set to support the e-commerce implementation of the organizations. Moreover, PEER expresses the assessment of an organization and the evaluation of accordant factors of external environmental (envrionmental imperative attributes. In their research, they found that environment also influence the e-commerce adoption.

In the TOE framework, environmental context refers to the arena where the organizations do the business. Mangula et al [20] also stated that IT innovations do not accomode only for an internal audience, but also to the company's customers, suppliers, and business partners. As similar with Molla and Licker study's [19], Ramdani et al [20] and Ghobakhloo et al [15] also found that environmental context significantly influence the e-commerce adoption. Thus, based on previous studies above, the following hypothesis is stated:

H3: Environmental context has significant influnce on the adoption of e-tourism by companies.

3   Research Method

This study empirically examine the influence of technological, organizational, and environmental towards adoption cluster, quantitative technique had been designed to address on research questions. Electronic survey method was used to collect data by distributing questionnaires using my3q website hosted. The tourism companies in Bali are the population of this research. Additionally, the sample selection was done by using non-probability sample technque, referred to convenience sampling. Therefore, 394 companies have been contacted to anticipate the questionnaires. The Associtation of Indonesian Tour and Travel Agency (ASITA) and *Perhimpunan Hotel dan Restoran Indonesia* (PHRI) of Bali already contributed the data collection by filling out the questionnaires from these links: http://my3q.com for the member of ASITA Bali and PHRI Bali. The numbers of questionnaires that can be analysed are 91 companies.

Adoption cluster as dependent variable was classified on five groups of website chracteristics, including the adoption of e-mail, web presence, prospecting, transactions or business online integration, and links which consist of 19 items based on Teo and Pian's study [12]. The classification of adoption cluster was employed by using cluster adoption through mean value of website features on each firm. Independent constructs of TOE formed three variables including technological, organizational, and environmental aspects were measured on a-Likert five point scale. Each variable of TOE framework forms three dimensions adopted from Ghobakhloo et al [15] and Gobakhloo and Tang [6]. Technological aspect consists of perceived benefit, cost, and compatibility; organizational was measured by the intensity of information, the conversance of CEO, and CEO's newfangledness. Furthermore, technology

merchants, customer or supplier pressure, and competition represent the environmental aspect. Therefore, totally 33 indicators were employed in TOE's construct.

Testing the measurement model was conducted to determine the extent to which indicators represent a given theoritical concept and to ensure the robustness of data. This research used formative indicators on each variables of TOE construct. Consequently, validity testing through convergent and discriminant validity also composite reliability to test reliability was not being a pa,rt of measurement model testing (outer model). Formative measurement only validated data based on the value of outer weights, since there is no correlation among indicators [22][23]. Additionally, according to Diamantopoulos [24], formative construct comprised distinct aspects which are not necessary to correlate amongst each other. Data analyzed using smartPLS software through formative measurement model. Bootstrapping process results the value of significance level based on T-statistics value to examine the proposed hypothesis.

4 Results and Discussions

4.1 Cluster Classification

Cluster classification in this study was conducted by analysing the value of the average of each cluster presented. Adoption websites of 91 companies in the tourism industry in Bali (e-tourism) in this study were divided into five clusters according to the research of Teo and Pian [12]. Cluster determination from each company analyzed through the average value of each cluster as a whole. Cluster classification is determined by rounding the average rate to above value [12]. Table 1 shows the distribution of clusters of 91 companies that were being respondent to this study.

Table 1 shows that the majority of the companies surveyed in this study are included in the classification of clusters 3 and 4 levels. Based in features in adopting the website, companies engaged in the tourism industry in Bali have the complete website features such as a contact number via e-mail, information about the company including the products or services offered, searching menu, but also provide customer service to build the opportunity for visitors to respond or give a feedback for the company. This can be evidnetly seen when company not only facilitates cinsumers to make reservations or marketing but also electronic paymentseven eqipped with integrarion or communication between consumers and suppliers. Consequently, 13.19% of these companies even provide links to other websites.

Table 1. Cluster by Category

Cluster	Category	No. of Firm	Percentage (%)
1	*Contact Method*	1	1.10
2	*Informations*	16	17.58
3	*Customer Service*	31	34.07
4	*Transaction*	31	34.07
5	*Links (Transformation)*	12	13.19
	Total	91	100

4.2 Formative (Outer Model)

This research uses formative measurement model. Validity test of formative inndicators refers to the importance of each indicators defined the construct. Validity testing was employed by using smartPLS program through bootstrapping process to calculate outer weights score. Based on Hair et al. [23], there is rule of thumb for the significance value of outer weights based on T-Statistics, which should greater than 1.64 at 0.10 of significant level. However, this study did not eliminate insignificant indicators in order to avoid the changing of theoritical perspective [25].

Indicators on each dimension of the TOE's formative construct shows that not all of the indicators have T-statistic values more than 1.64 (two-tailed tests of significance levels > 0.10). By looking at the value of the T-statistic on the outer weight output, several indicators on the construct formative tested insignificant or does not meet the validity testing. The value of T-statistic on outer weight output shows that some of the indicators that are invalid are not indicators measuring the dimensions and variables. Therefore, they are not valid to measure the construct of TOE (Technological, Organizational, and Environmental) statistically. This study also did not carry out the reliability testing because each indicator in a latent variable is assumed to be correlated. Accordingly, the reliability testing is not necessity to be measured [23].

According to Hartono and Abdillah [25], "If the formative constructs do not meet the criteria of construct validity testing (one or more indicators are not significant), then the formative construct statistically cannot be tested further in the structural model. However, removing a formative construct of a research model led to the loosing of its meaning and do not appropriate with the study purpose, then the researcher should maintain these formative constructs in order to examined further in the structural model". Based on this statement, in order that hinder the deviation of the reserach purpose theoritically, the researcher decided not to drop the indicators which are invalid. Hence, this study still engages all of the indicators to test the structural model.

4.3 Bootstrapping (Inner Model)

Structural model consists of latent construct which cannot be observed. This test contains the estimation of path coefficients that identify the strength of the relationship between dependent and independent variables. Testing of structural models generate significant path value of the relationship between latent variable by using the function of bootstrapping. Ghozali [26] stated that reflective constructs of structural model need to be evaluated by using the R-square for the dependent construct, which indicates the value of the impact of numerous independent latent variables on the dependent latent variables.

This study uses a formative construct. Therefore, the structural model testing was done by roughly calculating the path coefficient to assess the level of significance of each hypothesis. SmartPLS 2.0 M3 program was established to examine a formative inner model for this study. Path coefficient processing results in the form of statistical value and the amount of the original sample can be seen in the following table 2.

Table 2 illustrates that the environmental effects towards the cluster adoption is positive (0.462115) and significant at $\alpha = 0.10$ (two-tailed test) with the statistical value of 3.997701 > 1.64 (in bold). Variable organization negatively affect the adoption of cluster is positive

(0.295529) and were significant at α = 0.10 (two-tailed test) with the statistical value of 2.287575 > 1.64.

Table 2. The Path Coefficients (Mean, STDEV, T-Values)

	Sample (mean)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
ENVI->ADOP	0.414332	0.115595	0.115595	**3.997701**
ORG->ADOP	0.004163	0.128354	0.128354	0.725961
TEC->ADOP	0.321128	0.129189	0.129189	**2.287575**

Based on the significance of paths amongst, the constructs in the structural model according to T-statistic value in Table 2 above, the results of hypothesis testing conclusions as a whole is shown in Table 3.

Table 3. Hypothesis Testing

Hypothesis	Hypothesis Statement	Result
H1	*Technological* significantly influence towards adoption cluster	Supported*
H2	*Organizational* significantly influence towards adoption cluster	Not Supported*
H3	*Environmental significantly influence towards adoption cluster*	Supported*
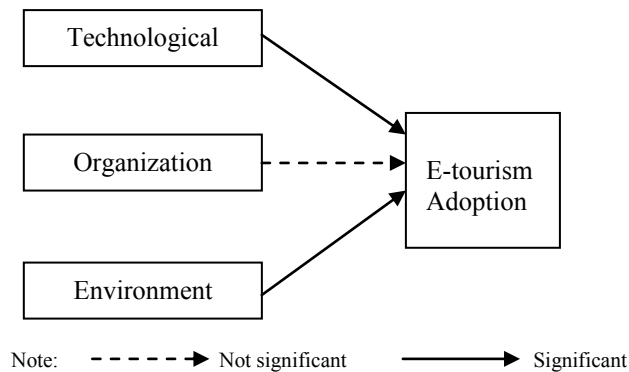
Figure 1. Research Model (Bootstrapping Output)

The result of path coefficient value after testing the research model through bootsrapping process. Based on the research model above, it can be seen that smartPLS 2.0 M3 run overall four variables (technological, organizational, environmental, and cluster adoption). Variable of technological aspect that consists of three dimensions: perceived benefir, cost, and

compatibility shows that the dimensions of perceived benefir have the greatest influence in defining the technology variables. It implies that the company tourism in Bali perceived that th e use of the website can provide many advantages in their businesses, such as the availability of timely information, improving the performance, profits and productivity, increasing serendipity, as well as enabling the company to carry out promotional and better marketing. Furthermore, costs of use, maintenance, and training are likely not provide a significant impact to the cluster adoption for tourism enterprises in Bali. As well as the suitability of website adoption with the company's value, the work of employees, legal policy and consumer needs are not being aspects to consider in utilizing the company's website. The result conformed to Pearson and Grandon [27], Ghobakhloo et al.[15], and Ramdani et al. [17], who describe the perceived benefit as the most decisive enabler in adopting website because it improves the company's performance and expand marketing opportunities.

Organizational aspect in this study significantly did not affet the level of cluster adoption. In terms of firm views on organizational aspect, respondents believed that the dimensions of information intensity, the conversance of CEO, and the newfangledness of CEO were not able to be a factor that encourages the increasing rate of website adoption, although statistically information intensity and the CEO'S innovativeness dimensions have a significant value of T-statistic. However, low influence of the CEO's knowledge in driving the adoption of the website indicates that high or low the understanding of CEO in adopting the website is not able to push the company to complement the features of the website. This is relevant with the previous study that hasd been conducted by Ghobakhloo et al. [15] which states that the knowldege of CEO and his or her experience was not found to affect the website adoption by SMEs.

Website adoption has been recognized not only defined by technological aspect but also environmental aspect. Environment variables formed by the dimensions of supports from technology vendors, customer or supplier's pressure, and competition. The competition factor determines the level of the company in adopting a website. Interestingly, the provision of information which can be accessed 24 hours directly anytime and anywhere by consumers makes the company seeks to provide a more complete website features within serving their potential customers. This intense competition forced by the widespread availability of information through the Internet. Therefore, it can be easier for consumers to find information quickly when they intent to access the product or service of the company's competitiors. However, pressure from consumers or suppliers and support from technology merchants do not become factors shaping influence on the envrionental aspects of the webstite adoption level. Website adoption in SME, influenced by the company's desire to maintain their innovation referred to MacKay et al. [28], Pearson and Grandon [27], Al-Qirim [29] and Oliveira and Martins [30].

5. Conclusion

Website utilization has a great impact on enhancing the number of tourist visitors in developing countries like in Indonesia. This study resulted that the technological and environmental aspects are being the most important factors towards e-tourism adoption decision behavior for tourism enterprises in Bali. Consequently, dominant percentage of website adoption level which showed in the cluster of prospecting and transactions implies that website characteristics of tourism companies in Bali should actualized their advantage by attract consumers to visit their website and making orders or transactions. It will be happened

if a company provided a timely information, friendly features, and quick response of customer service.

Since more and more firms attempt to develop their innovative website, not only technological and environmental factors but also various aspects through longitudinal study can be seen as an enabler to influence the website adoption for further work. In order to gain their competitive advantage, owner or manager should be aware to build innovative features of website. Adcance researches also nee to assess reducancy analysis and collinearity testing to evaluate emprically the formative outer models.

Acknowledgment

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Capital Expenditure and Natural Risk Incentives Analysis for the Hotel Industry In Padang

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Abstract. This study is aiming at studying the factors that will influence the capital expenditure decision for Hotel businesses in Padang, where there is a high natural environment risk specifically the earthquake and tsunami. By asking several hotels ranging from two star up to four star hotels, this study have found that location decision does not affect the risk on investment for the hotel in Padang City. The factor that does have influence on the investment is the inflows activity from the tourism in Padang. The high potential of inflow in the tourism sector can cover the capital cost and risk that have been taken by the investor. The support from financial organization in helping with the capital is also the factor that are being considered in the hotel industry in Padang because the higher the supply of financial helps can also decrease the cost of capital.

Keywords: capital expenditure decision, natural risk.

1 Introduction

The decision on capital expenditure in a company is very important because it can affect a company performance. McConnell and Muscarella [1] stated that capital expenditure has a direct influence on a company performance. If a mistake has been made in deciding on the capital expenditure, there will be a long term impact on the company, since investments in capital expenditures are usually invested for long-term fixed asset. Therefore, the selection of capital expenditures in the hotel industry will affect the profits of the company which will also affect the prosperity of shareholders or owners.

The hotel industry is one of the most popular industry in the Western Sumatera Province which has a relatively high market growth. Though with the high rate of earthquake, but still many new hotels are being built. This phenomena has become the indicator for the hotel industry where there are a lot of investor are interested to invest in the project. This is also supported by a rapid growth of tourism in West Sumatera, where the number of local and international tourists increase every year.

Based on the data in table 1 above, it can be seen that the number of hotels increased in the period 2013 – 2014. Furthermore, from the 370 hotels in Western Sumatera in 2014, 60 of the hotels are starred hotels and 33 of the starred hotels are located in Padang, 17 hotels in Bukittinggi, one hotel in Sawah Lunto, and the remaining is in Padang Panjang.

Over the past few years, the hospitality industry has invested heavily in capital expenditures to improve customer services such as; flat screen television, fast internet access, beautify room, lobby and restaurant. These capital expenditures are long-term and require substantial funds with sufficiently risky funding sources such as using long-term debt [2].

Table 1 Total Hotel in the West Sumatera Province in 2013 - 2014

	Hotel		Rooms	
Year	2013	2014	2013	2014
Total	339	370	7794	8321

Source: West Sumatera in 2015

This phenomenon is different from the investment literature where the area with high natural risk tends to decrease the level of investment [3]. Natural risks tend to be avoided by some investors for reasons of potential damage, impairment and asset damage. As for the securing the value of the assets with the use of insurance, the price for location with higher natural risk tends to be higher than the location with lower risk. Consequently, the total investment will increase. Natural risk is not only contained in the beta of project used in the calculation of equity costs but also has been included in the cost of debt where lenders have included this risk component in the debt risk.

With the limited resources, hotel management are facing problems in investment budget priorities and balancing profits with risks in increasing shareholder wealth. The challenge for hotel managers is to ensure that any capital expenditure decisions are not likely to be inefficient in the company's operations. Failure to invest in capital expenditures can result in a loss of market share because of the inability to offer the level of consumer desire of quality services at an attractive price. Therefore, it is crucial to identify the optimal capacity or capacity thresholds that describe the critical level requires to support service activities [4].

To make capital expenditure decisions, company managers typically use some capital budgeting techniques such as payback period (PP), net present value (NPV), internal rate of return (IRR), profitability index (PI) and accounting rate of return (ARR). Based on a survey of companies listed on the Fortune 1000 list, the NPV results is the most preferred capital budgeting technique by financial managers. This study also find that the financial managers use some capital budgeting techniques in investment analysis.

In the NPV calculation, each investment project has a required return or capital cost that is an incentive of the risk taken from the project. For business hotels in areas that have great natural disaster potential such as Padang, this natural risk has been included in the calculation of the cost of capital. This research will be conducted on identifying the incentives from natural risk incentives of capital expenditures made by hotels in Padang City, as well as the components of the natural risk that are considered when making a business feasibility analysis.

Based on the above explanation, the phenomenon of capital expenditure in the hotel industry in Padang City, is an important research object to be studied. Throughout our knowledge, research on natural risk-taking incentives has not been widely implemented, particularly those related to earthquake and tsunami risk. The formulation of the problem disclosed in this research are:

1 What are the factors that influence the decision of capital expenditure on the hotel industry in Padang City?
2 How is the effect of natural risk on hotel business incentives in Padang city?

2 Literature Review

Capital expenditure decisions and firm performance have a positive relationship [1], this means that firm performance is largely determined by decisions and the amount of funds in corporate capital expenditures. Then Gitman & Zutter [5] state that capital expenditures by firms are driven by several motives: business expansion, replacing of fixed assets and other reasons that have long-term benefits.

The determinants of capital expenditure according to Sartono [6] are Internal Cash Flow and Insider Ownership, where the greater the internal cash flow of the company, the greater the capital expenditure of the company, the greater the insider ownership, the less capital expenditure will be because the management tends to be more cautious in capital expenditures because if there is a mistake in the decision making, the management will also responsible for the risk.

Griner and Gordon [7] explains that capital expenditure is the amount of investment in property, plant and equipment (PPE). Collier & Gregory [8] adopted a field study approach to examine the practice of capital budgeting in the hotel sector. Their study found the fact that the hospitality business is highly capital-intensive.

Olsen et.al. [9] states that there are 5 major forces driving the changes that will affect the tourism industry within this new millennium. The intended strength is; capacity control, safety and security, assets and capital, technology, and new management. To date, almost all of these five major powers are the drivers of change in the industry, we can see them either through positive or negative implications.

Over the past few years, the hotel industry has invested a large amount of expenses to improve guest facilities and services including flat-screen televisions, high-speed internet access and redesign of guest rooms, lobby and restaurants. However, the Internet has changed the way business operates; accommodation companies began to employ ICTs to improve their daily operations and control their assets [10]. The Internet also plays an important role of mediation between customers and hotel companies as a place for information acquisition and business transactions [11].

This capital expenditure is long-term in nature and in large amounts of money from risky financial resources. With limited resources, managers must be able to overcome challenges to ensure that any capital expenditure decisions do not lead to operational inefficiency. Failure to invest in capital expenditures may result in the loss of market share due to the inability to offer the desired level of service quality at attractive prices.

Hotels generally bear large expenses and these are classified into two categories. The first group is called revenue expenses related to the profits realized within a year. This cost is also known as the period cost. Period cost is deducted from annual revenue in the same accounting period when costs occur. Thus, revenue expenditure reduces the taxable income for the year. The second group of expenditures is classified as capital expenditure and its profits are extended for more than one year [12]. Such expenditures include expenditures incurred to purchase long-term assets such as land, buildings and equipment or commonly referred to as Fixed Assets (PPE).

Research conducted by Kim [13] at a manufacturing company in Korea (1991-1998) investigated the impact of family ownership in capital structure on firm performance. The findings show that a positive relationship between the two variables indicates that the higher the family ownership in the firm's capital structure the firm's performance will increase. Maury [14] also found increased performance due to family ownership in Western European companies. Specifically stated that family ownership plays an important role in improving the

profitability of the company. This shows that family ownership decreases the classical agency problem between manager and owner.

In the Malaysian context, where government ownership and institutional ownership are relatively high, the impact of ownership on business decisions can be set aside. Fraser et. al., [15] found that firms with high government ownership and institutional ownership are generally profitable and have high leverage. Pecking Order Hypothesis (POH) states that there is no conflict between managers and current shareholders and thus, there is no influence between capital expenditure and insider ownership. Conversely, Managerial Hypothesis (MH) argues that managers increase their interest in determining the level of capital expenditure. Low managerial ownership can provide incentives for them to make higher capital expenditures. In other words, increasing insider ownership is expected to reduce managerial over-investment in capital expenditures. Thus, Managerial Hypothesis predicts an inverse relationship between capital expenditure and insider ownership.

Recently, a study by Dalbor & Jiang [16], using samples from the US restaurant industry in 2002 through 2012 examining how internal cash flow affects the company's capital expenditure. Their study found that internal cash flow and firm size are a positive determinant of capital expenditure, while economic recession is a negative determinant of capital expenditure.

According to the International Society of Hospitality Consultants [17], variations in the classification of capital expenditures are mainly due to the flexibility of its definition. For example, KPMG does not include new hotels built in the definition of capital expenditures [18]. Only items recorded in the balance sheet as fixed assets are included as capital expenditures. On the other hand, the study of the International Society of Hospitality Consultants [17] reports that capital expenditures also include capital improvement costs that extend the asset's economic life span.

According to Brignall [19], about 75 percent of the total hotel cost is fixed. The cost per square meter of hotel room can reach £ 1,300 or £ 13,600,000 for a hotel that has 150 rooms [20]. Comparing small firms with large companies, Barclay & Smith (1995) suggest that large firms are able to make and pay a higher fixed cost of debt and thus, will result in higher debt levels. In addition, Sheel [21] argues that large corporations also enjoy lower debt costs because the size of the firm is associated with the low probability of the company going bankrupt.

The Capex 2007 study conducted by the International Society of Hospitality Consultants (ISCH) [17], a review of capital expenditures in the hotel industry, found trends and historical capital outlays. The study is conducted in the United States and covers only the full service hotel / luxury hotel type, selected hotel services and extended stay hotel customers. This study has several significant findings that can be used as a reference and lesson to understand the domain of capital expenditures by the hospitality industry, namely:

• Capital expenditures for hotels are increasing according to the age of the hotel. Capital expenditures can be significant in the early years of a new hotel and increase dramatically from one year to the next.

• Percentage of repair and maintenance will increase according to the income and age of the hotel, exceptions when the property is fully renovated and or repositioned. The hotels analysed in this study indicate that spending is fairly consistent in repairs and maintenance over the life of the asset. The percentage of expenditure from total revenues ranged from 3-4.5 percent.

• On a long-term basis, CapEx 2007 data shows that all hotels, from new hotels to old / old hotels, spend an average of 8.5-9.8 percent of total revenues on capital expenditures for repairs and maintenance.
• From a historical perspective, the CapEx 2007 survey reveals that an overall decrease in capital expenditure from previous studies for hotels owned by public companies. Conversely, privately owned hotels show an increase in capital expenditures.
• The CapEx 2007 Survey revealed that capital expenditure as a percentage of total hotel revenues owned by public companies exceeds expenditures for private property.
• In full service type hotels and extended stay properties, private hotel-owned shopping is analysed as a ratio of total revenue and per room available higher than hotel expenses owned by a public company.

3 Research Method

This research will use qualitative and quantitative methods. For that purpose, a survey questionnaire (survey questioner), semi-structured interviews to the CEO (Chief Financial Officer) and / or CFO (Chief Financial Officer) of the hotel were sampled. Quantitative methods are used to test models that explain factors affecting capital expenditure decisions in the hospitality industry, incentives from natural risk taking and natural risk components to be considered in calculating the capital cost of the hospitality industry in Padang city.

The population of this study were all hotels that stood after the Padang city earthquake of 2009. The sample of this study is a 2 to 5 star hotel and the interview will be focused on gathering information about the practice of capital expenditure decision making. According to Ryan et al. [22], there are 5 types of field research or interview namely; descriptive, illustrative, experimental, exploratory, and explanatory. This field research study uses exploratory type because the interview will be focused to determine the issues related to capital investment decisions. Then, the sample technique used is purposive sampling which is to determine the number of samples to be used in this study so that in accordance with the targeted, by choosing the location / city in the city of Padang.

4 Result and Discussion

4.1 Respondent Characteristics

Research does not limit the characteristics of hotels in determining the sample. The questionnaires were disseminated and interviews were also conducted to get more in-depth information on what factors were considered by the hotel industry when deciding to develop new investment in hotel business in Padang city. From the graph 1, it can be seen that the majority of the respondent are managers from the star one and two hotels, while only 20 percent of the respondent are from the three star hotel. While for the four star hotel, it is relatively difficult to obtain the data from the managers.
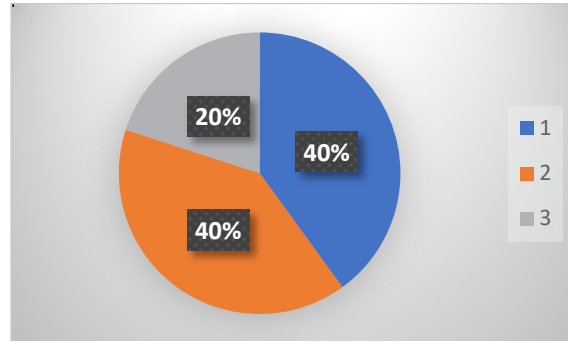
Figure 1 Characteristic of Respondent According to the Hotel Star

Characteristics of respondents cannot be developed further in order to facilitate data access to the executive of the hotel because some of the identity data of respondents and hotels are confidential, so this research focuses on only a few characteristics. For example, in Table 2, this study attempts to identify the site factor by asking the distance of the hotel building to the beach. So far this issue has become very important because it deals with disaster issues especially the tsunami disaster. For 40 percent of the respondent, their hotel location from beach are very close which is less than half a kilometre. Approximately 40 percent more are located relatively far from the beach, which is more than 5 kilometres.

Table 2 Respondent Characteristic

Characteristic	Percentage
Distance from the shoreline	
Less than 500 meters	40%
1-2 meters	20%
Over 5 kilometres	40%
Established	
Before 2009	40%
After 2009	60%

The majority of the hotels in this research only established after the 2009 earthquake, about 60 percent. The remaining 40% have stood before the 2009 earthquake. But of the 40 percent who stood before the 2009 earthquake, almost all of them made significant investment development after the earthquake.

4.2 The Influence of Site Factor to Investment Decision

In investing, site selection becomes very important because it does not only deals with future cash flows from planned investments, but also deals with investment risks. For investments in

the city of Padang with higher natural risk potential, particularly from earthquake and tsunami risk, proper location selection is essential to predict future potential disaster losses.

Table 3 Site Factor in the Decision of Hotel Location

	Percentage
Risk: Distance to Shoreline	
Strongly Disagree	20%
Disagree	40%
Neutral	40%
Agree	0%
Strongly Agree	0%
Closeness to Damaged Buildings	
Strongly Disagree	20%
Disagree	60%
Neutral	20%
Agree	0%
Strongly Agree	0%
Current Location According to Natural Risk	
Strongly Disagree	20%
Disagree	20%
Neutral	20%
Agree	40%
Strongly Agree	0%

Table 3 shows that the proximity of the hotel's location to the beach is not a major component in determining investment risk. About 60 percent of respondents say that they were not affected by the proximity factor with the beach in site selection, although the potential risks for tsunami were greater. Locations adjacent to buildings destroyed by the 2009 earthquake are also not factors considered in determining hotel business risk in Padang city. 80 percent of respondents stated strongly disagree and disagreed with the statement that proximity to buildings affected by the 2009 earthquake became a moral hazard for the risk of losses due to earthquakes. However, for 40 percent of respondents, the current risk selection is based on an analysis of possible natural risks in the city of Padang.

4.3 Factor of Earthquake / Tsunami

The probability of occurrence of natural disasters, especially earthquakes that will occur in the city of Padang. Based on table 4, 40 percent of respondents agreed that the potential or issue of the earthquake could decrease the asset or the fixed assets of the hotel. But 60 percent said they disagreed with the statement.

Table 4 Perception to natural Disasters

	Percentage
Potential of Decreasing Assets Value	
Strongly Disagree	20%
Disagree	40%
Neutral	0%
Agree	40%
Strongly Agree	0%
Earthquake Frequency Becomes an Important Factor	
Strongly Disagree	0%
Disagree	60%
Neutral	0%
Agree	40%
Strongly Agree	0%
Probability of a Bigger Earthquake	
Strongly Disagree	0%
Disagree	40%
Neutral	0%
Agree	60%
Strongly Agree	0%

The same result was also obtained for the effects of earthquake frequency on the earthquake decision. There are 60 percent of respondents said the frequency of the earthquake is not an important factor in making investment decisions in the city of Padang. However, the majority of respondents agreed that the probability of an earthquake in the city is greater than in other cities in Indonesia. Although not a major factor considered in making investment decisions in the city of Padang, their concern for the earthquake disaster is relatively higher.

4.4 Perspective of Respondents to Tourism in Padang City

Having previously focused on potential cash outflows due to potential risks from natural disasters, it is necessary to analyse the potential for cash inflows, especially the potential occupancy rate of rooms and the use of non-room facilities. Table 5 shows the responses of respondents about the potential cash inflows from the tourism sector and events held in the city of Padang.

Table 5 Perception of Potential Cash Inflow from Tourism Sector

	Percentage
Optimism on Tourists Visitor	
Strongly Disagree	0%
Disagree	0%
Neutral	0%
Agree	60%
Strongly Agree	40%

	Percentage
Positive Impact from Government Campaign	
Strongly Disagree	0%
Disagree	20%
Neutral	0%
Agree	60%
Strongly Agree	20%
International Event: Increase Rate of Occupancy	
Strongly Disagree	0%
Disagree	0%
Neutral	0%
Agree	60%
Strongly Agree	40%
International Event: Increase of Non-Room Business	
Strongly Disagree	0%
Disagree	0%
Neutral	0%
Agree	60%
Strongly Agree	40%
National Event: Increase Rate of Occupancy	
Strongly Disagree	0%
Disagree	0%
Neutral	0%
Agree	60%
Strongly Agree	40%
National Event: Increase of Non-Room Business	
Strongly Disagree	0%
Disagree	0%
Neutral	0%
Agree	40%
Strongly Agree	60%
Local Event: Increase Rate of Occupancy	
Strongly Disagree	0%
Disagree	0%

	Percentage
Neutral	20%
Agree	60%
Strongly Agree	20%
Local Event: Increase of Non-Room Business	
Strongly Disagree	0%
Disagree	20%
Neutral	20%
Agree	40%
Strongly Agree	20%

Table 5 shows the optimism of hotels to the cash inflows from tourism activities in the city of Padang. Although there are issues of earthquake and tsunami, respondents are optimistic that the level of tourist visits in the city of Padang will continue to increase. The majority of respondents also believe that tourism campaigns conducted by local and central government will have an impact on the increase of local and foreign tourist visits to the city of Padang, so as to increase hotel revenues in the city of Padang. Only 20 respondents did not agree that the campaign will have a positive impact on tourism in the city of Padang.

Table 6 Investment Capital Cost in Padang City

	Percentage
Beta of Padang City is Bigger Than the Neighbouring City	
Strongly Disagree	0%
Disagree	0%
Neutral	80%
Agree	20%
Strongly Agree	0%
Beta of Padang City is Bigger Than the City Outside of West Sumatra	
Strongly Disagree	0%
Disagree	0%
Neutral	80%
Agree	20%
Strongly Agree	0%
Required Return in Padang City is Higher than the Neighbouring City	
Strongly Disagree	0%
Disagree	20%
Neutral	20%

	Percentage
Agree	60%
Strongly Agree	0%
Required Return in Padang City is Higher than the City Outside of West Sumatra	
Strongly Disagree	0%
Disagree	20%
Neutral	60%
Agree	20%
Strongly Agree	0%
Requires Return in Padang Including Natural Risk	
Strongly Disagree	0%
Disagree	20%
Neutral	60%
Agree	20%
Strongly Agree	0%
Requires Return in Padang Including Natural Risk	
Strongly Disagree	0%
Disagree	0%
Neutral	100%
Agree	0%
Strongly Agree	0%
Anti-Seismic Technology Lowers the Cost of Capital	
Strongly Disagree	0%
Disagree	60%
Neutral	20%
Agree	20%
Strongly Agree	**0%**

For events held in the city of Padang, respondents believe that the events will give cash flow for the hotel business in Padang city. Especially international and national events, benefits are not only obtained from the occupancy rate of the rooms, but also from non-room revenue such as rental of premises such as hall and other facilities.

For local events, about 40 percent of respondents said they did not know or disagreed if the local event had a positive impact on the hotel's revenue from non-chamber business.

4.5   Investment Capital Cost in Padang City

In calculating capital costs, the determination of market risk (Beta) and required returns (cost of capital) is very important to avoid acceptance of projects that should have negative NPV or reject investments that should have a positive NPV. Table 6, the majority of respondents do not want to answer how many betas they use with the majority answered do not know. Some respondents stated that information about the beta is relatively secretive or some hotel voters never use the beta as a basis in decision makers. Only 20 percent of respondents stated that Beta investment in Padang city is bigger compared to other cities especially with cities that are not in the earthquake area.

But actually the total risk of investment can be seen from the required return used when the preparation of capital budgeting. Compared with neighbouring cities such as Jambi and Pekanbaru, the required return used in Padang is relatively larger. 60 percent stated that the required return in the city of Padang is greater with neighbouring cities. This indicates that additional risk has been included in the capital cost calculation.

4.6   Financing and Insurance Institution Support

Supports from financing institutions such as Banks and Insurance become very important in making investment decisions. The availability of financing facilities from banks with lower costs will be able to lower the cost of capital investment plan so that the potential feasibility of an investment in the city of Padang will be greater. From table 4.6 can be seen that there is a good support from the bank in financing the hotel investment in the city of Padang. This can be shown by the 60% of respondents agreed that the access to bank financing is relatively easy. While the majority of respondents do not know whether the interest rate of capital loans provided by banks for investment in the city of Padang are larger or smaller than the investment in other cities. The same is also answered by respondents to the minimum credit limit provided by the bank, whereas the average respondent does not know whether the credit limit provided by the banking for investment in Padang city is bigger or smaller than other cities

Table 7 Financing and Insurance Institution Support

	Percentage
Easier access of capital through bank loans	
Strongly Disagree	0%
Disagree	20%
Neutral	20%
Agree	60%
Strongly Agree	0%
Higher interest rate in Padang	
Strongly Disagree	0%
Disagree	20%
Neutral	60%
Agree	20%

	Percentage
Strongly Agree	0%
Lower minimum limit of capital loan	
Strongly Disagree	0%
Disagree	20%
Neutral	60%
Agree	20%
Strongly Agree	0%
Easy to find insurance due to high natural risk	
Strongly Disagree	0%
Disagree	40%
Neutral	20%
Agree	40%
Strongly Agree	0%
Insurance premiums are higher in Padang city	
Strongly Disagree	0%
Disagree	20%
Neutral	60%
Agree	20%
Strongly Agree	0%

For the value of earthquake and tsunami risk, 40 percent of respondents stated that it is easy to get insurance that will guarantee losses due to earthquake and tsunami disaster. Yet another 40 percent said they disagreed if they could get an insurance company that would guarantee the loss of natural disasters because the probability of earthquake occurrence in the city of Padang is relatively large. Even if there are insurance companies that provide these guarantees, the premium set tends to be greater. But the majority of respondents actually do not know whether the premium is expensive or not. For those premiums offered can still be affordable.

5 Conclusion

This research tries to examine the factors that determine the capital expenditure in Padang city for hotel business. By using descriptive qualitative research method, this research concludes several things as follows: (1) Site factor is not an important factor in investment decisions made by hotel business in Padang city. The location of the hotel that is near or further from the coastline is not a major factor in determining business risk. (2) The potential inflows of tourism activities and events that are local, national and international become a crucial factor why business hotels in the city of Padang is still very attractive after the earthquake in 2009. (3) Beta or market risk is not a major concern for business players in the

preparation of capital budgeting because of all the risks. (4) Support and convenience provided by financing institutions such as banking and the availability of insurance as a hedge of investment assets is a factor considered in investment decisions. (5) Risks taken by hotel owners are getting incentives in the form of potential inflows of tourism activities and events and support from banks that can make the cost of capital becomes relatively cheaper.

5 Research Implication

The several literature and managerial implications of this research are as follows: (1) this study reinforces the literature on the cost of capital that tends to be greater for investments with greater natural risk. (2) The results of this study also support the financial literature on the importance of greater supply of funds to reduce capital costs. (3) In managerial perspective, the results of this study have implications for the importance of government policies and efforts in intensifying tourist visits to the city of Padang because the main factors considered business hotels in the city of Padang is the visit of tourists and events. (4) The government can cooperate with financial institutions by providing guarantee for capital investment into Padang city so that the cost of capital can become smaller.

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Brand Awareness of 'I Channel Bandung' Through Local Culture in the Golek Puppet Show "Sampurasun Cepot"

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Abstract. The purpose of this research is to know the process of increasing brand awareness of I Channel Bandung through the event 'Sampurasun Cepot' by using integrated marketing communications. Besides that the researcher wanted to see the level of brand awareness I Channel Bandung achieved after using the cultural event program. The theory used in this research is integrated marketing theory by Tuckwell and theory of band awareness level by Aaker. Integrated marketing communications has six elements that are used to improve this television brand. It aims to see the level of brand awareness companies in the minds of the audience. This research uses case study method with intrinsic qualitative approach and constructivist paradigm. The result of this research is that integrated marketing communications can be associated with cultural programs to increase awareness of the company's brand. The use of puppet show of 'Sampurasun Cepot' managed to attract the audience became more aware of the presence of this local television. I Channel Bandung brand awareness improved and reached the brand recall level in the audience.

Keywords: brand awareness, local television, local culture-'sampurasun cepot'.

1   Introduction

The local television existence is currently increasing in Indonesia with various cultures. The ability of local television to explore the local culture makes local television has a role in preserving local culture. In Article 36 paragraph 1 of Law no. "The content of the broadcast must contain information, education, entertainment, and benefits for the establishment of intellectual, character, morals, progress, and nation power, maintaining unity and unity, and practicing Indonesian religious and cultural values."

The announcer should pay attention to these things in making broadcasts basically. In addition, the contents of private television shows can be seen under the Broadcasting Act no.32 "Keeping unity and unity with political, legal, and economic, social, cultural and security information". Local television has a very important role in the dissemination of information to the community irrespective of the things that can break the unity and unity of the nation. Local television was established to be one of the best quality shows, by highlighting the cultural elements of a particular region, and raising events related to local government, so that the public can get complete information without forgetting the cultures of the area.

Local television has some show content advantage, it is expected to revive indigenous cultures in an area that has already been forgotten by the people. One excellence example is the content of the event with the local language in accordance with the local television establishment. In addition, various art events are displayed, such as puppet show, *wayang kulit*, *wayang golek*, local music events containing local songs, to the typical culinary places and cultural attractions of the area.

The presence of local television is closely related to the Broadcasting Act as a foundation and its management. On Broadcasting Act no. 32 of 2002 Article 36 paragraph 1 and 2 as follows:

1. The content of the broadcast shall contain information, education, entertainment, and benefits for the formation of intellectual, character, morals, progress, and nation power, maintaining unity and unity, and practicing Indonesian religious and cultural values.
2. Broadcast content of TV broadcasting services, organized by Private Broadcasting Institution and Public Broadcasting Institution, shall contain at least 60% (sixty per cent) of domestic event's eyes.

Based on the fact, the program should have the same purpose with the Broadcasting Act from local television, the content of the event must have the moral and ethics of the Indonesian nation, put forward the diverse Indonesian culture and shape the mindset of the community to always unite in keeping unity and national unity. KPI issued the regulation No. 01 / P / KPI / 03/2012 article 68 paragraph (1) which reads "Local broadcasting program shall be produced and aired with a duration of at least 10% for television of at least 60% for radio of all networked broadcasts per day ".

One of the city that is putting forward the local culture is Bandung, so many emerging local television stations in Bandung amounted to 11 based on data from Bandung Information and Documentation Management Officials in 2017 [1]. I Channel Bandung has a minimization of brand awareness in Bandung society. With a variety of programs with bold and modern concepts, it is unfortunate that this television has not been known by many audiences. Brand is very influential in the continuity of this television, one of which is to be able to attract clients to advertise as a source of income I Channel Bandung. According to Shimp (2007) the brand also has an important role to be a differentiator between services or products offered by a company with rival brands (see (Rouly et al., 2017)Meanwhile, according to Rangkuti (Rangkuti, 2007) tendency of development of marketing war in the future will become war between brands that is a competition to gain brand dominance [2],[3].

Interestingly, the local TV reinforces existence by re-reminding the legend of the Sundanese legend on puppet show namely Cepot. When compared with other local television stations, puppet show as a hallmark of Bandung is not appointed to the surface, but other local television stations put forward the life style of young people in Bandung. With the goal I Channel which began airing October 10, 2012 is still having difficulty in the introduction of their brand. By promoting local culture, I Channel preserves the puppet show culture through its show 'Sampurasun Cepot'. The program 'Sampurasun Cepot' is using Sundanese language and performed with typical humor. To increase brand awareness of I Channel, in addition to using the local culture of the program 'Sampurasun Cepot', I Channel itself is a television media, which has a very powerful function in the dissemination of information to the public. As a mass media, I Channel must be able to utilize its function as a disseminator of information to be able to increase brand awareness in society. Based on the background of research that has been put forward, it can be formulated the main issues that will be discussed

about the process of increasing brand awareness through local culture, namely: (2) how does brand awareness improve I Channel Bandung with the use of 'Sampurasun Cepot'?

It takes serious and sustained effort in the development of local television in order to become a chosen television for audience to watch. The condition for local television is not easy compared with national private television as local television is limited in its range, competing for audience, and its advertisement is relatively same. However, local television has advantages in its 'closeness to social-cultural' with audience. Therefore, special efforts and activities such as utilization of content based on local wisdom to attract the audience can form brands awareness of local television.

1.1 The Theory of Brand Awareness

The brand awareness level of Aaker is chosen by researchers as a theory that can be used to describe the level of brand awareness felt by consumers related to this research. The stages of brand awareness is needed to see whether marketing communications conducted by a company can achieve the highest stages of corporate brand awareness.

According to Aaker (1997 in Farjam and Hongyi, 2015) brand awareness is the ability of a person who is a potential buyer to be able to recognize or recall a brand is part of a product category. Brand awareness necessitates the continuum of the uncertain feeling that a particular brand is known, being a belief that the product is the only one in the product class Aaker, 1997 [4]. Aaker (1997) in Chi, Yeh and Yang, (Chi, 2009), the level of brand awareness is as follows:

1. Unaware of Brand (Unaware of Brand)
   It is the lowest level of the brand awareness pyramid in which consumers are unaware of a brand.
2. Brand Recognition (Brand Recognition)
   This is a stage in which consumers know the brand that the level of consumer awareness of a brand is measured by providing assistance such as the characteristics of a product.
3. Brand Remake
   The brand recall is a reminder of a brand that is mirrored by another brand that the respondent remembers after mentioning the first brand. Brand recall using multi respond questions is to provide answers without help.
4. Top of Mind
   It is a brand first remembered by consumers or first mentioned when consumers are asked about a particular product. This level uses single respond question which means the respondent can only give one answer to the question about this.

The creating brand awareness the marketer hopes that whenever the needs of the category arise, the brand will be reappeared in the minds of consumers who are then taken into consideration various alternatives in decision making. Brand awareness shows the consumer's knowledge of the existence of a brand. This theory will be used to see where the level of the brand from I Channel Bandung [5].

In addition, the role of brand awareness in the brand value depends on the level of attainment of consciousness in the minds of consumers [6]. Brand awareness can be built and improved through the following ways:

1. The message is conveyed by a brand should be easy to remember by consumers.
2. The Messages are delivered must be different from other products and there must be a relationship between the brand with its product category.
3. Wear exciting slogans and jingle songs help consumers remember the brand.

4. If a brand has a symbol, it should be associated with the brand.
5. Brand name extension can be used to make the brand more consumers remember.
6. Brand awareness can be reinforced by using a cue that matches the product category, brand, or both.
7. Repeats to improve reminders, because forming memories is more difficult than forming as an introduction.

1.2 The Brand Definition

The brand is came from the word brand that has the meaning of "to burn", the Vikings are fueling their animals as a form of pet ownership. According to Kotler and Keller (Keller, 2008) brands or brands may take the form of logos, names, trademarks or a combination of the whole [7]. Based on that definition a brand has a function as a differentiator between a company's products with other companies. Using a name, logo, or trademark, the company seeks to notify consumers of their brand differentiator that aims to provide the company's brand knowledge and brand awareness. [8]

Meanwhile, according to the American Marketing Association (AMA) in Kotler and Keller (Keller, 2008) "A brand is a name, name, term, sign, symbol, or design of one seller or group of sellers to differentiate them from those of competition " [7]. According to Kotler and Keller (Keller, 2008) brands are names, terms, signs, symbols, designs, or combinations of these which are intended to identify products or services of a person or a seller and to distinguish them from competing products [7]. So the brand identifies the maker or seller of a product.

According to Laksana (Fajar, 2008), a brand is a name, term, sign, symbol or design, or a combination of all that is expected to identify the goods or services of a person, a seller or a group of sellers, and is expected to differentiate the goods or services of a competitor's product. Lindstrom (Lindstrom, 2005) says that, "Branding continuously strives to achieve authenticity and build a relationship with consumers that will extend from cradle to grave" [10]. So it can be said that branding is a process of communication and communication between both companies and consumers.

1.3 Local Culture

There are some cultural sense according to some experts one of them is the famous character of Indonesia is Koentjaraningrat .(2000) culture with the basic word culture comes from the language sansakerta "buddhayah", the plural form of buddhi which means "mind" or "mind" [11]. Thus Koentjaraningrat defines culture as a "power of mind" in the form of creativity, intention and taste, while culture is the result of creation, intention, and taste [12].

Koentjaraningrat explains that essentially many differentiate between culture and culture, where culture is a cultivated form of cultivation, which means the power of the mind. Culture is considered an abbreviation of a culture that is no different from the definition. So culture or abbreviated culture, according to Koentjaraningrat is the whole system of ideas, actions and the work of human beings in the framework of the life of society that made human self by learning [13].

Koentjaraningrat distinguishes the existence of three forms of culture are: (1) the form of culture as a complex of ideas, ideas, values, norms, regulations and so forth. (2) The form of culture as a complex of activity and the patterned actions of man in a society. (3) The form of culture as objects of human works.

According to Liliweri (Alo, 2002:, see Nugroho, 2012) culture is the life view of a group of people in the form of behaviors, beliefs, values, and symbols they receive unconsciously that are all inherited through the process of communication from one generation to the next. Culture, then, is the whole way of life of any society and not just about a part of the way of life that part of society that is perceived as higher or more desirable. From some cultural definitions it can be concluded that culture refers to various aspects of life including ways of prevailing, beliefs and attitudes, as well as the outcome of a typical human activity for a particular society or population group.

Fig. 1. 'Sampurasun Cepot' Event Program.

The program 'Sampurasun Cepot' was first aired on January 6, 2016. The show raised puppet show as a legendary art in West Java to be able to exist again through TV media. The event consists of seven players, one mastermind, the mastermind of Riswa and six traditional music players. Wayang golek as a Sundanese art serves as a messenger and advice to the community and wrapped with humor. Pogram event 'Sampurasun Cepot' is a medium from I Channel Bandung to be able to increase their brand awareness.

2 Research Method

This study aims to gain knowledge about the process of increasing local TV brand awareness through local culture using constructivism paradigm. According to John W Creswell (2013), the paradigm is very important because it can help researchers to determine the right way of looking at a problem and to help determine the theories and methods appropriate in the research [14],[15]. Littlejohn (2017) says that flow theories are based on the idea that reality is not an objective formation, but is constructed through the process of interaction within groups, society, and culture [16].

The research uses qualitative approach. According to Denzin and Lincoln (2009), that "qualitative research has an emphasis on processes and meanings that are not studied closely or not measured in terms of quantity, quantity, intensity, or frequency". Neuman (2013) In qualitative research, the process relies more on interpretative or critical principles on the case studied and research focus in a particular context [17],[18]. The emphasis is on doing a detailed analysis of specific cases that arise naturally in social life. The selection of qualitative approach in this research is based on the authors want to get the depth of the answer to explore the process of increasing brand awareness done through local culture on TV local I Channel Bandung. The study was conducted using case study method. A case study is an approach to studying, explaining or interpreting a case in its natural context without any outside

interpretation. According to Daymon & Holloway (2008), case studies are an intensive test using various sources of evidence, (which may be qualitative, quantitative, or both) bounded by space and time. The case raised can be an organization, a set of people, communities, events, processes, issues, or even campaigns [19].

Yin (2012), the focus of the case studied is about the process of increasing brand awareness using local culture in the minds of the audience I Channel TV Bandung [20]. The fundamental reason of the authors using the case study approach in this study, namely:

1. The appointed case is unique. This can be seen from the focus of research that wants to see cultural values play a role in raising brand awareness on local TV viewers I Channel Bandung. Where cultural values are poured through the *Sampurasun Cepot* event.
2. The selected case can be a proof of a well-constructed theory. The constructed theory has a clear proposition, which corresponds to a single case chosen so that it can be used to validate it. In this research the theory used is The Awareness Aaker Improvement Theory.

2.1 Spatial Approach

Spatial approach is intended that in developing water tourism area on the Pulau Lancang Kecil is done by observing the study area with all the potential and constraints contained there, so that the development of water tourism area on Pulau Lancang Kecil is achieved. However, this development remains paying attention and utilizes the existing potential. Spatial approach is used to observe the supply side of the tourist market that is considering Pulau Lancang Kecil as tourism area consisting of several sub-areas that have different potential. Thus, the intention of developing agro tourism needs to be done to select the most appropriate location, so the application of development efforts can be done optimally and supported by other tourist sub-region contained in the tourist area of Pulau Lancang Kecil as a form of new tourist offer to the tourists.

2.2 Result Approach

Natural resources and environment determine the type, quantity, and quality of water tourist development in Pulau Lancang Kecil. This approach emphasizes supply factors rather than demand factors. Natural factors, ecological considerations, environmental carrying capacity, and so on are more dominant in terms of social factors and the demands of human needs.

2.3 Activity Approach

This approach is based on common tastes and desires by first reviewing past activities to estimate the opportunities that need to be contained in the future. The emphasis of this approach is on the "user". In the process of planning, it is heavily influenced value of certain groups that is a well-organized group of values. This approach can work best if applied to homogeneous populations with limited scope.

If this approach is done in large cities with heterogeneous populations, it will be difficult to determine the types of activities that are mutually agreed upon because the heterogeneous population has diverse lifestyles, values, and socioeconomic levels.

2.4 Human Behavior Approach

This approach is based on an assessment of the attitudes and behaviours of residents in using leisure time (how, when, and where). The emphasize is on tourism activities as an experience, which is why people conduct travel activities, what kind of the most favourable tourist attractions, and what are the benefits derived from the trip. The desires, preferences, and satisfaction of the user of a tourism object determine the planning process.

This approach is used to understand market segmentation based on the characteristic of tourists so that the researchers can find out the market tendency from the opinion of tourists about the motivation, perception, and expectations that tourists want to develop the study area.

The results of this approach are used to further analyse in order to get the most appropriate form of development to be applied in Pulau Lancang Kecil.

2.5 Demand and Supply Approach

This approach combines elements of demand, supply, and identifies the social needs indicator to prepare the physical environment (space) that is compatible with human behaviours. This approach covers a wider range of possibilities than traditional recreational parks in general.

2.6 Development Approach

The exploring of tourism potential of Pulau Lancang Kecil has not been optimal yet. It caused the tourism activity in the area is less diverse and less well-coordinated. This development approach is used to direct the research that will be carried out to formulate the concept of agro-tourism development that is suitable to be applied in Pulau Lancang Kecil area to increase the development of the tourist area as a whole, both for Pulau Lancang Kecil itself and for the development of tourism in Kepulauan Seribu.

3   Results And Discussion

3.1 Definition of Tourism and Tourists

To expose and examine the process of increasing brand awareness at I Channel Bandung, the researcher conducted interview with key informant, that is Head of Marketing Communication at I Channel Bandung, because as Head of Marketing Communication, resource person have duty to increase brand awareness I Channel Bandung good our concept is more to young people, so there are mostly rich from its own show segment ranging from 15 years.

There is a program that is rather serious at night, but mostly 70% of the program is for young people. So the concept is different from the others, more highlight the creativity of young people, but still preserve the culture of West Java itself. Interview with Head of Marketing Communications I Channel Bandung, Mrs. Ria Rinjani, October to audience also advertiser:

"Brand awareness is vital to the growth of the company, supported by the uniqueness that distinguishes it from other local television. As said by the key informant, Mrs. Ria Rinjani about the uniqueness owned I Channel Bandung namely:" I Channel has a colorful slogan of Bandung, 25th at 10:17 pm)."

Brand awareness starts from the uniqueness of a company, which aims to attract the attention of people to be able to feel closer to the company. With so many local television popping up, the differentiating factor with other local television should be a major force in raising brand awareness to the audience. By looking at the needs of urban people in Bandung, I Channel put forward a fresh concept to get the attention of the audience and also advertisers.

From the results of research conducted, obtained information that I Channel Bandung has a uniqueness that can be used as capital to increase brand awareness on the audience. The number of other local television to make the company not only use the uniqueness owned, but the program must also successfully attract the attention of the audience in order to compete.

Determining the right target audience in I Channel Bandung as a local television in a tourist city that closely with the urban and Sundanese distinctive culture makes this television acceptable because it can accommodate every need of information audience. This is embodied in every event program that is present on I Channel, such as music program, lifestyle, and talk show to cultural arts program that did not escape from its function to raise locally charged themes in Bandung area.

Local television was formed in order to focus more on locally loaded news on an area where local television was built. Cultural themes are presented as one of the local means of television in preserving the culture. As well as the key informants regarding cultural preservation through local television, as follows:

"For your own culture, this local TV is loaded with 90% local information. One of them by raising the original local cultures of Bandung, because then we run the function of local TV as well as preserving art and culture of birth ground I Channel Bandung ". (Interview with Head of Marketing Communications I Channel Bandung, Mrs. Ria Rinjani, 25 October at 10:17 pm)."

The key informant statements are reinforced by producers and Dalang Riswa, namely:

Producer (informant 1): "I Channel is present in addition to meet the information needs around Bandung, but also to preserve the culture. Both cultured with urban lifestyle in Bandung, and still lift the art of Sundanese culture to be seen again by the urban people in Bandung ". (Interview with Producer I Channel Bandung, Mr. Rori, 26 October 2017 at 16.00 WIB).

The puppeteer Riswa (informant 3): "I see a very rapid cultural shift, with that what barudak-barudak (children) everyday use gadgets continue. The emergence of local TV at least a way of opening to preserve the art of Sundanese culture, because through this typical TV art media can be reappointed. Barudak-barakak tea where anyone else who knows or want to watch puppet show directly, but if via TV it's easier to watch it, stay a bit remot, tah so know them the same art of Sundanese culture ". (Interview with Dalang Riswa, Dalang on "Sampurasun Cepot" event, 30 November 2017 at 13.00 WIB)."

In an interview with Head of Marketing Communications I Channel Bandung, he revealed the same thing about the cultural program they created to increase brand awareness of this local television, namely:

"The event" Sampurasun Cepot "present at I Channel Bandung aims to preserve the culture of wayang golek that has long been invisible. Many young people who only know his name, puppet show, but do not know the antics of the puppet show itself. Like this legendary cepot, with his cuteness accompanied by other wayang figures and wrapped with traditional Sundanese traditional music, is expected to provide new colors and knowledge to the people who watch that wayang is not boring. At the same time to be able to increase brand awareness of I Channel as well ". (Interview with Head of Marketing Communications I Channel Bandung, Mrs. Ria Rinjani, October 25th at 10:17 pm).

The statement of the first informant, reinforced by the exposure of the third informant, is as follows:

"With the concept and theme that is being talked about in Bandung make the message from Dalang more easily accepted in the community. Therefore, the dalang is expected to adjust to the tastes of the audience, for example through the presentation of fresh humor that matches the theme of the pawayangan during the performance. "(Interview with Dalang Riswa, Dalang on" Sampurasun Cepot "event, November 30th 2017 at 13.00 pm).

To be able to increase a brand awareness requires many aspects that support each other. In the use of a cultural event program to increase the brand awareness of the company, must be paid attention to the harmony of all the performers. The event is the key to the success or failure of the company's brand awareness. So it takes good cooperation between each of the performers. Puppet will successfully deliver the desired information to the audience based on the slick game of the puppeteer. Where the puppeteer plays a very important role to create persuasive communication to the audience. The selection of puppeteer is certainly done based on the vision of a company's mission to create a wayang golek event in accordance with the company's goals.

The use of language that is easily understood by the audience becomes a key success to get the message from the puppeteer. The puppeteer communicates to the audience through "Sampurasun Cepot" on the theme raised. Communication is an advantage possessed by puppeteer in the delivery of messages so as to give color to a puppet show event. Submission of various information and advice cannot be separated from the themes that must be sung.

The increasing brand awareness through an event requires a good cooperation between the marketing division and the program division, because this event must have an impression in the minds of the audience. So the theme selection of the event should be discussed carefully in order to get the appropriate topics. This is justified by the statement of the first informant namely:

"If it is here, I belong to the program division, and indeed in some events there are working together to determine the theme of the event. Like the "Sampurasun Cepot" event it is being worked on by marketing people for brand awareness to the community. This we like to sit together and decide the theme for every week. But for example the rich tea this month I already have a theme, we continue to tea together it Teh Ria (Head of Marketing), well we talk that generally first .. ". (Interview with Producer I Channel Bandung, Mr. Rori, 26 October 2017 at 16.00 WIB).

3.2 Level Brand Awareness I Channel Bandung through Program Event "Sampurasun Cepot"

I Channel Bandung is used integrated marketing communications to increase brand awareness to achieve the level of corporate brand awareness. Based on the results of interviews regarding the level of brand awareness with key informants and informants, as follows:

3.2.1 Unaware of Brand

In creating brand awareness, it begins with a lack of awareness of a brand. This is the lowest level in the brand awareness pyramid. Where people are not aware of the existence of a brand of a service company or product. As the key informant said, as follows:

"For the awareness of the community itself and also the client two years ago it's still a lot of guns do not know about I Channel. So do not know at all so, like for example we offer advertisement to the client, many clients who asked I Channel Bandung Tea O Channel TV yes. For the audience also the results of our survey they do not know I Channel TV Bandung". (Interview with Head of Marketing Communications I Channel Bandung, Mrs. Ria Rinjani, 25 October at 10:17 pm).

The initial process of people's unconsciousness of a brand will be felt by all companies both engaged in services and products. So there must be a special attraction that can facilitate the public to be able to recognize the brand. In addition, the company must also have a uniqueness to be able to make people remember their brand. The uniqueness

owned by I Channel Bandung presented by the third informant, namely:

"The uniqueness that we have as a differentiator with other TVs lies in the concept of the show, the channel I view these young people as urban, urban people, with the mindset and thirst for information, so our concept is light, still contained, but the present. (Interview with Marketing Communications Staff of I Channel Bandung, Ibu Aulia, November 1st at 11.00 am).

The emergence of local TV that has fresh content and image quality equivalent to national TV, making people who initially did not know the existence of this TV to be more want to know about I Channel Bandung. Curiosity of the community is supported by the brand recognition made by I Channel Bandung through the program "Sampurasun Cepot".

3.2.2 Brand Recognition

Brand recognition is the first step in a company's marketing communications. Introduction is done so that the public is able to recognize the company's brand by generating interest and pleasure for the community.

To introduce the brand from I Channel Bandung, this company more use one program so that brand I Channel Bandung can be known in the community. It takes the right strategy in brand recognition to the public, so that the main purpose of brand recognition can reach the target and hit the community. In the case of introducing this brand submitted by the second informant that is as follows:

I Channel Bandung is an urban TV, providing impressions with contemporary content, light themes close to the people of Bandung, as well as cultural content that is also presented with the daily use of Sundanese language to be easily accepted by the audience. Especially the "Sampurasun Cepot" event used as a medium for brand recognition and increasing awareness to the public. Companies must also be able to keep up with the times, by doing brand recognition through other media. I Channel also perform brand recognition by providing information through social media, such as web, Instagram, twitter, YouTube, and path.

Brand recognition is not only done with social media, but by way of face-to-face. Face-to-face communication is done to be able to communicate information directly with the community. In addition, face-to-face communication has the advantage of interaction between communicator and communicant, so the message given was more easily accepted and understood.

Using a group communication approach will have a conformity effect, example a number of people in the group say or do something, there is a tendency for members to say and do the same, jalaluddin grace (2007: 150). Marketing Division I Channel Bandung strives to achieve that goal, so they make approaches to the communities in Bandung. When viewed from the point of view of the use of time, this way is not efficient, and very contrary to the use of social

media. Time ineffectiveness occurs because marketing and community divisions should meet in the communication process and spend time together in a place.

3.2.3 Brand Recall

Brand recall is a re-branding of a trademark that occurs in a walking society with no help to remind the brand. Well-known brands will usually stick to the community as the community categorizes the brand itself. I Channel Bandung is currently increasing brand awareness at brand recall level. To form a brand recall required a strong strategy and carried out continuously, so that people can receive the initial goals of the company.

The process of brand recall becomes very important because it is quite difficult to reach to this stage. A brand is easy enough to recognize only, but not to appear during the brand recall stage. The first brand that comes to the mind of someone will benefit more than a brand that has a low brand recall level. In this stage, I Channel Bandung requires hard work and to get to the stage of repetition to improve the reminders of the brand I Channel Bandung.

3.2.4 Top of Mind

Top of mind is the top level in brand awareness. At this level, the brand already has a place in the hearts of people. Top of mind this means that the brand is already at the highest peak in one's mind in making choices compared with other brands. When a brand reaches a top of mind position, people have full confidence in the brand for everyday use and are reluctant to replace it with others. This will lead to a purchase, be it a product or service. This level takes a long time to win the hearts of people. Brands must be of good quality and always consistent over time. As revealed by the second informant, namely:

"To get the top position of mind in the community is not easy, it takes a very long time to continue to maintain quality consistently. We still have a lot to do especially the Marketing Communication division to get to that stage. But we did keep trying to reach the final goal of reaching the top of mind stage ". (Interview with Marketing Communications Staff of I Channel Bandung, Ibu Aulia, November 1st at 11.00 am).

To be able to reach the level of top of mind, of course, required special activities to instill a strong product brand in the minds of the community. Each company would make the top of mind as the main target of the targeted to the community. This is also desired by I Channel Bandung in improving brand awareness. Activities in increasing brand awareness continue to be done, so that people increasingly recognize and realize this brand. The goal is for people to understand their needs for the weighted impressions and have the value and the message of life of each show program.

With the use of the "Sampurasun Cepot" event as a medium of increasing awareness in the community, this television is easier to achieve. The use of Sundanese art and culture related events becomes very interesting and has an emotional attachment with the audience. The puppet show presented by the mastermind of Riswa who is the famous puppeteer in West Java, has attracted enough public attention. Selection Dalang also be very important because the mastermind is the color giver in this program. The puppeteer should be able to convey the message well to be easily accepted so that the audience can receive the message well.

Based on the exposure of the key informants and some informants, it can be seen that I Channel Bandung has a very big hope to be able to reach the top of mind stage. So when people hear the television with a light concept and put forward the Sundanese culture, people can easily realize and remember television I Channel Bandung to meet those needs. I Channel

Bandung hopes to get the heart of Bandung society in the middle of the competition with other local television and national television.

Brand awareness is a common goal of a company's marketing communications. The goal is that the brand or the name of their company can be known to the public and reach the top of mind of the community. So with the existence of brand awareness, when the community needs the product or service, the brand will reappear from the public memory which will then be taken into consideration in making purchasing decisions.

Based on the results of interviews and observations that researchers do on I Channel Bandung, as well as some people of Bandung as the audience I Channel, there are similarities in the view of brand awareness between internal parties with external parties. Brand awareness will arise when a brand is easy to see, as well as complete information about the brand.

Brand awareness from I Channel Bandung is intended for the local television audience. Brand awareness will increase if the message given is well received by the audience, besides the message must be attractive and has always stable quality. The program "Sampurasun Cepot" can be said to always have good quality in every airing. This is supported by Dalang Riswa as a giver of power and meaning in the wayang golek played. Viewers of the event "Sampurasun Cepot", the informants know the event "Sampurasun Cepot" is a program located on I Channel TV Bandung. It proves that the program is successful in improving the brand awareness of the company at brand recall level. Based on the level of brand awareness according to Aaker, the following results are obtained.

4   Conclusions

From the results of the research results presented by researchers in Chapter IV, it is very clear how the process of increasing brand awareness by I Channel Bandung using integrated marketing communications through the program "Sampurasun Cepot". This is in line with the purpose of this study who want to know the process of increasing brand awareness of local television I Channel Bandung through local culture is the event "Sampurasun Cepot".

Brand awareness in the minds of people is very important for companies to attract advertisers. The level of brand awareness in the audience of I Channel Bandung allows I Channel to start the formation of brand image to the audience. Based on the results of research and analysis of the process of increasing brand awareness I Channel Bandung through local culture program "Sampurasun Cepot", researchers can draw conclusions:

1.   The use of "Sampurasun Cepot" as a medium for increasing brand awareness I Channel Bandung is quite successful. This means that the program successfully attracted the attention of the public to watch and know local television Bandung.

2.   The local culture program has an emotional attachment to the community, so the "Sampurasun Cepot" event can persuade the community with various themes that are displayed. The goal remains to introduce and increase public awareness that the event is only on local television I Channel Bandung.

3.   Increased awareness of the program, linked with IMC marketing activities conducted by Marketing Communication I Channel Bandung resulted in a significant increase in audience and advertisers during 2016 to 2017.

4.   Through the program "Sampurasun Cepot", currently I Channel Bandung already exists at the level of brand recall in the community. This can be seen from the statements of

the audience I Channel, who can already remember the brand I Channel Bandung without being given stimulation.

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Improvement of Rumen Degradability to Low-quality Tropical Forage with the Addition of a Complete Supplement

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Abstract. The low productivity of beef cattle is primarily due to the low rumen degradability of forage ration. This study aims to determine the level of addition complete supplement in improving rumen degradability to low quality tropical forages. The study was conducted *in vitro* using beef cattle rumen fluid treated with 4 levels of addtion complete supplement (0, 5,10 and 15% DM) in tropical forage was *paspalum conjugatum* containing CP 5.41%, NDF 56.47% and lignin 10.86%. Complete supplements are prepared from red sugar, bran, coconut meal, soybean meal, tapioca, urea, salt and mineral, with addition of 10% gambier pulp as source of condensed tannin. The addition of a complete supplement at level 10% significant (P <0.01) increased rumen degradability of dry matter, organic matter, crude fiber and crude protein. The concentration of NH3 in rumen fluid increased significantly (P <0.01) at the supplement level of 10% while the TCA-soluble N increased significantly (P <0.01) at the 5% supplement level. But the pH and total VFA were not significant effect (P> 0.05). Best level of complete supplement addition is 10% DM ration, while at level 15% gives negative tendency effect caused by negative effect of condensed tannin.

Keywords: complete supplement, beef cattle, tropical forage, rumen degradability, condensed tannin.

1 Introduction

In West Sumatera as well as in other parts of Indonesia, the development of beef cattle farm is was constrained in the provision of quality rations due to the limited source of quality feed and use competition with poultry farm resulting causes high prices so as not reached by the small farmers. This condition forces farmers to rely on beef cattle rations from native forages and is unable to provide concentrate feed. The low quality of tropical forage with low protein and rumen degradability [1] has led to lower rate of daily gain of beef cattle maintained on small farms [2].

Grass quality in tropical regions such as Indonesia is classified as low quality forage, has a protein content of less than 70 g / kg of dry matter [3] and unbalanced nutritional content [4]. The grasses grow in coconut, rubber and palm oil plantations without maintenance, resulting in low quantity and quality [5]. Tropical forages contain low rumen degradable protein because most of the nitrogen is bound to the cell wall, thereby reducing the degradation of the

forage crude protein which causes low ammonia (N-NH3) concentrations in rumen fluid thereby limiting microbial activity, resulting in low rumen degradability [6].

Supplementation of nitrogen compounds in the form of urea, biuret, casein belonging to rumen degradable protein is reported to improve rumen degradability [7]. Similarly, supplementation of fermentable energy compounds such as starch and starch with protein combinations can enhance rumen degradability and has interaction effects increase the growth rate of rumen microbes that play a role in fermentative processes in the rumen [8]. Supplementation of urea with sucrose in the form of molasses or brown sugar with mineral addition in urea molasses block and saka block has successfully improved the digestibility of low quality tropical forages and increase livestock productivity [9][10].

Table 1. Composition of rations and complete supplements

Item		A	B	C	D
Forage, %		100	95	90	85
Complete Supplement, %		0	5	10	15
Supplement Composition	% DM				
Red sugar	15				
Bran	27				
Coconut meal	12				
Soybean meal	15				
Tapioca	15				
Urea	5				
Salt	3				
Minerals	3				
gambier pulp	5				
Chemical composition, %		..................% DM..................			
Organic matter	86,13	90,33	90,18	89,63	89,88
Crude Protein	29,36%	5,41	6,10	8,46	9,46
NDF	42,50	56,47	54,86	52,22	51,67
Lignin	0,81	10,86	9,64	8,27	7,64
Catechin	0,49	0	0,025	0,049	0,074

In this study we will develop a complete feed supplement by combining block supplements that have evolved and understood the benefits with the addition of gambier pulp containing catechin as tannin condensation compounds to protect feed proteins. It is therefore desirable to have high rumen degradability by protecting quality protein to be available on post-rumen digestion.

2 Materials and methods

This study used a sample of low quality tropical forages from Paspalum conjugatum species taken on a smallholder farm in the Pariaman area of West Sumatra, Indonesia in the summer of March. This forage is a field grass that grows widely in the area of coconut plantations commonly used by farmers in this area as a source of forage in beef cattle farms. Complete supplements are prepared by formula Ramaiyulis et al [11] as shown in Table 1.

The treatment in this research is the level of complete supplement addition in ration that is 0, 5%, 10% and 15% (DM basis) in low quality tropical forage. The study was conducted in

vitro method following the Tilley and Terry procedure [12], using cattle rumen fluid extracted from slaughterhouses from traditionally raised cattle with full-forage without concentrate. The rumen fluid taken from 4 different cattle then brought to the laboratory using a heated flask. The rumen fluid was mixed with buffer solution [13] at a ratio of 1:4. Then the mixture was added to the fermentation bottle containing 2.5 grams of ration sample and no sample as a blank

After that into the bottle exhaled CO_2 gas to create anaerobic conditions, then bottle closed and incubated at 39 ^{o}C using Shaker Waterbath. After 48 hours incubation the bottle soaked in ice water to stop the fermentation process. Then pH measurements using pH meters Hanna Hi9807-phep. The contents of the fermentor bottle were centrifuged at 3,000 rpm for 5 minutes to precipitate the remaining un-degraded feed and washed with aquadest 2 times with the same centrifuge and then filtered with Wathman 42 filter paper. Then the residue was dried in a 60 ^{0}C temperature oven for 24 hours, then determined dry matter, organic matter, crude protein and crude fiber following procedure of ICARDA [14].

The soluble rumen fluid nitrogen content in Tricloroacetic acids (TCA-soluble) was analyzed following the Shultz and Shultz procedure [15] using 10 ml of rumen fluid plus 10 ml of TCA 20% and 10 ml of sulfoacetic acid (SSA) was allowed to stand for 1 hour, then centrifuged 3,000 rpm for 20 minutes then the resulting sedimentation results analyzed protein content.

The total VFA in rumen fluid were determined on 5 ml supernatan with steam destilation, while NH3 in rumen fluid was determined by analyzing 1 ml of supernatant mixed with saturated NaCO3 in Conway cup, both following procedure of the General Laboratory Procedure [16].

Data were analyzed statistically using analysis of variance (ANOVA) with block randomized design and to test the real difference between treatments, Duncan's mulltiple range test (DMRT) [17]. The regression analysis were used to examine the relationship between factors of treatments. Data processing is done by computer using application of Statistica version 10 and Microsoft Excel 2010.

3 Result and Discussion

Rumen degradability

The results of the study in Table 2 showed that the addition of complete supplement was highly significant (P <0.01) increasing the rumen degradability of dry matter, organic matter and crude protein of low-quality tropical forage rations. Increased rumen degradation occurs after the addition of supplements at the level of 10% of dry matter rations. The 5% supplement level did not significantly with the control, while the 15% level did not significantly with the 10% level. Means that the complete supplement level of 10% has optimally improved the rumen degradability of dry matter, organic matter and crude protein from low quality tropical forages.

The addition of complete supplements in ration of low-quality tropical forage caused an increase in crude protein content of the ration from 5.41 to 9.46% (table 1), this correlates closely with rumen degradability of dry matter (P = 0.04; R^2 = 0.91), organic matter (P = 0.05; R^2 = 0.90) and crude protein (P = 0.05; R^2 = 0.90). In this study we found that the crude protein level that gives optimal rumen degradability of dry matter, organic matter and crude protein is 8.46% ie in the addition of supplements at level 10% of dry matter rations. For

comparison Lazzarini et al. [18]reported that the optimal organic matter rumen degradability of low-quality forage was found at the crude protein level of 7.93% in ration.

Increased crude protein content in ration of low quality tropical forage due to the provision of adequate nitrogen for the formation of microbial enzymes that play a role in feed degradation [19]. Therefore increasing the rough protein of ration through the administration of easily degradable proteins with the addition of urea may stimulate rumen microbial activity and improve the degradation of organic matter, forage intake and livestock productivity in low quality tropical forage rations [7], [19].

If the supplement level is increased to the highest level (15%) in this study is not significant (P> 0.05) gives an increase effect compared to the level of 10%. This is due to the condensed tannin content in the gambier pulp which increases its concentration in the ration (Table 1). At the supplement level of 15% there is 0.067% catechin concentration in the ration which causes inhibition of dry matter digestibility, organic matter and crude protein. Catechin is a condensed tannin capable of forming complex bonds with proteins that are resistant to degradation at neutral pH in the rumen and one of the strategies in optimizing the use of nitrogen in ruminants [20]. Based on the results of meta analysis it was reported that in condensed tannins caused decreased digestibility of organic matter and crude protein in both in vitro and in vivo on centain level, but at low levels showed varying effects [21].

The effect of addition coplete supplement on the rumen degradability of crude fiber of low quality tropical forage showed highly significant effect (P <0.01). The lowest degradability occurs in the control without addition complete supplement that is only 35.76%. Addition of complete supplement at level 10% increased rumen degradability of crude fiber to 53.80%, but decreased again at a higher level on 15% to 46.78%. The addition of complete supplement to level 10% gives a positive influence on crude fiber degradability, this is due to the availability of nutrients needed by microbes that stimulate the activity of rumen microbes in degrading crude fiber of feed.

The decrease in the rumen degradability of crude fiber on addition complete supplement at level 15% occurs due to the content of the condensed tannin (catechin) compound in the gambier pulp. Tannins interact and inhibit the protein and fiber degradation in rumen [9], [22], [23] Wischer et al. [23] reported a significant decrease in fiber degradation by the tannin treatment of pelargonidine, catechin, cyanidin and sinapinic acid compounds, suggesting that fiber degradation was inhibited by condensed tannin treatment at level.

Rumen fluid Concentration

pH of rumen fluid influences rumen microbial activity especially cellulolytic bacteria which is expected to work optimally degrade high fiber rations of low quality forage. The addition of complete supplements did not show a significant effect on rumen pH (P = 0.11). The pH range obtained in this study was 6,90-6,97 which was at optimum pH for cellulolytic bacteria activity that is 6,9-7,0 [24]. Cellulolytic bacteria activity will be inhibited if the rumen fluid pH is below 6.0 [25].

The effect of addition complete supplement on low quality tropical forage on total VFA concentration in rumen fluid showed no significant difference (P = 0.12). VFA is derived from the fermentation of structural carbohydrates ie NDF and ADF fiber components in forage and non structural carbohydrates such as starch and sucrose contained in complete supplement. The process of carbohydrate degradation in the rumen occurs through two stages: breaking complex carbohydrates into simple sugars and simple sugar breakdowns into acetic acid, propionic acid, butyric acid, CO_2 and CH_4 [26]. In this study the total VFA concentrations ranged from 85.50 - 99.25 mM, the resulting VFA concentration was sufficient for livestock

survival because the VFA concentrations required for a livestock to grow normally ranged from 70-130 mM [27].

The NH3 concentration in rumen fluid in this study was lowest 2.40 in the controls and the highest was found in the addition of 10% supplement 4.63 and significantly (P <0.01) influenced by the addition of complete supplements. NH3 is the final product of crude protein degradation by rumen microbes through some of the previous products of polypepetide, amino acids and the last ammonia (NH3). Several factors affecting NH3 concentration in rumen fluid are feed protein level, protein source and its solubility and feed protein degradation rate [28].

The Complete supplement containing urea as crude protein and protected feed protein by condensed tannin from gambier pulp. At the complete supplement level of 10% there was an increase in crude protein degradation from control 39.29% to 53.68%. This is also reflected in the increased NH3 concentration in rumen fluid from control to the 10% supplement level. However, at a higher supplement level of 15% there has been a protection of protein degradation because condensed tannins form a complex bond with proteins that are resistant to rumen degradation causing NH3 concentrations that are not significantly different at that level.

The addition of a complete supplement significantly increased TCA-soluble N from the 5% level (P <0.01). The lowest values of these parameters were found in controls and highest in the addition of a complete supplement level of 10%. In control, the lowest score was 76.67 mg / dl of rumen fluid, significantly increased to 113.52 mg / dl after the addition of a complete supplement of 5% and 125.03 mg / dl at a complete supplement level of 10%. Apparently, if the supplement level is increased by more than 5% there is an increasing trend but not statistically significant.

TCA-soluble N contains proteins, peptides and amino acids derived from non-degraded feed proteins and proteins from rumen microbes, these are the values of proteins that will enter the post-rumen digestion. The increasd of TCA-solubel N is a plus value of a complete supplement, in which the benefits of supplements are able to provide nutrients for optimal rumen microbial activity in degrading feed nutrients and capable of protecting high-quality feed protein so that it can be readily available in post-rumen. So the level addition of complete supplement should be limited to 10%, because the condensed tannin compound in the complete supplement has a negative effect on the higher supplement level.

Table 2. In vitro Rumen degradability and rumen fluid concentration to low quality tropical forage with addition complete supplement

Parameter	Supplement level (% DM ration)				SEM[1]	P-value
	0	5	10	15		
Rumen Degradability, %						
Dry matter	49.01[b]	49.70[b]	51.97[a]	51.66[a]	0.01	<0.01
Organic matter	43.80[b]	44.33[b]	46.59[a]	46.21[a]	0.01	<0.01
Crude protein	39.29[b]	37.12[b]	53.68[a]	53.58[a]	0.02	<0.01
Crude fiber	35.76[d]	42.50[c]	53.80[a]	46.78[b]	0.01	<0.01
Rumen fluid concentration						
pH	6.90	6.90	6.94	6.97	0.03	0.11
VFA total (mM)	99.25	85.50	91.25	95.00	4.54	0.12
NH3 (mg/dl)	2.40[c]	3.85[b]	4.63[a]	4.25[a]	0.16	<0.01
TCA-soluble N, mg/dl	76,67[b]	113,52[a]	125,03[a]	122,12[a]	8,31	<0.01

Different superscripts on the same line showed significantly different effects

4 Conclusion

The conclusions of the results of this study are the addition of complete supplements can improve the rumen degradability of dry matter, organic matter, crude fiber and crude protein of low quality tropical forage. The addition of the optimal complete supplement is 10% of ration dry matter for optimal rumen degradability and the rumen fluid concentration that supports the growth and activity of rumen microbes. The addition of a complete supplement increases TCA-soluble N that is the protein that will be available in the post-rumen digestion.

Acknowledgements

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Impact of Family Background, Perceived Organizational Support, and Organizational Culture on Entrepreneurial Intention in University Students

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Abstract. This study aimed to investigate antecedents of students entrepreneurial intention in higher education context. The antecedents of entrepreneurial intention were predicted from family background, perceived organizational support, and organizational culture. The data were drawn from 148 university students in West Sumatera Province, Indonesia. The model was predicted by multiple regression analysis. The findings concluded that there is significant effect of family background, organizational culture and entrepreneurial significantly influenced students' entrepreneurial intention in the universities. Implication, limitation and suggestion for future research are discussed in the paper.

Keywords: Family Background, Perceived Organizational Support, and Organizational Culture Entrepreneurial Intention.

1. Introduction

Developing entrepreneurship in higher education has been attention for scholars and practitioners, mainly for developing countries. It is due to the growing numbers of entrepreneurs in a country can accelerate economic development through generating new ideas and utilize them in business activities. Given this prioritization, higher education institutions (i.e. universities) are encouraged to play a more active role by giving support and developing entrepreneurial culture. The universities might respond to this challenge by nurturing programs and activities to stimulate entrepreneurial mind-set among the students. This idea relies on assumption that entrepreneurial skills will prepare students better for their careers in small and large organizations alike. Nevertheless, determinant of entrepreneurial intention might be influence of the strength of family orientation (i.e. family background). The group, organization, or community possesses some potential for entrepreneurial activity. The environment has the potential for increasing entrepreneurial activity. Family background deals with issues relating to an individual's personal and family life. A person with entrepreneurial family background implies that parent possess a high expectation for family members to nurturing their business. It can be argued that family member has moral obligation to maintain sustainability of the business. Entrepreneurial family background refers to those people whose parents or family members are involved in self-employment [1]. As noted by Kolvereid [2], entrepreneurial family background may impact vocational choice to pursue an entrepreneurial career through formation of attitudes, subjective norms, and perceived behavioral control. Impact of family background on developing entrepreneurship has been explored in prior studies. Laspita, Breugst, Heblich, & Patzelt [3] and Zellweger, Sieger, & Halter [4] suggested

that students with family business background which stems from a particular familial context that may influence their future career intentions. The family influence might strengthen their willing to transform these intentions into actual behaviors.

Developing entrepreneurship in higher education context is inevitable from the role of university to encourage students in entrepreneurship activities. Others studies have found that perceived organizational support and organizational culture associated positively with entrepreneurial intention (e.g. Rutherford and Holt [5]; Antoncic and Hisrich [6]; Whiting [7]). Perceived organizational support (POS) is defined as a general belief in which employees feel that their organization values their contributions and cares about their well-being ([8]–[10]). Construct of POS was developed on the basis of Organizational Support Theory [11]. The theory supported that relationships between employers and employees based on social exchange. Employees view the organization as having human like characteristics and take its favorable treatment or unfavorable treatment as an indication that the organization favors or disfavors them as an individual. In the context of the higher education, students who feel sense of POS in the circumstance where they need university support during the students explore entrepreneur knowledge and skill. The students who feel university is willing to lend a helping hand, caring and personally fee respected to develop entrepreneurial activities might be encouraged to be self-directed, self-managing, and proactive [12]. Therefore, it can be argued that POS has impact on encouraging student entrepreneurial intention in higher education context.

The involvement of the higher education institution is all the more important given that this career avenue is becoming more common and necessary choice for students [13]. Given this important, to foster the entrepreneurs, the scholars to understand factors influencing of the student intention from institutional institutional perspective (i.e. organizational culture). Organizational culture defined as shared mental assumptions that guide interpretation and action in organizations by defining appropriate behavior for various situations [14]. Encouragement from university environment is likely to affect the entrepreneurial intention of university students [15]. Therefore, cultural values are also likely to determine "the degree to which a society considers entrepreneurial behaviors, such as risk taking and independent thinking, to be desirable" [16]. The currrent study is intended to examine the factors antecedents of enterprenuerial intention of universities students. Developing body of the literature supported that family background, perceived organizational support, and organizational culture might affect entrepreneurial intention in higher education context.

Entrepreneurship has been an interested topic discussed in these past years. Many studies found that entrepreneurship is one of the most important mechanisms to promote economic growth of a country through innovation, employment, and welfare [17]–[20]. Based on the research conducted by The Global Entrepreneurship and Development Institute to measure the entrepreneurial ecosystem health, Indonesia was ranked 103th out of 132 countries in the world [21].

This is a positive sign since in the previous year Indonesia was only ranked 120th out of 130 countries [22]. Although there was a big gain in ranks for Indonesia, the global entrepreneurship index's score was only increase by 1.72. This means that the development of entrepreneurship in Indonesia is still limited. Therefore, the promotion of entrepreneurship is important and it has been the main attention of governments. Some studies show that family background is one of the factors that affect entrepreneurial intention

Besides family background, other studies also found that perceived organizational support and organizational culture are positively related to entrepreneurial intention. This research is going to test all the variables mentioned above and see their impacts towards the

entrepreneurial intention of university students in line with government programs the university graduated is expected to create labor market.

This research is intended to identify the factors influencing entrepreneurial intention that will contribute to the formation of entrepreneurs so that the best strategy can be implemented to increase the numbers of entrepreneurs in Indonesia.

2 Review of Literature

2.1 Entrepreneurial Intention

Entrepreneurship is "the process of creating something different with value by devoting the necessary time and effort, assuming the accompanying financial, psychological, and social risks, and receiving the resulting reward of monetary and personal satisfaction" [23][24]. According to Academy of Management entrepreneurship is "the creation and management of new businesses, small businesses, and family businesses" [25]. Entrepreneurial intention is a tendency of individual desire to do entrepreneurship activity by creating new products through business opportunity and propensity taking [26]–[28]. The notion of prediction behavior through intention adpoted from work of Fishbein and Ajzen [29]. It plays an essential role which reflects an evolutionary transition from beliefs to attitudes, from attention to intention and finally from intention to behavior. It can be argued that the development of behavior can be understood as somehow determined or planned. Entrepreneurial intention indicates the effort that the person will make to carry out entrepreneurial behavior. For this reason, it consists of three motivational factors influencing behavior; personal attitude toward start-up, subjective norm, and perceived behavioral control [30][31]. The entrepreneurial intention is the motivational factor that encourages individuals to pursue entrepreneurial activities. Entrepreneur action is driven by intentional. Entrepreneurs intend to pursue certain opportunities, enter new market, and offer new product and this is rarely the process of unintentional behavior. Developing a model entrepreneurial intention will be rigor by considering beyond the personality attributes (e.g. family background, organizational support, and organizational culture).

2.2 Family Background and Entrepreneurial Intention

Personal/Family variable associated with issues relating to an individual's personal and family life. Paramount to success is finding support from family and friends during the developmental phase of a business start-up [32]. Family support and life balance are equally critical in order to succeed in starting a business start-up [33]. Issues regarding the personal life of an entrepreneur may interfere with the operation of the business, which may ultimately cause the business to grow or fail. Entrepreneurial family background may impact vocational choice to pursue an entrepreneurial career through formation of attitudes, subjective norms, and perceived behavioral control. There are several pieces of evidence in student entrepreneurship literature suggesting that students with family business background stem from a particular familial context that may influence their future career intentions [3][4] and strengthen their proclivity to transform these intentions into actual behaviors. A number of empirical studies have suggested the importance of parental experience, revealing its significant impact on children's entrepreneurial intentions and behavior [34]–[38].

In scientific research, the influence of family background, especially the influence of the father or mother, on the entrepreneurial career choice has been empirically supported. Several

studies support that family background is related to the propensity to choose self-employment as a career [37][39]. For example, Singh and DeNoble [40] argued that a close, self-employed relative has a strong positive impact on the attitude on self-employment. The influence of parents as model is assumed to be a powerful determinant [41]. Moreover, Klandt [42] found that the father's profession has an effect on the occupational decision of the son and the daughter, while the mother's influence is mostly limited to the daughter. Therefore the hypothesis can be proposed: *H1: Family background significantly effects on student's entrepreneurial intention.*

2.3 Perceived Organizational Support and Entrepreneurial Intention

Perceived Organizational Support (POS) is the beliefs of employees in regards to the extent to which the organization meets their socio-emotional needs, and how the organization responds to increased efforts at work [8], [10], [11]. A few factors are believed to influence whether employees perceive organizational support, such as organizational rewards and job conditions, and perceived fairness [43]. Organizational rewards and job conditions incorporate methods in which employees are recognized for their contributions as well as the working environment itself [9].

Perceived Organizational Support is important as it guarantees assistance provided by the organization to deal with the demanding conditions, and to carry out ones job efficiently and effectively [44]. People need to be valued and they are more concerned with the commitment of the organization to them, and being valued by the organization yield such benefits like pay, promotion, admiration, other forms of aids, and access to information by which they can carry their jobs better.

According to social exchange theory employees who perceive their organizational environment as supportive will feel obligated to reciprocate with behaviors that are beneficial to the organization. From this view point, it could be expected that perceived organizational support mediates the effects of human resources practices on entrepreneurship, because positive feelings about the organization and its supportive nature could positively influence employees' receptivity towards the organization's efforts to introduce and implement entrepreneurship [5]. Antoncic and Hisrich [6] also suggest that organizational support characteristics such as management support, work discretion, rewards, time availability, and loose intra-organizational boundaries have been seen to be crucial organizational elements impacting entrepreneurship. Therefore the hypothesis can be proposed:
H2: Perceived organizational support (POS) significantly effect on the student's entrepreneurial intention.

2.4 Organizational Culture and Entrepreneurial Intention

Understanding the culture of an organization is important in order to remove the challenges faced by the organization in the process of making organizational changes. Organizational culture is generally seen as a set of key values, assumptions, understandings, and norms that is shared by members of an organization and taught to new members as correct [45].Organizational culture creates the value of an institution not only by the manners and behaviors of every individual in the organization but also by the collective attitudes and behavior of the organization in general [46]. It is the pattern of values, norms, beliefs, attitudes as well as assumptions that may not be expressed but shapes the ways in which people in an

organization conduct themselves and get things done [47]. A model of norms, values, beliefs, and attitudes has a significant effect on organizational behavior [48].

A culture creates distinctions between one organization and others, conveys a sense of identity for its members, facilitates commitment towards the organization's goals, enhances the stability of the social system, reduces ambiguity, and serves as a control mechanism that guides and shapes the attitudes and behavior of employees. Nevertheless, a culture can also become a liability when it becomes too strongly entrenched within the norms, values and mindsets of the employees and resist changes, a culture can become a barrier to change, diversity and other transformations required for the organization to adapt in today's dynamic, globalized business environment.Organizational culture can reinforce or weaken the effects of national culture on an organization's entrepreneurial orientation [49]. Hofstede [50] has demonstrated the role of firm founder's values on organizational culture and the interaction between national and corporate value systems. Organizational culture, in addition to the capability to integrate daily activities of employees to reach the planned goals, can also help organizations adapt well to the external environment for rapid and appropriate responses. Understanding culture means understanding the difference between the formal and informal rules, the espoused way of doing things and the real way. The organizational culture profile can be viewed from three stereotypical dimensions: bureaucratic, innovative, and supportive [51]. Bureaucratic cultures attributed by hierarchical and compartmentalized, clear line of responsibility and authority, based on control and power. This kind of culture is appropriate for company or organization operates in a large and stable market. Innovative culture refers to entrepreneurial and ambitious characters of organizational members in which the organization operates in dynamic environment. Innovative environment is appropriate for individuals who possess attributes of entrepreneur, such as challenging, stimulating, creative, results-oriented and risk-taking. Meanwhile, supportive culture reflects organizational members act friendly, fair, and helpful each other. This type of culture also attributes people with open minded and harmonious environment. An organization has highly supportive environment if it is trusting, safe, equitable, sociable, encouraging, open, relationship oriented, and collaborative [51]. Veciana et al., [52] suggest that entrepreneurship might be developed in the higher education context through a process-based approach. Nevertheless, the robustness of entrepreneurial intention will be affected by cultural contexts. Hayton et al [16] noted that cultural values are also likely to determine "the degree to which a society considers entrepreneurial behaviors, such as risk taking and independent thinking, to be desirable" (p. 33). Therefore the hypothesis can be proposed: *H3: Organizational culture significantly effect on student's entrepreneurial intention*

3. Methodology

Self-report questionnaires were distributed directly to Andalas university students in West Sumatera Province. A total 150 questionnaires were distributed, 148 were returned. Measurement variable of family background, perceived organizational support, organizational culture, entrepreneurial intention and start-up were adopted and developed on the basis of established existing variables from previous studies. All variables were measured with 5-point Likert type scaling from 1 (strongly disagree) to 5 (strongly agree). Family background was measured by ten items which were adapted from Dombrovsky and Welter [53]. Perceived organizational support was measured by sixteen items which were adapted from Eisenberger et. al [11]. Organizational culture was measured by twenty four item with three dimension. The measurement were adapted from Roper [54]. Entrepreneurial intention was measured by

five items which were adapted from Linan and Chen [55]. Data analysis was conducted by using SPSS for Windows. Reliability check of the variables was computed using cronbach alpha. Usual lower limit of cronbach alpha range between 0.6 and 0.7 [56]. Testing of hypotheses was conducted by multiple regression analysis. The analysis is purported to explain the effect of family background, perceived organizational support, and organizational culture on entrepreneurial intention.

4. Results

The mean, standard deviation and correlation matrix for the study this variables are shown in table 1. Estimated correlation among the construct shown that all correlations did not greater than 0.7. They did not indicate the multicollinearity of the problems of lack of discriminant validity. Test of reliability or reliability test is a test to examine the accuracy and measurement precision of measurement tool which is consistent over time. In this research, the reliability is determined by the value of Cronbach alpha. Cronbach alpha of family background, perceived organizational support, organizational culture, and entrepreneurial intention is 0.73, 0.85, 0.89. and 0.79 respectively. It can be concluded that all four variables demonstrated a good reliability.

Table 1. Cronbach alpha, Means, Standard Deviation, and Correlation

	CA	Mean	SD	1	2	3	4
FB	0.73	4.38	0.71				
POS	0.85	3.72	0.69	0.63*			
OC	0.89	3.92	0.81	0.40*	0.36*		
EI	0.79	4.12	0.95	0.56*	0.43*	0.46*	

Note: $*p \leq 0.05$. FB: family background, POS: perceived organizational support, OC: Organizational Support, EI: entrepreneurial intention

Table 2. Regression Analysis

Variable	β	P value	F	R²
Family background	0.44	0.042	0.032	0.39
POS	0.52	0.039		
Organizational Cuture	0.39	0.022		

The survey results noted that out of the total respondents (N=148). They consists of 43.9 percent man and 56.1 percent woman. The student's age average is 20.5 years old with range between 16 to 24 years old. The descriptive of the survey found that 83.8percent plan to start a business and the rest continues study to higher degree.

The results of regression analysis (Table 2) found that family background, perceived organizational support, and organizational culture as significant determinant of entrepreneurial intention in higher education context. It can be concluded that family background, perceived organizational support significantly influence intention of the students to be entrepreneur. Therefore, the proposed hypothesis 1, 2, and 3 are supported.

5. Discussion

The results of testing hypotheses supported that family background, perceived organizational support, and organizational culture significantly effects intention of the students to be entrepreneur. It indicates that those with family background tends to have motivation to be entrepreneur. Supporting from family and friends can bring success of the student to start a business [32]. Knight [33] argued family support and life balance are equally critical in order to succeed in starting a business start-up. Developing body of literature in student entrepreneurship suggests that students with family business background stem from a particular familial context that may influence their future career intentions [3][4]. This situation strengthen their proclivity to transform these intentions into actual behaviors. The current research findings consistent with findings from prior studies which suggested the importance of parental experience, revealing its significant impact on children's entrepreneurial intentions and behavior [34]–[38]. In line with findings from Scherer, Brodzinski, & Wiebe [41], those noted the influence of parents as a model is regarded as crucial determinant of entrepreneurial intention. Klandt [42] argued that family backround effect on the occupational decision of the son and the daughter, while the mother's influence is mostly limited to the daughter. Therefore, students with a strong family business background tends to have higher intention rather than their non-business family background.

The result of testing hypotheses 2 showed that effect of perceived organizational support on entrepreneurial intention significantly influenced entrepreneurial intention on the students. This findings is supported by previous study conducted by Rutherford and Holt [5]. Their study noted that positive feelings about the organization and its supportive nature could positively influence employees' receptivity towards the organization's efforts to introduce and implement entrepreneurship. Antoncic and Hisrich [6] also stated that organizational support characteristics such as management support, work discretion, rewards, time availability, and loose intra-organizational boundaries have been seen to be crucial organizational elements impacting entrepreneurship. It practically happens because of differential of respondent's characteristic, differential of research object, and differential of time research observation. Bertolino et al [57] noted that individuals with prototypical proactive personality take action to influence their environment or "identify opportunity or act on them shows initiative, take action, and persevere until meaningful change occurs" (p.249).

Rhoades & Eisenberger [9] noted that there are three important points of perceived organizational support. Perceived organizational support should produce a felt obligation to care about the organization's welfare and to help the organization reach its objectives, POS should fulfill socio-emotional needs, leading workers to incorporate organizational membership and role status into their social identity. In the context of higher education, perceived organizational behavior can be felt as university giving support to the students to toward various activities both academics and no-academics activities. It is includes activities to nurturing entrepreneurship. Feeling support may increase students' proactivity which characterized by initiatives and assertiveness. This characteristics can encourage students to be self-managed and self-directed [12] which in turn increasing entrepreneurial intention. Therefore, perceived organizational support felt by students will increase students' entrepreneurial intention. The higher feeling support from the university, the higher intention of the students to conduct entrepreneurial activities.

The recent study supported organizational culture significantly affect entrepreneurial intention of students to be entrepreneur. According to Wallach [51] organizational culture can be view from three dimension: innovative, supportive, and bureaucratic. A testing of

composite dimensions found that organizational culture as significant predictor of entrepreneurial intention. Others studies conducted by Schere [58], Begley [59], and Whiting [7] argues that cultures with higher uncertainties will affect on entrepreneurial intentions.

6. Conclusion

The results of regression demonstrated that family background has significant influences toward student's entrepreneurial intention This result explains positive value that indicates the influence brings positive impact which means increase of family background of students. It will impact and attract more entrepreneurial intention to them. The student's perceived organizational support has significant influence towards student's entrepreneurial intention. Developing organizational culture, mainly entrepreneurial culture can accelerate student's entrepreneurial intention. Entrepreneurial intention is necessary to be developed for university graduated career. This result explains positive value and indicates the influences will impact and attract more start-up.

The current research has several limitation and suggestion for future research . This research is limited on sampling location of universities and number of sample size. Future researchers are suggested to enlarge the sample size of respondents to better represent the opinion of whole undergraduates' population, from private and public institutions. Future studies suggest to conduct the research in higher learning institutions in a broader context order to get higher accuracy of the university student's feedback to avoid the bias. The limitation of the research also includes methodology to collect the data The current study relied quantitative approach, future researchers suggest to use other combination of data collection methods like interviews. This can increase the participation of respondents and interviewers can get more opinions from multiple perspectives. Undergraduates from all faculties should be taken into consideration to get better insight into entrepreneurial intention and continue to start-up activity. Besides, this study only highlights the university students, different perspective and group's skill tendency of individual might have different thinking towards entrepreneurship. Thus, opinions from individual of different faculty should be considered. Entrepreneurial intention is regarded as strong predictor of entrepreneurial action. This research study only examines the entrepreneurial intention rather than actual business start-up activities. It appears to be impracticable in the real life and it requires a longer duration to monitor the actual action. Researchers also did not take into consideration about the opinions from different ethnic groups. It is one of the aspects that required attention as individuals from different ethnic group might have different perception toward entrepreneurship, and their entrepreneurial intention might vary. In order to obtain a more accurate result, all the respondents should be randomly chosen from different ethnic groups.

Implications of the study can explained from higher educational strategy toward developing entrepreneurial intention through supporting students with entrepreneur family background to create entrepreneurial programs in the university. The universities might develop circumstance that encourages the students to motivate for entrepreneurship programs. It is inline with nurturing organizational culture (i.e. entrepreneurial culture) in the universities. Therefore, the universities can take into account to support activities which can facilitate students to creative.

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Classification of Criminal Crimes From Data Twitter Using Class Association Rules Mining

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Abstract. The police obtain criminal crime data from the field based on reports from a person or group, from the data the police can evaluate the crimes that occurred. The police have no reports of crimes from other parties such as from social media. One such social networking media is Twitter. The information conveyed by Twitter users in a tweet usually contains something related to himself or his environment, including the occurrence of a crime. Such information will serve as data for classification as well as to know the trends of criminal crime. This research uses classification data mining technique that is Class Association Rules (CARs). CARs will find all frequent ruleitems through a series of stages and build rules using frequent ruleitems obtained, then rules will be obtained. The resulting rule will be evaluated to determine the strength of the rule using the Laplace Accuracy equation, which will produce the best rule. These rules will serve as models for the new data classification. The result of accuracy test of this method by using 100 test data is 96%.

Keywords: Twitter Data, Class Association Rules, Laplace Accuracy

1 Introduction

Criminality is all kinds of actions and actions that are economically and psychologically harmful in violation to the laws prevailing throughout the state of Indonesia as well as social and religious norms [1]. During the period 2010-2014 in Indonesia, the number of incidents of crimes against life (murder) and incidents of violations of rights/ property without the use of violence tended to decline. While for the incidence of crimes against physical / bodies (violence) and the incidence of crime-related narcotics fluctuates with the tendency to increase. Number of crime incidents against morality, crimes against rights / property for the use of violence and crime events related to fraud fluctuate. Then for the incidence of crimes against people's independence (abduction) tends to increase [2].

Police of the Republic of Indonesia or abbreviated with the Police in relation to the Government is to play a role in maintaining security and public order, and providing protection. The police only have data on crime reports from the field or in the field alone, have no reports of crimes from other parties such as from social media. Data from social media can be used to become one of the supporting reports on the crimes that occurred. Given the data

reports from the field and from social media, the police have the material consideration or evaluation of crimes that occur to be more accurate. Twitter is one of the social networking media has become part to the pattern of community communication.

Twitter data on crime can be used to generate new information such as to know the trend of crime. The amount of Twitter data allows to use data mining techniques. Minning data method chosen for this research is Class Association Rules Mining. This method has high accuracy and strong flexibility in handling textual data [3].

2 Literature Review

2.1 Classification

According to Prasetyo (2012) classification is a job of valuing data objects to include them in a certain class of available classes. In the classification, there is two main work done, namely the development on the model as a prototype to be stored in a memory and the use with the model to perform the introduction/ classification/ prediction on another data object to being known as the class where the data object in the model already saved.

2.2 Classification

According to Liu (2007) the importance of an association rule can be determined by two parameters, namely support and confidence. Support is the percentage of combinations of items in the database, with confidence being the strong relationship between items in association rules. Suppose $I = \{i_1, i_2, \dots, i_n\}$ is a set of items or objects, the database consists of a set of transactions. An association rule is expressed in the form of: $X \rightarrow Y$, where $X \subset I$, $Y \subset I$ and $X \cap Y = \emptyset$, X is called antencedent and Y is called consequent.

Let T be a collection of transaction data consisting of transactions n. Each transaction is labeled with class y. Let I be the collection of all items in T, Y is the set of all class labels (or target items) and I ∩ Y = ∅. Class Association Rules (CARs) are the implications of form

X → y, where X ⊆ I, and y ∈ Y

Support are defined in equation (1), whereas confidence is defined in equation (2). In general, CARs are different from normal association rules, namely:
1. Consequent CARs have only one item, while consequent from normal association rules can have any number of items.
2. Consequent y from CARs can only be from label set Y class, that is, y ∈ Y. No item of I can appear as Consequent, and no class label can appear as condition rule. Conversely, normal association rules can have any item as condition or Consequent.

$$support = \frac{rulesupCount}{n} \qquad (1)$$

$$confidence = \frac{rulesupCount}{condsupCount} \qquad (2)$$

The main operation is to find all the rule items that have support above the minsup. A ruleitem is in the form: (condset, y), where the condset ⊆ I is an itemset, and y ∈ Y is the class label. The number of support from the condset (called condsupCount) is the number of transactions in T that contain the condset. The number of support of a ruleitem (called rulesupCount) is the number of transactions in T containing the condset and labeled with class y. Each ruleitem is basically a rule: condset → y, where n is the total number of transactions in T.

The rule generating algorithm, called CAR-Apriori, is shown in Figure 1.

```
Algorithm CAR-Apriori(T)
1    C₁ ← init-pass(T);                         // the first pass over T
2    F₁ ← {f | f ∈ C₁, f. rulesupCount / n ≥ minsup};
3    CAR₁ ← {f | f ∈ F₁, f.rulesupCount / f.condsupCount ≥ minconf};
4    for (k = 2; F_{k−1} ≠ ∅; k++) do
5        C_k ← CARcandidate-gen(F_{k−1});
6        for each transaction t ∈ T do
7            for each candidate c ∈ C_k do
8                if c.condset is contained in t then   // c is a subset of t
9                    c.condsupCount++;
10                   if t.class = c.class then
11                       c.rulesupCount++
12           endfor
13       end-for
14       F_k ← {c ∈ C_k | c.rulesupCount / n ≥ minsup};
15       CAR_k ← {f | f ∈ F_k, f.rulesupCount / f.condsupCount ≥ minconf};
16   endfor
17   return CAR ← ∪_k CAR_k;
```

Figure 1: CAR-Apriori Algorithm

2.3 Evaluation of Rules

Laplace Accuracy is used to estimate the accuracy of the resulting rule, defined in Eq. (3).

$$LaplaceAccuracy = \frac{(n_c + 1)}{n_{total} + k} \qquad (3)$$

k is the number of classes that exist, is the total number of examples that satisfy all the antecedent rules generated, of which there are examples of class c, which is the predicted class [6].

2.4 Trend

A trend is something that is popular at a certain point in time. While trends usually refer to a particular style in fashion or entertainment, there may be a tendency for warmer temperatures (if people follow trends associated with global warming). Trend can happen in any field and not just reflect fashion, culture and entertainment. Trend can also occur in the stock market, politics, and others [7].

2.5 Testing

Testing performance evaluation algorithm in doing categorization will be determined based on accuracy value, that is defined in equation (4) [8].

$$accuracy = \frac{correct\ number\ of\ categories}{number\ of\ documents\ test} \times 100\% \quad (4)$$

3 Methods

The criminal classification system is a system that will categorize a text into one class. That is a class of crime against life, crime against morality, crime against people's freedom, property/goods crime, drug-related crime, fraud-related crime and physical/body. In outline can be seen in Figure 2.
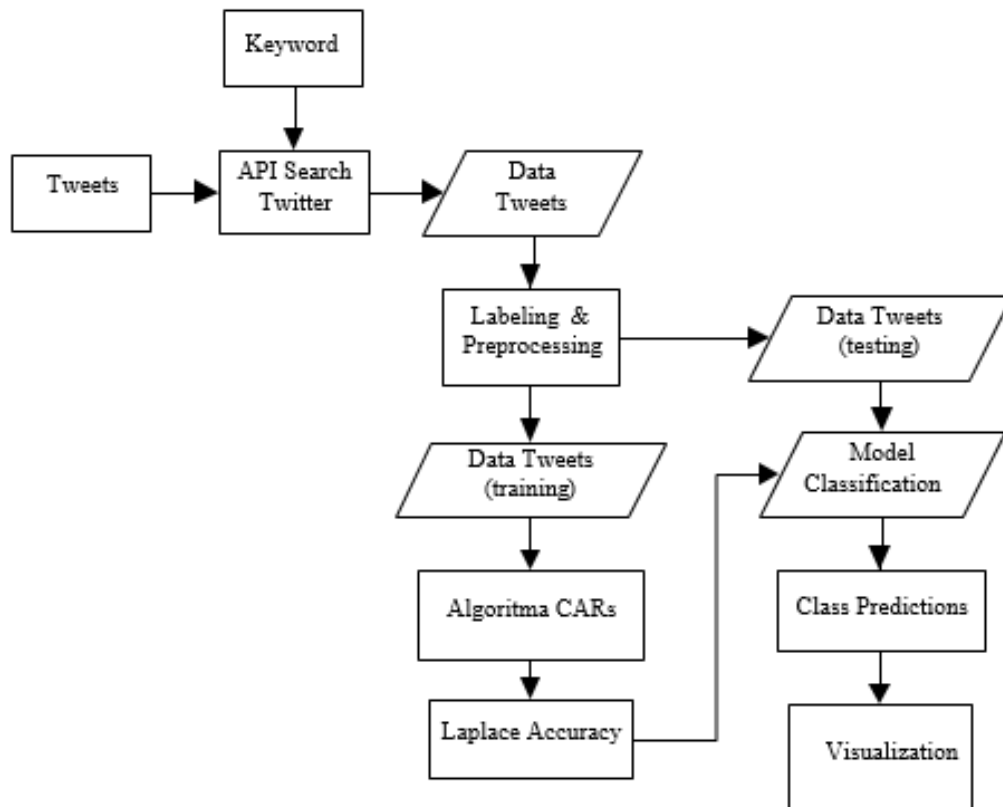
Figure 2: Overview of Crime Classification System

3.1 Tweet Collection

In outline can be seen in Figure 3.
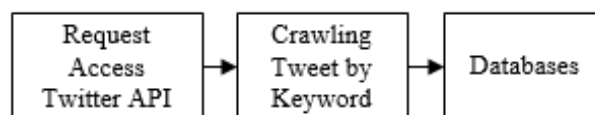
Figure 3. Tweet Collection

3.2 Labeling

The system will be created based on Twitter data, where the data will be done tweet labeling process. The data will be divided into training data and testing data. The training data will produce a model, which will be used to predict the testing data [9].

3.3 Process Preprocessing

Text mining is a step away from text analysis that performed automatically by a computer to extract a quality information from a series of texts summarized in a document [10].

After tweet data is obtained, the next step is to do preprocessing. In the process of preprocessing will do the cleaning of data tweets are downloaded *(dirty tweets)* so it will generate clean tweet data that will be used for the next process. In outline can be seen in Figure 4.
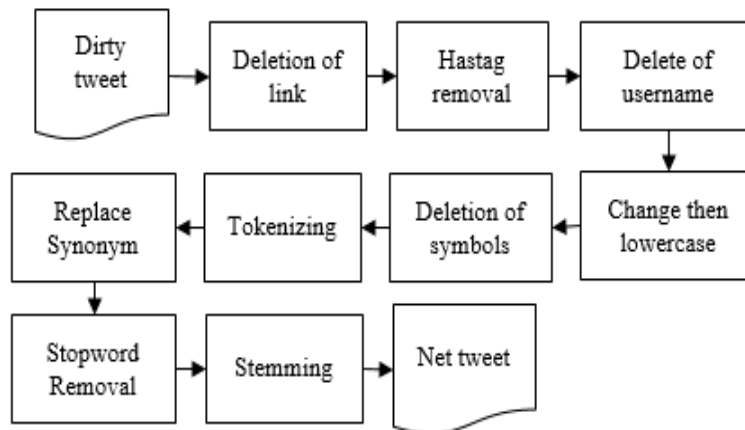
Figure 4: The Preprocessing Process

3.4 Development of Rules

The rule development process begins by finding all frequent ruleitems and constructing CARs, using the CAR-Apriori Algorithm in Figures 2[6], [11]–[15].

3.5 Classification Process

The classification process is done after obtaining the rules in the classification model. Classification is done by choosing the rules that match the test data, then calculate the average Laplace Accuracy value of the rules for each class. The highest average Laplace Accuracy value will be used as the prediction class [16].

4   Results

4.1   Testing Based on the Minimum Value of Confidence and Support

Testing using minimum value of confidence and support is test based on minimum value of confidence and support specified. The details can be seen in Table 1.

Table 1: Test Results Based on Confidence and Support

Support \ Confidence	20%	40%	60%	80%
2 %	58	52	48	45
4 %	22	17	16	16
6 %	17	15	15	15
8 %	3	2	2	2

Table 1 shows the number of rules generated using the minimum value of confidence and support. The higher the minimum value of confidence and support used, the resulting rule will be less. If the minimum value of confidence and support is lower than the number of rules generated will be more and more.

4.2   Testing of Laplace Accuracy Value

This test is used to get the correct Laplace Accuracy value. All rules obtained will be evaluated using Laplace Accuracy value based on Equation (3). The results from the evaluation of the rules can be seen in Table 2.

Table 2: Test Results Using Laplace Accuracy Value

Support \ Confidence	$\geq 0,75$				$\geq 0,85$			
	20%	40%	60%	80%	20%	40%	60%	80%
2 %	35	35	35	35	14	14	14	14
4 %	22	17	16	16	14	14	14	14
6 %	17	15	15	15	14	14	14	14
8 %	2	2	2	2	2	2	2	2

Table 2 shows that a rule with a Laplace Accuracy value of ≥ 0.75 produce a maximum number of rules of 35 rules compared with a Laplace Accuracy value of ≥ 0.85 only yielding as many as 14 rules.

4.3   Testing Accuracy

Testing accuracy using test data as many as 100 new data representing from seven classes. The results from the test can be seen in Table 3.

Table 3. Testing Results Accuracy

Support	Confidence	Accuracy	
		Laplace value ≥ 0,75	Laplace value ≥0,85
2 %	20%	88%	88%
4 %	20%	96%	88%
6 %	20%	96%	88%
8 %	20%	12%	12%
2 %	40%	88%	88%
4 %	40%	96%	88%
6 %	40%	96%	88%
8 %	40%	12%	12%
2 %	60%	88%	88%
4 %	60%	96%	88%
6 %	60%	96%	88%
8 %	60%	12%	12%
2 %	80%	88%	88%
4 %	80%	96%	88%
6 %	80%	96%	88%
8 %	80%	12%	12%

Table 3 shows the best accuracy obtained by using Laplace Accuracy value ≥ 0.75. From the test results above minimum confidence and support are taken the highest of the pair with minimum value of 80% confidence and support 6% with an accuracy of 96%.

4.4 Characteristics of Rules

Based on the minimum confidence value of 80% and 6% support and the result of evaluation of the rule using Laplace Accuracy value ≥ 0.75 obtained strong rule to be used as a classification model. The resulting rules can be seen in Table 4.

Table 4. Result Rules

No	Rules	Confidence	Support	Laplace Accuracy
1	Bunuh → terhadap nyawa	87.93	7.12	0.8
2	Aniaya → fisik/ badan	96.07	6.84	0.86
3	Keras → fisik/ badan	98.03	6.98	0.87
4	Perkosa → kesusilaan	94.54	7.26	0.85
5	Culik → kemerdekaan orang	97.95	6.70	0.87
6	Curi → hak milik/ barang	94.91	7.82	0.86
7	Maling → hak milik/ barang	94.33	6.98	0.85
8	Rampok → hak milik/ barang	94.33	6.98	0.85
9	Gelap → terkait penipuan	98.24	7.82	0.89
10	Korupsi → terkait penipuan	98.03	6.98	0.87
11	Tipu → terkapenipuan	98.27	7.96	0.89
12	Edar → terkait narkotika	100	8.10	0.90
13	Ganja → terkait narkotika	100	7.12	0.89
14	Narkoba → terkait narkotika	95.58	9.07	0.88
15	Sabu → terkait narkotika	100	7.40	0.9

4.5 Testing Accuracy

The test uses 13097 test data for 10 months collected from 1 January 2016 to 22 October 2016. Data is categorized into 7 classes. This test is done to find out the trend of crime.
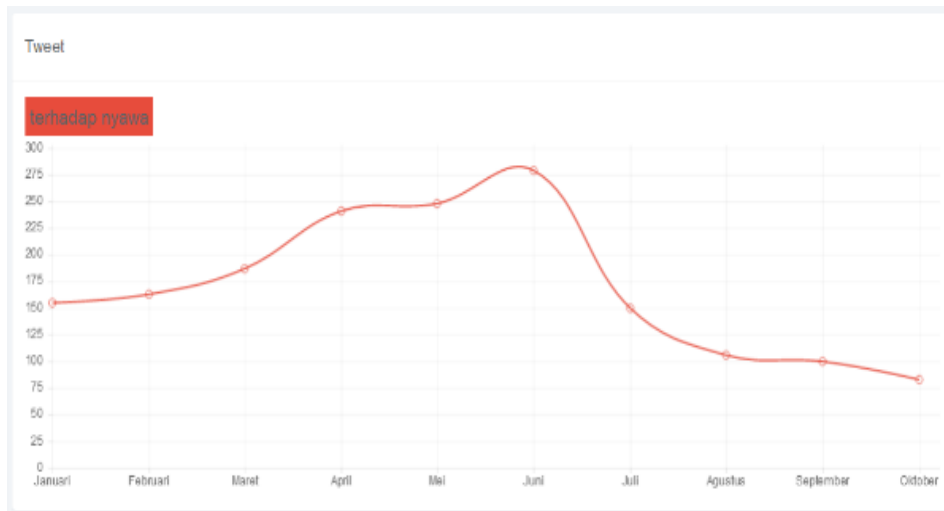
Figure 5. Visualization of Test Results of Crimes *Terhadap Nyawa*

Crimes *terhadap nyawa* have increased and decreased. As shown in Figure 5 crimes *terhadap nyawa*of the trend in June. Meanwhile, for crimes *terhadap fisik/badan* tend to decrease. Based on Figure 6 the crime *terhadap fisik/badan* experienced the trend in January.
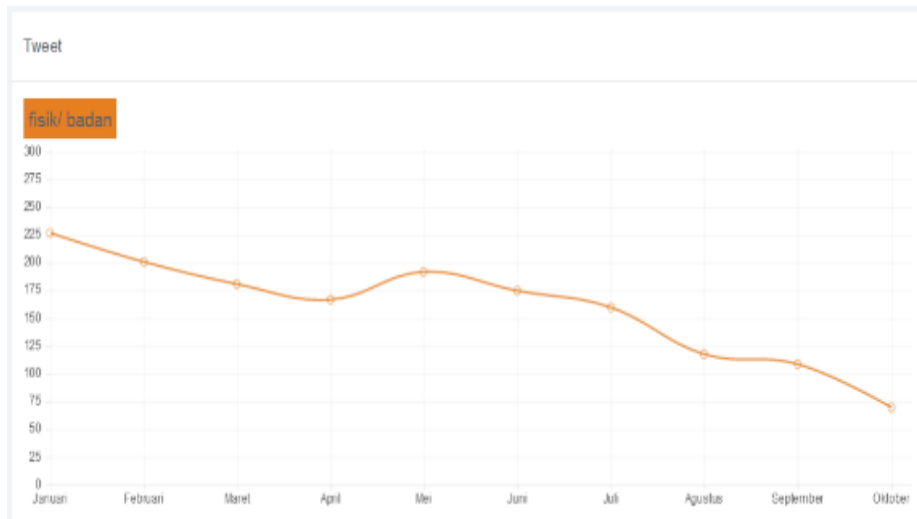
Figure 6. Visualization of Test Results of Crimes *Terhadap Fisik/Badan*
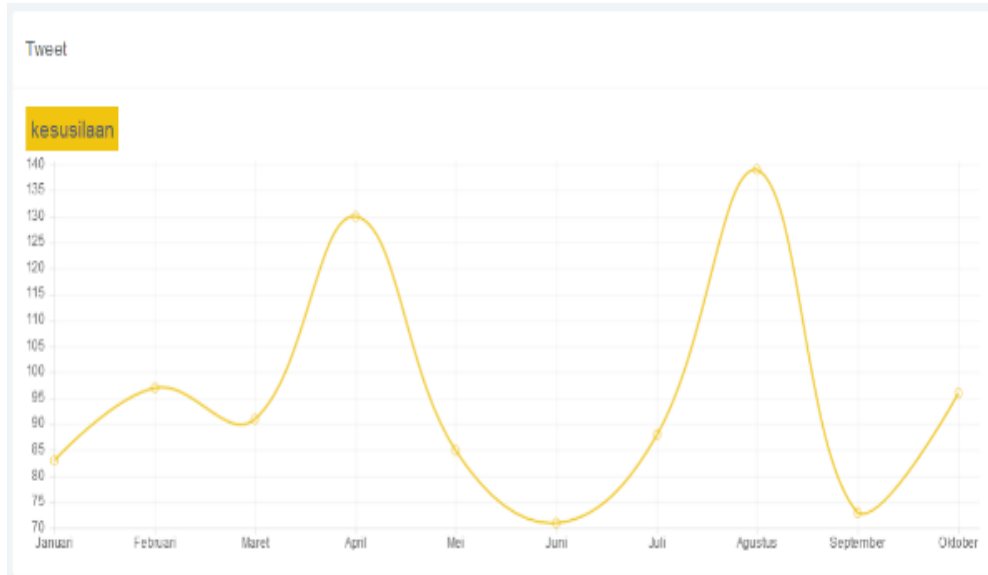
Figure 7. Visualization of Test Results of Crimes *Terhadap Kesusilaan*

Crimes *terhadap kesusilaan* fluctuate. As shown in Figure 7 crimes *terhadap kesusilaan* of the trend in August. Then, for crimes *terhadap kemerdekaan orang* also fluctuate. Based on Figure 8 crimes *terhadap kemerdekaan orang*of the trend in June.
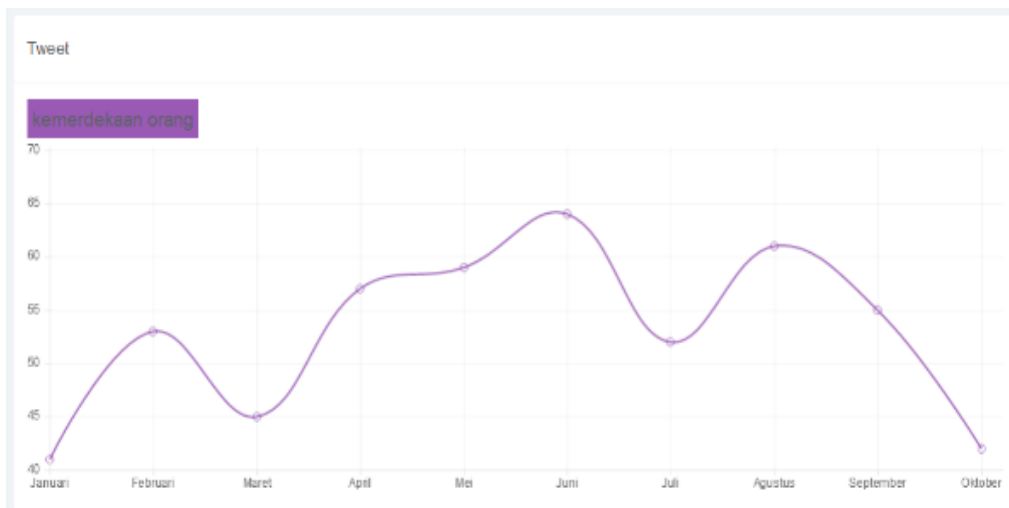
Figure 8. Visualization of Test Results of Crimes *Terhadap Kemerdekaan Orang*
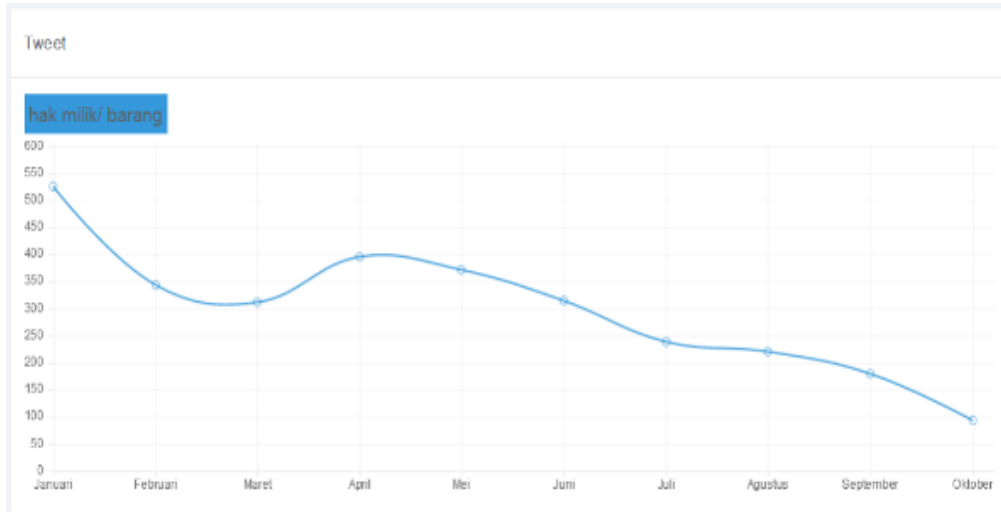
Figure 9. Visualization of Test Results of Crimes *Terhadap Hak Milik/ Barang*

Crime *terhadap hak milik barang* tends to decline. As shown in Figure 9 shows the trend of crime *terhadap hak milik barang* occurred in January. Based on Figure 10, crimes *terkait penipuan* fluctuates tends to decrease. The picture shows crime-terkait penipuan being a trend in February.
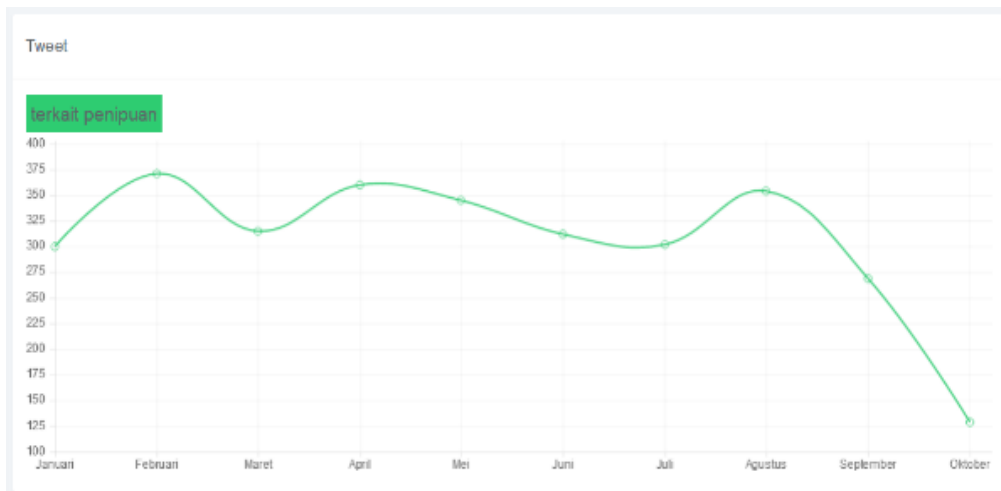
Figure 10: Visualization of Test Results of Crimes *Terkait Penipuan*
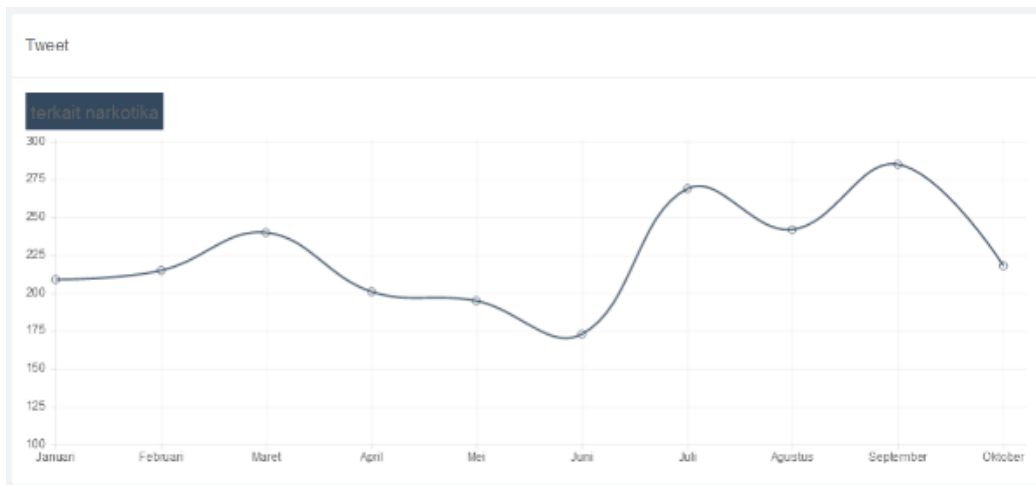
Figure 11. Visualization of Test Results of Crimes *Terkait Narkotika*

Figure 11 shows the crimes *terkait narkotika* being a trend in September.

5   Conclucion

Conclusions Based on the research that has been done then it can be concluded that:
1. Based on the accuracy test using the minimum confidence value of 80% and the minimum support of 6% which has the highest accuracy.
2. From the data as much as 13.097 for 10 months found that, crime *terhadap nyawa*of the trend in June, the crime *terhadap fisik/ badan*of the trend in January. Crime *terhadap kesusilaan* ofthe trend in August. Crime *terhadap kemerdekaan orang*of the trend in June. Crimes *terhadap hak milik/ barang*of the trend in January. Crimes *terkait penipuan*of the trend in February, and crimes*terkait narkotika* became a trend in September.
3. Accuracy test results using 716 training data and 100 test data indicate that the Class Association Rule Mining method has an accuracy of 96%.

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Posters Design for Anti-Hoax Campaign

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Abstract. Poster is one of visual communication media used to deliver the messages of a social movement or campaign. Visual communication conveys messages using understandable letters, symbols, colors, images, etc. This research aims to analyze the poster design for Anti-Hoax Campaign made by students of Library and Information Science Program at Faculty of Communication Science Universitas Padjadjaran, class 2016. This research used qualitative method with content analysis approach to 26 posters. The results show that some of the student groups have made a good poster designs. They combine all of poster elements such as images, text, letters, colors and compositions very well, while some other student groups could not make a good poster design. They cannot bring the images that suitable with text, the composition between text and images is not fit and text is too long or too small to read. The most common images shown in posters are a man in a prison or someone who imprisoned for spreading the hoax. Most of the messages conveyed in the posters are persuasive message by mentioning the negative consequences and only a small part contains informative messages. Overall, those posters able to convey anti-hoax messages for a campaign.

Keywords: Visual Communication, Social Movement, Campaign, Poster, Hoax, Fake News.

1 Introduction

Anti-hoax movement aims to make people aware of the information they receive, not to disseminate unknown information and to anticipate the impact of a hoax. Anti-hoax movement requires some steps to achieve the goals. Essentially, the public must be literate on information and have a concern on responsible information [1] [2] [3]. The public needs an information literacy education to have an ability to assess and select credible and verifiable sources of information, then they can avoid and do not disseminate irresponsible information. So that, a social movement can develop a culture as its purpose [4] [5] [6] [7].

Universitas Padjadjaran provides subject of "Information Literacy" to all new students of Undergraduate Program class 2016 in Happiness Integrity Transition Study (HITS) Program [8]. To find out the students' understanding of Information Literacy, Library and Information Science Student Association (Himaka) then took the initiative to organize the Anti-Hoax

 Poster Exhibition which was followed by all students of Library and Information Science (LIS) Program class of 2016. Those posters were analyzed in this research.

The poster is one of the visual communication media used to deliver the messages of a social movement or campaign. Visual communication conveys messages using understandable letters, symbols, colors and images as well as received response from the audience [9] [10]. However, information technology development is making poster become dynamic. A visual communication designer must be able to interpret, organize and present the message visually [11]. According to Frascara, a poster must have a strong image to show the coherence in a context, the content must be relevant and interesting as well as pay attention to aesthetic aspects [11].

This research aims to analyze the posters design for Anti-Hoax Campaign made by students of LIS Program at Faculty of Communication Science (Fikom) Universitas Padjadjaran (Unpad), class 2016. This research might contribute to develop poster design in disseminating information literacy messages.

2 Research Method

This research used content analysis. Content analysis aims to provide knowledge, new insights, represent a fact and a practical guide to action [12] [13]. The content analysis can be done both qualitative and quantitative methods. In this study, We used a qualitative method. The qualitative content analysis includes analysis and interpretation on verbal and non-verbal message [14]. This interpretation related to the data context.

There are six steps in using content analysis i.e. designing research, identifying unit analysis, determining samples, classifying research units in categories, describing conclusions and validation [12].

This research is designed to analyze the object of posters that have been made by students. There are 26 posters that made by students of LIS Program at Fikom Unpad Class 2016 and those posters exhibited at the exhibition of Anti-Hoax Poster on May 9, 2017. For primary data, We analyzed all of 26 posters. We analyze the elements that exist and are depicted in a poster. It will provide objectivity.

Briefly, the steps in this study can be seen in Figure 1.
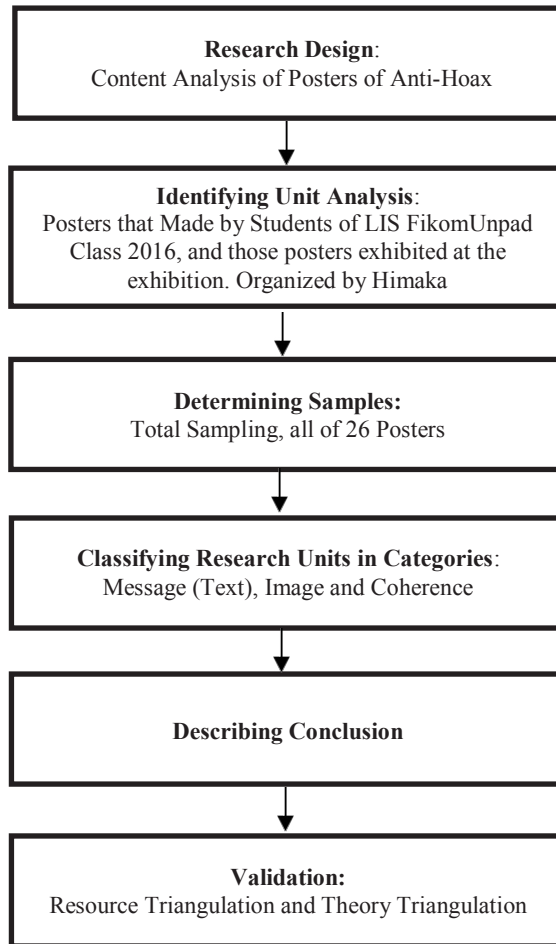
Fig. 1. Steps of Content Analysis, adapted from Krippendorff [12] by Nuning Kurniasih

To support data from posters, we also interviewed several participants and the exhibition committee. For data validation, We used resources and theory triangulation. Resource triangulation has done by interviewing two academics who understand the poster, they are Head of Graphic Laboratory and Head of Communication Management Program FikomUnpad. Meanwhile, theory triangulation has done by literature study.

3 Results and Discussion

The paper titled "Posters Design for Anti-Hoax Campaign" is a part of the research entitled "Anti-Hoax Campaign in Posters". Another paper entitled "Text in Posters of Anti-Hoax Campaign" has been presented in the "International Conference of Vocational Studies

on Applied Research" on September 13-15, 2017, at Universitas Diponogoro Semarang Indonesia.

Overall, in this research We analyzed three aspects namely text, image and coherence of poster design. Text in the posters that made by the students of LIS Program at Fikom Unpad delivered three messages, firstly, the messages to the audience to select and distribute the information received carefully, secondly, anticipate the negative impact and thirdly, stop spreading the hoax [15]. Images and coherence on paper design as student's work at LIS Program Class 2016 are discussed below.

3.1 Picture in Posters as Student's Work at LIS Program Class of 2016

The images that used in the poster should be able to represent a message in a context. There are many aspects in the image of poster, such as symbols, graphs, diagrams, maps, letters, numbers and colors. In this exhibition, posters made in A3 paper size (11.69 x 16.54 Inch). The most common images show a man in a prison or someone who imprisoned for spreading the hoax (6 posters) as shown in Figure 2-7.

Figure 2-7 show that students emphasize the consequences that must be faced when someone spreading a hoax. The consequences are shown by the image of a person who is in prison and a fine to be paid. Figure 2-4 show the message, do you still want to spread a hoax if the consequences are a 6 year imprisonment or a 1 billion rupiah fine? This refers to the Information and Electronic Transactions Act of the Republic of Indonesia (Letter regarded as UU ITE) clause 28 UU ITE clause 28 stated that spreading fake and misleading news (verse 1) and disseminating information to generate hatred or hostility (verse 2) are prohibited acts [16] [17] [18].

Likewise, Figures 5 and 6 give the same message that the audience do not spread the hoax or fake news because the consequences are as stated in the UU ITE clause 28. Meanwhile, the different message is shown in Figure 7. If in Figure 2-6, the poster messages emphasize the threat or consequences will be obtained by someone who spread the fake news, then in Figure 7 it appears that the student wants to give the message that a hoax is a criminal, it will bring us into the darkness so that we have to fight it.

A persuasive message by mentioning the negative consequences of what is done can be the motivation for the audience not to do the negative action but based on the discussion with the source of triangulation, the message with emphasis of the threat can be less effective than the informative message in conveying information literacy messages.

In Figures 6 and 7 there are interesting images, where the message to stop a hoax is also illustrated by hand and mobile phone. The pictures can illustrate that a hoax is spreading rapidly over the internet so we have to be careful to use our hands when connected to the internet.

The others image that dominant on posters are a suggest to say no to hoax, using a symbol like forbidden on a traffic symbol (Figure 8, 10, 11 and 12), or by waving and crossing out the word "spread" (Figure 9). This can be seen in figure 8-12.

Figures 8 and 9 show the suggestions for stopping the hoax by conveying the UU ITE Clause 28. Figure 10 conveys a message for people to filter information before sharing it with others. Figure 11 used a punch image of a cigarette brand by conveying the message that we should be embarrassed to spread a hoax as it may disrupt national unity. In Figure 12,the message in the picture to fight the hoax followed by a message in the Al Quran that God does not like lies. With quoted messages from the Al Qur'an, fire in Figure 12 can be asserted as hell. Figure 8-12 have not seen the original pictures that made by the posters designer, the

pictures shown on the poster are the images that already exist and have been widely known by the public.

There are also 2 posters show that someone need to choose the right direction or the right information to avoid mislead or misdirection. They show it by the direction or compass image as shown in the figure 13-14.

Figure 13 shows three directions to choose, where the hoax can lead us in the wrong direction. Figure 14 shows the direction in a compass where we need to find the correct source of information and care about the dissemination of information. However, the good and correct information can be disseminated, while unknown information does not need to be disseminated and, if necessary, report the matter to the authorized party. Figures 13 and 14 show that hoaxes are made to mislead people.

3.2 Coherence in Posters Design as Student's Work at LIS Program Class 2016

To assess the coherence all elements on the posters, We have discussed with expert sources. Based on discussion, it can be concluded that some posters already have a good designs with coherence in all of poster elements such as pictures, letters, colors, composition and text, while some other posters could not blend all the elements in the poster well. For example, can be seen in Figure 14-16.

The poster in Figure 14 is simple. That poster can show that there are many information sources and we need to ensure the right sources of information. Poster in Figure 15 shows the diversity in a white book whereas hoax will cause the book stained. Composition of images and text and also bland of colors in Figure 15 are good. The poster can be read and understood by the audience. The poster in Figure 16 is interesting. There is a picture of a tiger in the middle of a finger with text "your thumbs your tiger", which means please be wise in using your fingers. However, this picture has been used by others. Likewise, with the slogan of "Turn Back Hoax", this slogan has been used by others communities.

Some posters can not clearly show the messages, there are no coherence between the image and the text. Also, there are a poster with long text, so these posters can not be categorized as good posters. For example, can be seen in Figure 17-19.

Poster in Figure 17 has a good design with balance composition but the picture of a man with a face covered with cloth is irrelevant. They can use another relevant picture to show that "fake news can bring you into darkness". Poster in Figure 18, can not show clearly who the target audience is. The text is "get used to something so you are not blind", it's like intended for adults but the picture is a comic character which seem for kids. However, a good poster should be able to show the target audience, so it is not suitable to convey campaign messages.

Poster in Figure 19 actually has delivered information about the hoax very well, the students write down the definitions and steps to avoid the hoax. Informative messages are more effective than persuasive message by mentioning the negative consequences in delivering information literacy messages. Unfortunately, the text provided is too long. Thus it does not meet a criteria as a good poster. A good poster has a composition, 40% for images, 20% for text and 40% for space. Therefore a good poster does not include excessive text [19].

4 Conclusion

Some of the student groups have made a good poster designs. They combine all poster elements such as images, text, letters, colors and compositions, very well. While some other student groups could not make a good poster design. They can not bring the images that suitable with text, the composition between text and images are not fit and text are too long or too small to read. The most common images show in posters are a man in a prison or someone who imprisoned for spreading the hoax. Most of the messages conveyed in the posters are persuasive message by mentioning the negative consequences and only a small part contains informative messages. However, informative messages are more effective than persuasive messages with threats in delivering information literacy messages. Overall, those posters able to convey anti-hoax messages for a campaign.

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Appendix

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.
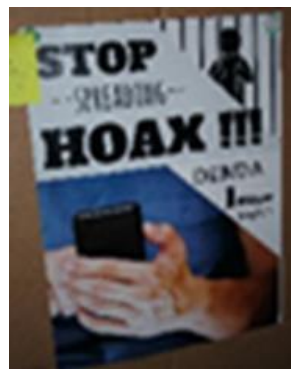
Fig. 6.

Fig. 7.

Fig. 2-7. Posters with Pictures of a Prison as Student's Work at LIS Program Class of 2016.
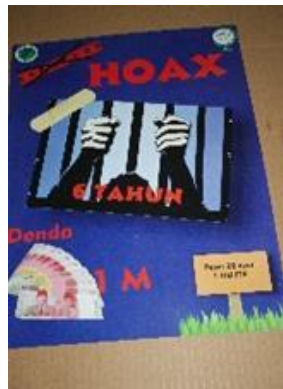
Fig. 8.
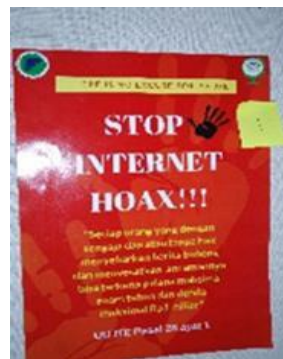
Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 8-12. Posters with Pictures of Stop Hoax Symbols as Student's Work at LIS Program Class of 2016.

Fig. 13.
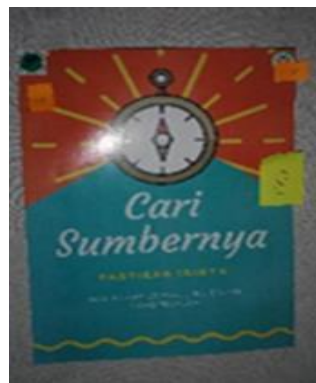
Fig. 14.

Fig. 13-14. Posters with Pictures of Information Sources Direction as Student's Work at LIS Program
Class of 2016.

Fig. 15.

460

Fig. 16.

Fig. 14 -16. Posters with Coherence as Student's Work at LIS Program Class of 2016.

Fig. 17.

Fig. 18.
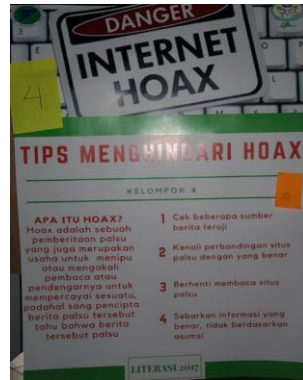
Fig. 19.

Fig. 17 -19. Posters with Incoherence as Student's Work at LIS Program Class of 2016.

The Influence of Product and Price toward Costumers' Satisfaction at Traditional Market in Sekayu

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Abstract. This research goal is to know the influence of product and price toward costumers' satisfaction at traditional market in Sekayu. In this research, sample was taken by using Maholtra with the total number of sample was 90 persons; those are the consumers of traditional market in Sekayu. Sampling technique is *purposive sampling*. Data was taken by using questionnaire which was been measured by Likert scale. This research used multiple linear regression analysis by helping of SPSS 17.00 version program. The research result showed that product variable (X_1) and price (X_2) pertially also have influence toward costumers' satisfaction at Sekayu traditional market.

Keywords: Product, price, consumers' satisfaction

1 INTRODUCTION

Traditional market is market which has an important role to advance the economic growth in Indonesia and has excellence compete scientifically. These Traditional markets presence are very helpful, not only for regional or central government but also all society who rely on their lives in trading activities, because in traditional markets there are many actors whom have important role and try to prosper their own lives such as sellers, buyers, porters and many others. All of them are the actors which have important roles in maintaining the excistence of traditional market in Indonesia.

According to Tjiptono [1], market is a place where the seller and buyer meet for goods and services offered to be sold and the transfer of ownership. Traditional markets are a meeting place for sellers and buyers and are characterized by direct sellers and buyers of products or services, the building usually consisting of kiosks or outlets, stalls and open bases opened by both the seller and the market manager.

According to Kotler & Keller [2], product is everything offered to the market to get attention, bought, used and thise are able to satisfy the consumers' needs or willingness. And the product level consists of core benefit, basic product, expected product, enhanced product, and potential product. Traditional markets are one place where many sales of various products, where the business is now flooding traditional markets, both in quantity and type of food and beverages and entertainment offered, so that the entrepreneurs compete with each other in improving product quality and price varies. Because with good quality and affordable price is

expected to provide a satisfaction to the consumer. With the achievement of needs, wants and expectations of the consumer then the producer's goal in increasing sales can be fulfilled.

According to Tjiptono [1], consumer satisfaction is a consumer condition which feel satisfy or dissatisfy after achieved his/her desire and expectation toward menu, price, faciluty and service offered. Consumer will feel satisfy if their desire and need have been fulfilled, and contrast consumers will feel dissatisfy if their desire and expectation haven't been fulfilled.

Traditional market in Sekayu is located at Talang Jawe Street Balai Agung Sekayu. This market is one of markets in Sekayu, it has strategic place to be choosen by buyers to buy things there. Beside its strategic location, it also has vary and products to be offered depend on Sekayu' society needs, but based on the field survey found that there are some consumers' dissatisfaction toward the product prices such as vegetables and meats at talang jawe traditional market Sekayu, from the front side to the vack side of the market, both have the same prices and expensive. Consumers are not allowed to bid because sellers think that how much the things will be sold, it will be bought by consumers. This condition which make the consumers feel dissatisfy to do transaction at Sekayu traditional market. Beside that, products offered in here have limited supply so the consumers found difficulty to buy in large quantities. Based on the writer' observation, the product prices at Sekayu traditional market is more expensive than others traditional markets in South Sumatera.

Results of interview authors to some consumers who are shopping at the market Talang Jawe Sekayu stated that the same price issue caused product distributor to include products in the Market Talang Jawe Sekayu not many. Therefore, the price of both vegetable and meat products the same price. In addition, every consumer who shop when making an offer to the average consumer merchant is only given a price that fits or with the traders' trademark especially in Talang Jawe Sekayu Market "*nak payo ngan dem*". It makes consumers feel dissatisfied with the attitude of traders.

The attitude of consumer dissatisfaction is expressed by some mothers who had writers met the market, they declared forced to buy because there is no other market as complete as traditional market Talang Jawe, there are also saying sometimes they prefer to choose to shop at the passing vegetables and bred sufficiently. If buying in bulk they prefer to buy to existing market in Palembang city or other area. Intnya they me, buy in Traditional Market Talang Jawe for the needs of little or just enough. Purchases in large numbers also become their disappointment because of the limited number of products available there.

Based on the phenomena have been stated, so the problems in this research are formulated as follows:
1. How the effect of product toward consumers' satisfaction at Sekayu traditional market?
2. How the effect of price toward consumers' satisfaction at Sekayu traditional market?
3. How the effect of product and price toward consumers' satisfaction at Sekayu traditional market?

2 THEORY

According to Tjiptono [1], product definition is everything that can be offered by the producer to be noticed, requested, searched for, bought, used and consumed by market as an effort to fulfill related market's needs and desires.

According to Kotler & Keller [2], the indicators were used by the writer to measure the product in this research are:

a. Kinds of sold products
b. Product suitability with price
c. Product quality

According to Kotler and Amstrong [3] some attributes that accompany and complement the product (product attribute characteristics) are:

a. Branding

Names, terms, signs, symbols, or designs, or any combination of these intended to identify products or services of one or a group of sellers and distinguish them from competing products.

b. Packing

Activity of designing and making container or wrapping of a product.

c. Product quality

Ability of a product to perform its functions include reliability, accuracy of ease of operation and improvement, and valuable attributes others.

According to Kotler and Amstrong [3], it's stated that price as amount of money which is billed on a product or service, or the sum of redeemed value by the consumers to get benefit of own or use a product or service. Indicators that characterize the price are:

a. Affordability
b. Price suitability with product quality
c. Price Competitiveness

According to Irawan [4], consumers' satisfaction is an accumulation result of consumers in using product and service. In this research consumers' satisfaction indicators are used according to Irawan [4], as follow:

a. Overall costumer satisfaction
b. Recommend to other parties
c. Reuse services

Kotler & Amstrong [3] states that there are 4 elements in customer satisfaction are:

a. Expectation

The consumer's expectation of a good or service has been formed before the consumer purchases the goods or services. At the time of the purchase process, consumers expect that the goods or services they receive in accordance with their expectations, desires and beliefs. Goods or services in accordance with consumer expectations will cause consumers to be satisfied.

b. Performance

The consumer's experience of the actual performance of the goods or services when used without being influenced by their expectations. When the actual performance of goods or services is successful then the consumer will feel satisfied.

c. Comparison

This is done by comparing the expectations of the performance of goods or services before buying with perceptions of the actual performance of the goods or services. Consumers will be satisfied when expectations before purchase match or exceed their perception of the actual performance of the product.

d. Comfimation/discomfirmation

Consumer expectations are influenced by their experience of brand usage of goods or services that are different from others. Confirmation occurs when expectations match the actual performance of the product. otherwise disconfirmation occurs when expectations are higher or lower than the actual performance of the product. consumers will feel satisfied when the confirmation / discofirmation.

2.1 Related Previous Study

The first research was conducted by Jahanshahi, e.t.al. [5] this research aimed to know the influence of service and product quality toward consumers' satisfaction and loyalty at outomotive industry in India. The research finding showed that there was big possitive influence between service quality and product quality toward consumers' satisfaction and loyalty, so there is link among product quality and its influence toward consumers' satisfaction.

The Second research was conducted by Nasir, et. al [6] which has goal to know the important factors those affect fast food restaurant consumers' satisfaction. Research finding be the basic consideration to research prices and understanding its influence toward consumers' satisfaction.

The third research was conducted by Lonardo and Soelasih [7] which has goal to analize the influence of product quality, price and physical environment toward "lapis legit" cake consumers' satisfaction. This research finding can be reference for this research to review price and quality product toward its influence with consumers' satisfaction.

The fourth research was conducted by Noto and Hakim [8] that did a research about analysis of the effect of product price and product quality toward consumers' satisfaction (Case study at Alin Motorbike Workshop services in Semarang). The result showed that the price variable and product quality have significantly and positively influence toward consumers' satisfaction so the hypothesis was accepted. This result showed that the consumers who satisfy with Alin Workshop motorbike Semarang with affordable and cheap product prices and good quality product.

The fofth research was conducted by Tristiana and Mashariono [9] which has goal to know the influence of product quality and price toward Honda Vario 125 motorbike consumers' satisfaction. Research findings showed that product quality variable, and price have significantly and positivelly effect toward consumers' satisfaction as Honda Vario 125 motorbike users at Dealer Panji Perkasa Perdana.

3 METHODOLOGY

Research method is a guideline for research about how a research steps are done. In this research, the writer use descriptive quantitative research method. According to Sugiyono [10], descriptive quantitative method is a research method that explain the relationship between variables and numeric data analysis by using statistical method through hypothesis testing.

According to Sanusi [11], the variables will be observed in this research those are independent variable (X_1), (X_2) and dependent variable (Y). More detail will be showed its operational as follow:

1. Independent variable, is a variable that affect another variable. In this research that will be independent variable is "Product and Price"
2. Dependent variable, is a variable that is affected by another variable. In this research that will be dependent variable is "Consumers' Satisfaction".

According to Sugiyono [10], population is all elements combination which has a series of similar characteristics, which include the universe for the sake of marketing research problems. Population in this research is all consumers who come to shop at Talang Jawe market in Sekayu. This technique was chosen because population and sample have certain characteristics. Those characteristics are:

a. All consumers who come for shopping at traditional market especially Talang Jawe traditional market Sekayu.
b. Their ages are above 20 years old.

According to Hair, et al in Malhotra (2009: 369), if the population isn't known recommend the number of sample at least 5 times of the total question items in questionnaire. Indicators in this research are 12 question items of independent variables and 6 question items of dependent variables. The total of question in this research is 30 questions, so 18 x 5 = 90. So that, the total of sample was taken in this research is 90 respondent.

According to Malhotra [12], sample is the selected subgroup of population elements to participate in study. While the sampling technique in this research used *non-probability sampling* method (non random sampling) by sampling technique is *purposive sampling*, where the sample was chosen based on characyeristics.

In this research for sampling technique that is use *Simple Random Sampling* a technique for taking sample of a population which is done randomly regardless of the strata present in that population [10].

According to Sunyoto [13], to get the data and information neede by the writer, so the technique was used by the writer to collect the data in this research are:

a. Questionnaire

   Questionnaire is a data collecting method that is done by giving questions to respondents with questionnaire guidelines. Questionnaire in this research used open and closed questions.

b. Interview

   Interview is direct questionning with parties in a company to the appointed persons to interview in collecting data.

c. Documentation Study

   Documentation study is a collecting data method that is done by reading books, literatures, journals, related references with this research and related previous studies those are related to the research is being done.

Research instruments will be used is a questionnaire that will be distribute to the consumers of Sekayu traditional market. By the measurement technique by using Likert scale and statistics of data processing by using *SPSS For Windows Version 17.0* by the limitation as follow:

Very satisfy with score   = 5
Agree with score   = 4
Confused with score   = 3
Disagree with score   = 2, and
Very disagree with score = 1.

Likert scale is a scale that is used to measure attitude, opinion, and perception of someone/goup of people about social phenomena [10].

In this research, data analysis technique used Quantitative analysis technique. Quantitative analysis is an analysis method by using numbers those are able to calculated and measured. Quantitative analysis is intended to estimate the magnitude of influence by using statistic analysis tool.

In analyzing statistic data used SPSS 17,0 (*Statistical Product Service Solution*), program that is an application program which has quite high capability of statistical analysis and data management system at geographic environment.

Validity Test, these testing are:
    If : sig t < sig α, it means that those questions are valid
    If : sig t > sig α, it means that those questions are invalid.
    Reliability is used to measure a questionnaire that is an indicator of variable or construct. A questionnaire is said reliable if someone's answer is consistent and stable from time to time. SPSS gives the facility to measure reliability by *Cronbach Alpha (α)* statistic testing. A variable is said reliable if (α) value > 0,60 [14].
    This analysis is used to know the influence of quality product (X_1) and price (X_2) toward consumers' satisfaction (Y). According to Sunyoto [13], multiple linear regression equation is as follow:

$$Y = a + b_1X_1 + b_2X2 + e \qquad (1)$$

Where :
Y = Consumers' satisfaction,
a = Constant,
b_1, b_2 = Regression Coefficient,
X_1 = product,
X_2 = Price and
e = *error*

a. Simultaneous Significance Test (F statistic Test)
    In this test, F test is used to know the influence of significance level of independent variables simultaneously toward dependent variable [15], in this research, hyphotesis were used are:
    H_0 = There is no influence between product and price toward consumers' satisfaction at Sekayu traditional market.
    H_1 = There is influence between product and price toward consumers' satisfaction at Sekayu traditional market.
    The Priyatno's basic decision making is by using significance probability numbers, those are:
    1)   If probability H_O> H_a, so there is no influence between product and price toward consumers' satisfaction at Sekayu traditional market.
    2)   If probability H_O< H_a, so there is influence between product and price toward consumers' satisfaction at Sekayu traditional market.

b. Test of partial significance influence (T - test)
    T test is used to test the significance relationship between X and Y variable, whether X_1, X_2 variables (product and price) really affect Y variable (consumers' variable), partially [15]. Hyphotesis were used in this testing are:
    H_0 = There is no influence betweeen product and price toward consumers' satisfaction at Sekayu traditional market.
    H_1 = There is influence between product and price toward consumers' satisfaction at Sekayu traditional market.
    Prayitno's basic decision making (2009 : 65) is by using number probability significance those are:

₁₎ If probability significance number > 0.05, so H_o was accepted and H_a was rejected.

₂₎ If probability significance number < 0.05, so H_o was rejected and H_a was accepted

4 RESULT AND DISCUSSION

Validity test was used to know which questions can be used to simple linear regression. Based on questionnaire answers that the researcher got from 90 consumers of Sekayu traditional market which all of them are as sample of this research, found the result as follow:

a. From validity test result for the statement that relate to product was found that correlation value of all items/statements at the questionnaire have 2 side value at significance level ≤ 0.05 (2 tailed). So, it can be concluded that those items significantly correlate with the total score and it can be stated that those instruments are valid.

Table 1. Validity Test Result of X_1 variable

No	Item	Sig t	Sig α	Ket.
1	X1_1	0.00	0.05	Valid
2	X1_2	0.00	0.05	Valid
3	X1_3	0.00	0.05	Valid
4	X1_4	0.00	0.05	Valid
5	X1_5	0.00	0.05	Valid
6	X1_6	0.00	0.05	Valid

From validity test result for the statement that relate to price was found that correlation value of all items/statements at the questionnaire have 2 side value at significance level ≤ 0.05 (2 tailed). So, it can be concluded that those items significantly correlate with the total score and it can be stated that those instruments are valid.

Table 2. Validity Test Result of X_2 Variable

No	Item	Sig t	Sig α	Ket.
1	X2_1	0.00	0.05	Valid
2	X2_2	0.00	0.05	Valid
3	X2_3	0.00	0.05	Valid
4	X2_4	0.00	0.05	Valid
5	X2_5	0.00	0.05	Valid
6	X2_6	0.00	0.05	Valid

b. From validity test result for the statement that relate to consumers' satisfaction was found that correlation value of all items/statements at the questionnaire have 2 side value at significance level ≤ 0.05 (2 tailed). So, it can be concluded that those items significantly correlate with the total score and it can be stated that those instruments are valid.

Table 3. Validity Test Result of Y Variable

No	Item	Sig t	Sig α	Ket.
1	Y_1	0.00	0.05	Valid
2	Y_2	0.00	0.05	Valid
3	Y_3	0.00	0.05	Valid
4	Y_4	0.00	0.05	Valid
5	Y_5	0.00	0.05	Valid
6	Y_6	0.00	0.05	Valid

Based on those validity test results can be concluded that all statements at questionnaire amount 18 questions those are consist of statements relate to product, price and statements relate to consumers' satisfaction all three varaibles can be said passed of validity test.

Reliability test in this research was done to know whether product, price and consumers' satisfaction instruments are reliable or not. And the reliability test results of both instruments are:

a. From reliability result 6 statements those are relate to product were known that 6 statements are answered by 90 respondents *Cronbach Alpha* value was 0.709. Because of its value is higher than 0.6, so it can be concluded that product instrument items can be said are reliable.

Cronbach's Alpha	N of Items
.709	6

b. From reliability result 6 statements those are relate to product were known that 6 statements are answered by 90 respondents *Cronbach Alpha* value was 0.784. Because of its value is higher than 0.6, so it can be concluded that product instrument items can be said are reliable.

Cronbach's Alpha	N of Items
.784	6

c. From reliability result 6 statements those are relate to product were known that 6 statements are answered by 90 respondents *Cronbach Alpha* 0.717. Because of its value is higher than 0.6, so it can be concluded that product instrument items can be said are reliable.

Cronbach's Alpha	N of Items
.717	6

Based on reliability test result for product, price, and consumers' satisfaction instrument can be concluded that the three instruments are reliable (passed of reliability test).

To define the multiple regression equation formula of product (X_1), and price (X_2) influence toward consumers' satisfaction (Y) regression coefficient analysis needs to be done. By using SPSS program facility, regression analysis result can be seen as follow:

$$Y = 8.73 + 0.522 X_1 + 0160 X_2 \qquad (2)$$

While to see the magnitude of influence between variables need to be done coefficient and determination, can be seen at this table :

Table 4. Correlation Coefficient and Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627[a]	.393	.379	2.185

T test is a test to know independent variable influence significance (product and price) partially or individually explain the dependent variable (Consumers' satisfaction). T sig value at product variable (X_1) is 0.000 with sig α (0.05). Therefore t sig value < sig α that is 0.000 < 0.05 and at price variable (X_2) with significance level 0.041. therefore t sig value < sig α that is 0.041 < 0.05, so H_0 was rejected and H_a was accepted, it means that there is significantly influence between product (X_1) and price (X_2) toward consumers' satisfaction.

Based on correlation coefficient and determination, showed that the magnitude of product variable influence (X_1) and price (X_2) toward consumers' satisfaction (Y) was 0.393 (*Adjusted R Square*), it means that the influence of product and price toward consumers' satisfaction at Sekayu traditional market showed there is positive correlation, which gives understanding that 39.3% consumers' satisfaction variable (Y) is affected by price and product variables. And the rest about 60.7% can be explained or affected by other factors.

Simultaneously Hyphotesis testing aimed to measure the magnitude influence of independent variables simultaneously toward dependent variable. Based on calculation result table is obtained that the significance amount 000[b by] using significant level 0.05 so F significant value is amount 0.000 showed less than 0.05 (0.000 < 0.05). therefore H_a was accepted, so hyphoteses that said there is a significant influence between independent variable with price and product simultaneously toward dependent variable (Consumers' satisfaction).

5 CONCLUSION

1. Based on validity test analysis result X_1, X_2 and Y variables with correlation value of all items/statements at questionnaire has significant value less than 0.05 so the instrument are valid.
2. Reliability test result X_1 variable with Cronbach Alpha value is 0.709 X_2 variable with Cronbach Alpha value is 0.784 and Y variable with Cronbach Alpha value is 0.717 with critical r value (2 tailed test) at significant level 0.05, so instrument items are reliable.
3. Based on analysis result of multiple linear regression is known that significance value at constant row is less than 0.05 that is amount 0.000. it means that at 95% level of freedom. Ho was rejected and Ha was accepted and it means that product and price significantly affected toward consumers' satisfaction at Sekayu traditional market.
4. The result of multiple linear regression equation between product variable (X_1), price (X_2) toward consumers' satisfaction (Y), is Y = 8.73 + 0.522 X_1 + 0160 X_2.
5. Test result of correlation coefficient and determination showed that consumers' satisfaction variable (Y) is 39.3% affected by product and price variables. The rest 60.7% can be explained or affected by other variables.

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The Schools' Evaluation Portfolio Characteristics for KURTILAS

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Abstract. Evaluation is quantified measurements based on the portfolio of curriculum objective. The Article investigated about KURTILAS portfolio measurements system in order to improve the quality and quantity of educational institutions as its core program productivity. The 13th National Standard Curriculum (KURTILAS) emphasizes modern pedagogical approaches that based on scientific within the subjects delivery, i.e. Observations, Questioning, Association, Experimenting, and Networking. The Article excluded the KURTILAS portfolio measurement system evaluation influenced for these following dimensions; characteristic, knowledge, and skill. Then, the deliver evaluation results increase students with senses of productive, creative, innovative and affective within the integrated strengthen KURTILAS dimensions abovee

Keywords: Evaluation Portfolio, KURTILAS.

1 Introduction

Evaluation is measurement systems. It exposes calculation and scoring. Evaluation is also quantified assessments process to validate the result of evaluation. It is a part of consideration decision taking for good or bad qualitatively influences. Evaluation is, also known as measuring and assessing, defined with size and quantitative achievements as feedback for building strong foundation in educational world. The curriculum philosophical approach in educational raised a challenge about the reliability gap to construct a valid evaluation. It concerns about to measure the objects (students' achievement) within schools as institution and teachers as the educators. The difficulty of evaluation pulls in a lot of basic cognitive process as it distinctly demonstration a link between a student's action and his occupation advancement. Opposite evaluation systems have been used for more than 60 years all over the world. [1].

Evaluation was executed with numerous and theoretical approach. It derived the seventh concepts of scientific evaluation. i.e. philosophy, psychology, communication, curriculum, management, and socio-anthropology. Within philosophy approach educational evaluation related to the fundamental issues about approach and method evaluation necessity and delivery. Moreover, its psychological effects are about difficulty level consideration which is reliable to students' skills and lesson objectives as well. The reliable evaluation suits contents to delivery as feedback and achievements. The evaluation systems are essential in educational achievement as mean of assessment or measurement. Literally, the word evaluation,

measurement and evaluation are identified as to assess. Moreover, the activity measure is included as evaluation to measure, assess, and evaluate as integration process. It is an activity that cannot be separated from one another, and the implementation must be done sequentially. The article projected the approaches and method of portfolio evaluation on KURTILAS for school institutions.

2 Portfolio Evaluation

Portfolio evaluation is an accumulation of the best illustration of student's activity. A portfolio is a meaningful accumulation of pupil activity that evidence the student's attempt, advancement, and accomplishment in one or more than domain ([2]. A portfolio in the context of the teaching-learning is a collection of student works that information skilfulness of a set of ability, practical knowledge, and mental attitude.

The various works in a portfolio are frequently mentioned to as "artefacts". Artefacts appearance: Unit demonstration principally demonstrates learners' progression. Procedure directed portfolios indicate to each the narration of the development of the student: they include a student's product from the occurrent to the extremity of the tilted portion. Public exhibition is a final common element of both kinds of portfolios. Circumstantial to under consideration education theories, portfolio supported learning could be perspective as inhabit the advanced form of cognition and ability combination. in that learners would be meditating on the improvement of all of their professional skills in the cognitive process of moving their sudden professional personal identity [3]. Student activity from the portfolio improvement procedure indicates that the process itself successful them more awake of their own learning activities and how they necessary to issue criterion of their learning action to variety them more purposeful for individual and professional development.

2 Text formatting

The main text should be written using Times New Roman, 10pt, fully justified. Italics can be used for emphasis and bold typeset should be avoided.

3 KURTILAS

Kurikulum Tiga Belas (KURTILAS), The 13th national standard curriculum issued on the in 2013 by the Ministry of Education and Culture for schools in Indonesia. It is implemented from Undang-Undang No. 20 Thn 2003 about the National standard in educational Definition and Systematic; its contexts, plans, objectives, lesson plan, and so on. Undang-Undang No. 20 Thn 2003 also stated about the dimensional of curriculum within the school units; the lesson plan and its objective, contents, and subject delivery; the approach and method in teaching-learning ("PERMENDIKBUD NOMOR 69 TAHUN 2013," 2013).

KURTILAS main objective is settled improve Indonesian' live quality with religiously faith perspective, productive, creative, innovative, and affective. It also is directed to contribute for national empathy for nation, country, and civilization. The concepts of KURTILAS are featured as follow:

1. KURTILAS evokes three domains i.e. Characteristics, Knowledge, and Skill. These domains projected the students' integrated self-enhancements of productive, creative, innovative, and affective.
2. KURTILAS characteristic domain transforms learning material to be critically "Why-Know"
3. KURTILAS Skills domain transforms learning material to be critically "How-Know"
4. KURTILAS Cognitive domain transforms learning material to be critically "What-Know"
5. KURTILAS projects feedback about balance in characteristic and skill with supported soft skill and hard skill for live quality of the students within characteristic, knowledge, and skill.

In Modern pedagogics approach, KURTILAS emphasized scientific approach; it concerns about observing, questioning, associating, experimenting, and networking.

4 Kurtilas Evaluation Domain

In Chapter 27, Act 2 of Undang-Undang No. 20 Thn. 2003, the evaluation objectivity domain in KURTILAS identified as lesson, program, and system evaluation. It concerns about the students-teacher, institution, and educational objective. It also concerns about formal and non-formal layer of educational institution unit.

Evaluation is the core process of teaching-learning feedback delivery. It evolves extended layers from curriculum to program assessment, i.e. program's implementations and affectivities. The domain perspectives exclude learning feedback and process as mentioned by Benjamin S. Bloom. The domains are projected as follow:

1. Cognitive has been revised by Anderson & Krathwohl in 200, it includes remember, understanding, applying, analyzing, evaluating and creating [5]
2. Taxonomy bloom was later re-developed by Krathwohl, Bloom, and Masia 1956 by adding a domain called Affective, it includes receive, respond, value, and organization [6] .
3. Psychomotor, it includes operational and execution. Psychomotor extend the its domain into three branches;
   a. Muscular or motoric skill; it includes movement, performance, result, jump, and motions
   b. Object material s manipulation, it includes fixing, structuring, cleaning, moving, and shaping,
   c. Neuromuscular coordination; it includes observe, implement, joints, pairing, cutting, and applications.
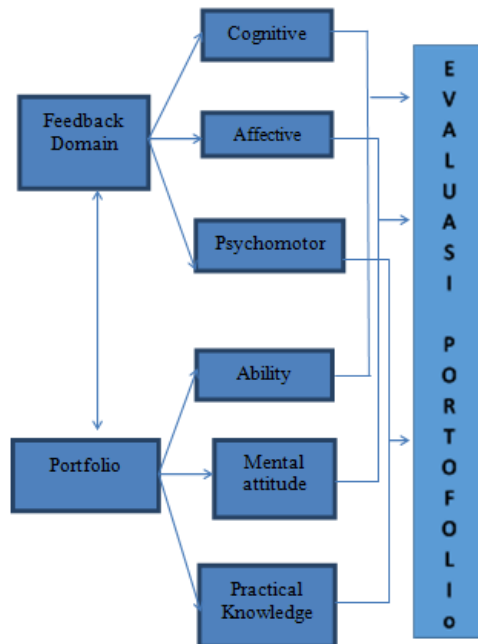
Figure 1. The correlation of Learning Feedback and Portfolio Evaluations

5 Kurtilas Measurements Dimension of Evaluation Portfolio

The weakness of previous KTSP curriculum basically indicated on the faded domain of affective, cognitive and psychomotor. Moreover, KTSP degraded these domains by skipping within teaching-learning materials. In other hand, it neglected human characteristic for testing and presume the superiority of cognitive to affective and psychomotor. To meet this weakness, KURTILAS was introduced on 2013 as modern pedagogic with scientific approach as the main catalyst in teaching-learning process [7]. The Scientific approach is the essential foundation to formulate methodology that resembles in strategy and technique for teaching-learning experiences of KURTILAS characteristics. In addition, there are three pillars of scientific approach within KURTILAS i.e. active learning, assessments, and diversity. It enables the students to work and observe phenomena of lesion that presented in videos, pictures, mind-setts, texts, natures, and so on.

The KURTILAS implements scientific approach by reaching these three domains; affective, cognitive and psychomotor. The government expects KURTILAS improve student's creativity, innovative, well-balance between soft skills; include about moral favor, knowledge, and hard skill with integrated personality improvement.
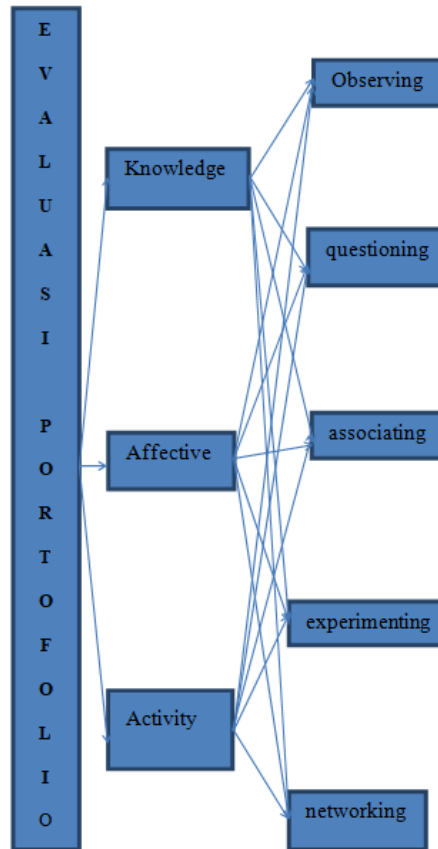
Figure 2. The Dimension of KURTILAS Portfolio Evaluation

6 Conclusion

The evaluation is actually a feedback for improvement and achievement both teacher-students and institution. Educational develop and evolve the human by considering the basic objective is to educate people to be better one. Evaluations, when it posted as test, play an important role to assess the executed program and organizations.

Acknowledgment

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this study is a beginning of new breakthrough in finding sustainability systems in educational world.

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Difference Analysis of Interest Rate and Revenue Theory System on Banking

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Abstract. Banking as a financial institution has strategic role where its main activity is absorbing fund from society which surplus fund and channeling back to society with deficit of fund, enactment of dualbanking system giving birth two fund management system of banking interest rate system and profit sharing system. There are at least five approaches that serve as a distinguishing indicator between the interest rate system theory and profit sharing in the banking system as well as the five indicators, among others, the determination of the amount of profit, the amount of profit, the assumption of payment, the amount of payments, and the existence of the law and its validity.

Keywords: Conventional Bank, Dual Banking System, Interest Rate, Revenue System, Syariah Bank.

1 INTRODUCTION

Growth and development of the Indonesian economy cannot be separated from the growth and development of the banking world that encourages the economy through the activities of raising funds and the channeling of funds both through conventional banking and Islamic banks.

Banking as a financial institution has a strategic role where its main activity is receiving demand deposits, savings and deposits, then the bank is also known as a place to borrow money (credit) for people who need it. Absorbs funds from society that surplus funds and redistributes to society deficit funds [1]. With the enactment of the dualbanking law the system makes the financial management system in financial institutions and banking in Indonesia is divided into two ways which also gave birth to two different theories.

The first theory is the theory that has long been used in the economic system in Indonesia and the world that is the interest rate system. The second financial management system is a profit sharing system that has been seriously glimpsed since the onset of the global economic crisis in 1998. Both theories above each have different operational systems that have their own advantages and disadvantages in the theory or application.

2 METHODS

The methodology used in this paper is a qualitative comparison method between interest rate theory and profit sharing in dual banking banking system in Indonesia which is seen in five aspects of indicator namely: the determination of the amount of profit, the amount of profit portion, the payment assumption, the amount of payment and its existence

3 DISCUSSION

3.1 Interest Rate System

Interest rates are one of the most important variables in the conventional economy which constantly influence both directly and indirectly the economy and social life of society, interest rates also influence the decision to invest or consume. Can we know the tendency of society when interest rates are high, people will automatically prefer to keep their money in the bank because he will get a high interest.

Conversely, if interest rates are low, people tend not to be interested anymore to keep their money in the bank and will withdraw their funds in the bank. From this it can be seen that interest rates have an important influence on public interest in the banking world.

Bank interest rates can be interpreted as a reward provided by banks that look at the principle of time value of money to customers who buy their products or when a bank or non-bank financial institution sells its products. Interest can also be interpreted as a price to be paid to customers (who have deposits) with which must be paid by customers to the bank (customers who get loans) [1].

In practice in banking, there are two prices that are always there namely the purchase price and the selling price. What if the bank collects funds from customers means the same as buying funds from customers, then later on the bank will pay a certain price to the customer in accordance with the initial provisions, therefore it can be said that the bank buy funds from customers with a certain purchase price is called deposit interest.

On the other hand banks will also sell funds to customers who need funds with a specific sale price in the agreement. The price is the selling price of the bank to the customer [2].

Interest is the dependency implied on the borrower of money, expressed as a percentage with the money lent or the loan term. Interest rates according to Sunariyah [3] is the price of the loan. Interest rates are expressed as a percentage of money perunit time. Interest rate is the cost of the loan or the price paid for the loan fund (usually expressed as percentage per year) [4].

According to Ismail [2] the application of interest contained in conventional banks can be separated into two types, namely:
   a. Savings Interest Savings interest rate is a certain price level paid by the bank to the customer for the savings he made.
   b. Interest on interest A loan interest or a loan interest is a certain price to be paid by the customer to the bank on the loan it receives.

For conventional banks, loan interest is the selling price charged to customers who need funds because conventional banking system thinks money is a commodity buakan tool of the transaction. In order to make a profit, the bank will sell the interest at a price that is relatively larger than the purchase price. This means, credit interest is greater than interest savings.

3.2 Share-sharing System

Profit sharing in the economic dictionary means profit sharing. Definitively profit sharing means "the distribution of some part of the profits to employees of a company" [5]. In general, the principle of profit sharing in sharia banking can be done in four main contracts namely, al Musyarokah (shirkah), al Mudharabah, al muzara'ah, and al musaqoh [6]. The four contracts are a cooperation agreement between two or more people where there are parties who play sebahgai shahibul maal and there are parties who act as mudharib.

But common and often used in the application of Islamic sharia is al mudharabah and al musyarakah, while ak al al-ka'ahah and al-musaqoh rarely even not applied in Islamic banking because there is no special product designed for financing agricultural or livestock.

It is understood that the concept of profit sharing is essentially a collaboration between the owner of the fund and the fund manager where the results of the cooperation are divided in accordance with the agreement between the two parties by upholding the norms and values of the Shari'a.

Philosophically, the profit-sharing system prevents economic oppression and distributes the economy's economic well-being, in line with the goal of establishing a banking institution.

The interest and profit-sharing differences can be at least observable from the following five aspects or indicators, the first indicator is the determination of the amount of profit.

Table 1. Profitability Determination Indicators.

Interest	Profit sharing
The determination of interest is made at the beginning of the contract with the assumption should always be a profit.	The determination of the ratio of profit / profit sharing ratio is made at the time of the contract with reference to the possibility of profit and loss.

Source: Antonio [6]

The indicator of the determination of the profit gain on a profit-making interest system is made at the beginning of the contract with the assumption that it must always be profitable.

For example, the bank promises a savings rate of 2% per year to depositors (buy) from the amount of savings, then the banks sell back the purchased money at 2% to customers who need money or funds at 4% per year. Indirectly the bank has made an agreement to the savers customers at the beginning of the contract will reward 2% of the funds that are held with the assumption of always a profit, on the other hand the bank also requires the customer to borrow capital to return 4% of the amount of money borrowed with the assumption always fortunately also without seeing the business condition of the customer.

In sharia banking Indicator of the determination of the amount of profit is determined based on the ratio / profit sharing ratio made at the time of the contract with reference to the possibility of profit and loss.

For example from the 10 million money in the tube agreed on profit-sharing ratio or ratio of 50:50 of the profit earned by the bank from the proceeds of managing the 10 million funds to the party financed by the sharia bank with the profit-sharing ratio or the ratio at 50:50 as well.

So what if the customers who financed by Islamic banks get 500 thousand profit per month then the Islamic bank will get 50% profit that is equal to 250 thousand and financing customer gets 50% also that is equal to 250 thousand also. The savers get 50% of the 250 thousand earned by the sharia bank that is equal to 125 thousand and Islamic banks also get 50% profit of 125 thousand. The second indicator is seen from the size of the profit portion

Table 2. Indicator of Profit Share

Interest	Profit sharing
The percentage is based on the time period and the amount of money (capital) that is lent.	The amount of profit-sharing ratio is based on the amount of profit earned.

Source: Antonio [6]

In the second indicator seen the amount of profit portion in banking conventional seen from the length of the loan period and the amount of capital borrowed this is because the conventional concept considers money is not a commodity as a medium of exchange, while the Islamic banks do not look at the time period and the amount of capital used but see the amount of profits derived from the capital invested. The third and fourth indicators are seen from the assumption of payment and the amount of payment.

Table 3. Payment Assumptions

Interest	Profit sharing
Fixed interest payments as promised without consideration of whether the project run by the customer profit or loss.	Profit sharing depends on the profit of the project being undertaken When the business loses, the loss will be shared by both parties.

Source: Antonio [6]

Table 4. Payment Amount.

Interest	Profit sharing
The amount of interest payments does not increase even if the amount of profit doubled or the state of the economy is "booming"	The number of profit sharing increases accordingly with an increase in the amount of revenue

As an illustration on the indicator of the determination of the amount of profit seen in the assumption of payment it can be seen if conventional banks get big profits then the customer will get a predetermined profit that is 2% no more and the same portion and if conventional banks experience small profits or losses then the customer also get 2% profit too.credit customers also experience the same thing when their business is profitable.

Conventional banks only get 4% of their invested capital even though customers experience a boom in profits, and still pay 4% of the borrowed capital even though their business is being dropped or decreased dependence.

This is different from the pattern applied by sharia banks if the bank gets a big profit then the penabungpun customers will get a large profit for example the ratio agreed 50:50 if the Islamic bank to profit 1 million customers will get 500 thousand banks 500 thousand if the Islamic bank to obtain 1.5 million then the customer earns 750 thousand banks also get 750 thousand, whereas if the bank has decreased keuantungan such as 500 thousand customers only got 250 thousand banks got 250 thousand.

The same is true with financing customers if customers get 1 million with a ratio of 50:50 agreed 500 thousand customers get 500 thousand what if 2 million banks will get 1 million and customers also 1 million and if it decreased the bank's equity as well decreased profits. The fifth indicator is existence

Table 5. Existence

Interest	Profit sharing
The existence of interest is doubtful (if not criticized) by all religions, including Islam.	No one doubts the validity profit sharing.

Source: Antonio [6]

The existence of a flower system is not justified in all of the celestial religions. Both Jews, Greeks, Romans and Christians in [6] are listed in the scriptures of each of these religions, in contrast to the profit-sharing system found no such restrictions as the flower system.

This proves that the system comes from God is the best system then the economic system is also what if you want to be good should use the system that has been in God in God's holy book bukn economics results of human thought alone.

For example, if the solar system that exists in space follows the system or the rules of human beings, of course pelanet-pelanet, the stars, the sun and other celestial objects collide with each other, but because the solar system in the sky follow the system or God rules then there is harmony and balance so there is no chaos.

As to which Allah says in Surah al mulk Verse 3 which means "Who has created the seven heavens in layers. You have not seen the creation of a merciful God of unbalanced things. Then look again and again, do you see something unbalanced?" [7].

Likewise in other living systems not only the economic system alone when applying the system advocated by God through his treatise or scripture then it is certain will be the best system for all living things.

Therefore, in Islamic banking using the system advocated by God does not experience or there is a term negative spread or failure to pay either from the customer or the bank's own financing. Because essentially the existence of a banking institution is an intermediary institution between an excess of funds with a party lacking funds that aims to improve the common welfare, rather than creating the social gap as it is now.

The purpose of establishing sharia banking to answer bahwasannya Islam is a perfect religious teachings that have a system and mechanism way bermuamalah separate, because Islam is a source of values and ethics in aspects of life as a whole [8].

The principle of ketauhidan is the most basic foundation of Islamic economics [9]. This is what underlies the values in the movement of syraiah banks as well as the difference between the conventional system with the sharia bank system

4 CONCLUSIONS

Interest rate system is a system born from human thinking so there are many imbalances of this system. While the profit-sharing system is a system born of God it appears that all religions that come from the sky opposed the flower system.

Of the five comparator indicators, the profit sharing system seems to be more prosperous for the community and the banking sector because the concept of Islamic banking is a holder of the mandate of the deposited funds rather than the owner of the deposited funds.

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The Effect of Loading on The Generator Voltage on The Pico-Hydro Power Plant: Experimental Study

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Abstract. Experimental study: generator loading at a 1 KVA, 400 Volt, 50 Hz, 1500 rpm power plant shows that the frequency and voltage are down slowly due to the inability of the spin of the water turbine to compensate the nominal rotation of the generator. Impulsive and rapid load changes can also cause the voltage drop in the generator. Voltage instability will affect the quality of apparent power generator generated. In this study, the generator is driven by a water turbine at 1500 rpm and loaded 1 kW. The excitation system generator is a self-excitation system. Voltage excitation field 18 Volt generator and excitation current 350 mA. The result of simulation of generator loading at 414.3-1183.2 VA, generator voltage decreases slowly from 399-380 Volt. Generic power generated by generator shows a linear increase of 138.1-394.4 VA. If a load of the generator is raised up to 1183.3 VA, the generator voltage falls to 380 Volts. The real power produced below the nominal is 394.4 VA and the load current is 0.6 Ampere.

Keywords: The Pico-hydropower plant, The generator voltage, Self-excitation and The apparent power.

1 INTRODUCTION

The quality of electric power generated by the power plant must have at least; frequency and voltage in stable condition. At each power plant, the frequency and voltage stability are obtained directly from the generator spin regulation. The nominal spin of a generator is generally 1500 rpm. The inability of the prime mover of the generator to compensate the 1500 rpm nominal spin of the generator,which later causes the instability of the voltage and frequency.

Unexpected changes can also cause voltage instability. The generator has an excitation system that serves to amplify the active voltage field of the generator. On some generator systems, generator voltage settings have been equipped with.

The voltage stability and generator frequency of the Pico-hydropower plant are highly depend on the speed of the water turbine. In turbine hydroelectric power capacity, the rotation arrangement is performed by the power system stabilizer while the voltage regulation is performed by applying automatic voltage regulator.

In the generator voltage regulation system, the excitation system is a must to take into account the voltage stability of the generator. As the load increases, the excitation system

generator serves to control the generator voltage by rearranging the input amount to reach a new equilibrium point.

Voltage stability may affect load performance such as electric motors and lighting, and temperature rise. Basically the stability of the voltage in the power system is the ability of the power system to restore the fixed voltage after an interruption occurs within a certain time. The voltage stability is expressed as the ability of the power system to maintain a fixed voltage along the bus in the system after an error occurs as the initial operating conditions.

The increasing problem in the micro-hydropower system is the fluctuations in frequency and unbalanced voltage profiles generated by generators with unequal loads on the customer side. This can trigger unfavourable effects on various electrical appliances [1].

The effect of the load side of the generator makes the voltage drop slowly under its nominal voltage. In this experiment, the generator is modeled on a Pico hydroelectric generator, when the generator is loaded, the voltage drops slowly and the pseudo generator power remains lit linearly.

If the load is increased to the installed power capacity of the generator, the voltage drops below its nominal voltage and the real power generated by the generator is no longer linear. In this study, the main driving generator used the turbine water simulator 1060 rpm. Installed generator capacity is 1kW 400Volt 50Hz and 1500rpm. Volt d.c

In this study, the prime mover generator uses a 1060 rpm turbine water simulator. The installed generating capacity is 1kW 400Volt 50Hz and 1500rpm. The Volt d.c Generator field excitation voltage is obtained directly from the rectification result a full wave rectifier circuit and becomes the excitation field source of the generator field.

The purpose of this study is to obtain load characteristics against generator voltages due to the inability of water turbines to balance the nominal rotation of the generator on the Pico-hydropower plant.

2 PICO-HYDROPOWER

Pico hydro is a hydro power plant with maximum power output of up to 5 kW. This measure of water power benefits in terms of cost, simplicity of various approaches in design and installation of the design, as compared to larger hydroelectric power plants. The latest innovations in Pico-hydro technology have made them a source of electrical energy even in some rural areas of the world. Because it is a versatile source of power, electricity can be produced by allowing standard electrical equipment. Some electrical devices that can be powered by Pico-hydro are light bulbs, radio, and television[2].

To provide electricity to off-grid areas in the country, the Pico hydroelectric is a very promising option. By utilizing the energy from the waterfall through the steep mountain is the water power. The water that flows is then converted into useful mechanical energy in a way like a water turbine works by using an alternator or generator. Then the mechanical power of the turbine can be converted into electricity.

Hydrokinetic methods of harvesting energy from the flow convert the kinetic energy of flow into mechanical energy by a machine that generates an electric current by a generator mounted on a shaft similar to a wind turbine. Hydrokinetic devices work with the greatest efficiency at locations where the water level is high and the current is relatively stable throughout the year, since the available power depends principally on the current velocity [3].

2.1 Generator Excitation

The main purpose of an excitation system generator is to supply a power source to the rotor field coil. The excitation system produces field currents and is controlled by automatic voltage regulators. This field flow control is important to ensure the generator is on at the appropriate voltage. It also controls the current value when the generator is connected to a large load. This will accept or provide the required reactive power level (kVAr). These are some factors for good running generator conditions.

The important issueregarding the combination of excitation system and automatic voltage regulator are as follow:

- Control the machine voltage accurately in response to slow power changes or reactive var request.
- Limit the magnitude of voltage visits due to unexpected load changes.
- Maintain steady-state stability.
- Ensure transient stability due to system faults.

2.1.1 Excitation System for Generator

Normally, to supply field current the DC generator is used and connected to the synchronous machine by its shaft. As for high-speed generators, a gearbox is used to reduce the exciter speed to its standard, around 700-1000 rpm.

It aims to avoid replacement problems with DC generators. In addition, the ring slip method is a common practice to feed exciter rotor output. This exciter is installed separately from the pilot plus. The overall dynamic performance of the system can be increased substantially by combining field coercion capability and additional stabilization signals.

2.1.2 Self-Excitation System

Self-Excitation Systems Equivalent schemes of self-excitation systems can be represented as series of inductance circuit and winding resistance and voltage source dependent on current circuit current motion as shown in Figure. 2. Self-excitation process consists of two stages. First, the charged capacitor is released through the excitation roll L_f. In the applied generator, the excitation winding parameters are $L_f = 17$ mH and $R_f = 2$ Ω [4].
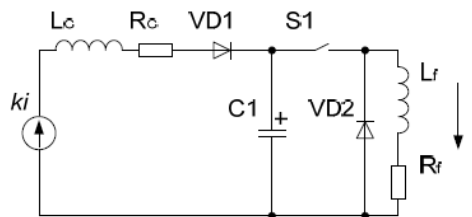
Fig. 1 The self-excitation system equivalent scheme[4]

This stage depends on circuit parameters and capacitor C_1 initial voltageU_{c1}:

$$L_f \frac{di}{dt} + \frac{1}{C_1} \int i dt - U_{c1} - U_{C1} = 0, \tag{1}$$

Where $C_1$is capacity of capacitorC_1.

At the second stage, the capacitor is used as a filter and further self-excitation depends on the rise of electromotive force connected with the rise of current. The scheme can be described as

$$(L_G + L_G)\frac{di}{dt} + i(R_G + R_f - k) + \frac{1}{C_1}\int i\,dt = 0, \qquad (2)$$

The process is developing only if $k > (R_G + R_f)$. Indicator k characterizes connection between the equivalent electromotive force of generator and current in excitation winding and it depends on the rotation speed of generator[4].

The self-excitation system of G1 sync generator with independent excitation is realized (Figure 2) with the L_f excitation circuit connection to the stator phase output through a three phase controlled thyristor rectifier[5].
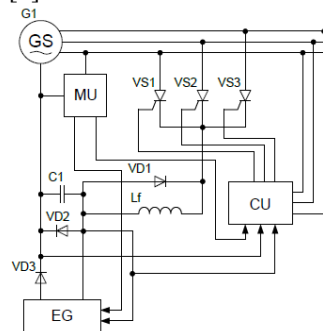
Fig. 2 The self-excitation system of synchronous generator with independent excitation[5].

2.2 Power Quality

Power quality has become an increasing concern for utilities and their electrical customers [6].

In the electric power system, each generator is equipped with a load frequency control (LFC) and an automatic voltage regulator (AVR) to maintain the system frequency and magnitude of the generator output voltage in the desired range when changes are observed in real/reactive [7].

Usually, there are two modes of operation on this plant, ie isolated mode and grid-connected mode. Under good mode, consumers who are fed by a micro power plant need continuous strength with good quality. One quality index is the frequency of the power system. Frequency drift is inevitable due to the imbalance between generation and load. To keep the frequency index within the allowable range, the control mechanism entitled load frequency control (LFC) increases [8].

This abnormal condition determines the voltage and current waveforms characterized by continuous disturbances including spectral content in wide frequency intervals (from 0-150 kHz), with uniform behavior in both time and frequency[9].

3 EXPERIMENT METHOD

The installed power capacity of the generator is 1 kVA, 400 Volt, 50 Hz and 1500 rpm. In this simulation, the water turbine is rotated at 1800 rpm. To obtain the generator voltage curve, the excitation current of the generator is set at 350 mA and voltage 18 VDC. Figure 3.

The Pico-hydropower plant 3-Phase-Generator Voltage Adjustment In the three-phase sync generator, the amount of off-load voltage generated depends on the speed of the revolution and the exciter voltage. The generator rotor is driven by a water turbine.
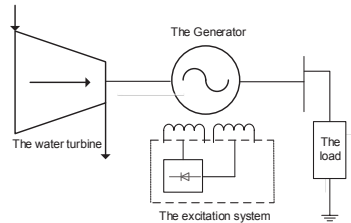
Fig. 3 The Pico-hydropower plant

3.1 Experimental Result

In the three-phase synchronous generator, the magnitude of the off-load voltage produced is dependent on the speed of revolution and the exciter voltage. The rotor of the generator is driven by the water turbine. The stationary magnetic field is induced in the winding rotor with the application of DC voltage.

The rotation of the rotor produces a rotating field for the stator, which induces three voltages in stator windings, 120^0 from phase to each other, generator producing 3 phase voltage. The circuit as shown in the diagram of Figure. 4 is the adjustment of the connection and the 3-phase generator voltage.

Adjust the speed revolution of the pico-hydropower to 1500 rpm, using the valve control of flow rate. Adjust the exciter current 200 to 400 mA and keep it constant during this measurement.
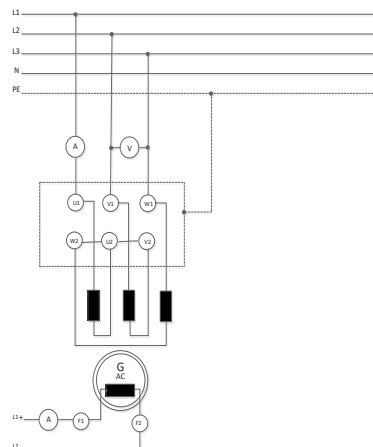
Fig. 4 Connection and voltage adjustment

In Table 1 shows the result of the measurement of the generator voltage based on the change of the excitation current in the no-load state.

Table 1. Change of excitation current to generator voltage

n (rpm)			1500		
I$_{Exc.}$ (mA)	200	250	300	250	400
V$_{Gen}$ (V)	255	310	355	400	445

At 320 mA exciter current, the generator produces its nominal voltage of 380 V (when under no load). As the exciter current increases, the magnetic field in the rotor becomes larger. Thus, the generator consumes more energy and the revolution speed of the drive machine is produced. Figure.5 shows the generator voltage curve generated based on the change in the excitation current of the generator.
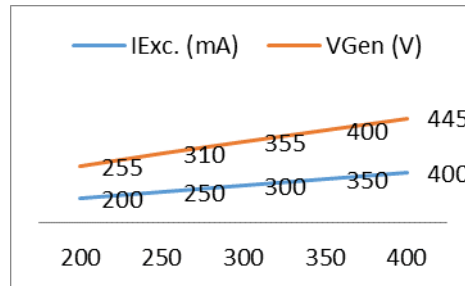
Fig. 5 The Curve of the generator voltage

3.2 Load Characteristics of generator

The voltage produced by dependent on the exciter current and the speed of revolution. The frequency of the generator voltage is proportional to the revolution speed.

$$f\ (Hz) = \frac{n\ (rpm).p}{60} \tag{3}$$

Where=number of pole pairs = 2

To be able to generate the usual mains frequency 50 Hz, the generator must be driven at 1500 rpm. The magnitude of the generator voltage is adjusted by the exciter current.

Because of to the low revolution speed, the exciter coils of the salient-pole machine are packed tightly, as in DC machine. The rotor is also referred to as a pole spider; it has an amortises winding which is in the form of individual rods. At each end, short-circuit ring connect the rods together. The rotor is similar to a three-phase cage rotor asynchronous machine.

The circuit diagram is illustrated in Figure 6. Set the load to 100% and adjust the speed revolution of the Pico-hydropower to 1500 rpm, using the valve control of flow rate.
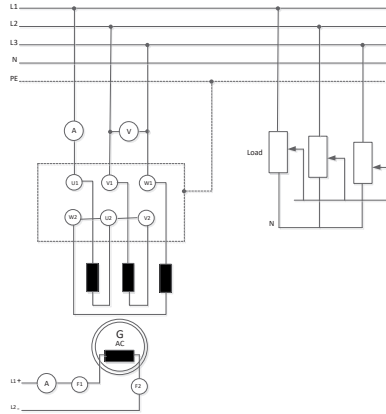
Fig. 6 Loading on the generator

Adjust the exciter current to 350 mA and keep this also constant during the measurements. Increase the loading on the generator by reducing the load. So that the values of current flow, as given in the Table. 2, are produced.

Table 2. Change the excitation current to the generator voltage with the load.

n (rpm)	1500			
$I_{Exc.}$ (mA)	350			
I (mA)	200	300	400	600
V_{Gen} (V)	399	396	392	380
S (VA)	138.1	205.5	271.3	394.4
S_{Load}(VA)	414.3	616.5	813.9	1183.2

When the generator loading at 414.3-1183.2 VA, the generator voltage decreases slowly from 399-380 Volts. Generic power generated by generator shows a linear increase of 138.1-394.4 VA. If the generator load is raised to 1183.2 VA, voltage drop off rapidly. The apparent power produced shown, the curve of apparent power flatters as in shown Figure 7.
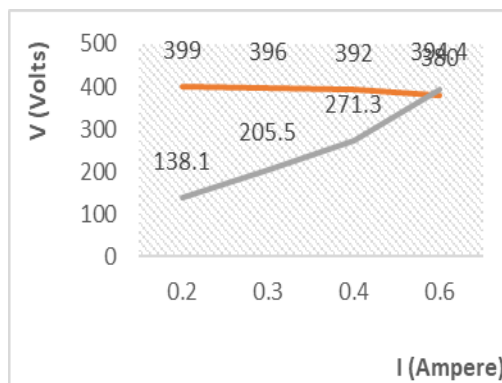
Fig. 7 The Load characteristics generator

4 Conclusions

When under load, at 320 mA exciter current, the generator produces its nominal voltage of 380 Volts. As the exciter current increase, the magnetic field in the rotor becomes greater. Thus, the generator consumes more energy and the revolution speed of the drive machine is produced.

When the generator is loaded, the voltage falls slightly until the point the nominal apparent power is reached. If the load on the generator is further increased, the voltage drops off rapidly. The apparent power produced shows, initially a linear increase. As the load increase, the curve of apparent power flatters.

ACKNOWLEDGEMENTS

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Selection of Plastic Waste Recycling Material Suppliers By Means of Analytic Hierarchy Process

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Abstract. The aim of this research is to determine how to manage the capability level for compliance of plastic waste as part of a raw material for the manufacture of plastic chips by the supplier by using a analytical hierarchy process (AHP). The research clarify the process from purchasing the raw materials, production, storage until selling the plastic chips to the end buyer. The research will prescribe the sequence of supplier performance in terms of providing raw material by using a hierarchical analysis process. The analysis outcome of the process hierarchy matrix obtained that the order of supplier which can meet the requests of the manufacturer is a supplier 1, 3, 2 and 4, in which the first dealer/supplier has the highest value. The sequence is the most reflective reflection for the satisfaction and compliance of production needs required by the manufacturer in this moment. Criteria for the assessment on a transaction of this plastic waste are: the type of plastic waste, price, colour, quality and quantity. The research is performed in one district in the province of Aceh, Indonesia. Wider scale should be conducted in the future. This research can help the manufacturer the better decision that they can manage in the future to run the manufacturer business of plastic waste conversion. This paper contributes to help the plastic waste business such as manufacturer, suppliers, others related to this activity.

Keywords: Analysis Hierarchy Process Matrix, Suppliers, Industrial Processing Waste Plastics and Plastic Chips.

1 INTRODUCTION

The process of establishing supply chain and management has a very important role as the business transformation of conventional systems to new systems. Many studies have performed a review of the supply chain with different levels of success and, more importantly, it positively impacts on the implementation of supply chain (SC) activities to the company in overall activity. SC and logistics activities can help develop strategies to minimize risks, help fix SC problems, and can avoid complex and inefficient problems that can certainly impact the biggest losses for the company.

To support the processing of plastic products required many sources of plastic waste that actually exist in the community and surroundings. Nevertheless, industry of the plastic waste processing into plastic chips are common and many in Aceh. Along with this, garbage collection activities, especially plastic waste, are something we often see in our environment and also in garbage collection and garbage dumps.

The chain process of collecting the plastic waste is tiered from scavengers either using collectors sack or basket at the back or scavengers simple pedicabs every day to accumulate the plastic waste and subsequently sold to the collectors who in this activity is regarded to as the collecting agent. The collectors are also divided ranging from small-scale of collectors, medium, up to large scale or in a chain of activities is also a small collector is further selling plastic waste collected to the large agency or sold to other manufacturers for processing into chips.

Furthermore, after the chips, plastic products produced by local manufacturer are then sold to other larger manufacturers and of course a large manufacturer of plastic chips will then process it into finished plastics products that have higher sales value. All activities are initiated from the collection, storage, sale and subsequent processing and distribution all together is a chain of important events that have sustained economic value. Of course, these activities from the supplier to the consumer until ending of industrial chain of activities which are integrated into a networking activity, namely the SC, or better known as SC management.

2 LITERATURE REVIEW

2.1 Supply Chain Management

Set of connections of facilities and activities that concerned with conveying a manufactured goods from raw materials all the approach through the customer is called as a SC. When it involves planning and organizing substance, parts and finished product distribution from the suppliers to the consumers it is known as SC management [1]. SC management requires effective knowledge management to attain competitive advantage and it also represents the sustainability perspective in the decision-making process [2]. In 1970s Thomas L. Saaty has developed a decision method which is known today as AHP. AHP assists organization to find one of the best suits their objective and perceptive of the problem. Thus, definitely provides a wide-ranging and reasonable agenda for structuring a decision problem, for replecting and quantifying its elements, for concerning those elements to overall goals, and for evaluating alternative solutions [3]. Korpela *et al.* [4] using the AHP for the allocation of production capacity, while Aghezzaf [5] uses relaxation Langrangian for the plant site selection and planning capacity, also Jung *et al.* [6] used a simulation technique and many varieties of methods used to overcome the problems in SC management.

SC management is more persistent on the integration and organization of the stream of commodities and services and the flow of information through the SC to create it more reactive to consumer needs while reducing the total cost by Russell and Taylor [7]. According to Li Ling [8], the SC is sequence of activities and decisions are interconnection inter each other to integrate suppliers, manufacturing, warehouse, transportation services, retailers and consumers more efficiently. It can be concluded that the goods and services can be distributed in the amount, timing and precise location to minimize costs in order to fulfill the requirements of the end consumer.

One of the keys to success and an important thing to be considered by the company is the distribution activities because the activity will directly affect the distribution cost of the SC and consumer needs. The proper distribution network be able to used to achieve various objectives of the SC, ranging from low cost to high response against customers requested [9].

In the business sector, it is seen the impact of an increase in a competitive market environment and the kind of adaptive strategy needed to succeed in a dynamic business environment to make continuous changes. Success in a competition will be determined by the level of success in building and maintaining cooperation and alliances [10]. SC management will greatly depend on coordination between enterprise and business interactions related products, services, financial resources and information. The objective of the SC management is to coordinate relations between actors in the SC, which creating an organized manner in the SC to interact with one another. The scope of the SC will depend on the consensus of the actors involved in building relationships in the SC system.

The SC must develop the ability to adapt to different and changes environmental in order to face the increasing competitive business environment and high uncertainty in the market. The required design is an adaptive SC and it is capable to respond to the market environment which is easy to change.

Moreover, there are several resemblance and distinction between SC management and logistics management. The equation of the two, namely: (1) Concerning both organizing of the stream of commodities or services, (2) Both are concerned about purchase, movement, storage, transportation, administration, and allocation of commodities and (3) Both involve efforts to rectify the efficiency and effectiveness of the management of goods.

2.2 Analytical Hierarchy Process

Saaty [11], the basis of the AHP is a concept that restricted to the scope of the environmental problem, which using a mathematical approach as the basis of this concept and also use a structured by using a consistent matrix approach and associated with eigenvector's and generate the corresponding weights [11][12].

The application of AHP has been lengthily used in making decisions to solve various problems, which this approach by using multiple criteria in a system consisting of various levels [13]. This mode has the capability to resolve the various problems with complex structure, multi-person, multi-attribute, and the problem of multi-period hierarchical [14]. In addition, the AHP is very useful in making decisions that complicated and complex where at times the goal to be taken were conflicting and differently to get a consensus decision [15]. AHP method can help in make a decision to resolve the various problems such as supplier selection, in which case they are to pick the greatest combination of suppliers [16].

Omkarprasad and Kumar [17], the AHP approach are the method that provides the criteria ranked according to the needs of buyers who also leads to more informed decisions on supplier selection. Some of the main advantages of utilizing the AHP technique are where buyers get a good overview of the performance of suppliers using criteria hierarchy and evaluating suppliers.

According to Yahya and Kingsman [18], The AHP method was introduced by Saaty used for decision-making to decide priorities in choosing a supplier. AHP application can be widely used in making a variety of decisions, in which involve multivel criteria in a system of various levels. From AHP feature, then generates a numerical priority of subjective knowledge expressed in the pairwise proportion matrix estimates. This method is also used and is very useful in evaluating the weight of suppliers in the field of marketing activities or in providing

its ranking. Nevertheless, it is still considered to be not easy to decide the weight and the corresponding sequence of each alternative.

In the AHP application, also requires the use of data based on the experience, knowledge and subjective judgment on a decision by the decision maker. There are some disadvantages of using this method that does not judge the risks and uncertainty of the ability of suppliers [14].

AHP is a measurement theory to handle the quantitative as well as insubstantial criteria that have been utilized to various fields of science, for instance decision theoritics and clash decision [19]. AHP is a solving the problem structure and have a systematic procedure to represent the elements of each issue, [11]. AHP is created based on three main principles, namely: decomposition, comparative assessment and creation of priorities. In AHP begins by describing a complex, multi-criteria problem into a chain of command in which each one of stage consists of elements that are managed by some of the decomposed into group of elements [20]. Afterwards, using a measurement methodology for arranging the priorities among the elements in all phase of the hierarchy. The final step in using AHP is to create the priority elements to build the overall priority to get an alternative decision. AHP is different from the conventional decision analysis methodology which does not require decision-makers to be able to guess the numerical development as a subjective judgment is easily included in the process and assessment can be done in verbal mode [21].

2.3 Logistic Performance and the Criteria for Supplier Selection

Initially the management of SC management and logistics operations are defined similarly, as both focus on the effective performance of the activities related to the optimization of the distribution and manufacturing and accelerate the flow of inventory and information through a channel system [22]. Therefore, a lot of writers who have used the words of SC management and logistics as a synonym. For instance, Thomas and Griffin define SCM as materials management and information flow in the form of facilities, such as vendors, assembly plants, manufacturing and distribution centers [23].

Rapid changes occur in almost all markets, where suppliers have to be flexible to restructure their logistics networks in a very short period of time. Therefore, business process reengineering (BPR) has received its site among essential approaches when improving or reorganization issues such as SC. According to a survey of the permanent needs of the European Logistics Association for re-engineering the logistics process has been received by European logistics leaders and other manufacturers who will follow future trends, (G. Roux, 1997).

Fawcett et. al., [24] depiction of the achievement of the logistics company's size is about the key factors are cost, quality, delivery, flexibility and innovation. This is not an easy decision to make because there are many different criteria for a good partner. Criteria to develop partnerships with the SC organization members is usually driven by expectations of quality, cost efficiency, dependency shipping, volume flexibility, and customer service information [25]–[28]. In different types of companies, there are different special requirements in terms of vendor evaluation. For instance, in the Europe automotive industry, logistics, supplier performance measurement functions include information management, the approach of clarification and formulation, supplier motivation, communication, alignment and coordination, assessment making as well as priorities, and learning [29].

3 METHODS

The methods and problem-solving approach in which the stages of research to be conducted in this study are as follows:

1. The SC activity that begins with the collection of plastic waste, collected by agents and distributors (collectors) and then sold to producers for processing and then sold to end buyers is another major producer (plastic conversion industry) to be make into diverse types of plastic end products. So part of this activity is a collection from begin to finale processing and sales, including in this transportation service deliver logistics to the destination.
2. Plastic waste suppliers are plastic waste collectors, both small and large scale collectors are somewhile related to as plastic waste collection agencies. Sometimes scavengers can collect waste in relatively small quantities and there is agreement between producers and suppliers (including scavengers).
3. The raw materials in this research is plastic waste that consists of various types, colors, quality and price which will then be used as plastic waste processing materials.
4. The product referred to in this research is plastic chips produced from the processing (production) by using a grinding machine.
5. There are many types of plastics waste are sold by the supplier, but the type that interest the buyers in the market is the type of PP cup and PP injection (polypropylene), PET bottles (Polyethylene Terephthalate) and HDPE (High Density Polyethylene), and others. All raw materials (waste plastic) are made from plastic waste of various kinds of products and consists of a various kind of colors.
6. AHP is used as model approach. With a decision matrix that is used as a tool for decision making on suppliers (distributors) raw material of plastic waste that the best one which will be helping manufacturers to make decision in purchasing.
7. SC intended in this research is described how the process of information that occurred beginning with the purchase of raw materials, production, storage and sales of plastic chips to the end buyer. For a better explanation, the SC will be described the flow of the SC data information.

4 Discussion and Analysis

4.1 SC Mapping (Raw Material Waste Plastic into Chips Plastic)

The production references in this research needs to be traced the flow of SC system behavior in processing plastic waste processing industry into plastic chips (at producers). It is needed to know first the flow of data and material (feedstock) in clearly and detail. Therefore, it is needed to do the mapping of data and information flow of raw material in several levels. The first level clarify the stream of data and materials in the system in general and the second level defines a more comprehensive flow, and so forth until the flow is completed detailed or can not be specified again.

a. Information flow and Plastic Waste Data. General
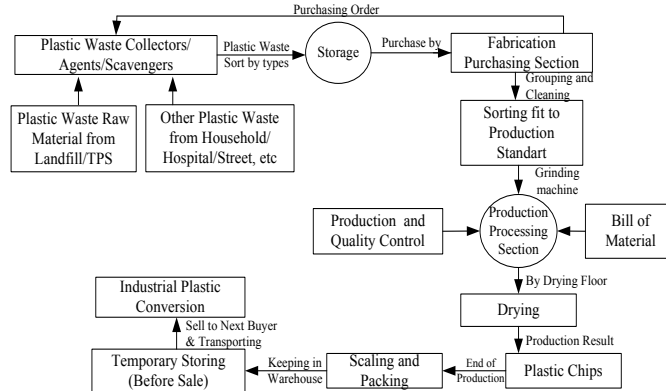
Fig. 1 Presented at The 1st Almuslim International Conference On Science, Technology, and Society (AICOSTS).

b. Data Information Flow and Plastic Waste Purchase.
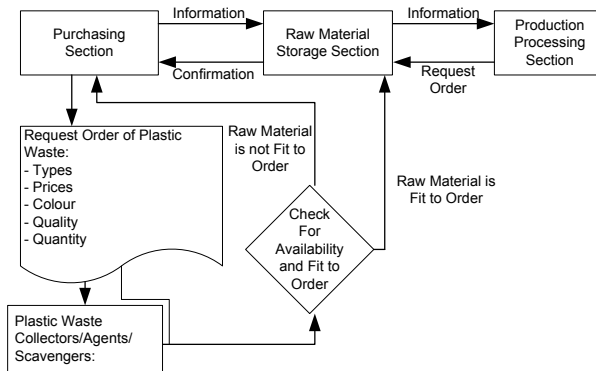
Fig. 2 Figure 2. Presented at The 1st AICOSTS.

c. Information Flow of Plastic Waste.
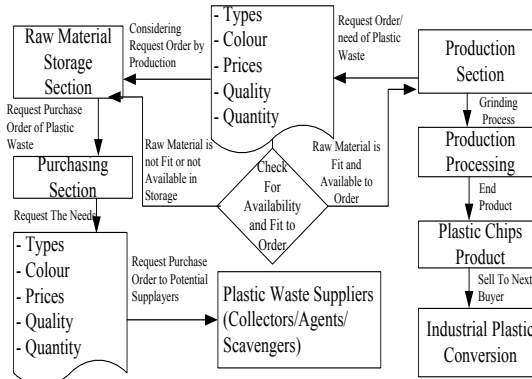
Fig. 3 Presented at The 1st AICOSTS.

d. Data Information Flow and Plastic Waste Purchase Raw Material (inventories).
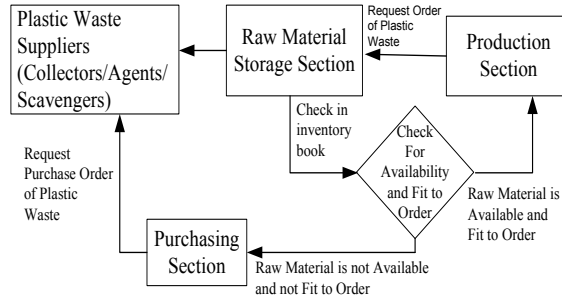
Fig. 4 Presented at The 1st AICOSTS.

e. Information Flow and Plastic Chips Inventories.
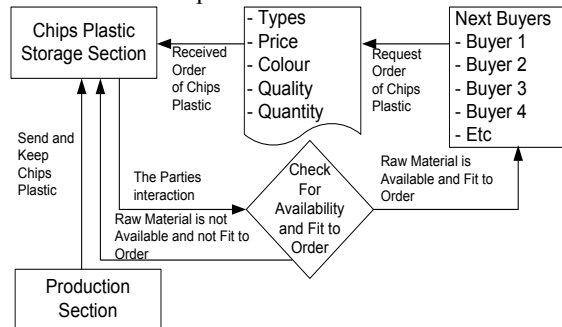
Fig. 5 Presented at The 1st AICOSTS.

4.2 Plastic Waste Suppliers

The supplier of plastic waste in the waste business and the processing industry consists of collecting agents (distributors). Once the plastic waste is sorted and cleaned, plastic waste will be collected in a sackcloth to take home before the sale. In general, collection agency activity does not own a formal business entity except the plastic waste processing industry has business entities such as UD, cooperatives or other government agencies. Consequently, in order to assist the assessment, then to group these suppliers will be coded with (S1, S2, S3 and S4), the coding is shortened in such a way in order to create it easier to make an assessment.

4.3 Plastic Waste Suppliers Assessment

Assessment criteria in SC activities are a reflection of SC activity. The criteria are plastic waste type, price, colour, quality, quantity, and delivery time. Usually industrial / manufacturing considerations in purchases and transactions vary from one manufacturer to another.

4.4 Plastic Waste Suppliers Assessment

AHP is a model that will be used in data processing, where the assessment will be given the criteria and sub criteria weight. The AHP model is appropriate to apply to cases that are relatively difficult to make and complex decisions using multiple assessment criteria.
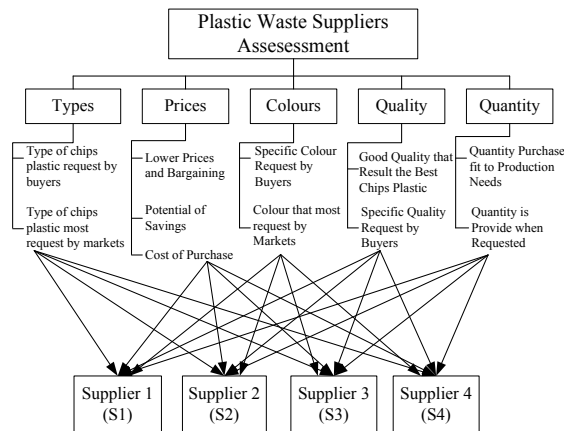
Fig. 6 Criteria and Sub-Criteria Assessment of Plastic Waste Suppliers With Approach Analysis Hierarchy Process (AHP) Structure (Modified from The 1st AICOSTS).

4.5 Plastic Waste Suppliers Assessment

At the AHP structure, assigning weights to each criterion, namely by way of comparison in pairs. Wherein if the assessment between the both criteria considered equally important as it is rated 1 for both criteria, whereas when there is a difference which one is more important, these criteria are given greater value than the others, namely 3, 5, 7, or 9, in accordance with level of importance of the other criteria into comparison.

Table 1. Pairwise comparisons Of Plastic Waste (Raw Materials) Supplier Selection. (Modified from The 1st AICOSTS).

	Types	Prices	Colours	Quality	Quantity
Types	1,00	1,00	3,00	1,00	3,00
Prices	1,00	1,00	2,00	1,00	2,00
Colours	1,00	0,50	1,00	0,50	2,00
Quality	0,50	0,33	1,00	1,00	2,00
Quantity	0,33	0,20	0,33	0,33	1,00
Total	3,83	3,03	7,33	3,83	10,00

At this stage compares the criteria for the purchase of raw materials of plastic waste and assessment of the level of priority (comparative) or which become more important relative to one another criterion, namely the criteria of the type, price, color, quality, quantity and time of delivery of the raw material of plastic waste.

Table 2. Weight Calculation of Each Criterion (Modifications of the First AICOSTS).

	Types	Prices	Col	Qual	Q'ty	Weight
Types	0,26	0,33	0,41	0,26	0,30	0,31
Prices	0,26	0,33	0,27	0,26	1,00	0,42
Col	0,26	0,16	0,14	0,13	0,20	0,18
Qual	0,13	0,11	0,14	0,26	0,20	0,17
Q'ty	0,09	0,07	0,05	0,09	0,10	0,08

From the table above, obtained weighting of each criterion are sequenced: 0.27; 0.23; 0.15; 0.18; 0.07 and 0.10.

4.6 Plastic Waste Suppliers Assessment

Assessment of suppliers made by the buyer has consideration of types of plastic waste, price, color, quality, quantity and delivery time. After the manufacturer considers these criteria, the manufacturer will consider buying plastic waste.

The next stage is to weigh up the weight value of each supplier. The value is obtained by summing the results of multiplication of the burden of each sub-criterion is concerned.

Table 3. Final Suppliers Assessment (Modifications of the First AICOSTS).

Citeria/Sub-Criteria	Weight	Supplier 1	Supplier 2	Supplier 3	Supplier 4
Types	**0,30**				
(T1)	0,20	0,345	0,125	0,255	0,275
(T2)	0,11	0,277	0,156	0,334	0,233
Prices	**0,26**				
(P1)	0,12	0,637	0,124	0,135	0,104
(P2)	0,09	0,267	0,276	0,176	0,281
(P3)	0,05	0,231	0,311	0,323	0,135
Colours	**0,17**				
(C1)	0,09	0,313	0,215	0,357	0,115
(C2)	0,08	0,274	0,197	0,276	0,253
Quality	**0,19**				
(Q1)	0,08	0,471	0,211	0,216	0,102
(Q2)	0,11	0,383	0,276	0,139	0,202
Quantity	**0,08**				
(Qt1)	0,03	0,376	0,219	0,212	0,193
(Qt2)	0,05	0,289	0,319	0,201	0,191
The Final Weight Value		**0,362**	**0,202**	**0,237**	**0,199**

As shows in the table supplier assessment above, the supplier 1 has the highest value of 0.359, followed by the supplier 3 with a value of 0.235, supplier 2 with a value of 0.205 and suppliers 4 with a value of 0,201.

5 Conclusions

Based on analysis by using scorecards and gap analysis models it can be concluded as follows:
1. Based on the results of calculations by AHP and model of supplier evaluation form to rank several suppliers based on several criteria. The order of suppliers based we provide 1, 3, 2 and 4, in which the highest value is first supplier with the value 0.362, followed by the supplier 3 with a value of 0.237 , supplier 2 with a value of 0202 and suppliers 4 with a value of 0.199. The sequence is a reflection of the most satisfying and fulfilling production needs.
2. Most of the current problems are getting raw materials that fluctuate and price compete between one supplier to another supplier. In addition, plastic waste raw materials are sometimes difficult to obtain because it competes with other potential buyers, especially

from other areas such as Medan. These conditions will create a very tight competition and potentially disrupt the stability of raw material supply in the region of Aceh. This is definitely very disturbing the SC, especially for processing plastic waste into plastic chips in serround of Aceh today.

3. To meet the requirements of raw materials for manufacturing, manufacturing (processing industrial waste into plastic chips), cooperation with many suppliers to get some sort of plastic waste that is needed by the producers where demand is a reflection of the buyer. Demand in the plastic industry is transformed into a final plastic product, undertaken to keep the production (capacity) needs of both short and lengthy period.

4. Loyalty of suppliers sometimes is a problem because in this matter the effect of market mechanisms, where the highest bidder (the best) will obtain raw materials more quickly.

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Relationship Analysis of Demography Characteristics on Female Workers' Income of Couturier Business in Banda Aceh

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Abstract. This research was conducted to answer the problems in the field of entrepreneurship especially couturier business, so it can be the concept of increasing the income of female workers in the couturier business. Data analysis in this research was done by using analysis model of Cross Tabulations (Crosstabs) by using Chi-Square (X^2) test. Based on the result of research, it indicated that there was a significant correlation between monthly incomes with age of female workers. The chi-square test (X^2) also showed that there was no significant relationship between monthly income and the formal level of female workers. Meanwhile, a significant relationship was shown between monthly income and marital status of female workers. The result of testing using chi-square test also showed that there is a relationship between monthly income and the number of dependents of female workers' family

Keywords: Demography, Female Workers, Couturier

1 Introduction

Indonesian women with the number more than half the population of Indonesia, is a potential human resources in development. However, the potential of women that is relatively large has not been utilized, especially in productive activities. The productive activities here is what is commonly called as working or doing an activity or assisting in doing some activities in order to earn income or revenue. Women, in their own decision, being participated in the labour market not only influenced by marital status but it is also influenced by demographic characteristics of age, residence (city/village), income, religion, education level, number of family dependents, husband's income level (for those already married), the women's education themselves as well as the regional unemployment rate. The main problem of female workers is the low social background which requires women to work.

In addition, the increased participation of the female labour in the labour market does not occur by chance. The increase in the percentage of working women is caused by two main factors, namely the increase in supply and demand sides [1]. In terms of supply, it is caused by the improvement of the level of education of women and it is also caused by the decline in the number of births. It is also encouraged by the increasing social acceptance of women who are working outside the house. From the demand side, economic development (from the

production side) requires female labour such as in textile and garment industries. While other phenomenon that increasingly encourage the entry of women to the workplace is due to the high cost of living if it is only supported by one family income buffer (One Earner Household). This phenomenon has emerged and has been clearly visible especially in families in urban areas.

According to data from the Central Bureau of Statistics (BPS) Banda Aceh, the number of women including the labour (female population aged over 15 years and for those who worked) is quite large, 14,682 people. The results of SUPAS (Intercensal Population Survey) 2015 shows that the number of women who have not/never attended school is 105 people, while the number of women who do not/have not finished elementary school is 171 people. Meanwhile, the number of women who graduated from elementary school is 833 people which is lower than the number of women who graduated from junior high school, 1,397 people. However, the number of woman labour in Banda Aceh who graduated from senior high school is 6,330 people, it is bigger than those who graduated from university, 5,821 people.

Increased Women's Labour Force Participation Rate is also affected by changes in the education level of the workforce, whereas the female work force of elementary and junior secondary education has lower participation rates than well-educated women or undergraduates. The development of science and technology has helped women to run various business in accordance with the skills they have. The current business of many women is couturier business. By opening this business, it will expand employment and business opportunities and it will improve the prosperity of artisans through the increase of revenue.

Couturier business is one of the handicraft businesses that has prospect in the future and it is a business done at leisure time, whether it is done outside or at home with the aim to increase family income, so that the business is increasing day by day. Along with the time, the need for clothing is not just to cover the body, but it has other functions such as for beauty, and aesthetics. The need for clothing is also increasing because of many activities outside the house. So the emergence of couturier business aims to meet the needs of people's clothes.

2 Theoretical Review

2.1 Demographic Characteristics

2.1.1 Age Factor

According to Sumarsono, the behaviour of the workforce is varied based on age group [2]. The publications of the Central Bureau of Statistics (BPS) divide the group into classes with 5-year interval classes into three age groups:

Young	aged 10-24 years
Excellent	aged 25 - 60 years
Old	aged over 60 years old

The youth labour force is usually unstable and its association with the labour market is still not strong. At this age, there is still another alternative in their time allocation of school. While the labour force group of excellent age is usually at this age that a person must work because of the demands of family responsibilities or because already invest their time to work then they are required to be active in the labour market. Meanwhile, for the age of 60 years old and over, for some people, is the period of resignation from the labour market where the level

of health is still low so that at the age, they are less able to be active in the labour market physically.

2.1.2 Education Level

In general the type and level of education is considered to represent the quality of labour. Education is a process that aims to increase skills, knowledge and increase independence and the formation of a person's personality. The things that are attached to the person is the basic capital needed to carry out the work. The higher asset values leads to a better ability in working. Their productivity is supported by education. Thus education can be used as an indicator of labour quality [2]. The level of education in Indonesia used by the Central Bureau of Statistics (BPS) is:

    a.   No school
    b.   Do not finish school
    c.   Primary school
    d.   Junior high school (public)
    e.   Junior high school (vocational)
    f.   Senior high school (public)
    g.   Senior high school (vocational)
    h.   Diploma Program (1 year, 2 years, and 3 years program)
    i.   University

2. Number of Family Dependent
3. Marital Status

2.2 Wages and Salaries

One of the major forms of labour welfare is wages. Wages are essentially all remuneration or remuneration given by the enterprise to workers for services or work performed in a working relationship. The wages include direct financial rewards such as basic wages or salaries, allowances, incentives and indirect financial rewards such as social security, facilities, or non-financial rewards such as challenging jobs and career opportunities. Therefore, it is clear that wages are a very important aspect of employment.

According to the Council for Wage Research, wages constitute acceptance as a reward from the granting of labour to the acceptance of work for a work or service which has been and will be performed which serves as a guarantee of viable survival for humanity and production that is expressed or valued in terms of money set by a agreements, laws and regulations and are paid on the basis of an employment agreement between the employer and the recipient.

In Government Regulation No. 14 of 1993 defining wages are as follows: "Wages constitute as an acceptance in return for the employer to the worker for a work or service which he has or will do, declared or assessed in the form of money stipulated in accordance with a process of purpose or legislation and paid on the basis of an employment agreement between the employer and the labourer , including benefits for both the workers themselves and for their families ".

The Work Accident Law of 1992 Number 3 defines that wages as payments in the form of money received by workers in exchange for employment. Meanwhile, according to Poerwono

[3], wages are the total amount set as a substitute for services that have been issued by the worker covering a certain period or conditions.

Wages or salaries can be viewed as rewards or remuneration to workers of the output produced. This reward or service, on one hand, is a right to be earned by workers, but on the other hand is an incentive to increase productivity [1].

2.3 Wage System

The theory underlying the wage system can be basically distinguished according to two extremes. The first extreme is based on Karl Marx's teachings on theory of value and class disagreement. According to Karl Marx, he states that only labour is a source of economic value. The value of an item depends on the value of the labour service or the amount of working time used to produce the goods. The second extreme is based on the theory of the addition of marginal products (Neo Classics) which is based on the assumptions of the free economy. Classical Neo Theory suggests that in order to maximize the profits of each entrepreneur using the factors of production in such a way that each factor of production used to receive or be rewarded by the value of the increase of marginal results of the factors of production. The employer employs a number of employees in such a way that the value of one's marginal return is equal to the wage that the person receives. The wage system in various countries including Indonesia is generally between the two extremes.

The basis of the remuneration system in Indonesia is the Constitution, Article 27, paragraph (2). The wage system in Indonesia is generally based on three wage functions [4]:
1. Being able to guarantee a decent life for workers and their families.
2. Reflecting rewards for one's work.
3. Providing incentives that can encourage increased work productivity and national income.

Earnings or remuneration received by an employee or worker in respect of his work may be classified into the following forms:
1. Wages and salaries in the form of money.
2. Allowances in kind.
3. Fringe benefits (additional allowances).
4. The condition of work environment.

Wages are basically the main source of one's income, therefore wages should adequately meet the needs of the workers and their families appropriately. This feasibility can be assessed and measured with Minimum Living Needs (KHM).

2.4 Couturier Business

The Directorate of Vocational Secondary Education of the Department of Education and Culture states: "Couturier is a sewing business done by individuals and is an side-line job". Wancik [5] mentions: "Couturier is a model expert and a dressmaker for women (where women's clothes are sewed)".

From the above statement, the current couturier develops not like the old couturier, just as a side-line job. But today's couturier is a model master and a tailor of women who make her couturier business as the main job or a place to earn a living and increase family income. Today couturier business is also managed by many women to utilize the skills they have to add experience as well as increase family income.

Business is an activity that can produce quality goods and carried out continuously, meaning the activities of holding goods or services or facilities for sale with the aim of obtaining optimal benefits. According to Sutjiono [6], "Business is a work done in succession according to certain rules or rules to achieve goals".

The current couturier business is developed as a source of income, with the current economic situation making couturier busines must be able to develop themselves by improving the skills and creativity of the workers. Couturier business today is not as a side-line work done by mothers and young women in their spare time, but couturier business as one source of income that is able to meet the needs of families and able to hire other people who have skills as labour to earn income.

2.5 Terms of a Couturier Business

According to the Directorate of Vocational Secondary Education of the Ministry of Education and Culture: "In a couturier business all work ranging from organizing, cutting up to completion is done on its own. Usually with simple equipment and assisted by 2 or 3 employees only ".

From the above explanation it can be understood that the couturier business develops its business by using simple equipment and assisted by its employees. Nowadays couturier business has developed in accordance with technological developments, couturier business today using more modern equipment. Couturier Business must have employees because the couturier business terms is in completing orders assisted by employees and the more advanced a couturier business can be marked by the increase of employees and equipment needed for order completion

2.6 Workforce

The labour concept used in Indonesia is in accordance with the concept suggested by the ILO (International Labour Organization), which is to divide the population into two groups: working age and non-working age population. The working age population is divided into two groups based on ongoing activities, namely the labour force and not the workforce. In Indonesia, generally, the meaning of labour is the population aged 15-64 years. According to the Central Bureau of Statistics (BPS), workers are residents aged 10 years and above.

The workforce is everyone who belongs to the working group in accordance with the relevant state labour law [7]. Meanwhile, according to Suroto [8], the labour force is part of the population in working age who have jobs and who do not have a job but effectively or passively find a job.

The workforce is the number of working population and job seekers [4].

Provision of TK = Workforce = Supply TK

Labour Force = Working + Unemployment

According Sumarsono [2], the workforce is part of the workforce who really want to work to produce goods and services. In Indonesia the workforce is a population aged 10 years and over who really want to work. Those who are willing to work consist of those who actually work and those who do not work but are looking for work.

2.7 The Job Market

The job market is a process whereby the occurrence of placement / employment relationship through the supply and demand of labour. Someone in the job market means he is

offering his services for production, either in a job or looking for a job. Furthermore, the magnitude of labour demand and supply are influenced by the wage rate.

According Sumarsono [2], the labour market is all the activity of the behaviour of actors that bring together job seekers and job vacancies. These actors consist of: (1) Employers who need labour; (2) Job seekers; (3) Intermediaries or third parties that make it easy for employers and job seekers to connect with each other. The intermediary function can be done by government agencies (Labour Department) or consultants

2.8 Job Opportunity

Job opportunities describe the size of the household company's willingness to employ the labour required in the production process. The magnitude of this willingness can be measured by the number of people or the number of hours [9].

Job opportunities according to Esmara [10] can be defined as the number of working people or people who have already got a job. The more people working the bigger job opportunities are. The job opportunities are also a condition in which a resident can undertake activities to get service or income for a certain period [11].

Meanwhile Prayitno [12] defines job opportunities as a place for a workforce that gets a rewarding job. The job opportunities can also be defined as positions that are generated both inside and outside the company as a result of investment and population growth and workforce on the one hand and the rate of investment growth on the other hand will affect the problem of unemployment and expansion of job opportunities [13].

3 METHODS

The research was conducted in Banda Aceh City which is the Capital of Aceh Province. This research discussed about female labour in Banda Aceh City. The discussion of this study was limited to the problem of the influence of demographic characteristics on female workers' income. The workers, in this case, are female worker who have worked in the industrial sector of couturier business in Banda Aceh City.

The research was conducted quantitatively with descriptive research design. Descriptive design aims to explain something, such as: explaining the characteristics of a relevant group, estimating the percentage of a core in a particular population that exhibits certain behaviours, knowing the perception of product characteristics, knowing how much a variable is related to and for knowing specific predictions [14]. In this research, the researchers wanted to analyse the relationship between demographic characteristics variable on female workers' income.

The type of data used were primary data and secondary data. The primary data was obtained through interviewing the respondents who are female workers and using a list of questions that have been prepared previously. The secondary data was obtained from indirect sources. This secondary data was obtained from the Central Bureau of Statistics (BPS) of Aceh, the Social Service and Labour of Banda Aceh City, the Office of Labour and Mobility of Aceh Province and various libraries that can assist in discussing the existing problems.

Respondents in this study were female labour force who work as an employee in the couturier business in Banda Aceh City. The number of respondents taken as sample was 50 respondents from 50 couturier business located in Banda Aceh City. The subjects chosen purposively (purposive sampling) with the following criteria:
1.   The couturier business that has 2 or 3 employees

2. Can produce a minimum of 5 pairs of stitches within 1 week
3. Have a customer who remains at least 20 customers.

In analysing the data for this research, the researcher used Crosstabulations (Crosstabs) analysis model using Chi-Square test (X^2) [15]:

$$x_n{}^2 = \sum_{i=1}^{n}\left(\frac{X_i - \mu}{\sigma}\right)^2$$

4 RESULTS AND DISCUSSION

Banda Aceh is the capital of Aceh province. After tsunami in 2004, Banda Aceh city has an area of 61.36 km2 with a population of 259,913 people and population density 4,641 per person / Km. In addition, the existing administrative system of government has nine sub-districts consisting of 20 urban villages and 69 villages. Its geographical location lies between 05 300 - 05 350 North Latitude (LU) and 95 300 - 99 160 East Longitude (BT).

Banda Aceh City is the Central Government of Aceh Province. The situation of the population and labour in this city is not much different from other cities in Indonesia. But this city has its own distinctive characteristics, especially women, where women must wear Muslim headscarf and clothing, except non-Muslims. Population is the basic capital of development and also one of the problems that get attention from government especially poverty eradication program.

Banda Aceh city has borders on the east by Regency of Aceh Besar, the west is bordered by Indonesian Ocean, Regency of Aceh Besar in the south, and Malaka Strait in the north. While other socio-economic conditions owned by the people of Banda Aceh City together with other cities outside of Banda Aceh.

4.1 Analysis of Results Crosstabulations Income per Month with Age

From the research result, it was found that monthly income was less than Rp.1.000.000.- with age less than 25 years old for 4 people (8,0%), while monthly income was above Rp.2.000.000, - with level age above 45 years as many as 9 people (18.0%). Using chi-square test (X2) shows that there was a significant correlation between monthly earnings with the age of female labour in Kota Banda Aceh, which was marked by probability value $0,001 < \alpha$ (0,05) and also based on spearman correlation amounting to 53.30 percent. For more details, it can be seen in Table 1 below.

Table 1. The Relationship of Monthly Income and Age of Female Workers in Banda Aceh 2017

No	Monthly Income	Age								Total	
		< 25		25-35		36-45		> 45			
		N	%	N	%	N	%	N	%	N	%
1	< Rp.1.000.000	4	8,0	3	6,0	1	2,0	1	2,0	9	18,0
2	Rp.1.000.000-Rp.2.000.000	1	2,0	10	20,0	4	8,0	1	2,0	16	32,0
3	> Rp. 2.000.000,-	0	0,0	6	12,0	10	20,0	9	18,0	25	50,0
Total		5	10,0	19	38,0	15	30,0	11	22,0	50	100,0
P = 0,001				df = 6							

Spearman Correlation = 0,533

4.2 Analysis Crosstabulations Income per Month with Level of Education

The results showed that monthly income of less than Rp.1,000,000.- with primary school education level of only 1 person (2.0%), while monthly income of above Rp.2.000.000, - with the level graduate education as many as 10 people (20.0%). Using chi-square test (X2) showed that there was no significant correlation between monthly income and formal education level of female labour in Banda Aceh, which was marked with probability value 0,492> α (0,05) and also based on acquisition spearman correlation value of 24.30 percent. For more details, it can be seen in Table 2 below.

Table 2. The Relationship of Monthly Income and Level of Education of Female Workers in Banda Aceh 2017

| No | Monthly Income | Formal Education | | | | | | | | Total | |
| | | Elementary School | | Junior High School | | Senior High School | | Bachelor | | | |
		N	%	N	%	N	%	N	%	N	%
1	< Rp.100.000	1	2,0	0	0,0	7	14,0	1	2,0	9	18,0
2	Rp.1.000.000- Rp.2.000.000	1	2,0	1	2,0	8	16,0	6	12,0	16	32,0
3	> Rp. 2.000.000,-	0	0,0	1	2,0	14	28,0	10	20,0	25	50,0
	Total	2	4,0	2	4,0	29	58,0	17	34,0	50	100,0

P = 0,493   df = 6

Spearman Correlation = 0,243

Results Analysis Crosstabulations Income per Month with Marital Status

The results showed that monthly income was less than Rp.1.000.000.- with married status of 7 people (14.0%), while monthly income was above Rp.2.000.000, - with married marriage status as many as 19 people (38.0%). Using chi-square test (X2) shows that there was a significant correlation between monthly income and marital status of female labour in Banda Aceh, which is marked by probability value 0.000 <α (0,05) and also based on spearman value correlation of 52.30 percent. For more details, it can be seen in Table 3 below:

Table 3. The Relationship of Monthly Income and Marital Status of Female Workers in Banda Aceh 2017

| No | Monthly Income | Marital Status | | | | Total | | |
| | | Single | | Married | | | | |
		N	%	N	%		N	%
1	< Rp.1.000.000	7	14,0	2	4,0		9	18,0
2	Rp.1.000.000-Rp.2.000.000	3	26,0	3	6,0	6		32,0
3	> Rp. 2.000.000,-	6	12,0	19	38,0	5		50,0
	Total	6	52,0	24	48,0	0		100,0

P = 0,001   df = 6

Spearman Correlation = 0,523

4.3 Results Analysis Crosstabulations Income per Month with Number of Family

Based on the results of research conducted that the income earned per month was below Rp.1.000.000.- with female workers who do not have family dependents of 5 people (10.0%), while monthly income of over Rp.2.000. 000, - with the number of dependents above 6 people as many as 8 people (16.0%). Using a chi-square test (X2) shows that there was a significant relationship between monthly income and the number of dependents of female labour families in Banda Aceh, which was marked by probability value 0.000 <α (0,05) and also based on value spearman correlation of 67.80 percent. For more details, see Table 4 below.

Table 4. The Relationship of Monthly Income and Number of Family Dependent of Female Workers in Banda Aceh 2017

| No | Monthly Income | Number of Family Dependent | | | | | | | | Total | |
| | | No Family Dependent | | 1 - 3 | | 4 - 6 | | > 6 | | | |
		N	%	N	%	N	%	N	%	N	%
1	< Rp.1.000.000	5	10,0	3	6,0	1	2,0	0	0,0	9	18,0
2	Rp.1.000.000-Rp.2.000.000	4	8,0	8	16,0	4	8,0	0	0,0	16	32,0
3	> Rp. 2.000.000,-	0	0,0	5	10,0	12	24,0	8	16,0	25	50,0
	Total	9	18,0	16	32,0	17	34,0	8	16,0	50	100,0

P = 0,001   df = 6

Spearman Correlation = 0,533

5 CONCLUSION and SUGGESTION

5.1 Conclusion

The test result using chi-square test (X2) showed that there was a significant relationship between monthly payment with the age of female workers in Banda Aceh City, which was marked with probability value 0,001 <α (0,05) and also based on the acquisition of spearman correlation value of 53.30 percent.

Testing using chi-square test (X2) showed that there was no significant relationship between monthly income and formal education level of female workers in Banda Aceh City, which was marked with probability value 0,492> α (0,05) and also based on the acquisition of spearman correlation value of 24.30 percent.

Using a chi-square test (X2) showed that there was a significant relationship between monthly income and marital status of female workers in Kota Banda Aceh, which was indicated by the acquisition of probability 0.000 <α (0,05) and also based on the acquisition spearman correlation value of 52.30 percent.

Based on the test results using chi-square test (X2) showed that there was a significant relationship between monthly income and the number of dependents of female workers' family in Banda Aceh City, which was marked with probability value 0.000 <α (0,05) and also based on the acquisition of spearman correlation value of 67.80 percent.

5.2 Suggestion

From the results of the study, it indicates that only the variable level of education is not significantly related to the monthly income of female worker in Banda Aceh which means that the average female workforce has the same level of income despite varying levels of education. Therefore, it is expected to the relevant institutions to pay more attention to the workers' income system in order to prevent social inequality

It is expected that the Local Government of Banda Aceh City will be more empowering and developing the potentials and skills of female workers. It aims to further improve the living standards of the people of Banda Aceh City in particular and Aceh province in general.

We hope you find the information in this template useful in the preparation of your submission.

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Determinant of IHSG Index; Indonesia Stock Exchange

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Abstract. Stock is a scurity that indicates a share of ownership of a bussiness entity. The change in the movement of the share price index indefinitely influences the global share price index. Stock price movement in the market as a whole are seen in the index of joint stock prices which is an index used in measuring the formance of shares traded on a stock exchange. This study aims to analyze the determination of Indonesia Composite Stock Price Index (IHSG). Secondary data used in this study at 30 companes from 2013-2015. Sample selection used is purposive sampling method. Data was analized using multiple regressions. The result of the research founded Nasdaq index, Dow Jones index and Strait Times index significantly influence to Composite Stock Price Index at Indonesia Stock exchange (IHSG). The result becomes a reference for investors to predict the movement of IHSG in Indonesia .The fluctuation of stock price on the stock exchange within a country is determined by the stock price of other countries and this phenomenon is called contagion effect.

Keywords: Nasdaq, Dow Jones, Strait Times and IHSG indexes

1 Introduction

Stock is a security that indicates a share of ownership of a business entity. In carrying out the business the investors will get dividend based on the number of shares held by each of them. Shares can be classified into two categories; common stock and preferred stock. Common stock represents ownership claims on the income and assets owned by the company. Furthermore, preferred stock is ownership has more rights than the common stock ownership. Preferred shareholders will be claimed first and also have more voting rights than the rights of common stockholders.

In Indonesia Stock Exchange are many types of indexes; Sectoral index, LG45 index, IHSG index, Sharia index, Kompas100 index and Main board index and individual index. Stock indexes is a historical information related to the movement of the composite stock price at a certain time and reflects a value that serves as a measure of the performance of joint stocks in the stock exchange [1]. All of stock price indexes become the indicators of market trends either active or sluggish. The active market is a market situation that reflects the rising

prices of securities and commodities at a given time, while the sluggish market is a market situation that reflects lower the price of securities at any given moment.

In Indonesia Stock Exchange are many types of indexes; Sectoral index, LG45 index, IHSG index, Sharia index, Kompas100 index and Main board index and individual index. Stock indexes is a historical information related to the movement of the composite stock price at a certain time and reflects a value that serves as a measure of the performance of joint stocks in the stock exchange [1]. All of stock price indexes become the indicators of market trends either active or sluggish. The active market is a market situation that reflects the rising prices of securities and commodities at a given time, while the sluggish market is a market situation that reflects lower the price of securities at any given moment.

2 Literature Review

2.1 Capital Market

The capital market is a place of transactions for buying and selling of financial instruments such as stocks and bonds. Capital market acts as an intermediary in supporting the economy of a country. Capital market can connect between people who have excess funds with people who have lack of funds. In the decree of the Minister of Finance of the Republic of Indonesia Number 1548 of 1990 mentioned capital market shaped place in the form of a building to sell securities by using an intermediary. The notion of the capital market is broadly related to intermediates such as banking in the commercial and other financial intermediaries. While the capital market in the middle sense relates to institutions that sell and sell financial instruments are long term [2].

Capital market is a market related to equity and debt [3]. The capital market is divided into the primary and secondary market. The primary market is entity that issued securities market, while the secondary market is trading of securities between investors after sold by first buyer. The capital market plays a role in mediating between investors and companies in the framework of supply and demand for long-term financial instruments. Types of financial instruments consist of warrant, rights issue, common stock, preferred stock, bonds and convertible bonds [4]. Nowadays all countries have a capital market to grow their country's economy, and place invest by their citizens in order to improve their welfare.

2.2 The Stock Price Index

The movement of the stock price index can signal the growth of investment in a country, and the movement is certainly there are factors that affect, among others the domestic factor itself such as inflation rate, interest rate, exchange rate and other macroeconomic in addition is also influenced by such as the Nasdaq index, the Dow Jones index, the Straits Times index, and other global indices. Overall market performance will be seen in the Composite Stock Price Index and can be used as parameters of the economy rate of a country. Composite Stock Price Index is the overall stock price movement as a reference of trend development in capital market [5].

In the IHSG Index, all types of stocks listed on the stock exchange have fluctuation in any time either per minute, hourly and daily due to market price changes and an increase in the number of shares. The IHSG Index can also be used as an indicator of securities trading reflecting stock volatility [6]. One country's stock price index is always integrated with other

country's stock price indexes, especially the global stock price index, as evidenced by the Darrat and Zhong [7] study that found US and Japanese stock markets affected the Asia Pacific stock market.

3 Method

The population in this study is all companies incorporated in IHSG Index, and foreign index; Nasdaq index, Dow Jones index and Straits Times index The sample is each index as many as 30 companies. Sample selection technique used purposive sampling. The sample obtained since 2014 to 2015 and analyzed by using multiple regression with formula:

$$IHSG = \alpha + \beta_1 NI + \beta_2 DI + \beta_3 IS + e.$$

IHSG : Indonesian Composite of Stock Price Index
NI   : Nasdaq Index
DI   : Dow Jones Index
IS   : Straits Time Index

4 Result

4.1 Normality Test

The data normality test is used to test whether the residual data in the regression on independent and dependent variables is normally distributed. The results of normality test the data is normal and can be seen on the probability plot figure 1 below.
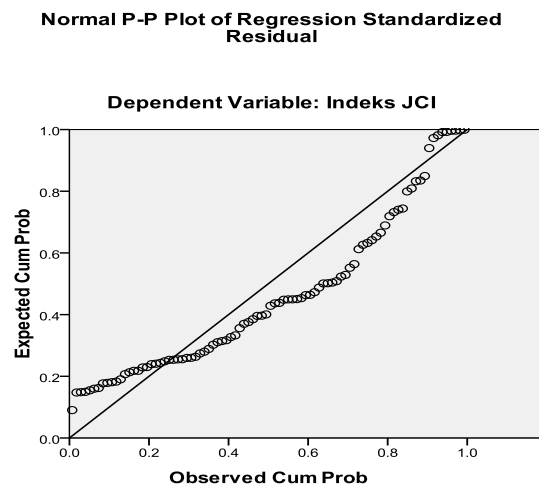
Fig. 1 Normality test probability plot

4.2 Autocorrelation Test

The autocorrelation test is used to determine the relationship between intrusion errors that arise in time series data. The results of the autocorrelation test found the number of DW is 2.226, between dl 1.5889 and du 1.7264. Based on this concluded the data is no indicated autocorrelation can be seen in table 1 below.

Table 1. Autocorrelation Test

Model Summary[b]		
Model	Std. Error of the Estimate	Durbin-Watson
1	15.22917	2.226

4.3 Multicollinearity Test

The multicollinearity test is to know the correlation between the independent variables. The result of the statistic test found that all of variables are unimpeded of multicolliearity because the value of Tolerance is greater than 0.1 and the value of VIF is less than 10, as show as in table 2.

Table 2. Multicolinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Nasdaq Index	.975	1.026
Dow Jones Index	.944	1.059
Strait Times Index	.966	1.035

4.4 Heteroscedasticity Test

This test is performed to see in the regression model whether there is variance inequality from residual one observation to others. Heteroscedasticity test result found that the data is homoscedasticity because the posit spreands both above and below Y. For the specific can be seen in the figure 2.

Dependent Variable: Indeks JCI
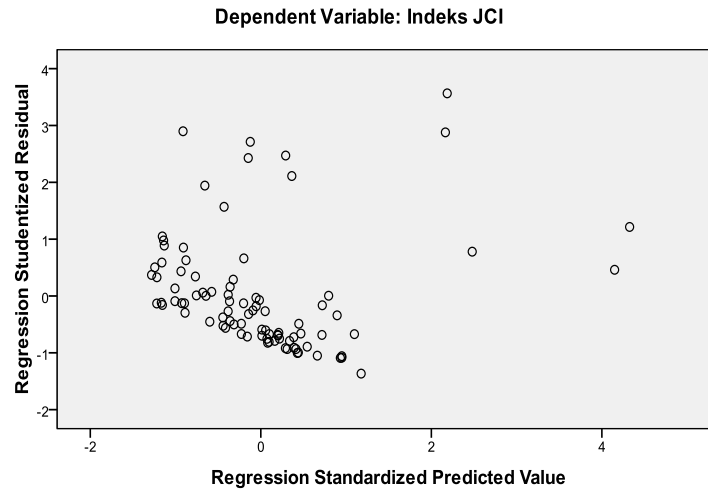
Fig. 2 Heteroscedasticity test scatter plot

4.5 Correlation Coefficient Analysis and Coefficient of Determination

Correlation coefficient is useful to know the relationship between independent variables to the dependent variable. Then the coefficient of determination to see how much variation of independent variables to the dependent variable. The results of correlation coefficient and determination can be seen in table 3 below.

Table 3. Coefficient Correlation

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.477[a]	0.277	0.200	15.22917

Based on the table above the coefficient correlation (R) is 0.477. It means the Nasdaq index, Dow Jones index and Straits Times index corresponds to the IHSG Index of 47.7%. The value of R^2 is 0.277, this shows the variation of Nasdaq index, Dow Jones index and Straits Times index able to explain its influence to the IHSG Index of 27.7%, remain the 72.3%, influenced by other variables.

4.6 Determinant of IHSG Index

In this table show the factors that determine of IHSG Index in Indonesia Stock Exchange use partially statistic test. Based on statistic test show that significance value of independent variables are less than 5% (0.05). Then the value $t_{statistic}$ is greater that t_{table}. It means the whole of independent variables have a positive impact on the dependent variable. For specific view can be seen in table 4 below.

Table 4. Partially Test

Coefficients[a]				
Model	B	t Statistic	t table	Sig.
1 (Constant)	-7.500	-1.623		.108
Nasdaq Index	9.904	4.174		.000
Dow Jones Index	10.069	3.007	1,662	.003
Straits Times Index	4.067	2.067		.042

5 Discussion

The fluctuation of stock price on the stock exchange in a country is determined by the stock price of other state exchanges, it is related to economic factor, technological sophistication and communication as well as due to investor uniformity Achsani [8]. This is evident from the results of this study that IHSG is influenced by Nasdaq index in the United States. This shows the rise in the Nasdaq index in the United States followed by the rise in the price index of IHSG in Indonesia. This event is called a contagion effect which means that if the stock price index of a country is changed it will be followed by other state stock exchanges [9][10]. Sutheebanjard and Premchaiswadi [11] found that the Dow Jones index, Nikkei index, Hang Seng Index affect the Stock Exchange of Thailand.

The Dow Jones index is one of the top stocks in the United States and may affect the stock exchange price index in various countries, one of which is the IHSG index in period of 2013-2015. the result of this research is consistent with [12][13]. The other global stock price index is the Straits Times index which is the best stock price index in Southeast Asian countries owned by the state of Singapore, this index also affects on the stock price index of different countries, including IHSG Index. These results are consistent with the results of previous studies [14][15]. Similar research has also been done by Prayitno [16], which finds global share price index to influence the IHSG Index.

6 Conclusion

Based on the results of this study can be concluded that the Nasdaq index, Dow Jones index, Straits Times index has a relationship with the Composite Stock Price Index, the Nasdaq index, Dow Jones index, Straits Times index able to explain the effect on the Composite Stock Price Index. Partial test of three variables consisting of Nasdaq index, Dow Jones index, Straits Times index have a positive and significant effect to Composite Stock Price Index in Indonesia Stock Exchange.

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Optimization of Mixture Proportions of High Strength High Performance Concrete Incorporating Rice Husk Ash by Using Response Surface Methodology

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Abstract. Five key variables of high-strength high performance concrete (HSHPC) were considered in the models developed such as water-to-binder ratios (w/b), binder contents, percentages of partial cement replacement with rice husk ash (RHA), ratios of fine aggregate to total aggregate (fa/ta), and percentages of superplasticizer dosage. Box Behnken Design (BBD) experiment and response surface methodology (RSM) were applied to determine the models that can optimize mix proportion consisting of the five variables with three levels leading to optimal slump value, compressive strength at age of 1 and 28-days. The quadratic model is statistically acceptable compared other models. The prediction of optimum values and the clarification of the interactions between the specified range factors were done by using the quadratic model and analysis of variance (ANOVA). The models were able to accurately predict the response of slump and compressive strength of HSHPC less than 5% error. The results proved that the models show that ratio w/b, binder contents, percentages of partial cement replacement with RHA and percentages of superplasticizer dosage have a significant effect on the slump and compressive strength of concrete. It shows that the proposed response models provide useful information regarding the mixture optimization for securing target strength and cost-effective of HSHPC.

Keywords: Rice husk ash; optimization; high strength performance concrete; response surface methodology, Box-Behnken Design.

1 INTRODUCTION

Many researchers had explored the idea of improving chemical and physical properties of RHA to be utilized in concrete. Previous studies on the RHA as supplementary cementitious material in the concrete are mainly in the fineness of RHA [1], [2] the carbon content of RHA [3] the mechanical and durability properties in strength of normal concrete (NSC) [4] and high performance concrete [5].

Now, the research trend focuses on high strength and high performance concrete (HSHPC) as the demand is increasing on compressive strength of HPC above 80 MPa lately. The concrete industries need HSHPC in order to construct high rise buildings, to increase the space of occupation, to reduce dead load through reducing the size of element and to improve durability as well. The lower columns of high rise building of .Petronas Towers had used concrete with compressive strength of 80 MPa The common strategy to produce HSHPC is by applying low w/b, Supplementary cementicious material (SCM) and highly percentages dosage of superplasticizer [6], [7]. Applying a water/binder ratio of less than 0.3 and SCM as partly cement subtitution greatly improves the microstructure and the qualities of the transition zone of concrete [8]. However, the guide for mix proportion of concrete for compressive strength above 60 MPa and involving SCM is beyond any available codes and mostly concrete producers providing the concrete by trial and error procedures which are time consuming and increase the concrete cost.

In the past, a few studies have been conducted to establish the mix proportions and investigate the performance of concrete containing RHA, especially in high performance concrete, 80 up to 110 MPa. The partial cement replacement with RHA in concrete increase the level hydration of cement, reduce the pore structure and the CaOH content in [9]–[11]. Partial replacement cement with RHA can be utilized up to 30% without affecting the strength and permeability properties of normal concrete (Bui *et al.*, 2012). Ganeshan [1], [12] investigated the effects of normal concrete incorporating 20% RHA as partial cement subtitution at three different particle sizes and obtained that the strength of concrete was improved at later age. In spite of a lot of information available in the existing literature on incorporating RHA as SCM, the applied procedures that for optimizing mix proportion of concrete having the compressive strength up to 100 MPa are quite limited. There are some researchers working on developing statistical models for optimizing concrete mixtures to find the required engineering properties. [13] presented a model to predict the compressive strength of silica fume concrete up to 85 MPa at 28-days with water-to-cementitious material (w/cm) ratios varying from 0.30 to 0.42 and percentages replacement of silica fume from 5% to 30%, which developed by using statistical methods. Ghesal and Khayat [14] utilized factorial design and RSM to optimize a four-component concrete containing limestone filler subject to eight performance criteria. Li et al. [15] utilized Boh-Behnken experiments and response surface method to model alkali slag concrete of normal concrete under freeze-thaw cycles. Islam et al. [9] conducted statistical method to predict the strength of HPC incorporating RHA for compressive strength in the varying of 40-90 MPa. However, they did not mention the particle size of RHA and mixing method used as both of them are critical parts of producing concrete incorporating RHA [7]. Furthermore, the model did not present the early strength age which is important information for concrete industries for enables early stripping formwork and its economic reasons.

In the present study, Box-Behnken Design experimental and RSM were used to model and optimize the ingredient of mix proportion leading to maximum slump value, 1 and 28-day compressive strength. Five key variables having significant effects on mix characteristics of HSHPC were designated to derive mathematical models for estimating relevant responses. Those models are valid for mixes made with w/b ratios of 0.22 to 0.28, binder content in the varying of 500 to 600 kg/m³, partial cement replacement with RHA up to 20%, a fine to total aggregate ratio (fa/ta) of 0.35 - 0.45, percentages of the Sp dosage of solid content in the varying of 0.4-1.3%. 46 mix proportions were casted and veryfied for developing suitable models to predict responses on slump value, compressive strength of concrete at age of 1 and 28-days. An additional mixture was prepared for verifying the optimum mix proportion

predicted by models for specific requirement on HSHPC. Those models could be useful to reduce the tests and the number of trial mixes of HSHPC. It will be beneficial in term of cost and time consuming for concrete industries and engineers aimed to utilize RHA as partially cement subtitusion in HSHPC.

2   MATERIALS AND METHODS

2.1   Raw materials and preparation

Table 1 shows the chemical and physical properties of cement and RHA. The ingredient of HSHPC is alike to regular concrete except incorporating SCM and high dosage of superplasticizer. Materials used were cement, RHA, aggregates, water and superplasticizer. Ordinary Portland cement (OPC) used Type I class 42.5 from a local supplier and its specific surface area and specific gravity are 3280 m^2/kg and 3.15, respectively. RHA was produced by uncontrolled burning in ferrocement furnace, but the temperature of burning did not exceed 700 ^{0}C so that it is expected in amorphous form. RHA was ground for 16000 cycles by LA machine and its average particle size was 13 μm. Its surface area and specific gravity was 23455 m^2/kg and 2.06, respectively. Major chemical composition of RHA consists of SiO_2, above 85 %, and LOI content of 4.1% which complies with ASTM C618 requirement. The specific gravities of crushed granite aggregate and mining sand and are 2.7 and 2.6, respectively. Figure 1 shows the particle size distribution of solid igradients. It shows that the particle size of RHA is finer than that of OPC which is expected it can be function as pozzolanic material and fillers to improve microstructure of concrete [16].

Aggregates were washed to minimize the clay in mining sand and dust in crushed granite. The mixtures were mixed with tap water which was clean and free from any visible impurities. The fresh properties of concrete were recorded through a slump test. Then the mixture was moulded and placed on a tremor table for 60–90 s. The specimen was covered by plastic to protect from water evaporation. After 24 hours, the moulds were dismantled and the specimen was cured in water tank until test age.

Table 1. Chemical composition of Cement and RHA

Chemical components (%)	OPC	RHA
Magnesium oxide (MgO)	2.06	0.81
Aluminum oxide (Al_2O_3)	5.60	0.25
Silicon dioxide (SiO_2)	21.28	85.76
Sulfate (SO_3)	2.14	0.31
Calcium oxide (CaO)	64.64	0.74
Iron oxide (Fe_2O_3)	3.38	1.15
Loss of Ignition (LoI)	0.60	4.05
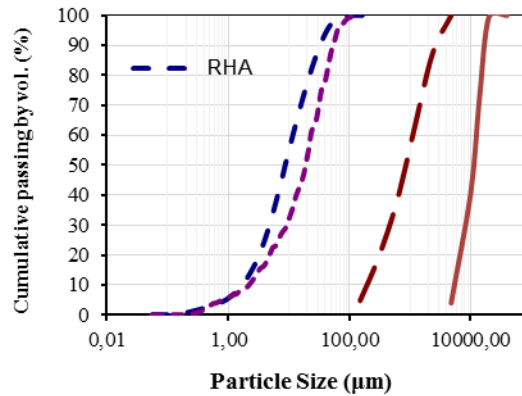
Fig. 1 Particle distributions of solid ingredient of HSHPC

In this study, the packing density of aggregate considered through the ratio of fine aggregate to total aggregate (fa/ta). Figure 2 shows that the optimum packing density of aggregates is close to the ratio fa/ta of 0.45. Previous models developed by Islam et al. [9], the amount of fine and coarse aggregate were incorporated without considering the packing density of the aggregates. The extreme packing density of aggregates produced the lowest void that lead to concrete having lowest cement consumption, porosity, shrinkage, highest performance and the lowest price [17]. However, Damone [18] suggested to apply the ratio fa/ta slightly lower than the optimum packing density to avoid harsh mixes. Figure 2 shows that the optimum packing density of aggregates is 0.69 at the ratio fa/ta of 0.45. In this study, the ratios fa/ta adopted were in the varying of 0.35- 0.45.
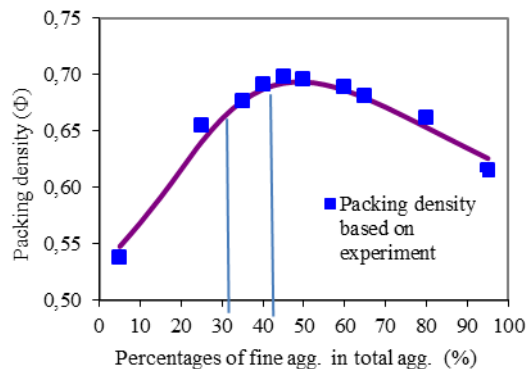
Fig. 2 Packing densities of various ratios of fa/ta

2.2 Methods

The fresh properties of concrete were tested through slump test based on BS 1881–102. The strength of concrete was tested trough universal test machine capacity of 2000 kN based on the BS 1881–116. The compressive strength of concrete was conducted at 1 and 28 days. A total of 46 HSHPC mixtures were tested in this study and their responses were exploited to

obtain models for predicting the responses designed and optimizing the mixture proportions of HSHPC using a response surface methodology.

2.3 Experimental design and data analysis

The Box–Behnken experimental design was preferred for finding out the relationship between variables (w/b, binder, RHA, ratio fa/ta and Sp dosage) for three different levels and the response functions (slump value, 1 and 28 days compressive strength). The models proposed by the Design Expert software (Statease Inc., Minneapolis, MN55103) are chosen through some criteria which satisfy to represent the effects of the mixture components and their interaction on the responses of slump (Y_1), 1-day compressive strength (Y_2) and 28-days compressive strength (Y_3). Table 2 shows independent variables and each their levels for the design used in this study. Based on five variables and three levels, the total of experiments run in BBD can be calculated as N = 2k (k-1) + Co, where k is the total of variables and Co is the total of central points applied. The total of central point adopted is 6 runs and then the totals of the run are 46 runs.

Table 2. The level of variables chosen for the Box–Behnken design

| Variables | Symbol | Coded variable level | | |
| | | Low | Centre | High |
		-1	0	+1
W/b	A	0.22	0.25	0.28
Binder	B	500	550	600
RHA	C	0	10	20
fa/ta	D	0.35	0.40	0.45
Dosage of Sp	E	0.40	0.85	1.30

The mixture proportions were calculated based on the absolute volume method. From the list of run of the Box-Behnken design, the actual mix proportions of concrete were calculated by the Eq. 1-5. After determining the mixture proportions, all materials are prepared such as the mass of cement, rice husk ash, fine aggregate, coarse aggregate and the amount of Sp. All mixtures were mixed by a 150 l pan mixer. The mixing method adopted was a two-step mixing, which involves mixing slurry of cementitious materials, water and fine aggregate, then adding coarse aggregate to form concrete.

$$M_C = M_{Binder} - \%RHA * M_{Binder} \tag{1}$$

$$V_{Cr} = V_w + V_C + V_{RHA} + V_{CA} + V_{FA} + V_{SP} + V_A \quad V_{cr} = 1\ m^3 = 1000\ l \tag{2}$$

$$V_m = 1000 - (V_w + V_c + V_{RHA} + V_{sp} + V_a) \tag{3}$$

$$M_{FA} = \frac{V_m}{\left(\frac{1}{\rho_{FA}} + \frac{(1-X)}{(X*\rho_{CA})}\right)} \tag{4}$$

$$M_{CA} = \left(V_m - \frac{M_{FA}}{\rho_{FA}}\right)\rho_{CA} \tag{5}$$

Where, X is the ratio of fine to total aggregate (fa/ta), V_{Cr} is the volume of concrete, V_w is the volume of water, V_C is the volume of cement, V_{RHA} is volume of RHA, V_{CA} is the volume of coarse aggregate, V_{FA} is the volume of fine aggregate, V_{Sp} is the dosage of Sp, V_A is the volume

of air (1.5%), V_m is the volume of mortar, M_{FA} is the mass of fine aggregate, M_{FA} is the mass of fine aggregate, M_{CA} is the mass of coarse aggregate, ρ_{FA} is the specific gravity of fine aggregate, ρ_{CA} is the specific gravity of coarse aggregate.

The relationship between the variables and the responses can be estimated by mathematical model of the second order polynomial, Eq (6):

$$Y_i = a_0 + \sum_{i=1}^{n} a_i x_i \sum_{i=1}^{n} a_{ii} x_i^2 + \sum_{i=1}^{n} \sum_{i=1}^{n} a_{ij} x_i x_j + e \qquad (6)$$

Where Y_i is the predicted response; a_0 is model constant; x_i is independent variables; a_i are linear coefficients; a_{ij} are cross product coefficients and a_{ii} are the quadratic coefficients This section must be in one column.\

3 RESULTS AND DISCUSSIONS

3.1 Developed Models

Table 3 shows the summary of various models analyzed by Design Expert software, which are quadratic and cubic. The criteria used to govern the appropriate models adopted based on statistic parameters such as coefficient of determination (R^2), adjusted R^2, adequate precision, the prediction error sum of squares (PRESS), p-value for lack of fit test, and aliased data. Predicted R^2 is a measurement of how good the model expects a response value (Lachiver et al., 2006). Furthermore, the models also checked for adequate precision which dealings the signal to noise ratio. They also compared the range of the predicted values at the design points to the average prediction error. The value was found greater than 4 which is desirable and indicates the reliability of the experiment data. Only quadratic and cube model show the p-value for lack of fit test greater than 0.05 which implies the models are not significant relative to the pure error and it means that the models are good. Eventually, the R-square of the quadratic model shows lower than that of the cubic model, but other side the PRESS value of the quadratic model show lower than that of the cubic model. In addition, Table 4 shows that the cubic models are aliased due to the insufficient unique design points to estimate all the coefficients for the chosen model. So that, it can be decided that quadratic model is the most proper model for predicted the mix proportion applied in HSHPC. The coefficient of determination (R^2) of the models for the response of slump, 1 and 28-days compressive strength was 0.9943, 0.9810 and 0.9858, respectively, which indicated a good fit between predicted values and the experimental data points.

Table 3. Summary proposed models by the Design Expert software

Responses	Models	R-Squared	Adeq. Precis.	PRESS	p-value for Lack of fit test
Y1	Q.dratic	0.9943	53.775	1965.58	0.138
	Cubic	0.9989	-	3544.11	0.459
Y2	Q.dratic	0.9810	31.862	499.07	0.112
	Cubic	0.9913		3090.53	0.073
Y3	Q.dratic	0.9858	36.45	549.12	0.087

	Cubic	0.9964	-	1690.99	0.150

3.2 Statistical Analysis

Best-fits of the models were developed for HSHPC properties e.g., slump, 1 and 28 days-compressive strength. To find the relation between the input variables and the responses on quadratic models, Analysis of variance (ANOVA) was utilized. The confidence interval (CI) adopted is 95%, which means that if the probability greater than 't-statistic' is less than 0.05 (5%), the model or variable has significant influence on the responses. Table 4 indicates that the results of ANOVA analysis for models appears that the probabilities of regression models greater than "F statistic" (Fisher statistic) are less than 0.0001. It means that the models are highly statistically significant with confidence interval more than 99.99%. In addition, the lowest R^2 values are 96.74 %, which is an signal of reasonably good fitness. The model also were checked its relation to pure error through the p-value of models for lack of fit test, which are greater than 0.05 and implies the lack of fit for all models are not significant relative to the pure error and it means that the models are good.

Table 4. Summary statistics of slump and compressive strength strength of reduced quadratic model

Regression coefficients	Slump	Comp. strength of concrete at 1 day	Comp. strength of concrete at 28 days
P-value	< 0.0001***	< 0.0001***	< 0.0001***
R^2	0.9937	0.9674	0.9838
F-v L of fit	*2.27*	2.87	3.15
P-v L of fit	*0.1837*****	0.1211****	0.1022****

* Significant (p < 0.05), **Significant (p < 0.01), ***Significant (p < 0.001), **** Not significant (p >0.05),

All the five variables such as a water binder ratio (A), binder content (B), partial percentages of cement replacement with RHA (C), ratio of fine aggregate to total aggregate (D) and percentages dosage of superplasticizer (E) were tested individually for 't statistic'. The probability greater than 't statistic' for intercept, all variables, and their interaction are indicated "*" in Table 5. The probabilities greater than 't statistic' are found to be less than 0.001 (confidence level more than 99.99%) for all variables except binder content (B) in the model of 1-day compressive strength and ratio of fine aggregate to total aggregate (D) in all models. All variables except the ratio of fine aggregate to total aggregate (D) are statistically significant and have direct influence on slump, 1 and 28 days-compressive strength at. It was possible due to the ratios fa/ta between the lower and the higher value are not significantly change the packing density value as the ratios ta/fa of 0.35 and 0.45 are 0.676 and 0.693, respectively. Also, all input variables have positive impacts on slump value except binder content (B) and partial cement replacement with RHA (C). Increasing binder content and cement replacement with RHA reduce the slump value while maintaining other variables constant was also reported [19].

Table 5. Model terms and their significance of slump and the 1 and 28-day strength model

Regression coefficients	Coefficients for reduced model		
	Slump	1-day comp. strength of concrete	28-day comp. strength of concrete
a_0	+1076.15	-2005.59	-1484.31
a_1	-3415.51	+3979.23	+1492.29
a_2	-2.84	+4.37	+4.089
a_3	-1.65	+1.98	+1.28
a_4	+1390.07	+1399.64	+991.21
a_5	+150.79	+84.15	+85.94
a_{12}	+7.83	-	+3.35
a_{13}	+22.50	+21.17	+29.50
a_{14}	-	-	-
a_{15}	-685.19	-	-331.48
a_{23}	-0.017	-0.016	-0.01
a_{24}	-	-	-
a_{25}	+0.72	-	+0.23
a_{34}	-	-	-
a_{35}	+3.50	-	-
a_{45}	-	-	-
a_1^2	-	-8345.12	-6981.48
a_2^2	-	-3.74E-003	-4.38E-003
a_3^2	-	-	-0.15
a_4^2	-	-+1744.242	-1226.67
	+1723.53	-	-
a_5^2	+164.49	-40.63	-53.70

Notes:

a_i: estimated regression for the main linear effects;

a_{ij}; the estimated regression coefficients for the quadratic effects.

Some variables are interacting with each other. Some of them have a positive influence and others have a negative influence on the response. Interaction w/b and the binder and the RHA are significant positive influences on the slump and strength of concrete. However, interaction between w/b and the dosage of Sp and between binder and RHA are significantly negative influences on the slump and strength. On the other side, interaction binder and the dosage of SP have a positive influence on the slump and later strength

After considering significant variables influenced on the models as shown in Table 6, the reduced models were proposed for slump, compressive strength at 1 and 28 days shown in Eq. 6-8. The real and expected values of slump and compressive strength at the age of 1 and 28 days are presented in Figs.3. Predicted values match with the experimental data points as indicating by R^2 closed to 1 (R^2 value of 0.9945 for slump, R^2 value of 0.9748 for 1-day compressive strength and R^2 value of 0.9856 for 28-day compressive strength). The fitted regression equation shows a good fit of the model.

The proposed model for Slump value is:

$Y1=+1076.15 -3415.51$ (A) $- 2.84$ (B) -1.65 (C) $+ 1390.07$ (D) $+ 150.79$ E $) + 7.83$ (A)(B) $+ 22.50$(A)(C) $- 685.19$ (A) (E) $- 0.017$ (B) (C) $+ 0.7$ (B) (E) $+ 3.50$ (C)(E) $- 1723.53$ (D)^2 $- 164.49$ (E) ^{2} (7)

The proposed model for compressive strength of concrete at age of 1-day is:
$Y2 = -2005.59+3979.23$ (A) $+4.37$ (B) $+1.98$ (C) $+1399.64$ (D) $+ 84.15$ (E) $+21.17$ (A)(C) $- 0.02$ (B) (C) $- 8345.12$ (A)^2 $- 0.0037$ (B)^2 $- 1744.24$ (D)^2 $- 40.63$ (E)^2 (8)

The proposed model for compressive strength of concrete at age of 28-days is:

$Y3 = - 1484.31 + 1492.30$ (A) $+ 4.08$ (B) $+ 1.28$ (C) $+ 991.21$ (D) $+ 85.94$ (E) $+ 3.35$ (A)(B) $+ 29.50$ (A) (C) $- 331.48$ (A) (E) $- 0.01$ (B)(C) $+ 0.226$ (B) (E) $- 6981.1$ (A) ^{2} $- 0.0044$ (B)^2 $- 0.15$ (C)^2 $- 1226.67$ (D)^2 $- 53.70$ (E)^2 (9)

(a)   (b)   (c)
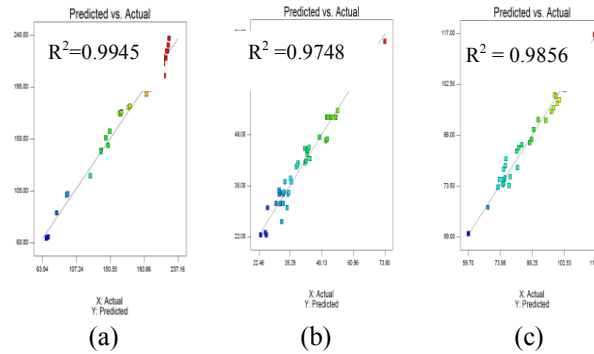
Fig. 3 Predicted and actual responses for (a) slump value (b) 1 day-compressive strength (c) 28 days-compressive strength

3.3 Effects of W/b, Binder, RHA, fa/ta and Sp dosages on the Responses

3.3.1 Slump value (Y1)

Figure 4.a shows the perturbation of a slump when w/b of 0.25, binder 550 kg/m^3, 10% RHA, ratio fa/ta of 0.4 and Sp dosage of 0.9%. Through this graph, it can be seen how the changing quantity of input variables affects to slump value of fresh concrete while others maintain to be constants. Increasing w/b (A) or Sp dosage (E) affect the increase of slump. However, increasing percentages replacement cement with RHA (C) or binder content (B) reduces the slump. Increasing ratio fa/ta (D) in the varying of 0.35 up to 0.45 is not significantly change the slump of HSHPC. When the high percentage of Sp dosage applied is 1.3%, the slump value is almost double compared to that of dosage of 0.5%. Figure 4.b presents 3D response surface and contour plots to interpret the interaction two selection variables to the slump. Changing to those variables is significantly changing the slump value. It also shows that the effect of SP has a limitation as beyond that optimum dosage there is no significant effect on slump value which called as saturated point.
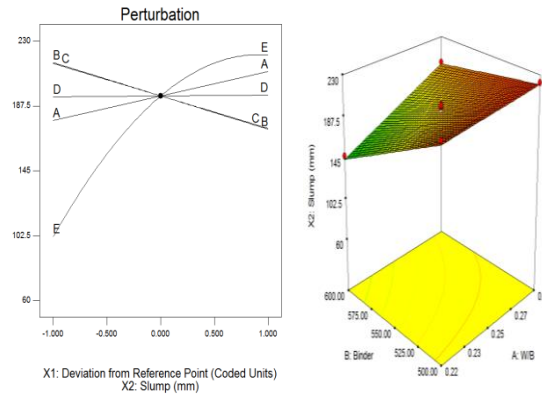
Fig. 4 (a) The perturbation of a slump when w/b of 0.25, binder 550 kg/m3, 10% RHA, ratio fa/ta of 0.4 and Sp dosage of 0.9% (b) Response surface plots vs Slump value for function of w/b and Binder

3.3.2 1-day Compressive strength (Y2)

Figure 5.a shows the perturbation of 1-day compressive strength when w/b of 0.25, binder 550 kg/m3, 10% RHA, fa/ta of 0.4 and Sp dosage of 0.9%. Increasing w/b (A) or binder (B), RHA content (C) and Sp dosage (E) affect the increase of compressive strength at age of 1 day. However, increasing the RHA content reduces the compressive strength and increasing ratio fa/ta (D) in the range of 0.35 up to 0.45 is not significantly changing 1-day compressive strength. At the high Sp dosage of 1.3%, the compressive strength at age of 1 day is higher 40% than that of dosage of 0.5%. Figure 5b presents 3-D response surface and contour plots to interpret the interaction two selection variables to the 1-day compressive strength. The optimum of 1-day compressive strength seems on w/b 0.25 and 10% RHA while the other keeping in constant.
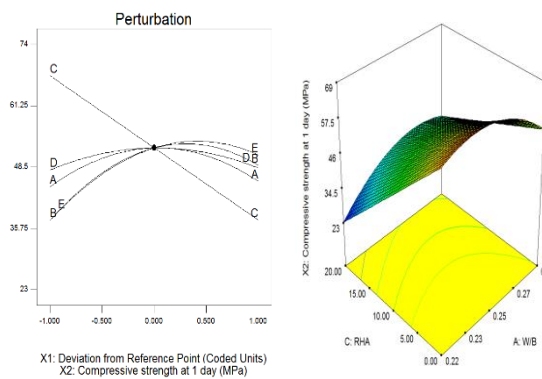
Fig. 5 (a) The perturbation of compressive strength at 1day when w/b of 0.25, binder of 550 kg/m^3, 10% of RHA, ratio fa/ta of 0.4 and Sp dosage of 0.9%. (b) Response surface plots vs 1 days compressive strength for function of W/b and RHA

3.3.3 28-day Compressive strength (Y3)

Figure 6.a shows the perturbation of 28-day compressive strength when w/b of 0.25, binder of 550 kg/m^3, 10% of RHA, ratio fa/ta of 0.4 and Sp dosage of 0.9%. Changing W/b

(A), binder content (B) or Sp dosage (E) significantly affects the on compressive strength at age of 28 days. However, the increasing RHA content more than 10% reduces the 28-day compressive strength. Changing the ratio of fa/ta in the varying of 0.35-0.45 is not significantly change the 28-day compressive strength while at the Sp dosage of 1.3%, the compressive strength at age of 28-days is higher than that of dosage of 0.5%. There was no sign of segregation and bleeding of fresh RHA concrete at a Sp dosage of 1.3 %. According to Chang the proper percentages dosage of Sp improves the flowability of concrete at low w/b ratios due to the friction between packed granular materials are reduced. Then, the strengths of RHA concrete are improved due to the RHA concrete is denser which related to hydration produced CaOH and then reacted with SiO_2 from RHA created more CSH. Figure 6b present 3-D response surfaces and contour plots to interpret the interaction two selection variables to the compressive strength at age of 28 days. The strength seems optimum on w/b 0.25 and 10% RHA while the other keeping in constant. There is increased in compressive strength as well if the binder content increased while other keeping in constant. The compressive strength seems to reach the ceiling while increasing binder and reducing w/b of mix proportion the strength reach almost similar strength that of w/b of 0.25, binder 550 kg and 10% RHA. It could be the strength of coarse aggregate already reaches its ultimate. At a certain level, the concrete strength was determined by the aggregate strength as the matrix and the interface transition zone was improved through applying lower w/b and incorporating RHA [20]. The results of the present models are higher than previous models proposed by Islam et al. [9] and it could be the different mixing method applied affected to different results on the slump value and the compressive strength. The two step mixing procedures produce more homogenous mixes than conventional mixing procedures [21].
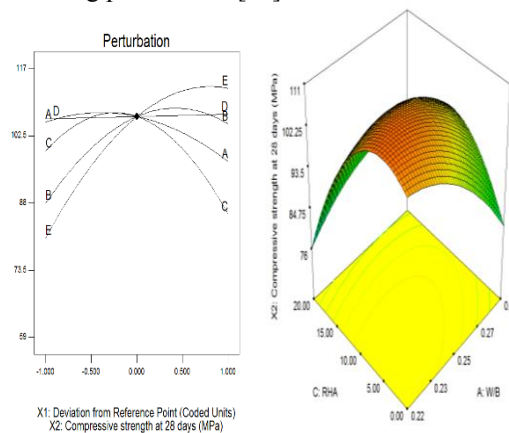
Fig. 6 (a) The perturbation of compressive strength at age of 28 days while w/b of 0.25, binder of 550 kg/m3, 10% of RHA, ratio fa/ta of 0.4 and Sp dosage of 0.9%. (b). Response surface plots vs the compressive strength for function of W/b and RHA

3.4 Optimization Using the Desirability Functions

In order to find the high compressive strength of HSHPC incorporating RHA, the significant input parameters have to be optimized. The optimization process of mix proportion of HSHPC was accomplished by using numerical optimization. The desirability function approach was then used to govern the optimum proportions of w/b, binder content, percentages of RHA, ratio fa/ta and percentages dosage of Sp to produce HSHPC by

simultaneously maximizing the slump value, 1 and 28-day compressive strength. To produce HSHPC at low cost, the binder content and percentages dosage of Sp are the lowest possible, meanwhile the partial replacement RHA is in the maximum requirement. In addition, the level of the ratio fa /ta was within the varying of 0.35–45. The responses on slump value, compressive strength at agev of 1 and 28-days were set for maximum desirability. The best mix proportion was located in Figures 7 at w/b of 0.26, binder content of 552.82 kg/m3, partial replacement cement with RHA of 10.48%, ratio fa/ta of 0.4, Sp dosage of 0.93% and desirability of 0.609. These optimum values were checked experimentally which resulted in slump value compressive strength at age of 1 and 28 days were 207 mm, 52.7 MPa and 110 MPa, respectively. The experimental results of slump, 1 and 28-day compressive strength were 210 mm, 51 MPa and 108 MPa. The variations between the predicted and experimental are 1.4 %, 3.3% and 1.9%, respectively. The good correlation was found between these two results obtained from the optimization analysis using desirability functions and the experiment. It can be concluded that Box–Behnken design including desirability functions could be effectively applied to optimize the mixes.
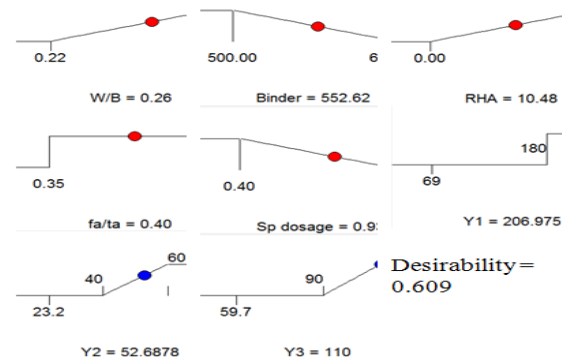
Fig. 7 Desirability ramps for numerical optimization of four selected goals

4 Conclusions

The models presented facilitate the prediction of the slump value, compressive strength of HSHPC at age of 1 and 28-day based on the input of mix proportion.

1. Response surface methodology by the Box–Behnken model was used to examine five ingredients of HSHPC to predict and optimize the responses of slump, 1 and 28-day compressive strength.

2. A quadratic regression model could properly predict the experimental data with the R^2 value of 0.9945, 0.9748 and 0.9856 for slump, 1 and 28-day compressive strength, respectively.

3. The simultaneous optimization of the multi-response system by desirability function indicated that the compressive strength of 100 MPa at age of 28 days can be produced by w/b of 0.26, binder content of 552.82 kg/m^3, partial replacement cement with RHA of 10.48%, ratio fa/ta of 0.4, percentages dosage of Sp dosage of 0.93%.

4. In the future, it is recommended that the different maximum aggregate size of coarse aggregates should be included in studying parameters. It is believed that changing the

maximum size of aggregates influences the value of slump and the compressive strength of concrete as well.

Acknowledgements

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Foreign Direct Investment, Portfolio Investment, and Economic Growth in Indonesia: Vector Auto Regression Approach

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Abstract. The goal of this research is to examine the Foreign Direct Investment (FDI), Portfolio Investment (PI) and Economic Growth (EG) correlation in Indonesia. This research is using the Economic growth, foreign direct investment and portfolio investment data during 2010-2016, which is accessed from www.bps.go.id; www.bkpm.go.id and www.bi.go.id, and using Vector Auto Regression method. The result shows that FDI and EG have two way correlationship, meaning the connection between past Indonesia FDI and recentIndonesia EG are exist. PI and EG have the same correlationship yet it does not influence the investors to invest at the Indonesia Stock Exchange, as they, particularly foreign investors, are looking forward to the Indonesia Macro-economy policies or recent information about it.

Keywords: Portfolio, Investment, Economic, Growth

1 INTRODUCTION

Indonesia economic growth recently is heading in uplifting direction. Central Bureau of Statistics in 2017, stated that Indonesia economic growth reached 5.01 percents at second quartal of 2017. It is due to the improving of the investment circumstances, both direct investment and stock exchange investment. Based on the Bank Indonesia, Capital Investment Coordinating Board, and Central Bureau of Statistics data stated that until 2016, previously the Indonesia economic growth was + 5.00%. Through the Table 1 above, it can be seen that the direct investment average is +67% and portfolio investment is +32%.

There were many empirical research clarified that the economic growth was closely connected with the investment. In China, Su and Liu [1], stated that FDI influenced the economic growth level in China. The same thing was found in Europe, Pegkas [2] claimed that FDI and share investment by foreign investor affected the economic growth of Europe.

Iamsiraroj and Ulubaşoğlu [3] and Iamsiraroj [4] found that there were positive connection between economic FDI in different countries, because of the trade openness and financial market development, thus, it made FDI as the stimulant of development in different countries. Encinas-Ferrer and Villegas-Zermeño [5], in Argentina, Mexico, discovered that FDI marginally affected the economic growth of the country. Abbes, et al. [6] stated that FDI affected the domestic products gross in 65 countriess, however, the ccausality examination showed different result

Research done in the developing countries showed the same thing regarding the investment correlation and the economic growth of a country. Nistor [7] and Ali and Hussain [8], researched in Romania and Pakistan, concluded that FDI related positively with the GDP growth. So as Gui-Diby [9], stated that in different time had different impact; low interest rate period, the economic growth was high, and vice versa. In Pacific countries, Feeny, et al. [10] mentioned that the poor of domestic economic growth due to FDI acted as investment substitute in the countries. In Africa, Agbloyor, et al. [11] resumed that FDI took effect to the economic growth of Sahara.

In portfolio investment, Baek [12] suggested that PI in Latin America and Asia still had different point of view, one withdrew and another prompted. Ferreira and Laux [13] stated that investing in the share market, especially stock portfolio investment of local investor improved the economic growth of America as well. PI, in Latin America, caused the economic growth, whilst in Asia it was only temporarily dropped in money (hot money). That because of, in Asia, market changing frequently and unstable domestic economy factor. Albulescu [14], researched in Europe and West Europe, stated that both FDI and PI affected long-term economic growth.

Research in Indonesia showed the same thing upon the FDI and EG. Setyowati, et al. [15] and Rahayu (2012) remarked that there were causality of FDI and EG in Indonesia and in short-term, FDI affected the economic growth. However, Indrawati [16] claimed that the impact of FDI was lesser compared to the investment portfolio towards the economic growth. Ruslan [17] mentioned that there was inter-dependence between FDI and economic growth and some other macro factors, such as: exchange rate, and interest rate. Meanwhile Manullang and Hidayat [18] stated that in a long-term there was a correlation between FDI and economic growth in ASEAN countries, except for Singapore which had positive correlation of FDI and EG. Indonesia, Malaysia and Philippines had negative one. Another finding showed that there was no two ways correlation between FDI and EG.

2 Research Method

The Center Bureau of Statistics, Capital Investment Coordinating Board , and Bank Indonesia data were used for the research, which was accessed through www.bps.go.id, www.bi.go.id andwww.bkpm.go.id for period 2010:Q1 until 2016:Q4. After tabulated, we tested root unit to analyze the normality of the data, by applying the Augmented Dickey-Fuller Test (ADF test), to intensify the Vector Auto Regressive analysis accuration. The ADF test used the Mckinnon test as the repalcement of the t table. It would be done the integrated level test if the data was not normal to find out the difference order of some stationer data.

Then, the lag optimum determination was done to detect the duration of exogen variables healing periodagainst the previous variables or other endogen variables. However, this matter was extremely determined by the short and long of a lag duration. Lag optimum determination

was done by counting the Akaike's Information Criterion (AIC), Schwarz Criterion (SC) or Hannan Quinn (HQ). The lower the score of AIC, SC or HQ, the better the model specification. Therefore, the lag chosen in this research was the lowest score of AIC, SC and HQ models.

This research was using the correlation calibration of FDI, PI and EG, by applying the Vector Auto Regression method (VAR). Abustan and Mahyuddin [19] stated that VAR was considered as the simultaneous model yet the endogen variables in the model had been deliberated by entering the previous score which affected other endogen variables in the observed model. On the other hand, VAR could analyse the causality relation all of the economy variables and in establishing the structured economy model:

$EG_t = a_{10} + {}_{a11}EG_{t-1} + {}_{a12}FDI_{t-1} + {}_{a13}EG_{t-2} + {}_{a14}FDI_{t-3} + e_1FDI = a_{20} + {}_{a21}EG_{t-1} + {}_{a22}FDI_{t-1} + {}_{a23}EG_{t-2} + {}_{a24}FDI_{t-3} + e_2$

$EG_t = a_{30} + {}_{a31}EG_{t-1} + {}_{a32}PI_{t-1} + {}_{a33}EG_{t-2} + {}_{a34}PI_{t-3} +$

$PI_t = a_{40} + {}_{a41}EG_{t-1} + {}_{a42}PI_{t-1} + {}_{a43}EG_{t-2} + {}_{a44}PI_{t-3} + e_4$

Descriptions:
EG_t=Economic growth in year t
FDI_t= foreign direct investmentin year t
PI_t=portfolio investmentin year t
EG_{t-n}=Economic growth in year t-n
FDI_{t-n}=foreign direct investment in year t-n
PI_{t-n}=portfolio investment in year t-n
$a_{10}, a_{20}, a_{30}, a_{40}$=Constanta
e_1, e_2, e_3, e_4=Trangressor factors

The three equations above showed that the foreign direct investment and the economic growth were interplay one another in all observed variables, same thing happened with the portfolio investment and the economic growth. Causality correlation test between foreign direct investment, portfolio investment, and the economic growth were applying the Causality Granger test in the form of this vector auto regression (Gujarati, 1995).

3 Results and Discussion

3.1 Stationer Data Test and Lag Optimum Selection

Stationer data selection were using Augmented Dickey-Fuller on FDI,PI and EG with the eviews tools. The result could be seen on the Table 1 as follow:

Table 1. Unit Roots Test on the Level

Variables	ADF Scores	MacKinnon's Critical Scores			Prob	Des c.
		1%	5%	10%		
EG	-1.979760	-3.737853	-2.991878	-2.635542	0.2930	TS
FDI	2.694524	-3.737853	-2.991878	-2.635542	1.0000	TS
PI	-0.164298	-3.711457	-2.981038	-2.629906	0.9316	TS

Source: Processed Data, 2017; PS: data TS was not stationer

The Augmented Dickey-Fuller(ADF) test results, Table 1, showed that all coefficient score variables on FDI, PI and EG were not stationer. That because of the coefficient score of FDI, PI and EG insignificant on the level under 5%. For instance, The EG's ADF,-1.97960, lesser than MacKinnon's Critical Scores on the credibility level of -3.737853. Further, Unit Roots Test was done on the 1st difference, the result as follows:Unit Roots Test on the 1st difference

Variables	ADF Scores	MacKinnon's Critical Scores			Prob	Desc.
		1%	5%	10%		
EG	-7.869607	-3.711457	-2.981038	-2.981038	0.0000	S
FDI	-7.967371	-3.711457	-2.981038	-2.629906	0.0000	S
PI	-7.313288	-3.711457	-2.981038	-2.629906	0.0000	S

Source: Processed Data, 2017.   NB. S (Stationer)

The Unit Roots Test (Table 2) on the 1st difference defined that all coefficient variables, FDI, PI and EG, showed that the data had been stationer. This was showed by all the significantly probabilty scores on the level of 1 percent. After Stationer test, the lag optimum duration test was done, by choosing the smallest score of Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ). Based on the test, the duration of lag optimum in this research was on the 3rd lag.

Table 2. Lag Optimum Selection

Lag	AIC	SC	HQ
0	14.40511	14.55138	14.44568
1	9.760228	10.34529*	9.922499
2	9.559169	10.58302	9.843143
3	8.902304*	10.36495	9.307981*

Source: Processed data, 2017

The result showed that SC scores on the 1st lag, and HQ and AIC scores on the 3rd lag. Thus, the lag score mostly appropriate with the model was the 3rd lag, on the LR score of 20.65297, FPE scores of 1.699895, AIC scores of 8.902304, and HQ scores of 9.307981. This meant that the acceleration or torpidity variables of this year influenced the previous year.The torpidity test showed the torpidity level of all variables to be stationer was lag 3. It can be concluded that the economic growth, foreign direct investment, and portfolio investment were causality better on lag 3.

This research was testing the Causality of FDI, PI and EG of Indonesia. The result showed that FDI and EG had bilaterally two ways relation. In other words, the increase of foreign capital flow would increase the economic growth of Indonesia. The same thing was happened with the correlation between EG and PI, the increase/reduction the past economic growth caused the increase/ reduction of capital flow in Indonesia. This because the investors or the foreign institutions expected positively towards Indonesia condition, i.e. society consumption level, companies profitability and controlled risk level.

The research found that PI and EG had two ways relation as well. This meant as the past portfolio investment activity at the stock exchange correlated with the present economic growth. The problem was, In Indonesia context, the economic growth was not responded rapidly with the height of portfolio investment, this could be seen on the significant score of

10 percent. It meant that the investors were still playing prudent or playing wait and see towards the condition of Indonesia economic growth during this research.

The research implicated of the government of Indonesia FDI and EG had been working proper over the past decade due to numerous FDI foreign capital flow. It needed to be attempted to be guarded constantly so that the future policies would not affecting the economic growth. Another implication was the government of Indonesia, in this case Jokowi and Jusuf Kalla's administration, to be more pro active to persuade the foreign investors to invest in indonesia undoubtedly, both FDI investment and moreover the portfolio investment, because the economic growth of Indonesia was above of the world economic growth currently. This research had its limitation in data time period was very short and it only used two variables. The future research could be done by adding the period of time or crisis and non-crisis period. And it could be added other variables, i.e. foreign portfolio investment, domestic portfolio investment or other sectors of investment.

3.2 The Correlation between Foreign Direct Investment and The Economic Growth

This section explained the correlation between FDI and EG based on the vector autoregressive regression model (VAR). There were equation model established from the VAR test, as follows (Table 5):

$$FDI=20.05407–4.950340EG_{t-1}+0.670404FDI_{t-1}+4.443333EG_{t-2} +0.091156FDI_{t-2}–2.249180EG_{t-3}+ 0.157303FDI_{t-3}$$

$$EG=3.953353+0.549977EG_{t-1}+0.022041FDI_{t-1}+0.499534EG_{t-2}–0.033603FDI_{t-2}–0.630393EG_{t-3}–0.015781FDI_{t-3}$$

$$EG= 3.655856 + 0.653843EG_{t-1} + 0.018680PI_{t-1} + 0.417963EG_{t-2} –0.014890PI_{t-2} - 0.591607EG_{t-3} - 0.017768PI_{t-3}$$

$$PI=23.84292 - 5.676201EG_{t-1} + 0.349992PI_{t-1} - 0.065576EG_{t-2} + 0.405885PI_{t-2} + 3.000064EG_{t-3} + -$$

The first equation explained that the foreign direct investment (FDI) on lag 1, lag 2 and lag 3 were positive. This meant that each increasing of the FDI of 1 point base would increase the FDI score itself in the amount of the FDI coefficient on each lags. For example, on lag 1, the FDI coefficient was 0.670404, meaning every increment of FDI on lag 1 in the amount of 1 percent would increase the FDI itself of 0.670404. Meanwhile, EG on lag 1 had negative score, lag 2 had positive score, and lag 3 had negative score, which meant that EG on lag 1 and lag 3 increased in the amount of 1 point base that would reduce the FDI score. Whilst on lag 2 the increase of EG was followed by the increase of FDI.

Table 3. VAR Results between FDI and PI against EG in Indonesia

Variables	EG	FDI	Variables	EG	PI
EG(-1)	0.549977 (0.17955) [3.06301]	-4.950340 (2.01885) [-2.45206]	EG(-1)	0.653843 (0.19553) [3.34401]	-5.676201 (2.01927) [-2.81101]

EG(-2)	0.499534 (0.23271) [2.14659]	4.443333 (2.61652) [1.69819]	EG(-2)	0.417963 (0.22486) [1.85876]	-0.065576 (2.32223) [-0.02824]
EG(-3)	-0.630393 (0.22351) [-2.82043]	-2.249180 (2.51307) [-0.89499]	EG(-3)	-0.591607 (0.19579) [-3.02169]	3.000064 (2.02197) [1.48374]
FDI(-1)	0.022041 (0.02053)** [1.07343]	0.670404 (0.23087) [2.90384]	PI(-1)	0.018680 (0.02197)** [0.85032]	0.349992 (0.22688) [1.54265]
FDI(-2)	-0.033603 (0.02453)** [-1.36993]	0.091156 (0.27580) [0.33052]	PI(-2)	-0.014890 (0.02116)** [-0.70361]	0.405885 (0.21855) [1.85716]
FDI(-3)	-0.015781 (0.01802)** [-0.87550]	0.157303 (0.20266) [0.77618]	PI(-3)	-0.017768 (0.01994)** [-0.89111]	0.176625 (0.20592) [0.85775]
C	3.953353 (1.40899) [2.80580]	20.05407 (15.8423) [1.26586]	C	3.655856 (1.70783) [2.14065]	23.84292 (17.6374) [1.35184]
R-squared	0.897748	0.968974	R-squared	0.879327	0.988022

On the second equation, the FDI coefficient score on lag 1 was positive, and on lag 2 and 3 were negative. It defined that on lag 1 the increase of 1 point base of FDI would increase EG of 0.022041. On lag 2 and lag 3, the increase of one point base of FDI will reduce EG score of 0.033603 on lag 2 and 0.015781 on lag 3. As for EG variables on lag 1 and lag 2 were positive and lag 3 was negative. This finding illustrated that the increase of 1 percent EG on lag 1 and lag 2 caused the increase of EG in the amount of 0.549977 on lag 1 and 0.499534 on lag 2. And the increase of 1 point base on lag 3, reduce the EG of 0.630393.

The third equation was the correlation of PI and EG by VAR model. The result estimation

Table 4 VAR Results between FDI and PI against EG in Indonesiashowed that PI variables on lag 1, lag 2 and lag 3 were positive. This meant that on each lags whenever there were an escalation of PI, then it caused the increase of the PI coefficient, i.e. the coefficient PI score of lag 1 was 0.349992, meaning if PI lag increase 1 percent, then the increase of PI was 0.349992. The EG on lag 1 and lag 2 were negative, whilst lag 3 was positive, which indicated that when there was the increase of EG on lag 1 and lag 2, one point base, will reduce the PI score of 5.676201 on lag 1 and 0.065576 on lag 2. The increase of EG one point base on lag 3, would increase the PI score of 3.000064.

Lastly, the VAR estimation on the correlation of EG and PI showed that EG on lag 1 and lag 2 were positive and on lag 3 was negative. This defined that the increase of EG of one point base on lag 1 and lag 2 will increase the EG score of 0.653843 on lag 1 and 0.417963 on lag 2. And the increase of EG of one point base on lag 3 will reduce the EG of 0.591607. On

the other hand, the PI variables on lag 1 showed positive, on lag 2 and lag 3 were negative. This meant that the increase of PI of 1 point base on lag 1 will raise the EG score of 0.018680. And on lag 2 and lag 3, the increase, 1 point base, of PI will reduce the EG score of 0.014890 on lag 2 and 0.017768 on lag 3.

3.3 Granger Causality Test

Granger Causality Test was done as form of causality relation test of foreign direct investment, portfolio investment, and economic growth. The result of the test generated variables which statistically influenced the two ways relation, in line one another. It could be seen on table 6:

Table 5. Granger Causality Test

Null Hypotesis	F-Statistic	Prob.
FDI does not Granger Cause EG	4.10530	0.0220**
EG does not Granger Cause FDI	4.10530	0.0220**
PI does not GrangerCause EG	4.56271	0.0369**
EG does not GrangerCause PI	2.96756	0.0596*

It showed that there was two ways relation between FDI and EG, which can be seen through the probability of Granger Causality Test of FDI to EG or vice versa which had significantly score under 5% or 0.020. The two ways relation explained that the changing pattern of FDI influenced the economic growth of Indonesia. This finding indicated that both past FDI and EG took effect on the score changing of present FDI and EG. Theoretically, it could be stated that the increase of EG in Indonesia could increase the amount of stock flows of FDI entering Indonesia. This because of the investors/ future investors considered that a country with good economic growth had small chance not to get the return or had small possiblity failed on investment. This finding was corresponding with stated by Rahayu (2012).

Furthermore, the causality relation was happened as well between the portfolio investment and the economic growth. The Granger Causality Test showed the correlation of PI and EG significantly on the level 5%, whilst EG and PI had significant marginal score of 10%. This indicated that the past PI and EG interplay the present PI and EG, However, the difference of the economic growth would not necessarily accelerate the share investment in the Indonesia Stock Exchange. That because Indonesia

4 Conclusion

This research was testing the Causality of FDI, PI and EG of Indonesia. The result showed that FDI and EG had bilaterally two ways relation. In other words, the increase of foreign capital flow would increase the economic growth of Indonesia. The same thing was happened with the correlation between EG and PI, the increase/reduction the past economic growth caused the increase/reduction of capital flow in Indonesia. This because the investors or the foreign institutions expected positively towards Indonesia condition, i.e. society consumption level, companies profitability and controlled risk level.

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growth. The problem was, In Indonesia context, the economic growth was not responded rapidly with the height of portfolio investment, this could be seen on the significant score of 10 percent. It meant that the investors were still playing prudent or playing wait and see towards the condition of Indonesia economic growth during this research.

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The Effect of Ozone Therapy on The Phase of Diabetic Wound Healing in Patient With Diabetes Mellitus at Alhuda Wound Care Clinic in Lhokseumawe

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Abstract. This study aims to see whether there is an effect of ozone therapy on the wound healing phase of diabetic ulcers in patients with diabetes mellitus at Al Huda Woundcare Clinic Lhokseumawe City in 2016. This research is quassy experiment with samples in this study amounted to 20 patients diabetes mellitus at Al Huda Woundcare Clinic Lhokseumawe City. This research was conducted from 04 until 18 October 2016. Sampling by total sampling method. The analysis used paired t-test (dependent). The result of this research is the age of patient of diabetes mellitus patient at Al Huda Woundcare Clinic of Lhokseumawe city most of the aged between 56-65 years as many as 12 respondents (60,0%) and gender of patient of diabetes mellitus mostly female are 11 respondent (55,0%) . The result of paired t test is obtained p-value 0.000 <α = 0,05. This shows that there is influence of ozone therapy to phase wound healing diabetic ulcer in patient of diabetes mellitus at Al Huda Woundcare Clinic of Lhokseumawe City 2016. The results of this study can provide benefits for the community, especially reponden that as an input that ozone therapy can serve as a new treatment alternative in addressing the problems of diabetic wounds with modern wound care so convincing to the public that diabetic wounds can be cured.

Keywords: Ozone Therapy, Injuries, Diabetic Injuries

1   INTRODUCTION

Diabetes melitus isknown diseases caused by chronic disorders, especially in the system of metabolism carbohidrate, fat and also protein in the body.

Metabolic disorders are caused by a lack of production of insulin hormone, which is needed in the process of converting sugar into energy and fat synthesis. Such condition result in the occurence of hyperglycemia, namely the increasenin blood sugar levels or the presence of sugar content in urine and ketone subtences and excessive acids.

Diabetes melitus (DM) is health problem that needs to be handled thoroughly DM prevalence increases annually, especially in high risk groups. Uncontrolled DM can lead to

metabolic complication or long term vascular complications, namely microangiopathy and microangiopathy. Diabetics are also susceptible to wound foot infection which can then develop into gangrene, thus increasing cases of amputation. According to World Health Organization (WHO) reports the patient's average adherence to long term theraphy against chronic diseases in developed countries is only 50% and in developing countries the number is even lower.In 2015 the number of diabetes sufferers is the world reaches 415 million people. Of which 50% counscius sufferers and about 30% of them regularly treated [1].

The process of accurrence of diabetic foot begins with angiopathy and neuropathy infection. Neuropathy caused a sensory disorder that eliminates or decreases the sensation of foot pain, so that ulcers can occur unnoticed. Motor disorders cause leg atrophy thus altering the fulcrum leading to foot ulceration. Angiopathy will interfere with blood flow to the leg, the patient may feel leg pain after walking with in a certain distance. Infection is often a complication due tro reduced blood flow or neuropathy.

Diabetic ulcers can become diabetic foot gangrene. Diabetic feet require long healing time and conprehensive multidisciplinary handling, ranging, and revascularization surgery, but to date none have satisfactory. This encourages the search for methods that stimulate the acceleration of wound healing, one with the method of ozone theraphy. The use of ozone as a complementary/alternative theraphy is now popular in indonesia and has been used since 1992 as a molecule that has enourmous energy. Ozone can meninaktifikasi bacteria, viruses, fungi and some tipes of protozoa, this can happen because of the ion, ion radical ozone degradation results in water in the form of hidrogen peroxide (HO2) and hydroxyl (HO) [2].

The infection of ozone in healding diabetic wounds is antimicrobial, it is generally belived that bacteria are destroyed by the protoplasm oxidation process. The oxidation of protoplasm will damaged the capsid or outer skin of the microorganism, which comprises an unsaturated bond of phostolipid or lipoprotein, then penetrates into the cell membrane acts with cytoplasmic substances and converting a closed DNA plasmid cycles into an open DNA crystal, which can reduce the efficiency of bacterial politation, directly effect cytoplasmatic integrity and impair some degree of metabolic complexity.

Based on research conducted by Anichini et.al.; on the effects of local ozone therapy on diabetic foot ulcers treated on 34 clients, reported 53% clientsoutcomes were cured in 20 weeks, 34% clients experienced a reduction in surface area of more then 50% [3].

Another study was conducted by Megawati et.al., on the effectiveness of modern modification dressing and ozone therapy wound healing in patients with pressure ulcer in wocare clinic bogor conducted on 16 clients, devided into two groups . It's treatment groups and groups control [4].

The result of the study in the use of modern modification of dressing and ozone therapy more effectively to wound healing compared to use modern dressing alone in patients with pressure ulcers. Bassed on a preliminary survey that researchers conducted with two nurses at the Alhuda

Wound Care Clinic in Lhokseumawe. The nurse said every patients who is treated is advised to take ozone therapy and treat wound at least 5-8 times.

Some patients who do therapy, when they feel the condition of the wound is better, the patient doesn't come or break the therapy and sometimes they come back when the wound conditions worsen. After that, the patient rountinely to follow oxyen ozone therapy, until the the wound healed.

Early interviews that researchs did with three patients said they choose ozone therapy because it was suggested by family members and health workers and the patient said wound

healing was faster with ozone therapy. The nember of visits of patients who come to therapy is amounted to 8 to 10 peolpe/day.

Based on this background, research is conducted to determine the effect of ozone therapy on diabetic wound healing face in patients with diabetes mellitus at AL Huda Wound Care Clinic of Lhokseumawe city in 2016.

2 METHODS

The research design used was quassy experiment. The study was conducted at AL Huda Wound Care Clinic In Lhokseumawe. The population in this study were all patients with diabetes mellitus with diabetic wounds from january to august 2016 as many as 101 people. According to Dempsey for studying was done univariate [5].

3 Results

The result of research of respondents characteristic is found that most of respondent age between 56-65 years old is 12 respondents (60,0%) and female is 11 respondents (55,0%), it can see on the first table.

Table 1. Distribution of Frequency Characteristics of Respondents.

No.	Characteristics	f	%
1.	Age		
	46-55 years	8	40,0
	56-65 years	12	60,0
	Genders		
2.	Man	9	45,0
	Women	11	55,o
	Total	20	100

Pre and post ozone therapy can known that phase wound healling diabetics before (pre-test) given ozone theraphy mostly in the inflammatory phase as much as 13 respondents (65,0%) and after given partial ozone therapy big on phase as much poliferation 8 respondents (40,0%) can be seen on table 2.

Table 2. Pre Post Ozone Therapy (n=20)

No	Fase	Pre-	test	Post-	Test
		N	%	N	%
1.	Inflammation	13	65,0	7	35,0
2.	Poliferation	15	25,0	8	40,0
3	Remodelling	2	100	5	25,0
	Totality	20	100	20	100

Simple with a regorous experiment, can use a minimun sample size of 10 to 20 subject. Samples in this study were 20 patients with diabetes mellitus with diabetic wounds.

The influence of ozone therapy taking the healing phase of diabetik wounds in patients with diabetes mellitus.

The result of statistical test shows that the value of p value 0,000 (p<0,05) so that it can concluded that there is a difference between diabetic injury before ozone therapy is given with diabetic wound after given ozone therapy with t value = 12, 073 > t table = 1,724 with q= 0,05 then ho rejected, thus ha accepted.

It can be concluded that there is an effect of ozone therapy on the phase of diabetic wound healing in patient with diabetes mellitus at Al Huda Woundcare clinic in Lhokseumawe city 2017 (Ha accept).

Table 3. Pre Post Ozone Therapy (n=20)

No	Variable	Mean	Standart Deviation	Standart Error	P value	N	t
1	The wound Diabetic before azone therapy is given	48,65	8,00	1,811			
2	The Wound diabetic after ozone therpy	37,05	9,960	2,227	0,000	20	12,07

4 DISCUSSIONS

The effect of ozone therapy on healing phaseof diabetic healing on diabetes mellittus patient.

The result showed that there was an effect of ozone therapy on diabetic wound healing phase in diabetes mellitus patient Al Huda Woundcare Clinic In Lhokseumawe city before and after ozone therapy, with data analysis (Pairred T Test), obtained P-Value 0,000 shows a value less than α =0,005.

Diabetic feet requiry long healing time and comprehensive multidiciplinary handling, ranging from blood glucose control, daily local wound care, antibiotic therapy, and revascularization surgery, but to date none have been satisfactory.

This encourages the search for methods that stimulate the accaleration of wound healing, one with the methode of ozone therapy.ozone therapy in addition to being used as an atiseptic, ozone is also said to have antiviral, anty fungal, and antiprotozoa effects. Ozone is able to oxidize various type of bacteria, spores,fungi, yeasts, and other organic matter. The ozone effect on bacteria is to integration of bacteria cell capsules by oxidation of phospolipids and lipoproteins, then penetrate into cell membranes, react with cytoplassmic substances and convert circulates of closed DNA, plasmic into opened DA circulate which can reduce the effecincy of bacterial prolifaration, directly effect cytoplasmic integrity and distupts some degree of netabolic complexity. In addition, ozone can also improve the distribution of oxygen and the release of growth factors are usefull in accelerating wound healing [6].

Based on research result, it is known that 55% patient are diabetic wounded female. This is accordance with research by Ferawati which show s hormoral changes in women entering of menopouse [7]. According to researchers, gender is one of the risk factors for the occurence of wound diabetic especiallly for the women.

The results of this study indicate that patients with diabetic injuries are most prevalent in the age group of 56 to 65 years as many as 60% . According Lipsky, on of the risk factors are

diabetic ulcers is age, where age is a factors taht cannot be changed [8]. The older the age, the physicological function of the body decreased. According to researhers, age is closely related to the increase in blood sugar levels, so the more age increases the higher the prevalence of diabetes.

Research conducted by Megawati et.al. [4] on the effectiveness of modern modification dressing and ozone therapy on wound healing in patients with pressure ulcers in Wocare Clinic Bogor conducted on 16 clients, devided into two group namely the treatment group and the control group. The result of this study is the use of modern modification dressing and ozone therapy more effective againts wound healing compared with the use of modern dressing alone in patient with pressure ulcers.

Another research conducted by Restuningtyas [9], there is the effect of combination of modern wound care with ozone bagging on diabetic ulcer healing process in client diabetes mellitus at Nurmalam Jember Hospital with P value 0.000 < 0,05.

Based on the result of the study, it can be concluded that the effect of ozone therapy on diabetic wound healing process in patients with diabetes mellitus in accelerating wound healing not only required primary therapy but also required additional therapy or referred to as complementary therapy, one of which is ozone therapy.

5 Conclusions

Based on the result of tthis research, the result of this research can be concluded the phase of diabetic wound healing before (pre-test) was given as many as 13 respondents (65,0%) ozone therapy on inflamatory phase. Phase of diabetic wound healing after (post-test) was given ozone therapy as many as 12 respondents (60,0 %) in the remodeling phase. There is an effect of ozone therapy on the healing phase of diabetic ulcer wounds in patients with diabetes mellitus at Alhuda Woundcare Clinic in Lhokseumawe city 2016 with data analysis (Paired T Test) obtained value P-Value $0,000 < \alpha = 0,05$.

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Review of Literature on The Impact of Foreign Workers on Wages Keywords:Foreign Workers; Wages

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Abstract. This paper reviews the current theoretical and foreign workers research with a particular emphasis on the impact of foreign workers on wages level. In general, the model that is used to measure the impact of foreign workers on wages level is Constant Elasticity of Substitutes model (CES), assimilation economic model, cohort effect model, spatial correlation model, Total Factors Productivity (TFT), Skill-Biased Productivity (SBP), *standard cross-section* and other estimation models. The research results found are different, thus emerging the positive and negative effect. The positive impact is the optimism of the impact of foreign workers' presence on local workers with high skills and experience. The group of high skill and experience shows that the relations between local and foreign workers are complementary and causes the transfer of technology and knowledge level, as well as the wages of local workers, tend to increase. Meanwhile, the negative impact is the pessimism of the impact of foreign workers' presence on local workers with low skills. The group of low skill and experience are substitutionary and causes increased unemployment, as well as the wages of local workers, tend decline.

Keywords: Foreign Workers; Wages

1 INTRODUCTION

The phenomenon of foreign workers in the process of globalization and the development of major world economy in an effort to improve competitiveness so that the establishment of cooperation labor mobility. Cooperation between countries is one form of self-protection from these countries (Smith, 1998). Foreign workers will come to countries that economic growth high [1] mostly Chinese and Indian immigrants emigrating to high GDP countries. High economic growth due to the increase of productivity, and capital investment and many emerging new industries that eventually led to increased demand for foreign workers [2]. Meanwhile, Duwicquet et.al, stated that migration policy countries China and India have put local workers prefer to work in the villages rather than in the industrial sector.

It begins with one of Cobb Douglas's production function which states that the workers are homogeneous cause the current research to emerge that break the assumptions. The initial current research was developed by Borjas, Card, Dustmann, Peri, Ottaviano, and others. Some research analyzes that workers are heterogeneous and classifying in some groups such as gender, foreign or local, education level, skills level, experience level and others. This classification will have an impact of wages level, in accordance with Hicks, 1932 on the wages theory that states that the differences in net economic profit, especially in the wage rate differences between countries, lead to the emergence of immigration or foreign workers [3]. This research emphasized on the review some research results of the impact of foreign workers on the level of the wages of local workers. This review can be divided into two groups of optimists and the pessimists.

2 THE BASIC LABOR MOBILITY FRAME

Trade was first introduced by Adam Smith in 1776 with the concept of absolute advantage and division of labor. Ricardo (1817) with the *theory of comparative advantage* [4]. The Heckscher-Ohlin (HO) theory attempts to empirically to link the endowment structure with production. The HO model assumption is that there are only two countries, using the same technology, constant scale of return, two commodities, perfect competence, perfect factor production mobility, no barries cost. Paul Samuelson developed the HO model known as HOS theory where equates the factor prices of production factors [5]. Besides, Vanek assumed the technology constant return to scale and costless trade with the assumption m=n, there is a linear relationship between output and endowment [6]. Until now, HOS theory continues to be developed by the researchers.

The HO model put trade among countries that relative endowment factors. The country will produce labor-intensive goods when having relative labor endowment that is capital and human. In addition, a country will produce labor when only have the relative labor. In the long term, free trade will have an impact on countries that have labor endowment will slump its economy where the wages of labor unskilled will fall on the countries relative capital yield. In contrast, economic developments occur in countries with the capital endowment [7]. Cunat and Melitz, [8] using the Ricardian model added that comparative advantages predict the volatility in the production of goods will be higher in a country with a flexible labor market flexible compared to a country with a rigid labor market.

Borjas is one of the researchers who stated that workers are heterogeneous and this was followed by some other researchers. Although, the researchers have the same assumption about workers is heterogeneous, the use of model, sampling and research results on the impact of foreign workers to the level of wages have always been a long debate to date. Borjas criticized several models for estimating the level of wages, including Roy Model and Linear Utility "Generalized" Positive Selection.

Roy Model distinguishes three distinct skills between local and foreign workers is a positive selection, where the average income of foreign workers in above the local workers. Negative selection, where the average income of foreign workers is below local workers. While the third is the final selection of foreign workers get average income under the origin country and get good treatment in the host country. This these statements show that although the gap between state revenues and cost affect the selection of foreign workers, however, the selection process expertise that determines the presence of foreign workers. Borgas assumes

that Roy's model does not see when there is a large wave of immigration/foreign workers that may affect the wage structure of both countries. In addition, in research of and Docquier and Marfouk [9] considers that the use of Roy's model is still limited because they do not pay attention to the education owned by each country [3].

Grogger and Hanson [10] tried to examine with other alternative models that are "generalized" positive selection. This model is very easy to see the difference in wages between two skills (i.e. high skills and expertise low) through linear utility framework. This distinction will eliminate the fixed costs of foreign workers because expertise is independent. Positive selection will see the wage gap between the host country and the origin country is greater in the high-skilled workers' group than in the low-skilled workers' groups. However, in the linear utility framework will show distracting, dynamic implications of attractiveness. It is anticipated that there will be massive displacement of high-tech expertise groups due to the absence of migration costs. [3]

In addition, there are also economic assimilation models, aging and cohort effects that affect the level of wages. The Model of assimilation explained that no data cross section described by Chiswick [11] to determine the level of wages such as length study and length of experience that is constantly changing over time. In addition, aging and cohort effects also determine in making a methodology for analyzing the level of wages [3].

Based on the above framework, Borjas devised a model to determine the impact of foreign workers on wages level. The production function with heterogeneous workers i.e. $Q = f(K, L_1, ..., L_z)$, where Q is output, K is modal and p is the output prices, and L is heterogenous labor $(L_1, ..., L_z)$. Heterogeneous workers will affect wages level in each skill group $m_i = \frac{dL_i}{L_i}$, where m_i represents a shift in the supply curve of host country's labor market. Development of the model framework of Constant Elasticity of substitution (CES) is as follows:

$$Q = \left[\alpha K^\delta + (1-\alpha)L^\delta\right]^{1/\delta} \qquad (1)$$

$$L = \left[\theta_1 L_1^\beta + \theta_2 L_2^\beta\right]^{1/\beta} \qquad (2)$$

Equation (1) is a function of the aggregate production and equation (2) is a function of the homogeneous workers in various occupations in the standardization of efficiency units. The Elasticity of substitution between capital and labor is $\sigma_{KL} = 1/(1-\beta)$ while the elasticity of substitution between the skill groups is $\sigma_{12} = 1/(1-\beta)$ with $\beta \leq 1$ and $\theta_1 + \theta_2 = 1$, changes the number of standardization of efficiency units in heterogeneous workers is:

$$dlogL = \frac{s_1 m_1 + s_2 m_2}{s_L} = \bar{m} \qquad (3)$$

In equation (3) there is no longer required values σ_{12} and σ_{KL} because there are already contained in the equation. Furthermore, the wage formula at input i is equal to the marginal utility is:

$$w_i = \left[(1-\alpha)Q^{1-\delta}L^{\delta-1}\right]\theta_i L^{1-\beta}L_i^{\beta-1} \qquad (4)$$

Equation (4) wages or marginal productivity is still in homogenous workers. To obtain the impact of the foreign workers on the relative wage rate dependent on the substitution elasticity, and then substituting equations (3) and (4) becomes:

$$dlogw_i = dlogw + (1-\beta)dlogL + (\beta-1)dlogL_i,$$
$$dlogw_i = dlogw + (1-\beta)(\bar{m}_1 - m_2) \qquad (5)$$

Furthermore, the effect of distribution is:

$$dlogw_1 - dlogw_2 = -\frac{1}{\sigma_{12}}(m_1 - m_2) \qquad (6)$$

Foreign workers will have no effect on relative wages when both groups are perfect substitutes ($\sigma_{12} = \infty$). Furthermore, foreign workers will affect relative wages when both groups are imperfect substitutes, where the magnitude of supply shock will decrease relative wages. Distributional effects also affect the average wages as well as in homogenous workers conditions so that $dlog\overline{w} = dlogw$. Based on Cobb-Douglas production function in the short term, there is greater -3% wage effect in one group and less than -3% wage effect to other groups in the case of an increase in the labor force due to the presence when adding the workforce as a result of the coming of the foreign workers by 10%. To determine the structure of wages based on the region or area then Borjas using spatial correlation approach and can estimate the national labor market [3].

Some researchers criticize the results of the research that has been done by Borjas. Gochenour [12] assess the Borjas too focused on the impact of immigrants/foreign workers on the labor market. His research in the Immigration Economics book does not answer the influence of political economies such as the effect on the welfare of the host countries, fiscal health host country, and the policies of the host country. In general, Borjas's research does not analyze the results of the research using appropriate meta-analysis because he only explains the results based on the CES model to analyze the effects of immigration/foreign workers on the labor market and empirical findings only.

Peri [13] assess that research produces the spurious correlation with mobility model. This is caused in measuring the pressure of the Borjas immigrants/foreign workers using parameter estimation ρ where there should be a positive bias in the partial correlation between the wages of local workers with immigrant/foreign workers shock but resulting in a negative bias. Using the CES model emerges the level of substitution between foreign and local workers because workers with similar educational and characteristics will differ in their treatment of the labor market. So, there are still many variants which have not been identified in the Borjas researches.The CES Model is not able to explain the effect of the average wages in the long term, even though it establishes a 10% increase in foreign workers will affect -3% wages. This is due to constant capital costs. It is important to be noted that technology and human capital continue to change so that it is impossible to remain and this applies to foreign and local workers.

Mandelman and Zlate [14] State that Borjas's research examined the national level through spatial correlation. His researches focus on spatial correlation to gain wage effects by combining job skill group work which resulted in wage elasticity at the national level. There are 3 things that should be noted are: 1) the skill group does not fix over time so that the impact of foreign workers on the wages of local workers may occur but local workers have shifted to higher level of expertise, 2) there are other factors that affecting the wages of local workers other than foreign workers (e.g. technology), and 3) a national level approach assumes that foreign workers are exogenous factor over time meanwhile Borjas makes foreign workers as endogenous factor as the result will be biased at the national level. The response to the wages of local workers is also very small and this is evidenced by no negative effects in Metropolitan Statistical Areas (MSA) or country level.

Borjas's research often uses the CES model that is flexible enough to estimate relative wage effects of foreign workers across educational groups where it is determined by a shift in the labor supply. But the CES model has 4 weaknesses. First, it does not look at the elasticity of substitution between foreign and local workers in the skill group because it only sees the relative labor supply shift across the skills group and on the short-term effects on the average wages depends on the elasticity of substitution on the skill level. Second, it does not estimate

the substitution elasticity between capital and labor. Third, labor supply to average wages is zero. Fourth, the assumption of equality of substitution elasticity in all skill groups.

3 The impact of foreign workers on wages level: optimistic and pessimistic

The research results of the impact of foreign workers on wages level are beneficial or harmful to local workers. The different usage models, locations, sampling that produce a positive and negative impact.

Table 1. Results of the impact of foreign workers on wages level and economic growth researches

Impact on wages level	Impact on economic growth
The presences of foreign workers bring positive impact on the local workers specifically high-educated such as professional workers, technical supervisors. In addition, wages will remain high when foreign workers are able to speak English and obtain the permanent residency	Increasing output (GDP), employment opportunities and economic growth of host countries
The presence of foreign workers, especially low-skilled, and this caused by the substitution relationship between foreign and local workers	Inequality wages where local workers feel threatened with low payments and companies recruit more foreign workers that will increase unemployment and lower purchasing power so that the country's GDP will descend
The presence of new foreign workers affecting the incumbent foreign workers	Inequality wages where incumbent foreign workers feel threatened by the low pay and more companies recruit new foreign workers and reduce incumbent's remittances.

The presence of foreign workers brings positive impact on the local workers specifically-educated in accordance with the research Islam, Islam, and Nguyen [15] examine the relationship between skilled foreign workers, innovation, and wages of local workers. This study used two analyzes: data at the individual level for estimation of foreign workers contribute to the capacity of innovation of local and state workers for patent rights to wage levels and unpatented workers. The findings are an increase of foreign workers will provide opportunities for local workers get patents in innovation so that the weekly wages of local workers will also increase as well as commercial patent right. Besides, that foreign workers also give the positive impact on higher wages on the state and all local workers both skilled and unskilled.

Peri and Foged [16] in the research of the foreign workers on local workers in Denmark using longitudinal data during the period of 1991-2008 ie data from the Danish Integrated Database for Labor Market Research (IDA). This research found that the entry of the low-skilled foreign workers had a positive positive impact on the low-skilled local in Denmark, especially in refugee areas, where low increased.

Peri, Shih, and Sparber [17] compare the productivity of foreign workers and local workers based on the type of the work of *science and technology, engineering, mathematics* (STEM) seen from the ownership of H-1B as inputs for innovation in the cities of the United States. To avoid the influence of the great recession, the analysis is divided into 1990-2000, 2000-2005. The method used there are 2 ie 1) O*Net database from ILO, and 2) identify the STEM occupations based on the skills workers possess before employment. Research findings STEM foreign workers are able to raise the wages of highly educated local workers and increase economic growth through productivity. In the long term, this research uses the Total Factors Productivity (TFT) and Skill-Biased Productivity (SBP), with the result of the increase of 1 % of the market share of foreign workers with STEM will increase the wages of educated local workers by 7-8 % and not in college group by 3-4 %.

Pinto and Michaelis [18] using the Melitz model to analyze the effects of the labor market from the effects of the trade liberalization by combining trade unions with heterogeneous workers. Finding that trade liberalization has negative effects for workers while highly skilled workers will benefit from high wages. In addition, the amount of low skilled labor will lead to increased unemployment and the welfare of the country will be dangerous and this is present in the characteristics of the wage offer.

Brucker and Jahn [19] using IABS analysis for data processing of German workers been recorded from the year 1975-2004 in analyzing the foreign workers and wages in the reexamination of the effects of the labor market. Immigrants/foreign workers will affect the unemployment rate depending on education, work experience level and wage flexibility. High labor supply with high wage flexibility and low unemployment will make the company add workers to lower wages and become substitutes for education and lower experience in the labor market. However, for highly skilled workers it will in the long run benefit local skilled workers

Mukhopadhyay and Oxborrow [20] analyzing the work based on the green card with data sources fro (NIS). Classification of the work based on the census of 4 digits and 5 occupational categories namely professional and managerial, health, services, sales and administrative, and another obvious lesson, where the green card recipient is R = 1 and that is not R = 0. This research estimates the increase of foreign workers wage based on the acquisition permanent residency in the United States. The findings in this study of foreign workers wages will increase after obtaining a permanent residency because the increasing population keeps the employers must pay foreign workers wages in the wages of local workers. Increased green card enforcement will make high-skilled foreign workers mobility impaired because and employers have more power. The employer is judged to be able to suppress wages and compare them with local workers.

Schoellman [21] by developing a comparative advantage model in the labor market with heterogeneous workers and using CES to analyze employment outcomes in aggregate to examine the differences in work based on human capital owned by foreign and local workers in the United States. The source of the data from the two sources namely 1) data the census of the United States to see the origin country of birth and type of work based on the *Standard Occupation Classification* (SOC) system, and 2) data O*Net to see the behavior of the work. The comparative advantages that are owned by the workers make workers freely determine the work in accordance with their skills and expertise. Foreign workers prefer employment based on cognitive-intensive skills in the field of science and physical skills. While local workers work more intensively-communicative like managers and reparations. The result of the study shows that the increase of wages due to foreign workers is only 0.3%

while the wage decrease is 2.8% and the decrease is mostly in the intensive work of cognitive skills.

Chiswick and Miller [11] examine the negative model of immigrant assimilation in the United States, with foreign workers data from English-speaking developing countries from the 1980, 1990, and 2000 censuses. Foreign workers who are the subject of research from Canada, United Kingdom, Ireland, Australia and New Zeland. The model of assimilation analyzes the group of workers based on the classification of English skills and proficiency. If skill transfer gets high price/wage for foreign workers then there will be positive assimilation. While the declining skills and the decrease in price/wages of foreign workers will result in negative assimilation. Using the standard cross-sectional approach and the cohort of the relative income model of foreign workers continues to diminish over time. However, this income/wage will remain high if able to speak English.

Asali [22] analyzes Israel's labor market of varying numbers of foreign and local workers using a quasi-experimental approach done to see the political instability and border area policy. The Levant Event-Type Counts DataSet is used for conflict data that is done every week. Estimates adopted Borjas for analyzing the quarterly rate. The research findings are a Palestinian worker complement with local workers Israel Arabs and this does not affect the Israel Jewish. Foreign workers (other than Palestine) do not affect the wages of local workers. In the event of a 10% induced Palestinian pardon inducement in the industrial sector, it would increase Israel's Arab wage by 3.4% but not with Israeli Jewish wages. This means that Palestinian workers do not affect the wages of Israeli Jewish workers but increase the wages of Israeli Arab workers.

Negative influence also occurs on the substitution relationship between foreign and local workers for the highly educated. Peri [23] in the period 1970-2014 there was a shift in the labor supply curve relative to the presence of foreign workers affecting the wages of local workers in the United States. The model used is CES by identifying based on high school and non-high school educated groups which are a combination of imperfect substitution between high school and high school dropout. The entry of foreign-educated high school workers lowers the relative wages of non-high school workers. Wage gaps occur in non-high school or low-skilled workers for the period 1900-2000. This study concludes that foreign workers do not negatively affect the wages of local workers. In 2010, foreign workers have a positive influence on the rising wages of local workers who have high school education or not.

Dustmann, Schönberg, and Stuhler [24] focused their research on wage analysis by ignoring the employment response, as well as using the national skill-cell and mixture approach with immigrant and local assumptions having the same level of education and experience in three countries: United State, United Kingdom, and Germany. In addition, the basic explicit parameter estimation approach is explicit in the canonical model to predict the effect of immigrant wages. The results showed that foreign workers responded to heterogeneity. Estimation of the effect of relative wages of immigrants with the national skill-cell approach is misleading and difficult to interpret for the total effect of foreign workers as a whole. Downgrades will lead to biased estimates in the national skill-cell approach and mixture approach as both depend on variations in immigration inflows of skill alerts. In the United States and some countries, however, the influence of wages is relatively negative with experience in national skill-cell approach and also negative with education using mixture approach, but the national skill-cell total approach immigration effect strongly strengthens the downgrade and does not need assessment of skill immigration.

Ruist [25] analyzed the wage gap between foreign and local workers using data from the US census 1960-2006, with a classification of 4 education groups and 8 experience groups.

Estimates were made using Elasticity of Substitution in accordance with [26]. The research findings do not occur perfect substitution of foreign and local workers in the United States. and complementary relationships were not found in this study. So that the average wage of foreign workers will be low if the number of foreign workers is high. The individual wages of foreign workers will lower or average relative wages of local workers, in the case of a complementary relationship between foreign and local workers because local workers have been divided into workplaces. It is different with Ottaviano and Peri who find that foreign workers (based on European countries in Germany) have negatively affected the incumbent and positive foreign workers with local workers.

In general, the negative effect of foreign workers on the level of wages of local workers tend to be in the low skill groups, and this causes the pessimists to be exposed to the presence of foreigners Bettin, Lo, and Daniela [27] studied foreign workers in the Italian manufacturing sector in the 9th wave survey period 2001-2003. this study uses a production function approach also analyzes the factor of price changes on labor inputs for the level of output produced and uses the Morishima Elasticities of Substitution (MES) to assess the relations of foreign and local workers in production. Although the output elasticity of foreign workers is lower, the addition of foreign workers is able to increase production and bring about changes in output. If the price of skilled workers is increasing, so companies will tend to ask for foreign workers and substitutes for low-skilled local workers. So there is substitution between foreign workers and local skilled workers.

Borjas [28] the shock supply of foreign workers in Miami as a whole did not significantly affect wage structures, but more impacted on low-skilled and unprofessional local workers. While in Florida, high school drop-out rates and college dropped 10-30% between the periods 1977-1979 and 1981-1986. Overall the Marielitos had a negative effect on wages throughout the placebo.

Dustmann, Frattini, and Rosso [29] The emigration cause low wages to low-skilled workers and only a modest increase in wages to medium- and high-skilled workers and this is in accordance with the research. Borjas, Grogger, and Hanson [30] using the demand function and estimate the wage rate through CES model. The study found that a decrease in black wage rates by 3% and reduced employment by 5% in the case of an increase in foreign workers by 10%. This research is also in line with the results of research by other researchers: [2], [18], [31]–[34].

 Negative impact not only on local workers' wages but also on immigrant wages. Manacorda and Manning [35] new immigration lower incumbent immigrant wages compared to local workers in the United Kingdom. Felbermayr, Geis, and Kohler [36] the presence of new immigration has negatively affected the wages of incumbent immigrants but has no effect on local workers. But Peri and Foged [16] found immigrants to have a positive impact on low-skilled local workers' wages in Denmark.

In addition to the empirical research the impact of foreign workers on wages of that done in continental Europe and the United States. Research the impact of foreign workers also conducted in ASEAN countries, especially Malaysia. [37] Professional foreign workers and technical supervisors have a positive relationship to foreign wage levels but have a negative relationship with capital goods and local wage rates. Therefore, the development of high-tech industries led to the need for cooperation between industries and universities in producing skilled labors. Ismail, Yussof, and Awad [38] foreign workers reduce the wages of local workers in Malaysian companies, in particular, the service sector, but this is different from professional wages. Yean and Siang [39] estimate wage and labor demand levels by deriving Cobb Douglas production function. The use of foreign workers has a very small negative

impact on all workers both foreign and local and not in all work groups in Malaysian manufacturing sector in the 2000-2006 periods.

4 Conclusions

The emergence of optimistic and pessimistic groups of foreign workers against wage levels is due to different research results. The diversity of the results of this study is due to the use of models in measuring the level of wages. In general, the models often used to measure the impact of foreign workers on the wage rate are the Constant Elasticity of substitutes (CES) model, economic assimilation, cohort effect, spatial correlation, Total Factor Productivity (TFT) and Skill-Biased Productivity (SBP), standard cross-section and other estimation models. However, it is not only the model that determine the difference of research results, sampling and location also determine the different results. The difference in determining the model of measuring the impact of foreign workers on wage rates continues to be a matter of debate to date.

The optimism for the presence of foreign workers occurs when the relations of foreign and local workers complement, where there will be the transfer of technology and science and can increase the wages of local workers, and vice versa pessimism will occur. Complementary relationships often occur between high-skilled foreign and local workers and substitutions occur between low-skilled foreign and local workers. Although there are several studies that find that the presence of foreign workers does not only affect local workers but foreign workers are incumbent.

Acknowledgements

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The Effects Of Reference Groups, Motivation, And Learning On The Used Of Whatsapp

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Abstract. The development of technology gave rise to many social media whose utilization was welcomed quickly by the market. One of the most famous social media is using Whatsapp (WA). This study aimed to determine the influence of reference, motivation, and learning groupson the used of WA. The design was developed associative design. The population of this research was all the head of family (KK) of Seberang Ulu II Plaju Palembang. The number of samples was determined by 171 KK selected by cluster sampling. The required data was primary data with questionnaire data collection method. Further data was analyzed using multiple linear regression. The results of the study indicated that (1) consumer reference groups provided strong pressure in terms of WA usage, (2) motivated consumers to communicate, seek information, and seek entertainment through the used of WA, (3) WA was considered to provide easy, simple, fast, and practical so that consumers will learn to use it.

Keywords: Reference Group Factors, Motivation Factors, Learning Factors, Using WA

1 INTRODUCTION

In recent years, technological advancement has provided tremendous facilities for the market for the used of the Internet for various activities. Even the used of the internet for social networking puts Indonesia in 2nd ranked as a country with the most social networking community. In addition to being a media of social networking developers, the internet can also be used to search for information, dowload / upload, chat, communication, transactions, games, and others. The impact of further development is the growth of various communication media. Currently people do not only use the phone, but also Line, WA, Facebook, Instagram and others to communicate, seek information and entertainment. Pre-research interview conducted showed 52% of people using Whatsapp (WA) as a social networking media, and others using facebook, Line, or HP. The used of WA was mostly done for practical reasons, simple, easy to learn, or because of the influence of relationships that exist around the consumer.

WA users come from all people [1], age, gender, geography, marital status, occupation, education, and income. [2] described the used of WA that tended to create addictive feelings associated with certain psychological conditions such as feelings of shame, mood, loneliness,

and stress. The used of WA had proved to be a stress reliever for people under 35, living in cities, and living as civil servants, with relatively low incomes [1] Unfortunately, specifically [3] found, the students had not been able to utilize WA users optimally for their educational purposes. In fact, [4] found that the used of WA did not only provide social benefits and relaxation needs, but could also meet the need for certain information, knowledge, and understanding. That is why a more comprehensive study of what factors affect consumers to use WA applications in various social interactions.

2 LITERATURE REVEW

Schiffman and Kanuk [5] described consumer behavior as a process through which a person seeks, buys, uses, evaluates, and acts post-consumption of products, services and ideas that were expected to meet their needs. Overall [6] suggested factors that influenced behavior could be as a stimulus to marketing, other stimuli, buyer characteristics, and purchasing decision processes. Furthermore, on the characteristics of buyers, there were cultural, social, personal and psychological factors.

Among social factors, reference groups hadan important role as human beings as social beings. According to [7], others, individually or in groups, have a strong urge to influence others. Groups could mean friendship groups, shopping groups, work groups, or other groups [5][8] calls it formal and informal groups, primary and secondary groups, or groups of aspirations and dissociations.

According to [9] the reference group is an individual or group of people who are considered to have significant relevance to a person in terms of evaluating, predating, or in behavior. The reference group will provide standards and values that will affect a person's behavior and serve as a reference for someone in purchasing and consumption decisions. There are three kinds of influence of the reference group [8] a) the normative influence, namely the influence of the reference group on a person through social norms to be obeyed or followed. This influence will be strong if there is pressure to comply with existing norms, social acceptance, and if the purchased product is seen as a symbol of social darinorma b) the effect of value expression, ie the effect that purchasing certain products will make consumers feel appreciated or admired, and c) the influence because the reference group is considered to have good knowledge and information.

Sari [10] proves the influence of the reference group on the use of social media Line. [11] also proves the power of this group's influence on the use of internet cafes. Further Natalia and [12] prove the influence of the reference group on the used of 3G. Based on existing theories and studies, the hypothesis was formulated:

H1: There was an effect of reference groups on the used of WA

Motivation is one of psychological element of consumer. Motivation can be described as a driving force within the individual that forces them to take a buying action that is believed to satisfy the need [5]. According to [8] motivation arises because of the needs felt by consumers. Needs arise because consumers feel the discomfort between what should be felt and what it really feels. The perceived need encourages a person to take action to meet those needs. This is what is termed as motivation.

Kotler and Keller [6] writes that Herzberg developed a two-factor theory that distinguishes dissatisfiers (factors that cause dissatisfaction) and satisfiers (factors that cause satisfaction). The absence of dissatisfiers alone is not enough, otherwise satisfiers must exist skillfully to motivate purchases. This theory has two implications. First, the seller should try as best as possible to avoid dissatisfiers, although it is not causing the product to malfunction, but can easily lead to unsold products. Secondly, the factory must identify the main satisfiers or motivators of the purchase in the market to then provide the factor of the satisfiers. Satisfiers will make a big difference to what brands customers buy. [9] distinguish between rational motivation and emotional motivation. The study of the influence of motivation on the used of social media has been done by [12] Hence the hypothesis was formulated:

H2: There was an effect of motivation on the used of WA

Another psychological factor that affects buying behavior was learning. According to [6] learning is indicated by behavioral changes arising from experience. Learning is generated through a work blend of stimulus, clue, response, and reinforcement:
  - A powerful stimulus is an internal stimulus that drives action.
  - The clue is a stimulus that directs the stimulus if it is consistent with the expectations of the
  consumer. Ads, product packaging, and prices are cues that affect consumers to meet their needs.
  - Response is a way of reacting individuals to encouragement or cues. If considered good, then
  consumers will buy it.
  - Reinforcement is something that increases the tendency of consumers to behave in the future due to
  the stimulus.
  [8] mentions that, marketers have an interest in teaching consumers to recognize the advertising of their products or services, remember it, love it, and still buy it. [11] and [12] have proven the influence of learning on social media usage decisions. That is why the hypothesis is formulated:

H3: There was a learning effect on the used of WA

3 METHODS

This research used associative design [13]. The variables used that was measured using each indicator as shown in the following table:
  1 The reference group (X1), was any individual or group that significantly affected the consumers using WA. The indicators used friends, family, and neighbors.
  2 Consumer Motivation (X2), which was the consumer driving force using WA. Indicators used communication, information, and entertainment.
  3 Learning (X3), was behavior change to keep using WA due to experience. The indicators used easy, simple, fast, and practical.
  4 Purchase Decision (Y), was consumer actions evaluate the used of WA. The indicator used the choice of services, hoists, and dealers.

The research population [13] was the community of 14 Ulu Plaju, Palembang. Samples were taken as many as 171 respondents in Cluster Sampling. The main data of the research was primary data [14] derived from the questionnaire.Furthermore, after testing to ensure the feasibility of the data, then performed the analysis. The analysis technique used multiple linear regression [15].

4 RESULTS AND DISCUSSION

4.1 Research Results

4.1.1 Characteristics of Respondents

Table 1. Respondent Characteristics

No	Characteristics	Total	
		Person	%
1	Gender		
	Man	76	44,44
	Woman	95	55,56
2	Age		
	16-19 Years	25	14,62
	20-30 Years	91	53,21
	31-40 Years	43	25,14
	Above 41 Years	12	7,2
3	Education		
	SMA	101	59,1
	S1	49	28,6
	S2/S3	21	12,3
4	Income		
	< Rp. 1.500.000	9	5,3
	Rp. 1.500.000 – Rp. 3.000.000	124	72,5
	> Rp. 3.000.000	38	22,2
5	Social Media Used		
	WA	81	47,37
	Line	24	14,03
	Facebook	27	15,79
	Headphone Number	39	22,81

4.1.2. The test result

The value of R showed the relationship between the reference, motivation, and learninggroup with buying decision of 0.77. Adjusted R Square number was 0,586, indicating that reference, motivation, and learninggroup variable that was only able to explain the changed of variable buying decision by 58,6% (Table 2). While the rest of 41.4% was explained by other variables that was not included in this study.

Table 2. Table 2. Multiple Correlation and Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,770[a]	0,593	0,586	0,972

Table 3. F Test Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	229,870	3	76,623	81,114	0,000[a]
	Residual	157,756	167	0,945		
	Total	387,626	170			

According to Table 3, the value of Sig (0.000) <0.05, which meant that Ho was rejected. There was a significant influence simultaneously, between reference, motivation, and learninggroups on the used of WA

Table 4. . T Test Result

Model		Unstandardized Coefficients		Standardized Coefficients	*T*	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,531	0,675		3,753	0,000
	X1	0,412	0,070	0,429	5,851	0,000
	X2	0,228	0,098	0,231	2,317	0,022
	X3	0,123	0,059	0,186	2,083	0,039

Based on Table 4, the following interpretations could be given:

The reference group variable had an influence value of 0.412. A positive t value indicated that the effect was positive and unidirectional. Sig value (0,000) < probability value (0,05), it meant that there was significant influence of reference group to consumer decision using WA.

Motivation variable had an influence value of 0.228. The positive t value indicated that the effect was positive and unidirectional. Sig value (0,022) < probability value (0,05), it meant that there was significant influence of motivation to consumer decision using WA.

The learning variable had an influence value of 0.123. The positive t value indicated that the effect was positive and unidirectional. Sig value (0,039) <probability value (0,05), it meant that there was significant influence of learning to consumer decision using WA.

4.2 Discussion of Research Results
4.2.1. Influence of Reference, Motivation, and LearningGroupon the Used of WA

Hypothesis testing proved that there was a significant effect simultaneously, between reference, motivation, and learning groups on the used of WA. Reference, motivation, and learninggroups, together affect purchasing decisions. This result was in line with Kotler's (2016) opinion, that marketing stimuli, other stimuli, buyer characteristics, and purchasing decision processes have an effect on consumer buying decisions. Reference group was one of the variable in social factor which was one of consumer characteristic. Motivation and learning were in the psychological factors of consumers.

These results were in line with [10], that the reference group affects the loyalty of instant messaging users. Support results as well as given to [11], that reference and learning groups have a significant effect on the used of internet cafe. Likewise, if associated with [12], that

reference, motivation and learning groups influence on the decision on the used 3G Technology.

Associated with the indicators used to measure the three variables, respondents indicated a relatively high agreement, so that the purchase decision was dominated by the respondent's consent.

4.2.2. Reference group

The reference group was shown to have a significant positive effect on the used of WA. Support is given to Kotler's opinion (2016). No consumer is not involved in the group, and group members build interaction with the continuum low to high. Interaction was often done the assessment of a particular product. The members of the reference group would be attracted to each other to support their purchasing decisions, including support for the used of WA.

Associated with the results of [10], the reference group variables equally positively influence and obtain responses with strong consent by consumers. Similarly with [11], and [12]. Based on the variable indicator, consistent results were indicated by the dominance of consumer consent

The study was dominated by respondents aged 20-40 years, with the majority of high school and income ranging from Rp 1,500,000, - Rp 3,000,000. Groups with these characteristics were similar to those described by [1]. Generally they took advantage of the WA that had not been maximized because of the new entertainment medium [2]. The used of WA due to the influence of the reference group, according to [8] stronger give normative pressure and expression of value compared with information. Therefore need to be studied more about the utilization of WA more leverage, especially in education through reference group.

4.2.3. Motivation

Motivation proved to have a significant positive effect on the used of WA. [6] states, that motivation is one of the psychological elements of consumers, internal elements of consumers who interact with the stimulus of marketing influence on consumer purchasing decisions. These results reinforced the findings Natalia and [12], in this study the motivation to be variable, although both had a significant influence, compared to previous research, this study had a deeper influence.

Respondents stated that motivation received a high approval answer, through communicative encouragement, information acquisition, and entertainment (whose approval was relatively lower). Booming used of WA in Indonesia caused incoming information that was crowded and it made consumers feel less comfortable. Nevertheless, [2] proves WA's utilization will recur because it is considered to reduce stress [1]. Moreover, according to [9], motivation is not only provides rational benefits, but also benefits hedonis. It needed further study on the used of WA to be more rational.

4.2.4. Learning

Learning had a significant positive effect on the used of WA. According to [6] states, that when consumers act consumers actually learn. According to learning theory, learning is generated by controlled behavior, stimuli, clues, responses, and reinforcement. When using WA, consumers actually exercise behavioral control, follow instructions, respond, and gain reinforcement. Linked to [11] learning variables are equally positive and gain strong approval

by consumers. In the previous study, learning became an indicator, whereas in this study the learning became variable. Although both had significant influence over previous studies, this study had a deeper influence.

Respondents considered learning to provide an easy, simple, easy to learn, and practical WA experience. Respondents of this study was the majority of high school education with age below 40 years. A group that was welcome and enthusiastic about the things that connoted progress. Especially according to [4] utilization of WA can meet the needs of cognitive, affective, social, and tension relief. In conjunction with cognitive needed, it was necessary to find the maximum WA media.

Based on this research proved that the variable reference, motivation, and learninggroup had their own role and influence in influencing purchasing decision. Because the variable reference, motivation, and learning group was an important part / aspect for consumers to determine purchasing decisions. So based on this study known reference group was the first part that determines consumer purchasing decisions, then depending on the consumer's own motivation, and continued with how consumers did learning on its evaluation indetermine the purchase decision. Thus if the reference, motivation, and learning group together would form an influence that almost represents the whole of the consumer's consideration in determining the purchase decision.

In this study, reference, motivation, and learning group variables could only explain the purchase decision as much as 58.6%. This meant there was still a chance and the role for other variables of 41.4% which could be used as influence variable to purchase decision. Thus it was suggested to re-do similar research by increasing the number of variables.

5 CONCLUSIONS AND IMPLICATIONS

5.1 Conclusion

WA became one of the most popular social media. The strength of the influence of the used of this media was the consumer reference group, which had a high frequency in interacting with consumers so to give a strong influence on its used. Consumer motivation also encouraged the used of WA through its benefits to communicate, seek information and entertainment. In addition, learning had an important meaning for consumers, the used of WA was considered easy, simple, fast, and practical that could change consumer behavior to consistent use it.

5.2 Implications

Reference, motivation, and learninggroup influenced on the used of WA in this research, however it was advisable to add another variable, because there was still possibility of other independent variable which influence to purchasing decision. In addition, in relation to education, needed to look for methods of utilizing WA media more appropriate for educational goals.

We hope you find the information in this template useful in the preparation of your submission.

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Dispute Resolution Through Mediation Can Reduce Case Deposits in Court

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Abstract. Indonesian judges are considered incapable of resolving disputes quickly so that many cases accumulate in court every year. Mediation is one of the Alternative Dispute Resolutions that are considered to help in reducing the burden on the accumulation of cases in court. Mediation has advantages such as mediation carried out on sincere and sincere intentions, closed and confidential mediation forums, all parties can actively participate, flexible procedures, mediators are selected by mutual agreement and the decisions taken do not harm either party (*win-win solution*). Under this approach, dispute resolution through mediation is faster and more economical with success rates of 80-90 percent. Although there are some courts in Indonesia classified as successful in mediation, such as the District Court of Depok by 25 percent and the North Jakarta Religious Court account for 70 percent of all cases that go to the court. However, the use of mediation in Indonesia is still relatively low at 4 percent of all cases admitted in court. In order for mediation to be effective, the government must reform several laws related to dispute resolution both in court and out of court.

Keywords: Mediation, Reduce, Stacking, Case, Court.

1   INTRODUCTION

Common conflicts or disputes occur and can not be separated in the historical development of human life. Almost all people, organizations, professions and even countries have experienced conflict both internally and externally [1], [2]. Generally, all disputes are resolved by court (litigation). However, dispute resolution through courts has many disadvantages. For example, dispute settlement through courts takes a very long time and need a lot of money to take care of their case in court [3].

As a result of the lengthy settlement of the trial in court, many cases have accumulated in court. For example, in 2016, the number of cases accumulated in the Supreme Court increased was 2,357 cases [4]. If it is classified by type of case, for example in 2016, the number of cases accumulated in the Supreme Court is 1,006 civil cases, 311 criminal cases, 124 special civil cases, 717 special criminal cases, 131 military criminal cases, 68 state administrative cases [4].

The accumulation of cases is not only happening in Indonesia, but also occurs in developed countries such as the United States, United Kingdom, Australia and Canada [5], [6].

To reduce the accumulation of cases in the courts, all of these countries, including Indonesia, implement faster and more economical alternative dispute resolution mechanisms such as mediation, arbitration, consultation, negotiation and conciliation.

According to Nolan-Haley, Alternative Dispute Resolution is an umbrella term which refers generally to alternative adjudication of disputes such as negotiation, mediation, arbitration, mini-trial and summary jury trial [7]. From those alternative dispute resolution methods, mediation is one of the more effective and efficient mechanisms for resolving disputes both in court and out of court. However, the problem is whether mediation can be applied to all cases, whether court or out of court? What are the advantages or advantages of mediation so as to minimize the accumulation of cases in court.

2 Research Method

This study is a qualitative research using normative juridical approach. This study is legalistic or doctrinal using analytical techniques substance. Content analysis technique is a research carried out systematically by analyzing a legal document pertaining to dispute resolution through mediation mechanism [8], [9]. The aim of the study is to find, explain, research, analyze and propose a systematic way of facts, principles, concepts, theories, certain laws and law enforcement institutions that find knowledge and new ideas for suggested be a change or renewal [10]. Doctrinal research is also a purely theoretical research, documentation or theoretical research in which the necessary data is sourced from libraries or other scientific databases [11].

3 Mediation In Indonesia

3.1 Mediation in the Civil Court

In the legal aspect, all civil cases such as copyright disputes and intellectual property rights, business competition, workers' dismissals, environmental pollution, medical disputes and others must be resolved through mediation before the dispute settles through the courts. Typically, the mediation is facilitated by the court and the mediator is one of the judges or other parties referred by the judge in charge of the dispute concerned. If in the mediation process the parties do not reach an agreement then the dispute will proceed to the next stage that is resolved through the court in accordance with the Book of Civil Procedure Code.

The mechanism mentioned above is called mediation in the court which means dispute resolution through mediation between the parties in court. Before the principal investigation process begins, the judicial panel provides an opportunity for the parties to the dispute to settle the case through mediation and the court facilitates the mediation process. If the mediation proceeds smoothly and the parties have made an agreement then the judicial process can be terminated in accordance with the agreement of both parties. The mediation in the court system is similar to the court-annexed mediation system. However, the mechanism of court-annexed mediation is conducted when the case is being tried in court. The judge may allow the parties to the dispute to settle the case through a mediating mechanism if both parties are willing [12].

In Indonesia, the system of mediation in the court or court-annexed mediation has long been implemented since the Dutch colonial period. This system has been regulated in the Het Herziene Indonesich Reglement (HIR, Staatblad 1941: 44), Rechtsreglement Buitengewesten (R.Bg, Staatsblad, 1927: 27) and Reglement op de Rechtsvordering (Rv, Staatsblad 1874: 52) [13]. In Articles 130 and 154 of the Indonesian Criminal Code (KUHPdt), it is determined that mediation in courts can be made against civil cases only. All mediation decisions are made in written form and established by the court. To ensure that both parties do not forward their case to court, in the mediation decision it should be mentioned that this case has been completed and no longer forwarded to court. All civil cases are required to follow the mediation and mediation process before the judges conduct the principal review of the case. If the parties do not find a solution or a solution to their dispute then the case proceeds to the process of resignation.

Currently, Indonesia has issued Law No. 30 of 1999 on Arbitration and Alternative Dispute Resolution. The law can serve as a basis for mediation through courts (litigation) and outside the court (non litigation). However, dispute resolution through courts has been issued Regulation of the Supreme Court (Perma) No. 1 of 2016 on Court Mediation Procedures. Under this rule, all judges, mediators and parties to the dispute must know and understand the rules to facilitate or expedite the mediation process in court.

3.2 Criminal Cases Settlement through Mediation: Is it Possible?

Generally, mediation can only be applied to civil cases only, whereas in criminal cases, mediation is not applicable. All criminal cases are submitted and resolved by the state through its law enforcement apparatus [14]. However, the many advantages found in dispute resolution through mediation, mediation was introduced and applied to criminal cases with penal mediation term. According to Rudi Satrio, there are several criminal cases that are difficult to resolve through the courts but more effective if the case is resolved through mediation, for example, a case involving many times such as brawl between villages, tribes and schools [15].

In the aspect of settlement of criminal cases, the concept of mediation or other types of alternative dispute resolution is called the concept of restorative justice that places the judiciary as mediator. The concept of restorative justice is a new term for the old concept. Restorative justice approaches have been used in solving conflicts between the parties and restoring peace in the community. Because retributive or rehabilitative approaches to crime in recent years are considered unsatisfactory. Therefore it causes the urge to move to a restorative justice approach involves perpetrators, victims and communities in an effort to create a balance between perpetrators and victims [16].

At the 10th United Nations Congress on the Prevention of Crime and the Treatment of Offenders held in Vienna, 10-17 April 2000, restorative justice was seen as an alternative model of criminal justice [17], [18]. Where all parties take part to solve certain problems together how to deal with the consequences of the problem and its implications for the future. In this model, the emphasis is on reparation and prevention rather than imposing a criminal. This restorative justice and other forms of dispute resolution (formal and semi-formal dispute resolution) reflect the present tendencies of individualism and diminish the functioning of the state.

Basically, mediation in the settlement of criminal cases is not recognized in the provisions of the law regarding the criminal justice system. Law No. 8 of 1981 on Criminal Procedure Code and Law No. 2 of 2002 on the Police of the Republic of Indonesia as the legal basis for the police to enforce the law against the perpetrators of criminal acts does not regulate

mediation as an alternative to the settlement of criminal cases. In both laws, it is even implied that there is no peace in the settlement of criminal cases and if the achievement of peace among the parties does not eliminate the existing criminal elements.

However, in recent developments shows that Indonesia is gradually beginning to introduce mediation to resolve criminal cases through customary justice. For example, the Government of Aceh has issued the Regional Regulation (Qanun) No. 7 of 2000 on the Implementation of Indigenous Life, which authorizes customary courts to reconcile through negotiations to resolve customary violations such as theft, nasty deeds, minor maltreatment, fights and others. The settlement of criminal cases through customary court by using mediation is also carried out in various regions such as Padang, Bali, South Sulawesi and other areas.

Currently, penal mediation has started to take shape formally, especially after the issuance of Chief of Police No. Pol: B / 3022 / XII / 2009 / SDEOPS 14 December 2009 on Case Handling through Alternative Dispute Resolution (ADR). This letter is partial and the principles of penal mediation referred to in this Chief of Police emphasize that the settlement of criminal cases by using ADR, must be agreed by the litigants but if no new agreement is settled in accordance with the legal procedures that apply professionally and proportionally.

However, juridically, mediation cannot be implemented against in criminal cases because there is no law regulating it. If mediation is used as an alternative in solving criminal cases, it must be amended first Law No. 8 of 1981 on the Criminal Procedure Code as the foundation for the police to enforce the law against the perpetrators of criminal acts. In addition, the mediation of criminal cases should be limited to criminal offenses involving mass forces, criminal cases of humanitarian considerations and prioritizing coaching, traffic accidents cases, public concerns and minor criminal offenses, where the consequences of the criminal act are very light [17], [18].

4 Mediation Can Reduce Stackage Of Cases In Courts

In general, the court is still the ideal place to seek and find justice. All disputes, cases or cases occurring in the life of the public both criminal and civil aspects will be tried in court in accordance with their powers. However, nowadays, the dispute resolution through the court has been heavily criticized and the negative responses to the court settlement usually take a very long time and spend cost a lot. This is due to the fact that the number of cases that go to court more than the number of judges who tried these cases, resulting in many cases that accumulate in court every year.

For example, In 2013, the number of cases registered in the Supreme Court was 22,449 cases, but only 16,034 cases were completed, so the cases that accumulated in the Supreme Court is 6,415 cases [19]. In 2014, there were 18,926 cases that reached the Supreme Court, but only 16,034 cases were finalized, resulting in an unfinished number of cases and 2,892 cases in the Supreme Court [20]. In 2015 also, the number of cases registered in the Supreme Court as many as 18,402 cases, but the trial only 3,950 cases alone, so that cases that accumulate in the Supreme Court as many as 14,452 cases [21]. Whereas, in 2016, the number of cases that reached the Supreme Court of 18,580 cases, but only 16,223 cases completed, so the number of cases that are not resolved amounted to 2,357 cases [4].
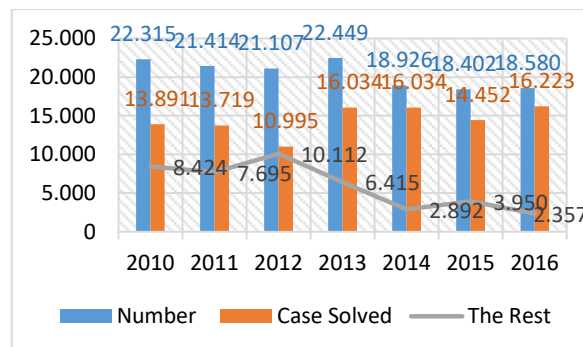
Fig. 1 Stacking of Cases in Courts from 2010-2016

The failure of the courts to resolve and reduce the stack of cases in court has caused disappointment and reduced the confidence of the disputants to bring their case to court. However, this fact is not a new issue and not just in Indonesia that there is accumulation of cases in court but the issue of accumulation of cases in court also occurred in other countries. For example, in 2009, civil cases filed in the Malaysian High Court was 44,873 cases, but only 23,272 cases and 21,601 cases were raised. In 2010, the number of cases that went to the High Court amounted to 9,734 cases, however, only 5,061 cases were resolved, resulting in 4,673 cases [22].

The length of time required to settle a dispute in court may cause harm to the parties to the dispute both material and immaterial damages. Abraham Lincoln states that the parties to the dispute are not encouraged to bring the case to be resolved in court as a litigation settlement can provide harm to both parties. For example, if a person who is declared victorious in his case in court, then in essence, the party loses because it has a lot of time and spends a lot of money to take care of his case in court [23].

Disillusionment with the court system has led to the increased public interest in resolving disputes through alternative dispute resolution. Freedman & Prigoff mentioned that alternative dispute resolution was in demand due to dissatisfaction with court performance in resolving disputes in the community [24]. The approach widely used in alternative dispute resolution mechanisms is mediation by appointing parties third as a mediator to lead the dispute resolution process between the parties [25].

In the Indonesian justice system, the position of mediation is to help the courts resolve disputes that have been registered in court so as to reduce the accumulation of cases in court. Mediation does not remove the position, function and role of the court. However, not all disputes or cases that occur in the community can be resolved through mediation. The parties who want to resolve their dispute through mediation must meet the various criteria that have been determined by the existing law.

The dispute resolution through mediation provides equal opportunities to the disputing parties to be actively involved in a negotiating forum to find a solution to the dispute being faced without putting forth the wrong side as well as the correct party. This negotiation forum is led by an independent mediator who has extensive knowledge of the issues at hand. If the mediator and the parties to the dispute can understand the mediation mechanism correctly, then many goodnesses and prosperities are found in solving various cases in both criminal and civil cases. According to MacFarlane, among the advantages contained in dispute resolution through mediation is that mediation does not waste much time, not expensive, can reduce the

psychological burden, avoid hostilities, so that the relationship of the parties to the dispute still be well-established [26].

The advantages of dispute resolution through mediation do not have a formal proofing procedure, so mediation process can be done simply, quickly and not cost much [24]. Usually, the most time needed in the dispute resolution process through the courts is the evidentiary process. Many warring parties carry documents and present witnesses to corroborate their claims or defend their arguments. The longer the court verification process, the more costs will be required as the parties to the dispute must increase the cost of their lawyers and pay the accommodation costs of the witnesses presented in court.

According to the American Bar Association, mediators are not bound by standard procedures such as dispute settlement in court. The mediator is free to determine what mechanism he considers appropriate to the case he is handling. One of the most important things is that the mediator must be able to create a comfortable mediation forum so that the parties to the dispute can think quietly and can produce acceptable decisions and satisfy all parties. The mediator must know and understand all stages of mediation if the mediator finds either party imposing coercion, dishonesty, fraud or unbalanced position, the mediator is entitled to stop the mediation process [27].

McAdoo & Welsh emphasized that in order to make mediation proceed effectively and efficiently, the parties to the dispute must have a competent and fair mediator in running the mediation [28]. According to Moore, competent mediators will guide the mediation process more quickly and appropriately. The job of a mediator should examine, analyze and simplify the dispute he is currently engaged in and offer several approaches to resolving disputes between the two disputants [29].

The advantage of dispute resolution through mediation is to use a win-win approach. This approach positions the parties in the mediation negotiation forum to feel won or no one is harmed. All things that are still incriminating one of the parties will be discussed and sought solutions to lighten the burden of both parties so as to avoid hostility between the parties to the dispute [30].

Dispute resolution mechanisms through mediation are confidential and closed. The parties to the dispute do not have to worry about their reputation and reputation will be damaged because the mediator is obliged to keep all the facts, documents and identities of the parties to the dispute. All the parties to the dispute can determine or choose which approach is used in resolving disputes between the two parties. In the mediation process there is no coercion, but mediation is conducted on the basis of honesty and sincerity [31]. Another advantage of mediation is to maintain and keep good relationships between the parties to the dispute because mediation does not put the disputing parties as winners and losers, but both parties will have a benefit and win the same (win-win solution).

Based on the Perma Number 1 of 2016 dated 3 February 2016 on Mediation Procedures in the Court, the period of time required to resolve the dispute is 30 days and if necessary it can be extended for another 30 days. The process of dispute resolution through mediation is very fast. This is very different from the process of dispute resolution through courts that can take years for years. According to former Malaysian Supreme Court, Tun Arifin Zakaria mentioned that mediation can help the court to decrease the accumulation of cases in court. Disputes among the parties can be resolved quickly if parties have the desire and sincerity to resolve their disputes without coercion of the parties [32].

The many advantages of mediation mentioned above can provide satisfaction to the parties to the dispute. There are some courts in Indonesia that have achievements in mediation, for example in 2013, Cibinong District Court succeeded in mediating 67 cases out of 367 civil

cases entering court. In 2015, the success rate of mediation at the Depok District Court was 25 percent of all mediated cases and the success rate of mediation in the North Jakarta Religious Court reached 70 percent. In addition, the Central Jakarta District Court, successfully mediate the case of PT. Petrowidada with PT. Indonesia's Leasing Lease with US $ 37.6 million involving foreign parties, such as businessmen from Japan and South Korea [33].

However, nationally the use of mediation as an alternative mechanism to solve cases is still relatively low. According to the Deputy Coordinator of the Supreme Court Justice Reform Working Group, Takdir Rahmadi, many cases are trying to resolve the case through a new 4 percent mediation that reached a peace agreement [34]. This is much different from the overseas mediation, the success rate reaches 80-90 percent [35], [36]. For example, the mediation run by Community Justice Center (CJC) in the state of New South Wales, Australia reaches 80% [37]. In addition, Indonesia has no valid data on the success of mediation nationally. Even though, the data is important to obtain, at least, to measure the extent of effectiveness of mediation in Indonesia.

5 Conclusions

Dispute resolution is generally done by two methods, namely litigation and alternative dispute resolution. However, in global developments, dispute resolution through courts began to be abandoned. Courts that are the only places where seeking justice are not effective. Disputes prosecuted in court are slow and require enormous expenses to take care of cases in court. As a result, there were many cases of court accidents in both the District Court, High Court and the Supreme Court.

One type of alternative dispute resolution method that has the potential to resolve disputes more quickly and economically is mediation. In mediation, the positions of the disputing parties are the same, no parties feel compelled or oppressed, the mediation forum is closed and confidential. In the mediation process, negotiations are led by a competent, neutral and elected mediator and agreed upon by both parties to the dispute. In addition, the advantage of dispute settlement through mediation is based on sincere and sincere intentions and the approach used is that all parties feel (win-win solution).

In the legal aspects of Indonesia, mediation can be applied to all civil cases. However, in the criminal case still exist cross-references. There are some people who allow mediation as an alternative to the settlement of criminal cases but also some others who disagree as peace does not abolish its criminal acts. However, in the process of criminal penalty subscription, the police often make peaceful efforts before the investigation and investigation process is carried out. This article suggests, to avoid differences of opinion on the legality of the mediation of criminal cases, it is necessary to make changes to the Law No. 8 of 1981 on the Criminal Procedure Code.

Many advantages of mediation in resolving disputes have given hope to the disenchanted community to the performance of the courts so that the public is more interested in resolving the dispute outside the court through negotiations led by an independent and neutral mediator. Although in some courts in Indonesia, mediation has helped to reduce the accumulation of cases in court. For example, In 2015, the level of successful mediation in the Depok District Court was 25 percent of all mediated cases. However, nationally the use of mediation as an alternative mechanism to resolve cases is still relatively low at only 4 percent.

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The Development Of Textbook In Growing The Character Of Students

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Abstract. This study aims to measure the effectiveness of chemistry textbooks in High School Class XI Semester 1 generated in this study in developing the character of students so that in accordance with the objectives of the 2013 curriculum. The sample of this research are chemistry teachers in senior high school at Medan City, North Sumatra Province. The sample was taken purposively. The approach used to achieve the objectives that have been formulated is qualitative descriptive research. Data in the form of conformity assessment of the contents of the book with the character to be developed. Data obtained from the questionnaire given to the respondents are high school chemistry teachers in Medan City. Prior to giving treatment to the sample, a prerequisite test of data normality was done by SPSS 20 Kolmogorof-Smirnov test at significance level $\alpha = 0,05$. The results showed that the chemistry textbook developed in this research was effective in developing the character of responsibility, creativity, and communicative. This can be seen from the results of book assessments that indicate that the average assessment results fall into the "high" category.

Keywords: Textbook, Character, Curriculum

1 Introduction

Teaching materials or textbooks are the dominant instructional medium of their role in the classroom and the central part of the education system [1]. This is because the textbook is an important tool for delivering curriculum materials. The need for textbooks occupies the most important priority scale. This is because the textbook not only serves as a teaching resource that provides learning materials, but even functions as a syllabus. The textbooks provide instructional guidance to teachers, allowing teachers to teach without having to look at the syllabus. Thus, the quality of classroom teaching is not independent of the type of textbook used

In the 2013 curriculum, there is a formula of Core Competencies and Basic Competencies that include character education must be integrated in the learning process. Therefore, teaching materials should be equipped with teaching materials that support the achievement of core competencies and basic competencies as formulated in the curriculum 2013. Curriculum 2013 focused on the formation of competence and character of learners, in the form of guides

knowledge, skills, and attitudes that demonstrated learners as a form of understanding of concepts that he learned conceptually[2]–[6]. The development of teaching materials should be directed to the fulfillment of curriculum standards as an effort in achieving educational objectives. Development of teaching materials produced should be able to support the development of student character in the learning process so that in accordance with the 2013 curriculum. Therefore, the resulting teaching materials must be specially designed to develop the character of the students.

One of the top concerns about science teaching in secondary schools and universities is the new design of textbooks with systems and special exercises for students' self-employment so that they discover the ability to learn by themselves[7]. Science textbooks have long been a key issue in science learning. Many reports indicate that textbooks play a dominant role in the teaching of science and have a profound effect on the choice of concepts as best as they are taught. In addition, if analogy is provided in textbooks, teachers can use teaching models using analogies to improve student learning[4], [8]–[12]

A well-considered element in a textbook is effective learning in the sense that the content of the book is developed to achieve the competencies set out in the curriculum. Therefore, the research was conducted with the aim to measure the effectiveness of chemistry textbook in SMA / MA Class XI Semester 1 which was produced in this research in developing the character of the students so that in accordance with the objectives of curriculum 2013. The measured character is responsibility, creativity, and communicative.

2 METHOD

This research was conducted at High School (SMA) and Madrasah Aliyah (MA) in Medan City, North Sumatera. The population of this research is the teacher of chemistry study in Medan City of the academic year 2013/2014. The sample was taken by purposive sampling technique based on the consideration of the researcher. The type of approach used in this study to achieve the objectives that have been formulated is qualitative descriptive research.

The steps taken are: preparing questionnaires/ questionnaires about book assessments, then providing questionnaire questionnaires to books on chemistry teachers. The type of data obtained at this stage is the qualification data in the form of responses from the teacher. Then the assessment (response) obtained is collected and tabulated and calculated average assessment of the feasibility of the content, language feasibility, and feasibility of presentation in accordance with the objectives of the 2013 curriculum.

This study was conducted with the aim to measure the effectiveness of chemistry textbooks in SMA / MA Class XI Semester 1 which was produced in this research in developing the character of the students so that in accordance with the purpose of curriculum 2013.For that conducted data collection to compare the book being used in schools SMA / MA, which is a book based on curriculum KTSP with books developed in this study, the book based on the curriculum 2013. The data obtained in the form of questionnaires respondents for the assessment of the effectiveness of the book.

Data in the form of conformity assessment of the contents of the book presentation with the development of creativity, curiosity, environmental care, love the homeland, and love to read. Data obtained from the questionnaire given to the respondents are high school chemistry teachers / MA in Medan City. Each indicator in the questionnaire is given a score of 1 - 4, then

the score is summed and given the value, then the value obtained is seen normality with Kolmogorof-Smirnov test at significance level $\alpha = 0.05$.

Hypothesis test data obtained can be done after the prerequisite test first, the test data normality. Normality test data is done on the data of research results that is the average assessment of the results of character assessment contained in the book by using SPSS 20 Kolmogorof-Smirnov test with a significant level $\alpha = 0.05$.

3 RESULT AND DISCUSSION

The data obtained to illustrate the results of research that is the average assessment of the results of character assessment contained in the book. The sample in the research for the quality assessment of books conducted on high school teachers / MA in Medan.

Table 1. Description of Data Average Score The result of character assessment contained in the book

Rating	Description data	Mean	Deviation value
	Creativity	79,91	11,39
	Curiosity	81,27	9,32
Characters in Books	Like to read	75,52	8,23
	Love the homeland	76,52	13,54
	Enviromental care	71,09	16,26

Assessment of the growth of character, namely creativity, curiosity, love to read, love the homeland, and care about the environment also shows a good average. For the average creativity character of 79.91 ± 11.39, it is categorized as "high". The average curiosity character of 81.29 ± 9.32 is categorized as "very high". The average reading character of 75.52 ± 8.23 is categorized as "high". The character of love of the homeland averages 76.52 ± 13.54 is categorized as high. And finally, the average environmental care character of 71.09 ± 16.26 is categorized as "high".

Normality test data is done on the data of research results that is the average assessment of the results of character assessment contained in the book by using SPSS 20 Kolmogorof-Smirnov test with a significant level $\alpha = 0.05$ and obtained data as in Table 2.

So, from the results of the analysis, it can be concluded that the chemistry textbook developed in this research is effective in developing the character of creativity, curiosity, reading, love of the homeland, and caring environment because the average category is "high".

Table 2. Normality Test Results Data Quality Rating Book

Data	*Kolmogorof-Smirnov*	α	Information
Responsible	1,895	0,05	Data is normally distributed
Creativity	1,876	0,05	Data is normally distributed
Comunicative	1,677	0,05	Data is normally distributed
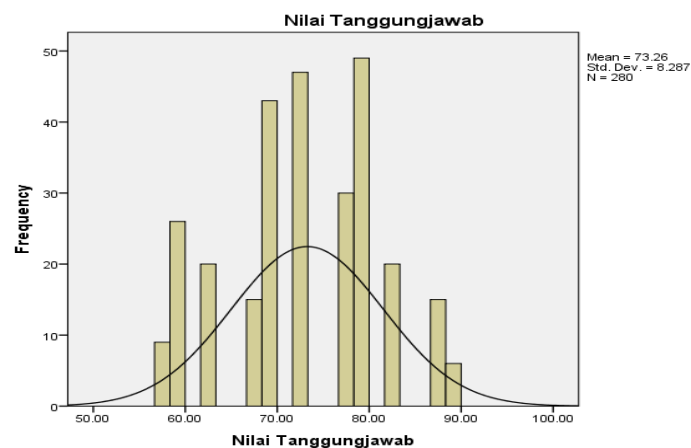
Fig. 1 Characteristic normality test result responsibility
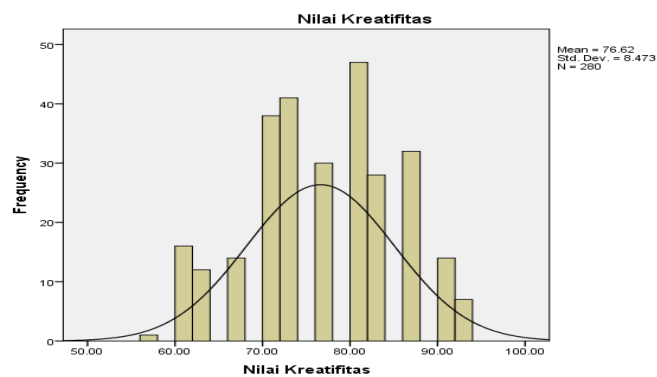
Fig. 2 Characteristic normality test result creativity
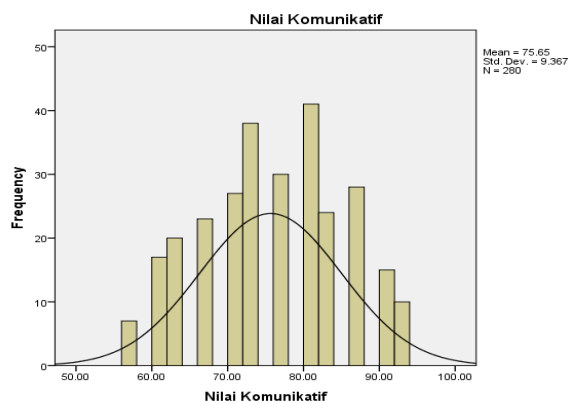
Fig. 3 Characteristic normality test result communicative

4 CONCLUSION

Chemical textbooks developed in this research are effective in developing the character of creativity, curiosity, love reading, love homeland, and care for the environment. This can be seen from the results of book assessments that indicate that the average assessment results go into the "high" category. So it can be concluded that the needs analysis here concluded the book Curriculum 2013 needs to be developed.

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The Effect of Financial Compensation and Job Satisfaction Against Turnover Intention at Muhammadiyah Hospital Employees Palembang

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Abstract. The purpose of this study is to analyze the influence of Financial Compensation and Job Satisfaction on Turnover Intention At Muhammadiyah Hospital Palembang. Design research based on the environment of study, research included in the field of field research design. The researcher focused the attention of the phenomenon that existed in the field so that the involvement of the researcher was directly limited to the observations as the material of cross information obtained from the object. Research location of Muhammadiyah Palembang Hospital, with 86 samples of medical and non medical employees. Technical analysis used: Validity and reliability test, Multiple Linear Regression Analysis, Hypothesis Testing (F test and t test) The result of Analysis stated that there is significant influence of financial compensation and job satisfaction together to turnover intention. And partially significant effect of job satisfaction on turnover intention. While financial compensation has no effect on turnover intention

Keywords: Financial Compensation, Job Satisfaction, Turnover Intention

1   INTRODUCTION

Human are creatures that are adptive and sensi-tive to what happened and needed in their environment. With the ability and potential possessed, humans strive to meet and realize all what is desired. With the potential and capabilities that humans have to try to interact and socialize also form groups and become part of the group to meet various expectations [1] [2].

Human participation in groups and organizations is called human resources. Human resources are seen as an important corporate asset, because human resources are dynamic and always needed in every process of producing goods and services [3] [4].

Discomfort in work that occurs can cause bad things for company and employees concerned. Among other things that happen is the incidence of intentions or the tendency of employees to make a turnover in the company. To reduce or even to pre-vent the occurrence of turnover intentions in the company, human resource management should pay more attention and apply policies to workers to fit the needs and expectations of workers. Management of the

provision of good compensation will make employees become loyal to the company so that will increase productivity and morale [5] [6].

Compensation has a great influence in employee withdrawal, motivation, productivity, and employee turnover. Properly managed compensa-tion will generate employee loyalty and will reduce turnover rates [7] [8].

Employee desire to leave the organization is very detrimental in terms of performance and productivity of an organization. The desire to leave the organiza-tion with employee turnover is intertwined. Employee turnover results in increased costs and also limits the organization to optimally improve its performance. Employee turnover negatively impacts both short-term and long-term productivity and the effectiveness of the organization itself. Similar organizational impacts can also be a serious problem for healthcare organizations and humani-tarian service agencies. Employee turnover within a health organization needs attention, as its impact is not only recruitment and training costs, but also on service quality. The statement is in line with the opi-nion of Gray and Philips, which explains that high rates of nurse turnover in hospitals will negatively impact the capacity of hospitals to meet patient needs and concern for. In addition, in Argote's opinion, employee turnover can weaken the performance of working groups within health organi-zations whose outcomes affect productivity. Furthermore it will affect the con-sistency in the service of the patient and weaken the relationship between the patient and the employee of the health organization [9] [10] [11].

Typical hospital management makes the study of hospital human resouces management is interes-ting to be studied. There are two major groups in the hospital's human resources: medical personnel consis-ting of doctors, nurses, other health workers, and non-medical personnelconsisting of administra-tive and other personnel [9] [12] [13].

To face the competition, the hospital must have qualified human resources. However, the pheno-menon that often occurs in the Islamic Hospitalin Palembang Muhammadiyah Hospital Palembang is when the performance of the company has been good can be damaged either directly or indirectly by various employee behavior. One form of employee behavior is the exit (turnover intentions) that can lead to employee decisions to leave his job [14].

Based on the background of the above issues, it is interesting to do further study in the form of research on the Influence of Financial Compensation and Job Satisfaction To Turnover Intention On Em-ployee Hospital Muhammadiyah Palembang.

2   REVIEW OF LITERATURE

Caplin in intention is a purpose or self-interest with characteristics that can be distingu-ished from psychological processes that include references or relation to an object. "Turnover intentions are essen-tially the same as the desire to move employees from one workplace to another." The opinion indicates that turnover intentions are a desire to move, not yet reached the stage of realization of moving from one workplace to other workplace. "turnover intentions are the level or intensity of the desire to get out of the company, the many reasons that lead to turnover intentions and such is the desire to get a better job."

Factors causing turnover intentions are age, length of work, education level, length of service, em-ployee satisfaction, attachment to company, corporate culture. Some aspects of the turnover intention described by Mobley. Thinking of quiting, considering leaving the organi-zation; 2). Intention to search, the desire to seek work outside the organization and; 3). Intention to quit, the decision to leave the organization.

There are various factors that affect employee turnover. According to Woods and Macaulay, there are eight main reasons for causing employee turnover: 1) Low pay and benefits; 2) Uncomfortable working conditions; 3) Lack of quality of supervision; 4) Less effective communi-cation; 5) Lack of peer quality; 6) Incompatibility with the company's "culture"; 7) Lack of clear defini-tions and responsibilities about work; 8) Unclear direction for things to do.

Woods et al. (1998) also explained that there are five internal factors that can lead to employee turnover, namely: 1) Compensation; 2) Communi-cation problems; 3) Lack of career opportunities; 4) Employee conflict; 5) Conflict with the management.

Define turnover as a permanent termination of a person from his work in a work organization. Meanwhile, accor-ding to Glueck, Sherman and Bohlander, turnover is the movement of workers in and out in a work organization.

According to Mobley, turn-over as one form of employee withdrawal is the right of the individual in determining his choice. Mobley prior to turnover, the behavior that preceded it was the intentions or turnover intentions that were the best predictors of turnover. "Turnover is a particular challenge for human resource development. While Mobley, argued that the general limitation on em-ployee turnover is: "the cessation of individuals as members of an organization with accompanied by financial rewards by the organization concerned".

According to:"Turnover in-tentions are characterized by various matters con-cerning employee behavior, among others: increased attendance, from lazy work, increased courage to violate work rules, courage to oppose or protest to superiors, settling all the responsibilities of emplo-yees that are very different from the usual. "These indications can be used as a reference to predict employee turnover intention in a company: 1) In-creased attendance; 2) Start lazy to work; 3) Improve-ment of breach of work order; 4) Increased protests against superiors; 5) Positive behavior is very differ-rent from usual

Compensation by Mondy and Noe is defined as any form of reward given to employees inexchange for the contributions they provide to the organization. Compensation is divided into 2 (two) parts, namely: 1) financial compensation consisting of direct and indirect financial compensation, and 2) nonfinancial compensation consisting of work and work environ-ment. The organization's compensation system should be linked to the organization's vision, mission, goals and strategy. Financial compensation is divided into direct and indirect financial compensation, whereas nonfinancial com-pensation is divided into work and worker environ-ments. The objectives of compensation are to get qualified employees, to retain qualified employees, the existence of justice in the employees, efforts to change attitudes and behaviors that lead to better, cost efficiency, and legalization of organizational adminis-tration.

Defines compensation as everything that an employee receives as a reward provided by the organization for the work performed. According to the compensation system should be managed seriously and appropriately by the company because if not managed properly will result in pay dissatis-faction that is the feeling of dissatisfaction of emplo-yees on the remuneration received that impact on turnover.

Compensation has a great influence in employee withdrawal, motivation, productivity, and employee turnover. Mapped out the compensation forms in two major groups of financial compensation and non-financial compensa-tion. Financial compensation in the form of direct financial compensation while non-financial compen-sation in the form of satisfaction obtained by a person from the work itself, or from the psychological, and or physical environment in which the person works.

Divides the forms of compensation, including financial compensation, which is a form of compensation paid to employees in the form of money for services they contribute to their

work, and nonfinancial compensation ie rewards given to em-ployees not in money, but rather leads to awards such as more challenging work, more work hours, career rewards, social security, or other forms that can lead to job satisfaction.

The main dimensions to consider in compensation are: 1) meeting basic needs 2) considering external justice, 3) considering internal justice, 4) compensa-tion value adjusted to individual needs, and 4) consi-der performance.

There are three main dimensions that can be used to assess justice in compensation, namely: inter-nal justice (relative value), external justice (market competitive value), and individual justice. Internal justice can be explained, that the basic structure of compensation (primarily the salary) of an organi-zation should reflect the value of the work, in which jobs of equal value are compensated equally and of different compensation for work of unequal value.

View job satisfac-tion as the overall result of the degree of work's likes or dislikes for various aspects of the job. Job satis-faction is one form of employee behavior in the organization. Furthermore, satisfaction can affect work behavior, such as motivation and morale, work productivity, work performance, and other forms of work behavior.

States job satisfaction (job satisfaction) is an emo-tional state of employees where there is or does not occur the intersection between the value of employee repayment of the company with the level of the value of the desired services by the employees concerned, financially and non financially.

Job satisfac-tion is individual and job satisfaction issues can affect employee absenteeism, labor turnover, morale, grievances and other vital personnel issues. This means job satisfaction as a person's feelings toward his work.

States that job satisfaction is not necessarily affect the performance of work. Although there is often a positive relationship be-tween high job satisfaction with high work perfor-mance. In reality in the world of work, the relation-ship is not always the case. Many employees are high employee satisfaction but the average work producti-vity alone, so it seems that job satisfaction itself is not a powerful motivator.

Divide job satis-faction into two kinds, namely: 1) Functional satisfaction is the satisfaction derived from the achie-vement or completion of tasks that are the respon-sibility of employees, and 2) Psychological satisfac-tion is the satisfaction obtained from the sides other than the fulfillment of duties and obligations.

To know the dimensions of employee job satisfaction is through Job Description Index (JDI). JDI consists of five dimensions, namely:
1) The work itself. In discussing this, job design is an important component.
2) Supervision. Is a factor of job satisfaction about the relationship between superiors with subordi-nates related to the work done, including the attitude of superiors to subordinates, assistance provided, communication relationships with em-ployees and feedback provided.
3) Rewards. Reward or compensation is something that a company receives in return to the emplo-yee in return for the energy, thought and time that has been given to the company
4) Promotion work. Promotion is the transfer of employees from positions to other positions that have higher levels of organization, responsibility and rewards.
5) Coworkers. Coworkers are peer relationships in providing support for each other related to work.

3 RESEARCH METHODS

This study was at the Muhammadiyah Hospital of Palembang. The selection of this hospital, because theoretically and empirically has various characteris-tics that fit the topic and purpose of the study.

Number of Population Muhammadiyah Hospital Palembang is as many as 595 people consisting of: Medical personnel – Doctor (95); Medical Personnel-Nurse (350); and Non-Medical Personne (150)

States that sample sizes greater than 30 and less than 500 are adequate for the entire study. The number of samples was determined based on calculations from the Slovin formula with a tolerable error rate of 10% with the following formula.

$$n = \frac{N}{1 + N\,(e)^2}$$

By using the above formula can be obtained the number of samples as follows:

$$n = \frac{595}{1 + 595\,(0,1)^2}$$

$$n = 85,61 = 86 \text{ Respondents}$$

3.1 Definition of Operationalization

The research variables are essentially something that is examined, which can differentiate or change value. All the variables in this study are described descriptions and developed each of its variables into several indicators in detail as illustrated in the following, variables and Variable Definitions:

3.1.1 Turnover Intension (Y)

The desire of someone to exit the organization, that is evaluation of a person's current position with regard to discontent can trigger a desire someone to go out and look for another job. **Indicator:** a) Increased attendance; b) Start lazy to work; c) Increased violation of work discipline; d) Increased protests against superiors; e) Positive behavior is very different from usual

3.1.2 Work Compensation (X1)

In this research is every form of appreciation provided to employees in the form financially as remuneration for that contribution given to the organization. **Indicator:** a) Incentives according to the same task; (b) Incentives in accordance with the same old employees.

3.1.3 Job Satisfaction (X2)

In this study is the gap between expectations and the reality received in doing the work within an organization as its. **Indicator:** a) Satisfied with the views of people around this work; b) Satisfied for the availability of free work; c) . Incentives are given according to the time promised; d) Incen-tives are given according to the work; e) Incenti-ves given fair; f) Some partial incentives can be saved.

The data needed in this research is qualitative data, that is data which can not be measured in nu-meric scale. Qualitative data in this research is ordinal data.

Various methods of data collection according are interviews (interview), ques-tionnaire, observation, documentation (secondary sources), or test (test). In this study used question-naire (questionnaire). Data analysis technique in this research using multiple regression analysis technique with SPSS 20 program. The stages of executing the analysis include:Validity Testing; Reliability Testing;

3.2 Analysis Technique:

3.2.1 Multiple Regression Analysis

Used to know how big influence of variable of Finan-cial Compensation (X1), Job Satisfaction (X2) to Turnover Intention (Y).
Multiple linear regression is used because the in-fluence variable (X) is more than one, by the formula:

$$Y = a + b_1X_1 + b_2X_2 + \varepsilon$$

Keterangan:

Y	=	Turnover Intention
a	=	Constants
b_1, b_2, b_3	=	Coefficient of regression
X_1	=	Financial Compensation
X_2	=	Job satisfaction
ε	=	Error of Term

3.2.2 Concurrent Testing (Test F)

Regression analysis of simultaneous test (Test F) is done to prove the hypothesis of research influence the independent variables of research together to the dependent variable**.**
The testing criteria are as follows:

$$\textbf{Ho accepted} \quad : \textbf{sig F} > \textbf{0,05 dan } F_{count} < F_{table.}$$
$$\textbf{Ho rejected} \quad : \textbf{sig F} \leq \textbf{0,05 dan } F_{count} \geq F_{table}$$

Ho:There is no effect of Financial Compensation and Job Satisfaction collectively simultaneously to Turnover Intention.
Ha:There is influence of Financial Compensation and Job Satisfaction simultaneously to Turnover In-tention.

3.2.3 Partial Testing (Test T)

Regression analysis of partial test of each indepen-dent variable to dependent variable can be explained by using t test.

The testing criteria according to Duwi is: Test the hypothesis with t test ie testing the hypo-thesis of variable X to variable Y partially or one by one [15].

The test criteria are as follows:

Ho accepted: sig t > 0,05 dan t$_{count}$< t$_{tabel}$.
Ho rejected : sig t ≤ 0,05 dan t$_{count}$≥ t$_{tabel}$.

Ho:There is no effect of Financial Compensation and Job Satisfaction partially to Turnover Intention.
Ha:There is influence of Financial Compensation and Job Satisfaction partially to Turnover Intention

4 RESULTS AND DISCUSSION

4.1 RESULTS

4.1.1 Instrument Testing Results

Based on the calculation result using SPSS for Windows Version 20.00, the data validity test on question items in Turnover Intention (Y), Financial Compensation (X1), and Job Satisfaction (X2) varia-bles are stated valid at the real level (α) = 5%, so it can serve as a valid measuring tool in the next analysis.

Based on reliability testing on the dependent variable is Turnover Intention (Y), and independent variables are Financial Compensation (X1) and Job Satisfaction (X2). it is seen that all Cronbach's alpha of each variable is above the number 0.600, otherwise relabel, it means that all the items of question that exist in each of these variables, can be used as a reliable measure in the next analysis.

4.1.2 Linear Multiple Regression Analysis

Used to know how big influence of variable of Financial Compensation (X1), Job Satisfaction (X2) to Turnover Intention (Y). Based on the calculation results obtained the estimated function of multiple linear regression equation, namely**:**

$$Y = 1,990 + 0,095\ X_1 + 0,437\ X_2$$

The regression equation can be described as follows:
a.   Constant of 1.990 means that if Financial Com-pensation, and Job Satisfaction has a fixed value then the Turnover Intention level of 1.990
b.   The coefficient value of financial compensation variable is 0,095. This implies any increase in the number of one-unit financial compensation variables, the Turnover Intention variable will rise by 0.095 assuming that other independent variables of the regression model are other independent variables of the fixed regression model.
c.   Value of coefficient of Job Satisfaction variable is 0,437. This means any increase in the number of variable Satisfaction Working one unit then Turnover Intention variable will rise by 0.437 with the assumption that other independent variables of the regression model fixed.

4.1.3 Concurrent Testing (Test F)

Table 1. Test results F

ANOVA[a]

Model	Sum of Square	df	Mean Square	F	Sig
Regression	3,149	2	1,575	12,341	,000[b]
Residual	10,590	83	,128		
Total	13,739	85			

[1]Dependent variable: Y
[2]Predictors: (Constant), X1, X2

As the test decision that: Ho accepted if Sig F ≥ 0.05 and F arithmetic ≤ Ftabel. Then Ho is rejected if Sig F <0.05 and Fcount> Ftable.

Based on the above table, the value of Sig F (0,000) <α (0,05), then Ho is rejected and Ha accepted, mea-ning there is significant influence of Financial Com-pensation (X1), Job Satisfaction (X2) jointly to Turn-over Intention (Y) At Muhammadiyah Hospital staff Palembang

4.1.4 Partial Testing (T Test)

Table 2. Test Result t

Coefficients[a]

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	1,990	,440		4,520	,000
X1	,095	,065	,145	1,466	,146
X2	,437	,102	,425	4,302	,000

Based on result of t test output can be concluded that:
a. **The Effect of Financial Compensation on Turnover Intention**
Based on the above t test results for Finan-cial Compensation (X1) with Sig t of 0, 147 > α (0,05), Ho is accepted and Ha rejected, meaning no significant effect of Financial Compensation (X1), to Turnover Intention (Y) At the emplo-yee Muhammadiyah Hospital Palembang

b. **The influence of Job Satisfaction on Turnover Intention**
Based on the result of t test above for varaibel Job Satisfaction (X2) with Sig t equal to 0.000 < α(0,05), Ho is rejected and Ha accepted, meaning there is significant influence of Job Satisfaction (X2) to Turnover Intention (Y) Mu-hammadiyah Hospital Palembang

4.2 DISCUSSION

4.2.1 Significant Influence of Financial Com-pensation and Job Satisfaction Together to Turnover Intention

Based on Table 2, above, the value of Sig F (0,000) < α(0,05), then Ho is rejected and Ha accepted, meaning there is significant influence of Financial Compensation (X1), Job Satisfaction (X2) together towards Turnover Intention Y) At the employee Mu-hammadiyah Hospital Palembang.

This study is in agreement with Woods et al. that can affect employee turnover rate, which is job satisfaction and incentive (compensation) factors [16]. Compensation and good job satisfaction can reduce the employee turnover rate while poor job satisfaction will encourage employees to exit.

Research conducted by Charlie et.al., with the results showed that high employee turnover caused by the existence of inade-quate payroll system. In contrast to the negative effect of payroll growth on employee turnover, where an adequate payroll system leads to low employee turn-over rates [17].

Based on the results of research, previous re-search and theory, then what has been passed to medical and non medical employees by Muhamma-diyah Hospital leaders Palembang it has been good, so that employees no intention to change work from Muhammadiyah Hospital Palembang. This will result in the performance and productivity of Muhamma-diyah Palembang Hospital will also be good. And if the desire of employees to leave the organization is very detrimental in terms of performance and productivity of an organization. Therefore, the head of Muhamma-diyah Hospital of Palembang must create comfort for medical and non medical emplo-yees, if the discomfort in work that happened can cause things that bad for Muhammadiyah Hospital Palembang and the employees concerned.

4.2.2 Significant Influence of Financial Com-pensation to Turnover Intention

Based on Table 3, above the above t test results for Financial Compensation (X1) with Sig t of 0, 147> α (0,05), Ho is accepted and Ha is rejected, meaning no significant effect of Financial Compensation (X1) Turnover Intention (Y) At the employees of Mu-hammadiyah Hospital Palembang.

Compensation has a great influence in employee withdrawal, motivation, productivity, and employee turnover [18]. Properly managed compen-sation will generate employee loyalty and will reduce turnover rates.

In accordance with the opinion of Lieke mentioned above, it means that financial compen-sation given by the leadership of Muhammadiyah Hospital to the medical and non-medical employees, is good enough, so the intention to move for the employees becomes low. If an employee moves out of the Muhammadiyah Hospital, the good performan-ce of the company can be damaged either directly or indirectly by various employee behaviors.

4.1.3. Significant Influence of Job Satisfaction on Turnover Intention

Based on Table 3, the result of t test above for varia-ble Job Satisfaction (X2) with Sig t is 0.000 < α (0,05), Ho is rejected and Ha accepted, meaning there is significant influence of Job Satisfaction (X2) to Turnover Intention (Y) At Muhammadiyah Hospital staff Palembang.

The higher the level of job satisfaction of a medical and non medical employee of Muhammadi-yah Palembang Hospital, the lower the intensity to leave the job, this is proved in the research Lum et al. [19] and Cowin et.al. [20]. Lum et al. [19], states that job satisfaction

affects employee turnover, low job satisfaction usually results in high employee turnover.Job satisfaction is individual and job satis-faction issues can affect employee absenteeism, labor turnover, morale, grievances and other vital personnel issues.

5 CONCLUSIONS AND IMPLICATIONS

5.1 Conclusion

a. The result of the analysis states that there is a significant effect of financial compensation and job satisfaction together on turnover intention. And partially significant effect of job satisfaction on turnover intention. While the financial com-pensation has no effect on turnover intention

b. The financial compensation given by the head of Muhammadiyah Hospital to the medical and non-medical employees is good enough, so the intention to move for the employees is low. If the employee has moved from Muhammadiyah Hospital Palembang, then the good performance of Muhammadiyah Palembang Hospital can be damaged either directly or indirectly by various employee's behavior.

c. The higher the level of job satisfaction of a medical and non medical staff of Muhammadiyah Palembang Hospital, the lower the intensity to leave the job.

5.2 Implications

a. The results of this study indicate that financial compensation has no significant effect on hospital staff turnover intention. It becomes interesting to follow up on the same company at a later date or on a different research object as a research gap.

b. The Head of Muhammadiyah Palembang Hospital keeps paying attention in terms of financial compensation and job satisfaction, to create com-fort for medical and non medical employees, and if the inconvenience in work that happened can cause things that bad for Muhammadiyah Hospital Pa-lembang and the employees concerned

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The Effect of Good Corporate Governance, Return On Asset, and Firm Size on Firm Value in LQ45 Company Listed in Indonesia Stock Exchange

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Abstract. This research objective was to know the influence of Good Corporate Governance, Return On asset, and Firm Size to Firm Value On Company Registered in LQ45. Population The Grand Theory in this research are Agency Theory and Signaling Theory. Sampling method used is Purposive Sampling. The population of this research ware 45 companies of LQ45 and the sampples ware 12 companies of LQ45 indonesia during the period of 2012-2015. Data Analysis Technique used was Multiple Regression Linear. This results partially showed that Good Corporate Governance and Firm Size had negative effect on Firm Value, while Return On Asset had posittive effect on Firm Value. While the results showed that Good Corporate Governance, Return On Asset, and Size had significant and positive effects to Firm Value. The implication of this research is Return On Asset has a dominant effect on firm value. The was high Return On Asset can cover the Good Corporate Governance and the Firm size of the company wrote the low, it can be seen from the magnitude of property owned. As the result those factors become the important thing for investors to invest in the company.

Keywords : Firm Value, Good Corporate Governance (GCG), Return On asset (ROA), Firm Size

1 Introduction

The economic crisis in 1997 that hit Indonesia made Indonesia's economic condition chaotic and experienced a significant decline. This is seen from the many bankrupt companies, the bad performance of the national banking, the number of bad credit financing, the low competitiveness of Indonesian products with foreign products, to the fear of owners and management of companies and governments against the various consequences that will arise from the free trade.

Ethical standards in business can be done by the implementation of Corporate Governance. Adrian Sutedi defines Good Corporate Governance as a set of rules that establishes relationships between shareholders, managers, creditor, government, employees and other internal and external stakeholders in respect of their rights and obligations, or in other words directing and controlling the company [1].

Good Corporate Governance is concerned with people (morality), work ethics, and good working principles. Companies that sincerely and purely implement Good Corporate Governance will automatically have endurance from internal and external threats. Companies with the principles of Good Corporate Governance have positive values to maintain consistency and professionalism of the firm.

Table 1. GCG Average Progress, ROA, Firm Size, and Corporate Value (Tobin's Q) At LQ45 Firm period 2012-2015

Year	*Good Corporate Governance* (GCG)	*Return On Asset* (ROA)	Firm Size	*Tobin's Q*
2012	79,78	116,285	18,786	3,409
2013	79,78	13,490	19,904	4,098
2014	83,40	14,618	17,368	3,742
2015	75,54	13,072	18,354	3,211
Average	78,298	14,367	18,603	3,615

This formulation of the problem ari how does the influence of Good Corporate Governance, Return On Assets, and the size of the firm to the firm value partially on firms listed in LQ45 period 2012-2015 and what is the effect of Good Corporate Governance, Return On Assets, and firm size on the value of the firm jointly on the firms listed in LQ45 period 2012-2015.

2 LITERATURE STUDIES

2.1 Agency Theory

Agency theory is the underlying theoretical basis of the company's business practices. Agency theory is a contractual relationship between one or several people (principal / owner of the company), with others as agents (managers) who include the authority to perform tasks for the principal interests, especially in taking a decision [2] [3].

2.2 Signaling Theory

Management always strives to disclose private information which, according to its consideration, is in great demand by investors and shareholders, especially if the information is good news. Signaling theory emphasizes that companies will tend to present more complete information to obtain a better reputation than firms that do not disclose, and it will eventually attract investors [4].

2.3 The Value of Firm

Companies established for the purpose of increasing the firm value. The value of the company will be reflected from the stock price. the higher the stock price is, the higher the value of the company will be [5].

2.4 Good Corporate Governance

Defines Good Corporate Governance as a set of rules that establishes relationships between shareholders, managers, creditor, government, employees and other internal and external stakeholders in respect of their rights and obligations, or in other words directing and controlling the company [6] [7].

2.5 Good Corporate Governance Assessment

IICG (Indonesia Institute for Corporate Governance) harnesses the index as the basis for Good Corporate Governance assessment in the form of Corporate Governance Perception Index (CGPI) published in SWA magazine. The CGPI assessment includes four stages with value weights:
a. Self-assessment (15%)
b. The Collection of Company Documents (25%)
c. The Preparation of Papers and Presentations (12%)
d. The Observations to the Company (48%) 5.

2.6 Benefits of Good Corporate Governance

The implementation of Good Corporate Governance has several benefits in both short and long term as follows (Intan, 2010):
a. It can increase the value of the firm's share and improve the company's image.
b. It can reduce the cost to shareholders in relation to the delegation of authority to management to run the company.
c. It can reduce the capital cost of the company, which as a result of good corporate management is a decrease in corporate risk, resulting in decreased funds required or borrowed by the company.
d. It can increase support from the shareholders against various strategies and policies of the company that is considered more assured to be of maximum benefit to the company.

2.7 Return On Asset

Return On Assets (ROA) is the ratio that shows the results of the amount of assets used in the company (Cashmere, 2014).

$$\text{ROA} = \frac{Net\ profit\ after\ tax\ deduction}{Total\ assets} \times 100\%$$

Good Corporate Governance (GCG) as a set of rules establishing relationships between shareholders, managers, creditor, government, employees and other internal and external stakeholders in relation to their rights and obligations, or in other words the system that directs and controls company (Adrian Sutedi, 2012).
H1 = Good Corporate Governance positively affects the value of the Company.

This framework is designed to make it easier to understand the relationship between Good Corporate Governance (GCG), Return On Assets (ROA), and firm size to firm value. Based on the basic concepts of theory and the results of previous research. Then, the factors that can be used as indicators that affect the value of the company is Good Corporate Governance (GCG), Return On Assets (ROA), and company size.
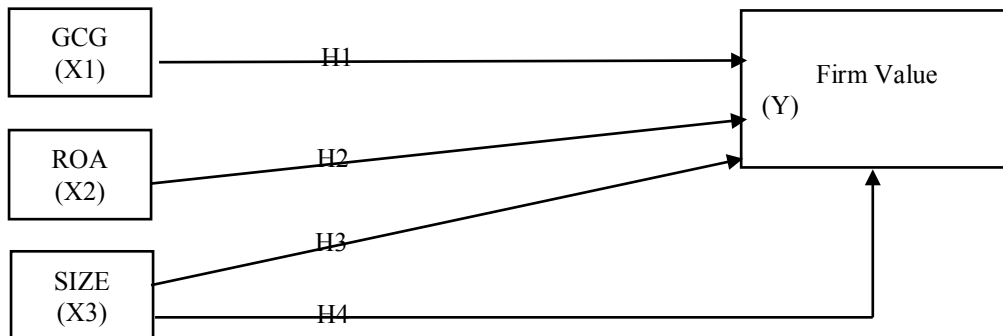
Fig. 1 Framework GCG and ROA

3 RESEARCH METHODS

The authors limit the scope of this study to the effects of independent rincipa, ie Good Corporate Governance, Return On Assets, and firm size to the dependent i.e firm value by using Tobin's Q in companies listed in LQ45 period 2012-2015.

3.1 Research Design

This study uses data contained in companies listed in LQ45. Period of data used is the financial statements of 2012 - 2015 (4 years).

Table 2. Definition Variable Scale Indicator Assessment

No	Variable	Variabel definition	Scale	Assessment Indicator
1.	Y= Firm Scale.	Firm value is a certain condition that has been achieved by a company as a picture of public confidence to the company through a process of activity for several years. (Febry Nugroho, 2013)	Ratio	Tobin's Q = The market value of equity + Book value of debt Total book value of assets
2.	X_1= Good Corporate Governance (GCG).	*Good Corporate Governance* is defined as a set of rules that establish relationships between shareholders, managers, creditors, government, employees and other internal and external stakeholders in respect of their rights and obligations, or in other words detailed that direct and control the company	Scale	Rating level on CGPI • Very Trustworthy (85,00 – 100) • Trustworthy (70,00 – 84.99) • Quite Trustworthy (55,00 – 69,99)

No	Variable	Variabel definition	Scale	Assessment Indicator
		[8].		
1.	X_2 = Return On Asset (ROA)	Return on Assets (ROA) is one form of profitability ratio to measure the ability of a company to generate profits by using the total existing assets and after capital costs (the cost of funding assets) which is excluded from the analysis.	Ratio	ROA Ratio = Profit After Tax X 100% : total assets
2.	X3 = Company Size.	The size of a company is a scale which can be classified by the size of the company in various ways such as by total assets, log size, stock market value, total sales, monthly total average and average of total funds.	Scale	Size = Ln Total Assets

4 RESULTS AN DISCUSSION

Based on raw data obtained from Corporate Governance Perpection Index (CGPI) and Indonesian Capital Market Directory (ICMD) in 2012-2015, data which can be obtained in this research such as Corporate Value (Tobins), Good Corporate Governance GCG), Return On Assets (ROA) and Company Size (Size) [9].

Table 3. Descriptive of Corporate Value (Tobins), Good Corporate Governance (GCG),

	N	Minimum	Maximum	Mean	Std. Deviation
TOBINS	48	0,24	27,72	3,6146	2,24601
GCG	48	71,19	88,70	78,2967	4,33687
ROA	48	-4,75	40,38	14,3660	9,18335
SIZE	48	15,83	28,58	18,6031	3,42475
Valid N (listwise)	48				

Source: Result of Data Processed Statistics Program.

Based on the table above, it can be seen that minimum value of company value (Tobins) is 0.24 or 0.24% and the maximum value of company value (Tobins) is 27.72 or 27.72%. From the table also shows that the average value (mean) value of the company (Tobins) is 3.61 or 3.61%. Standard deviation of corporate value (Tobins) is 2.24 or 5.24%. The average

value is greater than the standard deviation. It means the value of the firm value variable is good.

Descriptive Analysis of Good Corporate Governance.

Based on the above table, it can be seen that the minimum value of Good Corporate Governance (GCG) is 71.19 or 71.19% and the maximum value of Good Corporate Governance (GCG) is 88.70 or 88.70%. From the table, it is also seen that the average value (mean) Good Corporate Governance (GCG) is 78.29 or 78.29%. Standard deviation of Good Corporate Governance (GCG) is 4.33 or 4.33%. The average value is greater than the standard deviation, it can be said that the value of Good Corporate Governance (GCG) variable is good.

Descriptive Analysis of Return on Assets

Based on the table above, it can be seen that the minimum value of Return On Assets (ROA) is -4.75 or -4.75% and the maximum value of Return On Assets (ROA) is 40.38 or 40.38%. From table, it is also seen that mean value (mean) Return On Asset (ROA) equal to 14,36 or 14,36%. Standard deviation Return On Assets (ROA) is 9.18 or 9.18%. The average value is greater than the standard deviation, it means the value of the variable Return On Asset (ROA) is good.

Descriptive Analysis of Firm Size

Based on the table above, it can be seen that the minimum Size of the Company is 15.83 or 15.83% and the maximum value of Company Size (Size) is 28.58 or 28.58%. From the table, it is also seen that mean value (mean) Size of Company (Size) equal to 18,60 or 18,60%. Standard deviation of Company Size (Size) is 3.42 or 3.42%. The average value is greater than the standard deviation, it means the value of the variable Size of the Company (Size) is also good.

1. **Good Corporate Governance (GCG) Influence on Corporate Value**
   Based on the calculation of multiple linier regression test and partial research calculation (t test), value significance count is 0.193. The value of calculated significance is greater than the value of significance which has been determined (0,193> 0,005). It means there is negative influence of Good Corporate Governance to company value.
2. **Return on Asset Impact (ROA) on Corporate Value**
   Based on the calculation of multiple linier regression test and partial research calculation (t test) which gained by significance value, it can be seen that it is 0.000. The significance value result is smaller than the specified significance value (0,000 <0.05) which means there is a positive influence on the Return on Asset value of the company.
3. **The Influence of Company Size (Size) on Corporate Value**
   Based on the calculation of multiple linear regression test, the significance value is 0.124. The calculated significance value is greater than the specified significance value (0.124> 0.05) which means there is a negative influence on firm value.
4. **Discussion of Results of Collective Research (Test F)**
   Based on the results of calculations with simultaneously test that have been done using the results of data processing statistics program in Table 4.5 shows that significant F arithmetic is 19.294 and F Table is 2.81. This means F Count> F Table. The significant value is = 0.00> α = 0.05. From these two things, it can be concluded that the variables of Good Corporate Governance, Return On Assets and size of the company (Size) affect the value of companies (Tobins) on LQ45 Company in 2012-2015 period simultaneously.

The Adj column R2 in Table 4.5 has a value of 0.568. Adj R2 is also called the coefficient of determination. The value of determination coefficient is 0,568 or 56,8% indicate that Good Corporate Governance variable, Return On Assets and company size able to explain company value detail equal to 56,8% and the rest equal to 43,2% explained by other details besides the detail proposed in this research.

Table 4. Summary of Research Results

Influence	Research Results	Description
GCG has a negative and significant effect on Firm Value	Negative (-) and no significant impact	Rejected
ROA has a positive and significant effect on Firm Value	positive (+) and significant impact	Accepted
Size negatively affects Firm Value	Negative (-) and no significant impact	Rejected
GCG, ROA, and Size affect the Firm Value	Impact	Accepted
Return On Asset has dominant influence to Firm Value	dominantly impact	Accepted

5 CONCLUSION

Based on the results of data analysis, it can be concluded several things as follows:
1. The results of the first hypothesis testing obtained value significance count is 0.287. It can be concluded that there is a negative effect of Good Corporate Governance on the value of the company.
2. The result of second hypothesis testing obtained by significance value is 0.000. There is a positive effect of Return On Assets on the value of the company.
3. The results of the third hypothesis testing obtained value significance count is 0.124. There is a negative effect of firm size (Size) on firm value.
4. The research results also show that of the three independent variables (Good Corporate Governance, Return On Assets and Company Size), Return On Asset which has a dominant influence on Corporate Value with Beta 0.696.
5. Simultaneous test results show that the significance of F arithmetic is 0.000. That the variables of Good Corporate Governance, Return On Assets and firm size simultaneously have a positive and significant effect on firm value.

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Developing Mathematical Communication Problem Solving Ability Using Hot Potatoes Software

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Abstract. The purpose of this study is to examine the increase of students' mathematical communication ability gained from the learning using problem solving approach with hot potatoes software. Random sampling method was used to collect sample from one of the junior high school in Banda Aceh. The sample consisted of 32 students for experiment class and 32 students for control class. Quantitative method employing t-test and correlation test was employed to analyze the data. The results show that there has been a significant increase of students' mathematical communication ability using the problem solving approach with hot potatoes software; students' mathematical ability of the experiment class is higher than the control class. Furthermore, students in the experiment class have higher self-efficacy and therefore they can formulate a more directed mathematical model for solving geometry problems.

Keywords: Problem Solving Approach, Hot Potatoes Software, Mathematics Communication Ability

1 Introduction

Mathematics communication is a visualization of both students' verbal and non-verbal abilities for solving problems. NCTM [1] mentioned that mathematics communication is students' ability to present a unique way to solve problems; students' ability to construct and explain real world phenomenon presentation in graph, words or sentences, equation, table and physical presentation; or students' ability to provide conjectures of geometric figures. Greenes and Schulman [2] identified mathematics communication as (1) the ability to express mathematical ideas in oral, written and demonstration forms and to draw it visually into different forms, (2) the ability to understand, interpret and assess ideas presented in written, oral or visual forms. Sullivan and Mousley [3] emphasized that mathematics communication is not just about presenting ideas in a written form; in a broader context, it is students' ability in speaking, explaining, illustrating, listening, questioning, clarifying, working together (sharing), writing and finally reporting what have been learned.

Mastering mathematics communication ability is essential.Thus, this ability should be promoted in each level of education. However, students are often found to have difficulties in communicating mathematics ideas in a written form, especially for the problems of three-dimensional (3D) geometry related to daily life. While the ability to translate language into

mathematical models such as pictures, graphs, pattern and the other modelling form is crucial to solve the problems, students are not able to illustrate the situation of a problem to a mathematics model. In 3D geometry, the ability to illustrate pictures is one of the steps used to assist the process of solving further problem, especially in determining the surface area and volume of 3D geometry objects such as prism and pyramid when presented in word problems. Problem solving approach using hot potatoes software is applied to address this issue. In this model, students are obliged to be able to solve the problem using Polya's version of problem solving and to recheck the results using the software. Problem solving using hot potatoes software positively influence students' motivation and performance (Hung, Huang and Hwang, 2014). The combination of problem solving and hot potatoes software is the solution we proposed to overcome students' difficulties in understanding the topic of 3D geometry. Furthermore, the combination of problem solving and hot potatoes software can also improve students' self-efficacy [3].

The use of the software is recommended by thegovernment to improve learning efficiency and effectiveness (the ministry of education regulation/Permediknas No 22, Year of 2016). Hot potatoes software is one of the software based technology product that can be utilized to create web based quiz interactively and attractively [4]. Hot potatoes software can be used as an evaluation program. The benefits of computer based evaluation program outweigh the paper based test including providing feedback, presenting the test results directly to the students, and time efficiency in assessing students' works.

Hot potatoes software consists of six programs, namely: (1) JQuiz, (2) JMix (jumbled-sentence exercises), (3) JCross (Crossword puzzles), (4) JMatch (Matching or ordering exercises), (5) JCloze (Gap-fill exercises) and (6) The Masher.
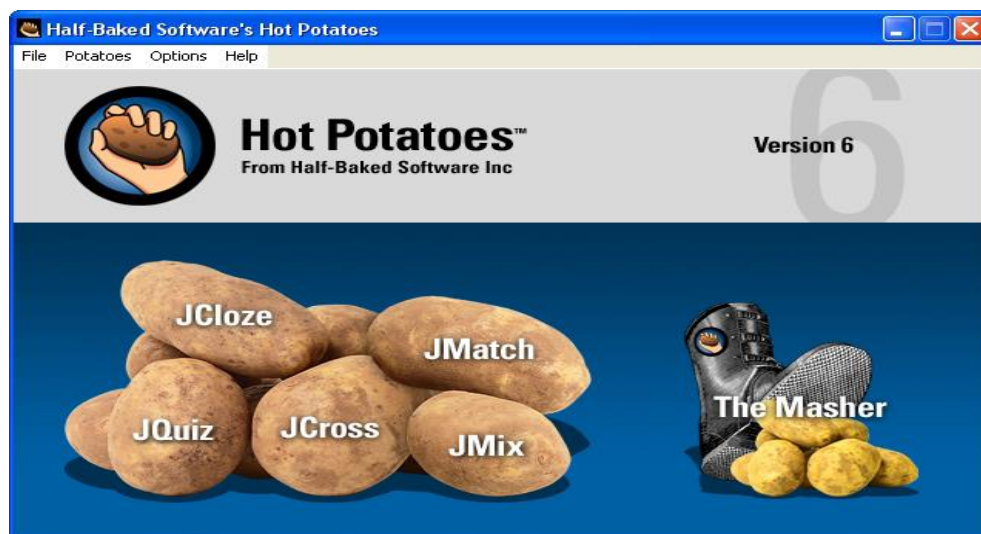
Figure 1. Front display of hot potatoes

The six programs in hot potatoes software can produce some output files that can be formatted in the form of web page (htm), compressed file (Zip), SCORM 1.2 packet file (Zip) or can also be printed or uploaded to the server of LMS supporting standard content of e-learning application with SCORM such as LMS and Dokeos. Hung, Huang and Hwang [5] mentioned that JQuizthe program that can be used to prepare four types of exercises including

multiple-choice, short answer,hybrid (combination of multiple-choice and short-answer) and multi-Select; JMix (jumbled-sentence exercises) is the program that can be used to create exercises of arranging sentences; JCros (crossword puzzles) is the program that can be used to prepare materials in crossword puzzles; JMatch (matching or ordering exercises) is the program that can be used to create exercises in a form of matching exercises; JCloze (gap-fill exercises) is the program that can be used to prepare exercises in a form of fill in the blanks exercise; The Masher is the program that can be used to manage the combination of exercises or problems mentioned before by compiling some types of exercises in hot potatoes. To run the software, the user should choose the preferred types of the program.

2   Methods

2.1   Sampling

The sample of this study is 64 year 8 students (age 140-15 years old) from one of the junior high school in Banda Aceh. The sample is divided into experiment (32 students) and control group (32 students). Pretest, treatment and post-test are given to the students. The pre-test is related to plane geometry related to prism and pyramid.

2.2   Procedure and Treatment

The design of the study used *"Pretest and Posttest Control Group Design"* model. The sample obtained through purposive and random sampling resulting in the experiment and control class. The experiment class learned in group consisting of 5 students, the treatment using Polya's version of problem solving model using hot Potatoes, while control class also learned in group consisting of 5 students, the treatment using Polya's version of problem solving without hot potatoes. The data collection was conducted from April to July 2017.

Both classes learned 3D geometry, the topics of Prism and Pyramid, with the learning technique using students' worksheet. Both classes were guided to implement Polya's steps in problem solving, namely: understanding the problem, planning, conducting the plan, concluding and rechecking the works. In the experiment class, after students have completed the worksheet, they used hot potatoes software. This software presented quiz related to the topic of 3D geometry.

The quiz in this study was conducted as a tournament (game) between groups to encourage students to be actively involved and challenged to answer the problems presented. It is expected that there are no more passive students as this method encourages students to solve the problems smarter, more precisely and accurately. In addition, this method also trains students to be more confident in expressing their opinions to their peers in group. Bandura (1997) stressed that positive encouragement and feeling will result in more positive self-efficacy.

When the five treatments have been completed, post-test of mathematics communication related to 3D shapes was administered to the students. The test has met the requirements of validity and reliability tests.

1.   A prism tub (height is 2 meters) will be fully filled with water. The base of the prism is triangle (3x 4x5 meters). How many liters of water are needed to fully fill the tub?

2. Mr. Amin owns a swimming pool. The swimming pool is a rectangular prism (length is 10 meters and width is 4 meters). The depth of the water at the shallow end is 1 meter and gradually reduced to 2 meters at the deepest end. Illustrate the situation in an easily understood mathematical model! What is the volume of the swimming pool ?.

3. The figure shows a triangular prism name plate. Complete the information of the figures and find the area of the cardboard needed to wrap the name plate!
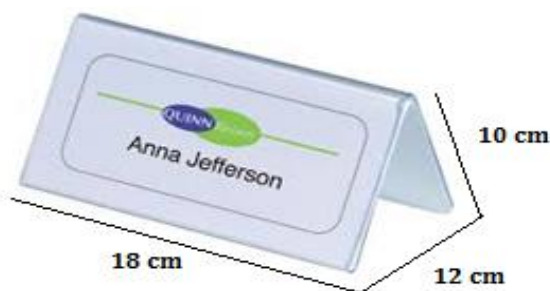
4. A pyramid green house will be renovated. The base of the green house is a rectangle (length is 12 meters and height is 9 meters). The whole surface of the green house will be covered with glass, the glass costs IDR 125.000 per m^2. Illustrate the problem and calculate the budget needed to renovate the green house!

2.3 The Assessment Guidelines of Mathematics Communication Ability

Table 1. Mathematical communication scoring adapted from Ansari (2016).

Score	Qualitative Category	Quantitative Category	Representation
80-100	Providing complete and correct answer; being fluently in providing various correct answers	The explanation is both mathematical sense making and correct even though it is lacking in language	Written Texts
		Drawing diagram, pictures or table completely and correctly	*Drawing*
		Forming algebraic equation or mathematical model and then conducting the calculation completely and correctly	*Mathematical Expressions*
60-79	The answer is close to complete and correct; being fluently in providing various correct answers.	The explanation is both mathematical sense making and correct. However, there are few mistakes.	Written Texts
		Drawing diagram, pictures or table completely and correctly. However, there are few mistakes.	*Drawing*
		Using algebraic equation or mathematical model in conducting the calculation. However, there are few mistakes.	*Mathematical Expression*
40-59	Some of the answers are complete and correct.	The explanation is mathematical sense making but there are only some of them are complete and correct.	*Written Texts*
		Drawing diagram, pictures or table. However, they are neither complete nor correct.	*Drawing*
		Using algebraic equation or mathematical model and conducting the calculation. However, only some of them are correct and complete.	*Mathematical Expression*
20- 39	The answer is unclear and procedural	Showing limited understanding of both content of writing, diagram, figure or table as well as the use of mathematical model and calculation.	*Written Texts, Drawing, and Mathematical Expression*

3 Results

3.1 Recapitulation and Explanation of the Pretest and Posttest Test

Table 2. Descriptive statistics of students' mathematical communication ability pretest
and posttest.

Class	N	Pre-test				Post-test			
		Min	Max	Mean	SD	Min	Max	Mean	SD
Experiment	32	43,7	75,6	65,73	7,69	68,4	88,7	79,84	6,46
Control	32	46,3	73,5	64,90	6,91	59,2	84,8	74,61	8,29

On average, the posttest results show that the students' mathematical communication ability of
both classes is improved. It is observed that the experiment class results are higher considering
the difference of pretest and posttest results. However, further analysis for the increase of
score gained by both experiment and control class using normalized N-Gain is required. The
average N-Gain score of students' mathematical communication ability for both classes is
presented in Table 4.

Table 3. Descriptive statistics of Students'mathematical communication ability

Class	Mean	Standard Deviation	N
Experiment	0,36	0,14	32
Control	0,28	0,016	32

The N-Gain mean different of the two groups was then analyzed, given that the homogeneity
and normality test requirements has been met.

Table 4. N-Gain t-test results of students' mathematical communication ability of experiment
and control class.

		t-test for Equality of Means		
		T	df	Sig.(2-tailed)
N-gain ofmathematical communication ability	Equal variances not assumed	2,001	63	0,050

It can be concluded that there is a significant different of students' mathematical -
communication between the experiment and control class. The students who experienced
problem solving using hot potatoes reached higher gain of mathematical communication
ability.

3.2 Attempts to Integrate Problem Information

a. For the answer of question 3 related to the area of cardboard needed to cover a triangular
prism name plate.

Illustration:
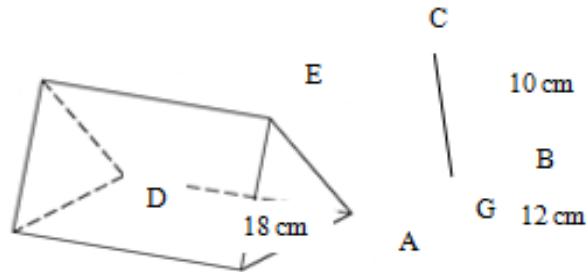
A student from control class started the problem solving by illustrating the correct figure with logical explanation. However, there were some mistakes in the calculation:

$CG^2 = \sqrt{CB^2 - BG^2}$
$CG^2 = \sqrt{10^2 - 6^2}$
$CG^2 = \sqrt{100 - 36}$
$CG^2 = \sqrt{64}$
$CG^2 = 8$ cm.

Then he/she calculated the area of the cardboard needed for the seen parts only, including three sides out of five sides of the triangular prism, and the surface area of the prism = The area of base + (all right sides + all left sides)

$= (\frac{1}{2} \times AB \times CG) + (AD + DF + FC + CA) \times 2$
$= 48 + 112$
$= 160 \ cm^2$

This is a failed final answer

b. The answer of question 4 of one of the students in experiment class

Figure 2. One of student's answer in experiment class

Based on the answer presented on Figure 2, it is indicated that student's skill in communicating ideas is improving, student could understand and write all information provided in the question. In addition, the answer was systematic, well-planned and corresponding to the figure.

4 Discussion

Table 2 indicates that problem solving approach using hot potatoes positively contributes to improve students' mathematical communication ability compare to the problem solving approach without the software. The difference of students' mathematical communication between experiment and control class is due to the different characteristics of both approaches, experiment class using problem solving approach using hot potatoes software with additional innovation; students are trained with the steps of problem solving approach as well as various questions provided by the software in a web display with the working duration decided in advance.

Even though students in control class conducted the Polya's version of problem solving, they were not as enthusiastic in rechecking their answer (looking back) as they were bored (using paper based test) resulting in some failure in the final answer. This is not the case with the students using hot potatoes software, the software enables various feedbacks without paper so that students can directly see their test results without a long wait. This is also indicated by control class students' answer of question no 2 mentioned before, they make an illustration to clarify the problem, however, they still have difficulty in illustrating all the information obtained in the appropriate mathematical models.

The results of this study are relevant to previous research by Esty and Teppo [7] who found that students are able to solve problems given in the forms of narrative drawings but students failed to build a problem solving formula. Therefore, it is expected that school can utilize information technology and communication (both hardware and software) in the teaching and learning to improve students' cognitive ability. This is in line with Hung, Huang and Hwang [8] who argued that the feedbacks using computer and information technology such as e-book, wireless network, and multimedia encourage students to learn mathematics. Chao, Chen, Star, and Dede [3] also mentioned that technology based resources is one of the solution that can be used to develop higher students' confidence in mathematics problem solving.

Ansari [4] identified some factors contributed to poor mathematical communication ability of the students, as experienced by students in control class, including: prior knowledge, reading, discussion and writing ability, as well as mathematical knowledge. NCTM (2000) emphasized that communication is crucial in mathematics education as it allows teacher to better understand students' ability in interpreting and expressing their understanding of the concepts and processes of mathematics they learned. In line with NCTM, Brodie (2010) claimed that "mathematics reasoning assumes mathematical communication. Communication is an integral part of process reasoning".

Bloom [7] argued that there are three parts of understanding, namely, translation, interpretation and extrapolation understanding. Translation understanding is the ability to understand an idea expressed in a different way from the original statement. For example, one can change a question into symbol or vice versa. Interpretation understanding is the ability to understand an idea arranged in another form such as equation, graph, table and diagram.

Extrapolation understanding is the ability to predict the continuation of the current tendency based on certain data.

Mathematical communication is inseparable from the process of understanding. Therefore, mathematical communication ability can be observed when student explain an algorithm to solve mathematics problems. Ernest [9] proposed that communication emphasized on students' ability and skills in using words, notation, pictures, table and mathematics structure in reasoning, connection and problem solving.

Based on students' answers, there are three cognitive processes conducted by students in selecting and choosing the rules of solving geometry problems. The students use drawing as a model, formulating mathematics equations (associating ideas), describing in their own words (written text), and a combination of all those aspects. In this case, the focal cognitive process is students' ability in mathematical representation [12]. Drawing was frequently used by both classes. Furthermore, formulating mathematical models and explaining based on students' own expression (written text) were also frequently used by the both classes, whereas the combination of drawing, formulating a mathematical model, and constructing their own expressions were more frequently used by the experimental class.

Table 2 indicates that there is a significant different of the increase score of students in experiment and control class using normalized N-Gain. On average, N-gain of students' mathematical communication of experiment class is higher than control class. The results show that the topic of 3D geometry taught using hot potatoes positively contribute students' success in the final test.

4 Conclusions

To sum up, the increase of students' mathematical communication ability in the class taught using problem solving approach using hot potatoes software is better than those class taught using problem solving approach without the software. Students who learned using hot potatoes software acquire Polya's problem solving skills so that they are more directed in formulating mathematics model compared to the students' who learn without the software; they also achieve better results. In addition, problem solving approach using hot potatoes software positively influence students' self-efficacy. This study investigates students' mathematical communication ability limited to the topics of prism and pyramid and it is expected that further research can develop the learning utilizing problem software approach using hot potatoes software for different abilities and broader topics.

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The Impact of Brand Trust and Students Satisfaction Towards Student Loyalty

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Abstract. This study aimed to determine the impact of academic service quality on student loyalty, the impact of academic services on student satisfaction, and the impact of student satisfaction on student loyalty. This research was explanatory research in which the population was students of Faculty of Economics and Business Budi Luhur University, Jakarta. The data were collected using questionnaires that its reliability and validity were tested for 30 respondents. The research sample used was purposive sampling with total 96 respondents. The data were analysed using SPSS. Based on the analysis results, it was seen that brand trust affects students' loyalty. However, brand trust did not affect student satisfaction, and student satisfaction did not affect student loyalty. The limitations of this study were on the research object and the number of respondents. The least number of variables used in this study was to expect further research to add other variables that could affect student satisfaction and loyalty. Based on data analysis, it revealed that brand trust variable did not affect student satisfaction and student satisfaction variable did not influence student loyalty

Keywords: Brand Trust, Student Satisfaction, Student Loyalty.

1 Introduction

Budi Luhur University must be able to retain customers which in this case is the current student and as much as possible tries to find new customers or prospective students while still paying attention to aspects of marketing. According to Ibanez et al. in Gecti and Zengin (2013) and Hafizah (2012), brand trust is one of the factors that can affect brand loyalty [1],[4],[9]. With the belief in the higher brands, it is expected that consumers will be loyal to the brand. According to Lau and Lee in Rizan et al. (2012), brand trust is the trust of consumers in a brand with various risks faced as their expectation of the brand to provide positive benefits, which with the brand trust, it will lead to brand loyalty [18]. According to Hellier et al. (2003), that satisfaction is considered as the preferred degree or overall customer satisfaction that found by the product's ability to meet the consumers' wishes, expectations, and needs to the product [10]. According to Kotler (2003), customer satisfaction is the perception of a person for the performance of a product or service that compared to expectations owned by consumers, where with customer satisfaction, it will lead to brand loyalty [12]. Customer satisfaction is closely related to quality. A company needs to know

several factors that affect consumer perceptions and expectations. According to Griffin (2005) Loyalty is literally interpreted as loyalty, including the loyalty of a person to an object [5],[6].

2 Framework And Hypotheses Concept

2.1 Composite Reliability

Research conducted by Nisa et al. (2013), Bastian (2014), Tezinde et al. (2001) and Lau and Lee (1999) show the evidence that brand trust affects consumer loyalty [1],[13],[16],[23]. The existence of trust is the activator of the rise of loyalty, because it can create highly valuable relationship exchange. Consumer loyalty, in this case the students, based on continuous relationships and the maintenance of important value relationships created for Budi Luhur University Jakarta from the trust. Thus, trusts are closely related to consumer loyalty (Garbarino and Johnson, 1999), which in this case is about brand trust. According to Ibanez et al. in Gecti and Zengin (2013) and Hafizah (2012), brand trust is one of the factors that can affect brand loyalty [3],[4],[9]. Based on the above opinion, hypothesis is created as follows:
    H1: Brand trust affects student loyalty.

2.2 Brand Trust towards Student Satisfaction

The research of Setyawan (2008) conclude that brand trust is a mediating variable of the relationship between the variables of satisfaction on the brand [21]. When consumers get satisfaction from the purchase of a product then it will create a positive attitude to the brand so that consumers will make a purchase [19]. Chaudhuri and Holbrook (2001) define brand trust as the willingness of average consumer to depend on the ability of a brand ingetting its utility or function [2]. Based on the above opinion, a research hypothesis can be developed as follows:
    H2: Brand trust affects student satisfaction.

2.3 Student Satisfaction towards Student Loyalty

Research conducted by Evans and Lindsay in Mohsan (2011) shows that companies with satisfied customers have a good opportunity to turn them into loyal customers who buy products from the company over a long period of time [15]. This is also expressed by Lokito and Dharmayanti (2013) that satisfaction owned by the customer significantly influence customer loyalty to the brand [14]. According to Oliver (1999), that customer satisfaction is a major cause of brand loyalty, which means that the loyalty arises because of satisfaction to the brand of certain products and/or services [17]. According to Boulding et al. and Selnes in Karsono (2008) that a positive and significant influence isfound between satisfaction and loyalty [11]. According to Kotler (2003) customer satisfaction is the perception of a person for the performance of a product or service that compared to expectations owned by consumers, where with customer satisfaction, it will lead to brand loyalty [12]. Results of research conducted by Ha et al. (2009) and Ha et al. (2011) reveal that customer satisfaction has a positive and significant impact on brand loyalty [7],[8]. Thus,based on the above opinion, hypothesis can be built as follows:
    H3: Student satisfaction affects student loyalty.

3   Methodology

This research is the category of explanatory research. The population in this study are students of Faculty of Economics and Business (FEB) Budi Luhur University (from generation of 2013/2014, 2014/2015, and 2015/2016) with a total of 2244 students. The sample in this study amounted to 96. Here is the Slovin formula and table the number of samples in accordance with the percentage. The percentage usage on the samples number isto obtain sample from each generation based on itsproportion.

$$n = N / (1 + N.e2) \tag{1}$$

Where:
n = Sample number
N = Total Population
e = errors margin e.g. 10%
n = 2244 / (1 + 2244. 10% 2) = 96

Based on Slovin formula, the samples number in this study amounted to 96. Then to easein spreadingthe questionnaires, a table percentage of the samples number for each year is created as follows:

Table 1. Sample Percentage of Each Force.

Academic Year	Number of FEB Students (JM)	Percentage (%) = JM/JT X 100%	Sample (n) n= % X n *Slovin*
2013/2014	774	35%	34
2014/2015	791	35%	34
2015/2016	679	30%	28
Total (JT)	2244	100%	96

Source: Data Processed Year 2017

The measurement scale used is the interval scale by using Likert scale. The data collection techniques used is interviews using a research instrument in the form of questionnaires. The analysis tools used are validity and reliability, correlation analysis, regression analysis, and coefficient of determination. The research variables with their indicators are shown in detail in Table 2.

Table 2. Sources Referred for the Measurement.

No.	Variable	Indicator	Source
1	*Brandt Trust*	• Brand Reputation • Brand Predictability • Brand Competency • Trust In The Company • Brand Linking	Lau and Lee (1999) [13]

| 2 | Student Satisfaction | • More Faithful
• Often Buying More
• Provide Comments
• Less Attention to Other Brands | Kotler (2003) [12] |
| 3 | Student Loyalty | • Habits of Transaction
• Repeat purchase
• Recommendation
• Commitment | Selnes (1993) [20] |

4 Analysis And Findings

Based on the reliability test result, it can be stated that it is reliable, because Cranbach Alpha value is >0.60 (Ghozali, 2001), and the validity test is valid with corrected item correlation greater than 0.3 point [22]. Regression analysis result of the influence of brand trust to student loyalty, brand trust to student satisfaction, and student satisfaction to student loyalty are described in following figure:
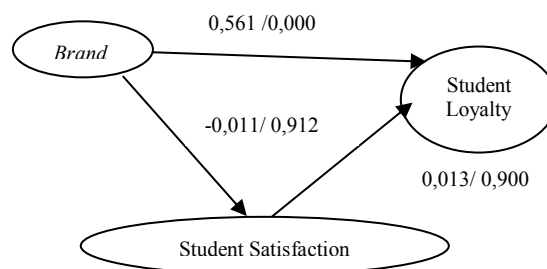
Fig. 1. Regression Analysis Results.

4.1 Brand Trust Affects Student Loyalty

Based on the regression analysis in Figure 1, it can be seen where the sig. valueof brand trust to student loyalty is 0.000; this means the value of Pvalue is smaller than 0.05 which then it can be said that brand trust affects student loyalty. Empirical facts shows that brand trust indicators in the form of brand reputation, brand predictability, brand competency, trust in the company, and brand linking are well perceived by the respondents, so that brand trust is able to influence student loyalty. This research is in line with research conducted by other researchers [1],[3],[13],[16],[23]..

4.2 Brand Trust Affects Student Satisfaction

Based on the results of regression analysis in Figure 1 above, it can be known sig. value of brand trust to student satisfaction is 0.912. This means the value of Pvalue is greater than 0.05, in which brand trust does not affect student satisfaction. Empirical facts show that respondents still perceive low indicator of brand trust so that does not yet able to influence consumer satisfaction. This is because the staff/lecturer of Budi Luhur University Jakarta has not provided good friendly and service, so this affects the satisfaction of students. This research is not in line with a research conducted [2],[19],[21].

4.3 Student Satisfaction towards Student Loyalty

The result of regression analysis in Figure 1 shows that nig sig. of student satisfaction is 0.900. This means the value of Pvalue is greater than 0.05 in which student satisfaction does not affect student loyalty. Empirical facts show that respondents still perceive low indicator of student satisfaction. This is because the students are still not loyal to the campus where they studied by with rare involvement or participation in activities held by the campus, the students unwilling to comments related to the campus, and the students are still often paying attention to other universities. This study is inconsistent with the research conducted [7],[8],[11],[14],[15],[17].

5 Managerial Implications

The management of Budi Luhur University Jakarta is expected to continue to provide and fulfill what is needed and desired by the students as well as able tomaintain the emotional bonds between Budi Luhur University and its students. It is expected that the results of this research can help the campus managers to pay more attention to the factors that influence students loyalty such as: further improvement on the role of students both in activities held by the campus and students involvement in giving comments to some activities held by the campus, or students participations by commenting on a policy applied by the campus. It is expected to form the emotional ties of students with the campus and make students to continue their studying to a higher level at Budi Luhur University Jakarta.

5.1 Future Research

Suggestions for future research are: adding other variables that may affect student satisfaction and loyalty such as service quality, brand equity, switching cost, and other variables. It is needed to extend the research object, as well as increase the number of respondents, and of course also the use of other methods in obtaining and processing data.

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An Analysis of Workload and Worker's Complaint In Tofu Industry

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Abstract. Tofubusiness is a business that always done by manual material handling. The study aims to identify the workload and complaints on the tofu business. The research method is standard nordiqquestinnaire used to identify the point of the workercomplaint, biomechanics and REBA to identify workload done by the worker, anthropometry and percentile used to design, statistic test used to process anthropometry data, excel software used for data calculation anthropometry and percentile, auto cad software is used to create research designs. Result of the discussion that standard nordiq questionnaire have 26 point of complaint, REBA get three workers with action level 3, biomechanics used is maximum permissible limit got result with mean of force equal to 8676,36 N. The conclusion of standard nordiq questionnaire identifies 26 complaints of pain and rather ill, REBA identifies that three workers with a high risk level so that the workload is large, the MPL identifies that all workers have a large workload so that the activity is dangerous. Workload is minimized by ergonomic work station design and lay-out.

Keywords: Anthropometric, biomechanics, design, rapid entire body assissment, workload.

1 Introduction

Tofu business is a business that all operator activity is done manually material handling and not ergonomic. Incorrect manual handling material handling (MMH) may result in an accidental loss to employees. Musculoskeletal complaints is one of uncorrect activity caused from the consequences of MMH activity [1].

Musculoskeletal complaints on the parts of skeletal muscle felt by someone strat from very mild to very sick complaints [2]. Without realizing that the activity of removal goods which was done by the workers can cause disease or injury to the spine especially if the work is not done properly [3].

Observation results that workers often lifting weights without assisted by the tool, the load raised is a container that has been filled with soybean material that has been mashed with a weight of ± 50 kg.The fine soybeans are removed by means of lifting to the boiling site at a distance of seven meters, this is due to the location of all irregular workstations.

The location of irregular workstation causes the workers to do an activity lifting manually is not ergonomic and done repeatedly. Workers who perform activities with repetitive cycles are particularly susceptible to musculoskeletal disorders [4].

In addition to the location of work stations that do not fit the process sequence, soybean milling machine is so low that workers bending over to pick up smooth soybeans containers, and activity is repeated. Bending attitude is a non-ergonomic work attitude. If repeated and long periods of time will cause musculoskeletal disorders.

This observations do in the field it was known that the activities of workers in the tofu business   done for 10 hours, even more during Ramadan, this is a huge workload for the workers. They also complain that the upper body is sick and tired.Huge workloads and complaints from workers are the issues that will be investigated with ergonomics.

2   Literature Review

2.1 Ergonomi

Ergonomics can be defined asthe study of human aspects withinits work environment is reviewed anatomically, physiology, psychology, engineering, management and design [5].

2.2 Standard Nordiq Quetionnaire

Thestandard nordiq questionnaire is a tool used to identify the complaints on 28 sections. Pain sore point on posture is found in table1.

Table 1. This caption has one line so it is centered.

No	Type of complaint	No	Type of complaint
0	Rigid pain in the upper neck	14	Pain on the left wrist
1	Rigid pain in the lower neck	15	Pain on right wrist
2	Pain in the left shoulder	16	Pain in the left hand
3	Pain in the right shoulder	17	Pain on the right hand
4	Upper left arm pain	18	Pain in the left thigh
5	Pain in the back	19	Pain in the right thigh
6	Upper right arm pain	20	Pain in the left knee
7	Pain at the waist	21	Pain in the right knee
8	Pain on the buttocks	22	Pain in the left calf
9	Pain in the butt	23	Pain in the right calf
10	Pain on the left elbow	24	Pain in the left ankle
11	Pain on the right elbow	25	Pain in the right ankle
12	Pain in the left forearm	26	Pain on the left leg
13	Pain in the right forearm	27	Pain in the right leg

Table 1 shows that 28 points of complaint including the point of complaint 0 is a type of upper stiff on upper neck. Through the questionnaire it can be seen that the parts muscles has complaint with the level of complaints start from not sick (NS), Rather Sick (RS), Sick (S), and Very Sick (VS) [6].

2.3 Rapid Entire Body Assesment

In the beginning rapid entire body assesment was originally developed to assess posture in the health care industry [7].

Rapid entire body assesment is a method for identifying disorders that occur in the overall posture. In the rapid entire body assesment method, body segments are divided into group A and group B. Group A isthe back, neck and legs. Group B is the upper arm, lower arm and wrist. The determination of the rapid entire body assesment score, begins with determining the A score for the group A postures plus the load score and B score for the group postures B plus the coupling score[8]. Score C obtained after score A and score B is determined. rapid entire body assesment scores are obtained by adding activity scores on score C.

2.4 Biomechanics

Biomechanics in the measurement is done by two methods namely MPL (Maximum Permissible Limit) and RWL (Recommended Weigh Limit), research done using MPL method. In Method of MPL data used is the weight of burden, human weight as worker. The calculations are performed by calculating the forces that occur in the palms of the hands, lower arms, upper arms and back. The calculation results will be obtained compressive force (Fc) on theL5/S1. The standard given by MPL method is the large compressive force under 6500 N at L5/S1 while the limit of normal lifting force (the action limit) is 3500 N at L5/S1, so the standard is as follows [9]:

- If Fc <Al (safe)
- If Al <Fc <MPL (need to be careful)
- If Fc> Al (dangerous)

2.5 Anthropometry and Percentiles

The design is done to lay a soybean machine so that workers can work ergonomically, based on anthropometry.

Anthropometry studies the appropriateness of tool dimensional or machine with the body dimensions.Procedures that can be followed in the application of anthropometric data on the design process [10] is:

- Determine the user population of product design or work station. Different people in the age group will have different physical characteristics and needs, as well as forgender, race, ethnic group, civilian or military group;
- Determine the body dimensions that are thought to be important in design;
- Select the percentage of the population to be accommodated in the design;
- For each body dimension determine the relevant percentile value;
- Give looseness to existing data if necessary.
- Use simulators to test the design. The designers need to evaluate whether the design is appropriate or not;

Calculation of anthropometric data used is:

▪ Unity data antropometry test.

$$UCL = X + k\sigma \tag{1}$$

$$LCL = X - k\sigma \tag{2}$$

Information :
UCL = Upper Control Limit
LCL = Lower ControlLimit
k = Confidence Level (95%) = 2

▪ Antropometric data adequacy test.

$$N' = \left[\frac{k/s\sqrt{N\sum X^2 - (\sum X)^2}}{\sum X} \right]^2 \tag{3}$$

Information :
S = Level of accuracy (5%)
N = Amount of data needed
N' = Number of observation done
If $N' \leq N$ then the data considered enough ;
If $N' \geq N$ then the data is considered not enough (less) need to add data.
The percentile used to design is the 50th percentile by reason of its general use.

3 Method

The study was conducted for 3 weeks with the object of research is five business tofu operators who perform activities to lift the soybean with 50 kg weight to the boiling place. The instrument used is the camera to see the work posture, body ruler to measure workers' body dimensions, standard nordiq questionnaire to see the point of complaint on the worker's body.

Stages in the research that starts from looking at work posture when the workers do activities and retrieve data body dimensions of workers and provide standard nordiq questionnaire. After the data obtained then the data is done by using standard nordiq questionnaire, rapid entire body assesment, maximum permissible limit, anthropometry and percentile methods. Device design is done after anthropometry and percentile are obtained. While the design lay out done after making observations. The results of rapid entire body assesment and maximum permissible limit can be seen the amount of workload of workers.

4 Result

4.1 Standard Nordiq Quesionnaire

The standard nordic questionnaire is used to see the point of complaint to workers. The results of the standard assessment of the questionnaire obtained almost all the worker's body experiencing pain complaints.

4.2 Rapid Entire Body Assessment

Workers in the work are assessed using the rapid entire body assessment. The assessment is conducted for five workers, contained in recapitulation table 2.

Table 2. Recapitulation of table A, B, C at rapid entire body assessment

Worker	A	B	C
Worker 1	8	3	9
Worker 2	4	3	5
Worker 3	6	3	7
Worker 4	6	5	9
Worker 5	7	4	9

Table 2. shows that of rapid entire body assessment for worker 1 gets table A is 8, table B is 3 and table C is 9.

4.3 Biomechanic

Workers are assessed using the maximum permissible limit.The recapitulation of abdominal pressure (AP), stomach style (SS) and muscle style (MS) is shown in table 3.

Table 3. Recapitulation of maximum permissible limit

Worker	AP (N/m^2)	SS (N)	Ms (N)
Worker 1	0,42	197,54	6383,80
Worker 2	0,11	49,44	8034,26
Worker 3	0,09	41,03	6368,85
Worker 4	1,27	591,66	9064,49
Worker 5	0,52	240,25	9653,69

Table 3 shows that worker 1 with abdominal pressure (AP) is worth 0.42 N/m^2, stomach style (SS) is worth 197,54 N and muscle style (MS) is worth 6383,80 N.

4.4 Layout Actual

The result of observation to the field there is workstations that do not fit the process sequence, shown that Figure 1.
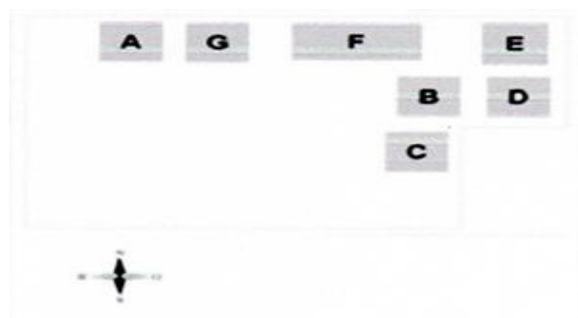
Figure 1. Layout the actual.

Figure 1. shows that the layout of the workstation is not in the order of the process.The working station in tofu business is A. for station frying pan of tofu; B for soybean milling machine; C for soy washing station; D for soybean boiling station; E for filtration station; F for tofu printing station and G. for tofu cutting station.

5 Discussion

5.1 Standard Nordiq Quesionnaire

Workload Workers in the activity using manual material handling, while the load lifted by ± 50 kg and repetitive, so that workers complain of pain in some parts of the body. SNQ questionnaire is used to see how many points of complaint on the worker's body.Questionnaire results are known there are 25 points of complaint that perceived workers are shown is found in table 4.

Table 4. Recapitulation of standard nordiq questionnaire.

Worker	Complaint (%)
Worker 1	80,00
Worker 2	82,35
Worker 3	63,64
Worker 4	80,00
Worker 5	75,68

Table 4 shows that worker 1 with 80 % complaints, worker 2 with 82,35% with complaints, worker 3 with 63,64% complaints, worker 4 with 80% complaints, worker 5 with 75,68% complaints.

5.2 Rapid Entire Body Assessment

Rapid Entire Body Assessment (REBA) is used to assess the workload of five workers on tofu business. Recapitulation of workload assessment is found in table 5.

Table 5. Recapitulation of REBA methods

Worker	Level of action	Level of risk	Action
Worker 1	3	High	Soon
Worker 2	2	Medium	Need
Worker 3	2	Medium	Need
Worker 4	3	High	Soon
Worker 5	3	High	Soon

Table 5 shows that there are three workers with high-risk level and immediate action are workers 1, 4 and 5. While worker 2 and worker 3 have medium risk level so action is needed.

5.3 Biomechanic

Workload assessment can also be done using biomechanical methods. The biomechanics used is the MPL (Maximum Permissible Limit) method.
Recapitulation of workload assessment using MPL method is found in table 6.

Table 6. Recapitulation of MPL method

Workers	Fc	MPL	Conclusion
1	6652,99	6500	Dangerous
2	8547,87	6500	Dangerous
3	8900,83	6500	Dangerous
4	9192,57	6500	Dangerous
5	10087,55	6500	Dangerous

Table 6 shows that the activity in lifting containers filled with fine soybeans is an activity with large and dangerous loads.

5.4 Anthropometry

The design undertaken is the design of machine work stations and lay out. The design of machine work stations is based on the anthropometry method. Machine work stations designed according to the workers dimension. The employed dimension is the dimension of hand coverage to determine the widthof the base of the fine soybean container, the knee height dimension is used to determine the height of the soy container base, the height of the standing elbow is used to determine the soybean grinder base. Data of anthropometric dimension was done by statistical test that is data uniformity test and data adequacy test. Recapitulation of uniformity test for knee height dimension is found in figure 2.
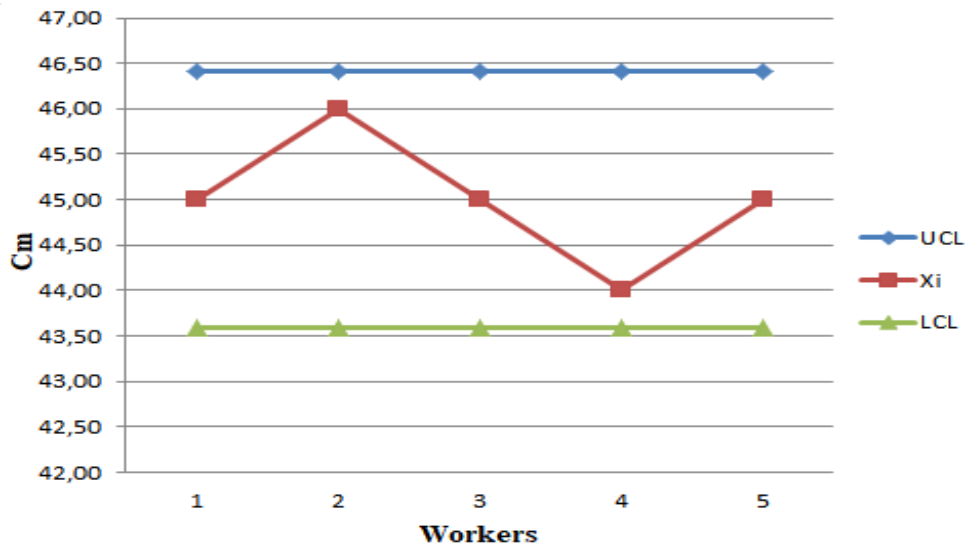
Figure 2. Recapitulation map of knee high dimension control

Figure 2 shows that knee height dimension for all data is between the control limits, meaning all uniform data, such as worker 1 have with knee height dimension 45 cm, dimension of worker 1 are between UCL is worth 46.41 cm and LCL is 43.59 cm. The recapitulation of data adequacy test is found in table 7.

Table 7. Recapitulation of data adequacy test.

Dimension	N	N'	Conclussion
Range Hand	5	1,23	Enough
Height knee	5	0,30	Enough
Standing Tall Elbow	5	0,86	Enough

Table 7 shows that for knee height dimensions with N 'worth 0.30 under N data of 5, it means enough data for designing work stations. The percentile used for the work station design is the 50th percentile, the percentile recapitulation is found in table 8.

Table 8. 50th percentile recapitulation.

Dimension	Persentil 50
Range Hand	80,20
Height Knee	45,00
Standing Tall Elbow	104,40

Table 8 shows that the 50th percentile for knee height dimension is 45.00 which is used as the basis for the width of the fine soybean container. Work station design is found in figure 3.

Figure 3. Desiging Work Station

Figure 3 shows that the height of softcoy container table based on knee height is 45,00 cm, table width of soybean container based on the dimension of hand reach that is 82 cm, height of soybean machine table based on height height of elbow stand that is 102 cm. Workstation design is expected to change worker's attitude, from a bent position to a standing position. The design of lay out in tofu business is done on the grounds the lay out that already exists, the location of the work station is not similar so that workers in the activities raised to another work station to be far away. Remote lifting activities and large loads make the activity no ergonomic. The layout design is found in Figure 4.
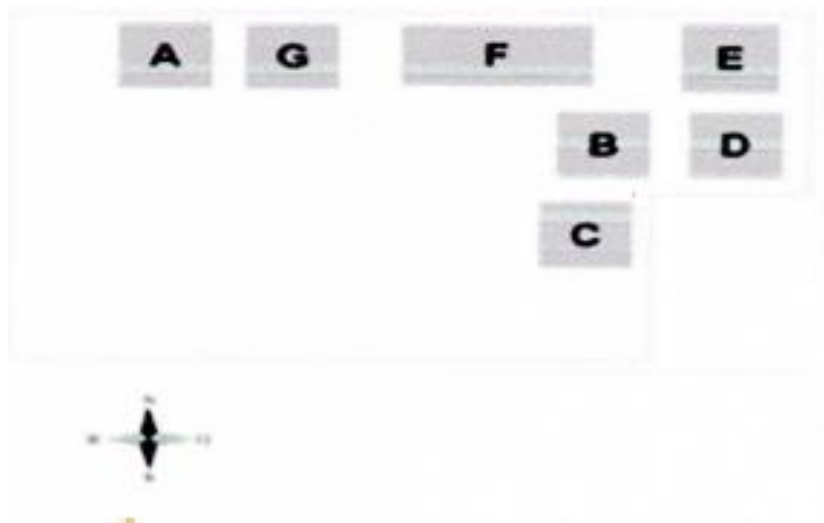
Figure 4. Designing ergonomics layout

Figure 4 shows that the location of all work stations was designed in accordance with the production process.

6 Conclussion

The based on the research it can be conclude:
- Standard nordiq questionnaire (SNQ) identifies that there are 26 point complaints ranging from mild to sick;
- REBA identifies that three workers with immediate category of action are taken because of high risk levels, while two workers with the category need to take action because of the level of risk being;
- The MPL identifies that all workers to engage in dangerous activities because the force of all workers exceeds the standard which applied;
- The design soybean milling machine is done to minimize manual handling material handling and work ergonomically;
- The design of lay-out is done to minimize the point of workers complaints and workload.

Acknowledgments.

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Paris Agreement Agreement 2015 and its Impact on Indonesian National Law

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Abstract. The 2015 Paris Agreement (PA 2015) was agreed in December 2015. This agreement indicates that the issue of climate change will remain a global agenda at least until 2030. The 2015 Paris Agreement position will replace the 1997 Kyoto Protocol as one of the climate change agreement regime (UNFCCC 1992). Indonesia has participated and signed and ratified the 2015 Paris Agreement. By ratifying the international law into national law through the Law No. 16 of 2016, it will have an impact on the existence of Indonesian national law. The purpose of this study is to examine the relationship between international law in the form of the 2015 Paris Agreement and Indonesia's readiness through national law as an implementation at the national levels. The results of the study show that some national legislation has been adjusted to the 1992 UNFCCC, 1997 Kyoto Protocol and 2015 Paris Agreement objectives. The conclusions of this study indicate that there are significant impacts of the existence of international agreements on national legal instruments. This research has also shown that Indonesia has committed to implement the 2015 Paris Agreement with the legislation as a measure of the successful implementation of international agreements.

Keywords: Paris Agreement 2015; National Law; NDC; International Agreements, Legislation Products.

1 Introduction

Climate change has become a global environmental agenda. Climate change occurs due to an increase in human activity on the use of fossil fuel so as to produce high greenhouse gas emissions. The impact of climate change has been felt in almost all sectors of life. Real action is needed to deal with the impacts of climate change through adaptation and mitigation efforts. One important tool in achieving global commitments to reduce greenhouse gas emissions is a global agreement through international agreements. UNFCCC in 1992 was agreed upon with the aim of stabilizing greenhouse gases to efforts to reduce emissions through the 1997 Kyoto Protocol which is valid until 2020. In the year after 2020 a new, more binding and ambitious agreement is needed. After lengthy negotiations, on December 12nd in year 2015 the 2015 Paris Agreement was agreed which aims to replace the 1997 Kyoto Protocol and attempt to reduce greenhouse gas emissions by 2030 [1]. The 2015 Paris Agreement is a more state`s participatory in International Agreement since almost all countries have obligation to reduce greenhouse gas emissions measured through National Determined Contribution (NDC) [2]. Indonesia has been fully involved in the negotiation process until an agreement is reached through the signing of an international agreement instrument namely the Paris Agreement in 2015. A year later Indonesia ratifies the 2015 Paris Agreement to become national law. This

will certainly have an impact on the existence of national law that has existed so far. Various instruments of national legislation both the Law, Government Regulations, Presidential Regulations until the regulations below will adjust to the provisions of the Paris Agreement 2015. On the other hand the policy of the central government must also be followed by the local government through a local law instrument such as the Regional Regulation up to Village Regulation. But for this adjustment it takes time and process that is long enough to be able to adjust to the 2015 Paris Agreement.

2   Theory and Literatur Review

Mitchell said that there were more than 1,000 international agreements in the field of environment both multilateral and bilateral which were successfully formed and approved [3]. The instrument of international agreement is an agreement between countries. However, in practice in the field of international environmental law an international agreement does not only bind the subject of international law such as the state or international organizations. In certain cases, Non Governmental Organizations (NGOs) have the same attachment to other subject of international law [4]. International agreements have various forms including those in the form of international conventions, protocols, agreements and other forms. In addition there are principles of international law in dealing with climate change impacts such as bona fide, pacta sunt servanda, common but differentiated responsibility, applicable for all, as a concern for climate change regime that countries agree to sign the United Nations Convention on Climate Change (UNFCCC) on June 5, 1992. Five years later to implement the 1992 UNFCCC through its Greenhouse Gas emission reduction targets, the Kyoto Protocol was agreed in December 1997 [5] This protocol was then implemented through two periods of Commitment namely the Commitment I Period carried out in 2008 to 2013 and the Commitment II Period carried out in 2013 to 2018 which was later extended to 2020. To replace the 1997 Kyoto Protocol, through the Durban Platform was agreed to discuss an international agreement which finally agreed in 2015 namely the Paris Agreement 2015. The 2015 Paris Agreement will begin in 2020 until 2030. The provisions in the 2015 Paris Agreement regulate such as an agreement to reduce emissions below 2 degrees, reduce emissions through adaptation and mitigation, NDC, use various market mechanisms, climate finance etc. Indonesia as one of the countries that has ratified and it is necessary to implement it at the national level. UNEP (2007) asserts that institutional arrangements and mechanisms are needed to support the implementation of international agreements both at the international and national levels [5]. In Indonesia legislation products that can be issued in the form of laws (UU), government regulations (PP), Decree / Presidential Regulation (Perpres), Decree / Ministerial Regulation (Permen) and Regional Regulation (Perda). In addition, it can also be in the form of a Decree / Director General Regulation, Circular Regulation (SE), Joint Decree (SKB), Decree / Regulation of the Governor, Mayor or Regent. In integrating the provisions of international law into national law, various methods are needed in the framework of the legislative theory.

3 Research Methods

This research is based on a qualitative analysis approach with quantitative combinations (mix methods). This research is desk study research and library study. Data collection is carried out based on primary and secondary data. Primary data in the form of legislation while secondary data in the form of literature. The data is carried out through the process of identification, data sorting, data usage and data analysis as well as conclusions based on research objectives.

4 Results and Discussion

Before the ratification of the 2015 Paris Agreement, Indonesia also ratified the 1992 UNFCCC and the 1997 Kyoto Protocol. Several implementing regulations issued before the 2015 Paris Agreement ratification compared to after the Paris Agreement ratification can be seen in the table below:
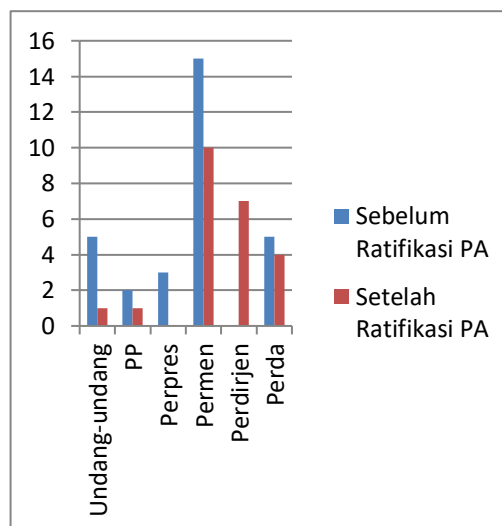
Fig. 1. Legislation issued before and after the 2015 PA ratification.

From the picture above, the legislation product acts as a follow up to the ratification of both the 1992 UNFCCC ratification, the ratification of the 1997 Kyoto Protocol and after the ratification of Paris Agreement in the form of a Ministerial Regulation is most populer. When viewed from the sector policy, the Ministry or institution that provides the most legislation products is the Ministry of Environment and Forestry (Fig. 2).
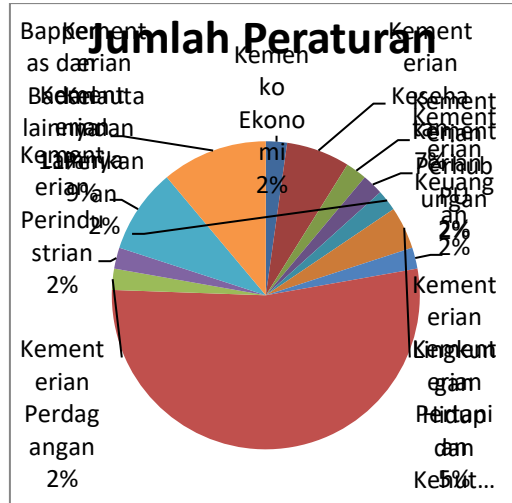
Fig. 2. Percentage of Product Regulations issued by the Ministry related to climate change.

From the data above, it appears that the number of legal products issued by the Ministry of Environment and Forestry is the most. This is in accordance with the main tasks and functions. But it should be noted that before the National Council on Climate Change (DNPI) was dissolved, the main tasks and functions of national climate change were under the DNPI.

With Indonesia's involvement and its commitment to addressing global climate change, it turns out that it has an impact on national law, especially in the legislation products have been published. National legislation has been published with a variety of purposes and objectives. When the 1992 UNFCCC was ratified by law, there are many regulation has adjusted and made such as the Minister of Health Regulation No. 035 of 2012 concerning Guidelines for Identifying Health Risk Factors Due to Climate Change. When Kyoto 1997 Protocol was ratified, adjustments were also made to national legal instruments such as Presidential Regulation Number 61 of 2011 concerning National Action Plans for Decreasing Greenhouse Gas Reductions. The 2015 Paris Agreement, although it is not yet valid globally, it requires readiness especially for national legal instruments so that the 2015 Paris Agreement can be achieved in 2030. For Indonesia it is necessary to change the provisions in its legal products, especially in the existing laws and regulations. For example, Presidential Regulation Number 61 of 2011 seems to have to accommodate new developments, especially in the framework of reducing emissions below 2 degrees and as stated in the new Indonesian NDC. Likewise, the establishment of new regulations that are urgent is mainly related to readiness to adjust to Indonesia's emission reduction commitments as stated in the Indonesian NDC. In the future, national legal instruments must also be prepared as in the face of carbon trading mechanisms that will change from the Kyoto Protocol 1997 regime to the 2015 Paris Agreement regime. Mechanisms that are calculated and recognized in the Kyoto Protocol 1997 such as Clean Development Mechanism (CDM), Joint Implementation (JI) and Emission Trading (ET), will develop in the 2015 Paris Agreement through a non-Kyoto Protocol mechanism such as REDD plus and other mechanisms. So it is necessary to develop Measurement, Registration and Verification (MRV) that can be recognized and taken into account in reducing emissions. For that national law products must be prepared and able to follow new developments so that

by 2020, Indonesia will be ready to implement the 2015 Paris Agreement as a global commitment.

International law has a very important impact on national legal instruments, especially in increasing the capacity of national law itself. The rules are not yet valid, then because of an increase in global commitments in the framework of reducing emissions, national commitments must be increased. In addition, national and regional institutions must also be formed to be able to adjust to the provisions of the 2015 Paris Agreement. Required funding is available or utilizing international funds provided in the 2015 Paris Agreement framework. On the other hand the use of low-carbon technology will affect technological development in Indonesia is expected to be in accordance with the 2015 Paris Agreement commitment. The important thing of the 2015 Paris Agreement as an international legal instrument, of course, will increase the knowledge, understanding and awareness of the Indonesian people in order to be transformed towards improving national environmental quality and also in accordance with the commitment Sustainable Development Goals (SDGs) in line with the 2015 Paris Agreement.

5 Conclusion and Recommendation

The conclusions of this study are:
a. The 2015 Paris Agreement is a global commitment that must be
    implemented by Indonesia through an adequate legal instrument.
b. The national legal instruments include products of national legislation that some have been able to adjust to readiness towards the implementation of the 2015 Paris Agreement.
c. An important impact on national law is that there is an increase in legal capacity, institutions, funding, technology and human resources that can be included in the provisions of national legislation,
d. Adjustment to legislation products so that they are in line with the 2015 Paris Agreement objectives will increase national development capacity to be in line with the Sustainable Development Goals (SDG).
e. The existence of NDC is a benchmark in the process of forming future legislation.

While the recommendations are the need for a more in-depth study, especially in the ability to make decisions related to the provisions of the 2015 Paris Agreement that must be adapted to national law products.

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Tabu Analysis List Length on Lecturing Scheduling

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Abstract. Lecturing scheduling is the management of lecture plans that will be arranged in period and roomand lecturer teaching lectures. The lecturing scheduling process is well arranged by fulfilling a set number of constraints with the goal of producing a more optimal lecture schedule.Taboo algorithm searches a search-based optimization method by shifting from one solution to another by selecting the best solution from the current (current) environment that is not classified as a taboo solution. The fundamental memory structure in taboo search is called taboo list. The taboo list stores the attributes of some moves (the solution transitions) in the previous iterations. Tabu search algorithm is influenced by several parameters, one of which is the magnitude of the taboo list will affect the iteration and time provided to produce a more optimal lecture schedule.

Keywords: Scheduling, Lectures, Tabu search, Tabu list

1 Introduction

In the academic system of college, scheduling is a routine job done every semester. scheduling is used to apply events that contain the components of the course, lecturer, class and semester on the time slot that contains the time and space components as needed. If using a manual system then this problem takes a long process time to look for the solution, especially when problems arise with the increase in the number of components and the constants or conditions specified by the institution where the schedule is used [1].

In this case constraints must be fulfilled have a number of specialties due to limited time and space and the willingness of lecturers in teaching with the time specified, because some lecturers have activities outside the campus. Allocating lecturers, time, and space to a class will greatly affect other classes to be a difficult case to solve. Problems are still increasing complex with the course that must be allocated in a certain room that has its own criteria.

Tabu Search is a search-based optimization method through a shift from one alternative to the next, selecting the best alternative Neigbourhood now (current) that is not considered a taboo alternative. The basic idea of a taboo search algorithm is to prevent searching from local searches from retrieving the already traced solution space by utilizing a memory structure that records some of the traces of the search process that has been performed.Based on the description above, the authors are interested to take the title "Tabu Analysis List length On lecture scheduling"[2].

1.1 Problem Formulation

Based on the background for the problems that have been raised, then the formulation to the problem is the analysis of the effect from the tabu length list on tabu.

2 Literature Review

2.1 Tabu Search

According to S. Abdullah, Ahmadi, Burke, Dror, & McCollum [4] tabu search is an optimization method based on local search. The search process moves from one solution to the next, choosing the best alternative from the current alternative environment (taboo) that is not classified as a forbidden alternative (taboo). The fundamental memory structure in taboo search is called taboo list. The taboo list stores the attributes of some moves (the solution transitions) in the previous iterations.

2.2 Algoritma Tabu Search

According to Glover (1989) as a guide to move from i to the next solution in N (i). memory usage as a barrier in the selection of several subsets of N (i) by preventing movement to some neighboring solutions.

- Selects initial solution I in S. Set i * = I and k = 0.
- Set the value k = k + 1 and generate subset V * as the solution in N (i, k)
- Select j 'best' in V * and set i = j.
- If f (i) <f (i *) then set i * = i.
- If a stop condition is found, then the process is terminated, whereas if it has not returned to step 2.

2.3 Research Contribution

The author hopes this research can be use dask now ledge and compareson insight about scheduling and search tab algorithm and can be applied to real life such as the problem of arranging schedule, job shop scheduling, map coloring and storage area.

3 Method

Problems discussed in this research is to analyze the size of taboo list on lecturing scheduling process with taboo search algorithm. The analysis is done by comparing the number of steps and time required by the taboo search algorithm to generate more optimal lecture scheduling with different taboo list sizes. The research methodology in this study is illustrated as in Figure 1.
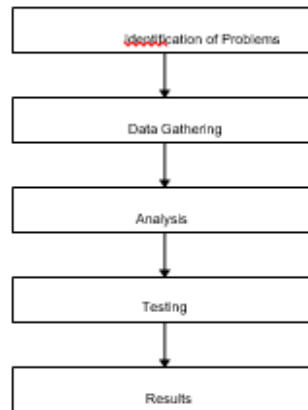
Figure 1: Research Method

3.1 Analysis

The scheduling of the lecture is a system of managing the lecture process at a university in the form of a set of course C (c1, c2, c3, ..., cn) that will be arranged in a set of periods T (t1, t2, t3, ..., tn) room R (r1, r2, r3, .., rn). Each Ci lecture program consists of several lectures that will be scheduled.In this study, the scheduling process discussed consists of several entities, among others.

- Day, TimeSlot, and Period: Scheduling of days used in 1 week of lectures and some equal timeslot for entire lecture day. A period is a pair of days as well as the available timeslot
- Lectures and Lecturers Program: A lecture program is a collection of lectures and lecturers who teach in the lectures and students who take the lecture.
- Room: space for lecture program implementation. Each room is considered appropriate for every lecture
- Curriculum: is a set of courses that will be selected by all students.

The scheduling rules used in this study are divided into 2 parts: hardconstrain and softconstrain. Hardconstrain deals with:

- Lectures: Each lecture should be scheduled for different periods and times.
- Room: class schedules should not be arranged in the same room and period
- Conflict: Lecture programs in the same curriculum or taught the same teacher can not be scheduled in the same period, or in other words each period does not have the same student or the same teacher.
- Availibility: If the curriculum teacher is not available within the given period, the course schedule is also not available.
- If the curriculum teacher is not available within the given period, then the course schedule is not available.

While softconstrain is a rule of penalty (penalty) against the scheduling conducted in the form:

- Space Capacity: students who are scheduled in the curriculum of a room according to the given space capacity

- Room Stability: All lectures are arranged in the same room. If it can not be done then the amount of space used to a minimum
- Minimum Working Days: Each lecture is endeavored to be disseminated by minimizing the day
- Curriculum Density: Student lecture agenda cultivated to a minimum

3.2 Data Format

Data is made in the order that has been determined that Courses Courses, Room, Curriculum, and Constrain. The data format performed in the scheduling is arranged in the form of:
- Program: <ProgramID><Lecturer>
            <#student><MinWorkingDays>
            <# lecture>
- Room: <RoomID><capacities>
- Kurikulum: <KulrikulumID><# Program><lectureID-1> ... <lecture-n>
- Constraints: <ProgramID><Day><Periode>

as an example :
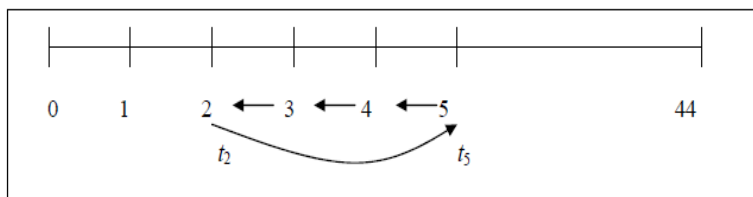
Figure 2: Proces Swap Move [2]

Program   : <Program1><Dsn.X><2><3><30>
Room   : <Room1><35>
Curriculum : <Curriculum1><Program1>
Constraints : <Program1><2><0>

The data tested in this research are data: 24 lecturers, 14 curriculum, 30 lectures, 160 lectures, 30 periods, 6 rooms and 53 periods are available to fill.

3.3 Tabu Search

Tabu search uses tabu-lists to deny solutions that meet certain attributes to prevent search processes from experiencing cycling in the same solution area, and guide the search process through unvisited solutions [5].

According to [6] Muller, Camozzato, & Araujo [5] in the design of lecturing scheduling using tabu search, the initial schedule that has been produced serve as the initial solution. The next process is to look for conflicts that occur during each schedule period on each iteration. The total value of the conflicts obtained is used as the best value temporarily. So get the initial solution stored in the taboo list for the next iteration process.

Calculation of cost in Tabu Search algorithm in this thesis is divided into 2, the value of Hard Constrain cost and Soft Constrain cost value. Value of Hard Constrain cost. The cost

value of Hard Constrain has been designed to produce a value of 0, if the schedule already has the best lecturers' composition and lecture time, fulfill all the constraints.

Instead the SoftConstrian cost is designed to approach 1. If SoftConstrain value close to 1 means that the resulting schedule contains many violations.

3.4   Neighborhood

According to Betrianis & Teguh [6] neighborhood is a solution found from the issues being discussed. Neighborhood is found through the moving stages of each item in the Taboo Search algorithm. In this study the selected neighborhood is N2 (select a random schedule and move to a new randomly scheduled place as well), where the solution is found through a schedule exchange with no violation of the constraint set. SwapMove process and examples of scheduling swap process in the picture below.

Monday	Tuesday	Wednesday	Thursday	Friday
1	9	17	25	33
2	10	18	26	34
3	11	19	27 lesson i'	35
4	12	20	28 lesson i'	36
5 lesson i	13	21	29	37
6 lesson i	14	22	30	38
7	15	23	31	39
8	16	24	32	40

Figure 3. Swap Move Proces schedule

3.5   Tabu List

According to Abdullah, Burke, & Mccollum [1] tabu list is to store n previously visited solutions. So any current solution left behind will be recorded and entered into a list called tabu list. Taboo list is also to avoid the acceptance of previous solutions into current solutions in the next loop.

Before a neighbourhood solution is checked, it must first be checked whether the solution has been entered into the taboo list. If it is then the neighbour solution should be rejected and the process is continued by checking the new neighbors solution. Thus with the taboo list can avoid cycles (iteration goes on without improving the quality of the solution).

In order for the desired solution to be achieved, each soft constraint violation is defined as a different cost value. This is done because the level of necessity to fulfill a soft constraint is different from one to another. Soft constraints that need to be filled are given a higher weight than soft constraints that are considered more tolerable.

The problem of tabu list size in the course scheduling process is done to determine the schedule that is considered tabu (meet the solution) at the time the program is running. Schedule that is considered to meet is placed into a tabu list to avoid repeated searches.

The tabu list process is used to store tabu data. If the taboo list size is 2, then every time the tabu data is stored as much as 2. If the tabu schedule data is more than 2 then the first tabu data will be removed from the tabu list because the process on the tabu list is FIFO (First In First Out). If tabu list 2 [3].

In this study, the taboo list value to be tested consists of several taboo list sizes, among others 2, 4, 6, 8 and 10. The scheduling test in this study with various taboo list sizes was

performed to determine the number of iterations and time required in order to produce a more optimal schedule.

4 Results

The results obtained in this research is the output of processing schedule tabu search algorithm with taboo list size is 2, 4, 6 and 8. Testing system in this research is done on laptop with specification of i3 core processor and 2 GB memory. The discussion of this thesis is done on the time and number of iterations obtained for each taboo list size in the roster scheduling process.

4.1 Parameter

The parameters tested in this study include the taboo list size, the number of iterations, and the time required to achieve a more optimal schedule.

4.1.1 Program Output

The output generated in this study is the output of the program, as well as the results of the tests performed on the parameters set, which is the initial schedule compiled starting on Monday, Tuesday, Wednesday, Thursday and Friday. Test results on lecture schedules with taboo list size of 2, 4, 6, 8, 10 and description of test results against the taboo list above by giving HardConstrrain and SoftContrain values and the average time required to achieve an optimal schedule.

Figure 4. Initial Schedule View

Figure 4 is an initial schedule that is compiled and used as an initial solution. The composed schedule pairs are placed in days 0 (Monday), 1 (Tuesday), 2 (Wednesday), 3 (Thursday), and 4 (Friday).

Test results on lecture schedule with taboo list size of 2.
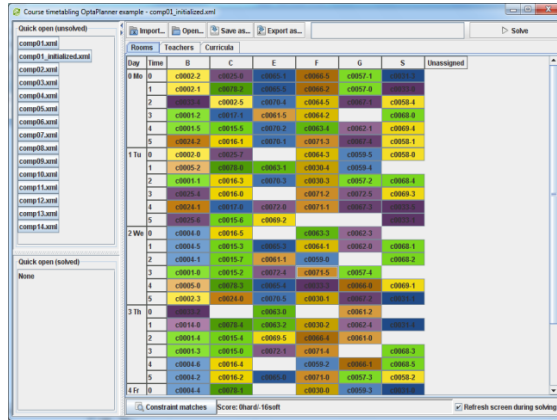
Figure 5. Test Results with Taboo Size List 2
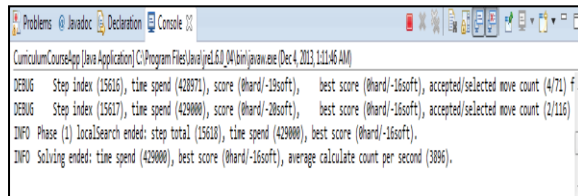
Figure 6: Description of Testing Results with Tabu List 2

Test results on lecture schedule with tabu list size of 4.
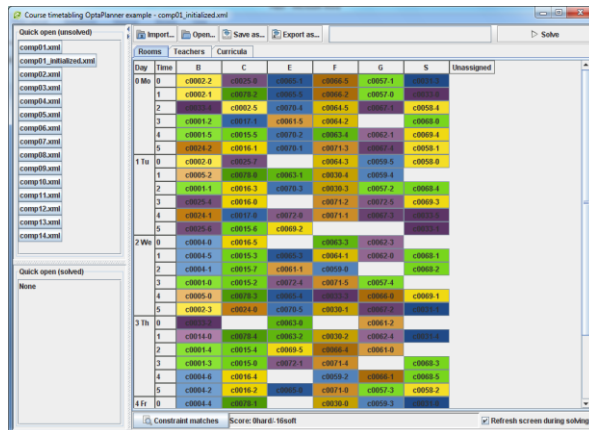
Figure 7. Test Results With Tabu Size List 4
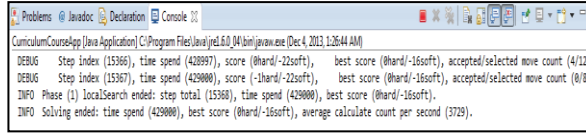
Figure 8: Description of Testing Process Results with Tabu List 4

Test results on lecture schedule with tabu list size of 6
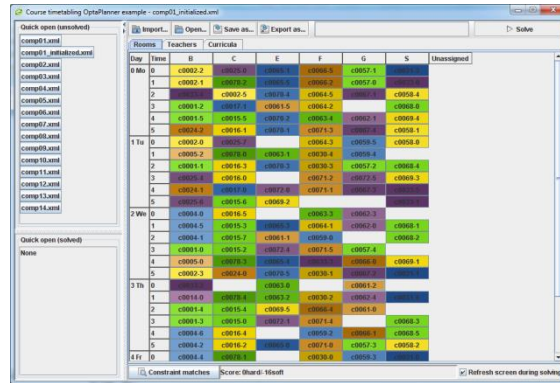
Figure 9: Test Results With Tabu Size List 6
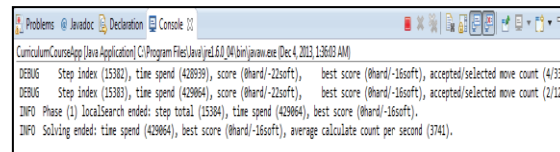
Figure 10: Description of Testing Process Results with Taboo List 6

Test results on lecture schedule with tabu list size of 8 .
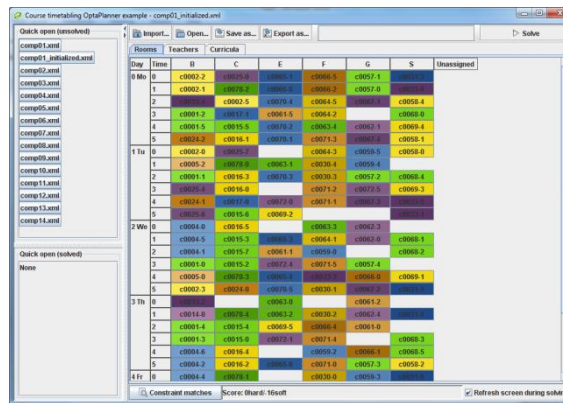
Figure 11.Test Results With Tabu Size List 8
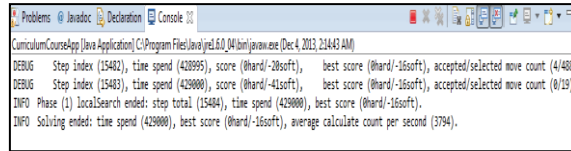
Figure 12. Description of Testing Process Results with Tabu List 8

Test results on lecture schedule with taboo list size of 10
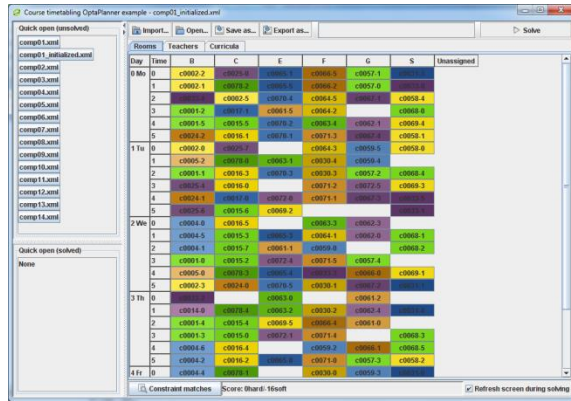
Figure 13. The Results With Tabu Size List 10
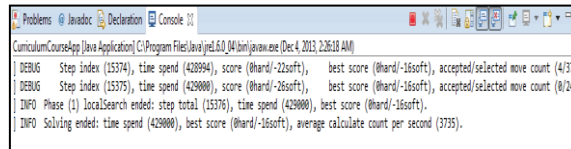
Figure 14: Description of Testing Process Results with Tabu List 10

4.2 Discussion

Results of experiments conducted several times, then obtained the results of taboo tabbed list size analysis taboo serach algorithm on lecture scheduling process in the table below

Tablel 1. Tabu Size List Analysis Result

No	Tabu List	Number of Iterations	Time (Mili Second)
1	2	10612	429005
2	4	10301	429001
3	6	9524	429001
4	8	9234	429001
5	10	9234	429001

Base on the experimental results in table 1. It is found that the larger the taboo list size will reduce of iterations required by the taboo search algorithm to reach the optimum schedule.

Results of Hard Constrain value obtained from the resulting schedule is 0,which gives meaning that there sulting schedule meets the specified criteria. There sulting Soft-Constrain value is-16.

5   Conclusion

The conclusions that can be produced in this study include:
- The taboo list size will affect the taboo search algorithm in the lecturing scheduling process. The larger the taboo list size, the less iteration it will take optimal lecture schedule.
- Average time required the optimal schedule is 429001.6 mili seconds.

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Dualism of Regulation of Criminal Law in Aceh:Criticizing the Neglected Legal Certainty

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Abstract. The purpose of this study is to analyze the dualism of the regulation of criminal law in Aceh after the enactment of Qanun No. 6 year 2014 regarding Jinayat Law which resulted in the uncertainty of the implementing of criminal law. The research approach is statute approach using secondary data that deeply discussed the contents of a written document. But in this research also use empirical method by conducting interview to one of the District Court judge. In reality there is a dualism of regulation of criminal law in Aceh. The data shows that the act of sexual abuse and rape of children there are 2 (two) First, Law No. 35 Year 2014 on Amendment to Law No. 23 Year 2002 regarding Child Protection, the trial was carried out by District Court and second, Qanun No. 6 Year 2014 regarding Jinayat Law which is trial was carried out by the Syar'iyah Court. The background of this dualism is the disagreement between law enforcer in Aceh and the consideration of sanctions contained in the qanun is lower than the law. This dualism resulted in legal certainty for the defendants, victims and the public.

Keywords: Aceh, Criminal, Dualism, Regulation

1 INTRODUCTION

Since the founding of the Unitary State of the Republic of Indonesia, the founders of the State are aware that the existence of a plural society is the wealth of the Indonesian nation that must be recognized, accepted and respected, and then manifested by the motto of Bhineka Tunggal Ika. Indonesia consists of 17,504 islands (16,056 islands have been verified) [1]. With a population of over 263,846,946 million in 2016, it consists of 714 tribes and 35 provinces. For the State of Indonesia which has such complex heterogeneity with high disintegration potential requires every step and its policy directed to strengthen national unity and unity.

One such policy is the handover of special autonomy to the province of Aceh through Law No. 44 Year 1999 regarding the Implementation of Special Feature of Aceh Province and Law No. 18 Year 2001 regarding Special Autonomy for the Special Province of Aceh. Aceh is one of the provinces in Indonesia which has a long history of armed conflict between the Free Aceh Movement (GAM) led by Tengku Muhammad Hasan Tiro and the government of Republic Indonesia since 1976. The handover of special autonomy through Law No. 18 Year

2001 has not been able to reconcile the conflict in Aceh. Peace is achieved through a peace agreement between the government of Republic Indonesia and Aceh called Memorandum of Understanding (MoU) Helsinki. The Helsinki MoU was signed in Helsinki, Finland on 15 August 2005.

The Government of the Republic Indonesia and the Free Aceh Movement (GAM) affirmed their commitment to resolution of the Aceh conflict on peaceful, comprehensive, sustainable and dignified for all. The parties are determined to create conditions so that the Aceh government can be realized through a democratic and fair process within the unitary state and the Republic of Indonesia constitution. The parties absolutely believe that only by peaceful resolution of the conflict which will enable the reconstruction of Aceh post-Tsunami on 26 December 2004 can achieve progress and success. The parties involved in the conflict are determined to build mutual trust [2]

One of the points in the Helsinki MoU is the birth of Law No. 11 Year 2006 regarding the Government of Aceh as well as replacing Law No. 18 Year 2001. This Law was born on the consideration that the system of government of the Unitary State of the Republic of Indonesia according to the Constitution of the Unitary State of the Republic of Indonesia Year 1945 recognizes and respects the units of special local government or special nature which is governed by this Act [3]

Compulsory matters which are the authority of the Aceh government in the implementation of Aceh's privileges include the implementation of religious life in the form of implementation of Islamic Shari'ah for adherents in Aceh while maintaining the harmony of interfaith life (Article 16 (2) point a, [3]. The provisions of the implementation of the law relating to the authority of the Aceh government are established by qanun.

On October 22, 2014, the Aceh government ratified Qanun No. 6 year 2014 regarding Jinayat Law which became effective 1 (one) year after it was enacted. In principle this qanun is the implementation of Islamic Shari'ah in Aceh, so the government of Aceh deem it necessary to regulate a legal provisions on criminal acts in accordance with Islamic Shari'ah is against criminal acts that have a different understanding with the provisions of criminal law applicable in Indonesia. As for criminal acts that are not regulated in qanun, still follow the Criminal Code (Criminal Code) and the Special Criminal Law outside the Criminal Code. The judicial process for Qanun No.6 year 2014 regarding Jinayat Law is implemented in the Syar'iyah Court. Qanun No. 10 Year 2002 regarding Islamic Shari'ah Courts regulates the authority of the Mahkamah Syar'iyah that examines, decides and resolves the case on the first level in the field of al-ahwal al-shakhsyiah, muamalah, and jinayah [4]

Based on the above description, there are 2 (two) criminal law in Aceh: (a) Qanun No. 6 year 2014 regarding Jinayat Law and the Law (KUHP) and Special Criminal Law outside the Criminal Code. It is interesting to analyze whether there is a dualism of the criminal law arrangement in Aceh that leads to the uncertainty of the application of criminal law.

2 LITERATURE REVIEW

Qanun is a legislative regulation similar to a provincial regulation governing the governance of the Acehnese community life. In fact the qanun is not exactly in line with the local regulations, although in terms of qanun mentioned as a local regulation, but he is given special powers that is the rule of direct implementation for the law in special autonomy affairs. In other words, qanun is a hierarchical exercise directly under Law No. 11 Year 2006

regarding the Government of Aceh, so that Law No. 11 Year 2006 may override other laws and regulations by following the lex principle of specialist derogate lex generalist. There are several principles to be considered in the lex specialist generalist derogate lex generalist:

a. The provisions found in general rules of law remain in force unless they are specifically regulated in these particular legal rules.

In relation to the regulation of criminal law in Aceh, general criminal law arrangements may be disregarded if they have been specifically regulated in qanunHukumJinayat.

b. The lex specialist provisions shall be equal to the terms of lex generalist (statute by law).

In relation to the regulation of criminal law in Aceh, qanun is a direct implementation regulation of Law No 11 Year 2006 regarding the Government of Aceh, so that Law No 11 Year 2006 becomes equivalent to the Criminal Code and Special Criminal Law outside the Criminal Code

c. Thelex specialist provisions are in the same legal environment as the lex generalist.

In relation to the regulation of criminal law in Aceh, qanun of Jinayat Law has the same legal environment as the Criminal Code and the Special Criminal Law outside the Criminal Code, which equally stipulates the criminal act.

The word Jinayah is a verbal noun (masdar) form of the word jana. Etymologically the word jana means to sin or wrong, while jinayah is defined as a sin or wrongdoing. The word Jinayah in legal terms is often referred to as a criminal act or delict. The word Jinayah has an understanding as expressed by Imam al-Mawardi namely: jarimah are acts prohibited by syara 'which is threatened by Allah with hadd or ta'zir law. [4]

According to Achmad Ali there are 3 conventional streams about the purpose of law, namely:[5]

a. Ethical flow, namely to assume that basically the purpose of law is solely to achieve justice;

b. The flow of utilities, namely assuming that basically the purpose of law is solely to create the benefit or happiness of the citizens;

c. The dogmatic juridical flow is to assume that basically the purpose of law is solely to create legal certainty.

3 METHODS

This research used is normative juridical. The main characteristic of this is to use the main source of library materials or secondary data. Approach method used in this research is statute approach (statute approach). But in this study also uses sociological / empirical method by conducting interviews to one of the District Court judges.

4 RESULT AND DISCUSSION

4.1 Dualism of Regulation of Criminal Law in Aceh

Qanun No. 6 year 2014 regarding Jinayat Law (hereinafter referred to QanunHukumJinayat) consists of 10 (ten) Chapters and 75 (seventy five) Articles. There are 10 (ten) criminal acts regulated in qanun, that is:

a. Khamar;

    b.   Maisir;
    c.   Khalwat;
    d.   Ikhtilat;
    e.   Zina;
    f.   Sexual Abuse;
    g.   Rape;
    h.   Qadzaf;
    i.   Liwath, and;
    j.   Musahaqah

Table 1. The explanation of the criminal act

Criminal Acts	Details of Actions	The Criminal Code	The Special Criminal Law outside the Criminal Code
Khamar	Intoxicant and/or alcoholic beverages of 2% (two percent) or more	Article 492 and Article 536(having an element of criminal act different from qanun)	-
Maisir	an act containing the element of betting and / or an element of chance made between 2 (two) or more parties, accompanied by an agreement that the winning party will be paid a certain benefit from the losers either directly or indirectly.	Article 303 (having an element of criminal act different from qanun)	-
Khalwat	The act of being in a closed or hidden place between 2 (two) people of different sex not mahram and without marital bond with the willingness of both parties that lead to the act of adultery	-	-
Ikhtilat	The act of making out like making out, touching, hugging and kissing between men and women who are not husband and wife with the willingness of both parties that lead to the act of adultery	-	-
Zina	Intercourse between a man	Article 284	-

	or more with a woman or more without marital ties with the willingness of both parties	(having an element of criminal act different from qanun)	
Sexual Abuse	By deliberately sexually abusing children	Article 287 (has been ruled out by the Special Law outside the Criminal Code)	Law Number 35 Year 2014 on Amendment to Law Number 23 Year 2002 regarding Child Protection
Rape	Deliberate rape of both male and female children	Article 285 (has been ruled out by the Special Law outside the Criminal Code)	Law Number 35 Year 2014 on Amendment to Law Number 23 Year 2002 regarding Child Protection
Qadzaf	Accuses a person committing adultery without being able to file at least 4 (four) witnesses	-	-
Liwath	The act of a man by placing his penis into the other male anus with the willingness of both parties	Article 292 Has an element of the same act	-
Musahaqah	The act of two or more women by mutually rubbing limbs or faraj to obtain sexual stimulation (pleasure) with the willingness of both parties	Article 292 Has an element of the same act	-

Based on the above table there are some criminal acts regulated in qanun which actually has been alluded to in the Criminal Code, but has a different element of action. For example the act of khamar that is prohibition of liquor, in the Criminal Code Prohibition of liquors emphasized must fulfill the element disturb public order while in qanun there is no.

Problems arise in the regulation of criminal law for sexual abuse and rape of children. There is a dualism regulation of criminal law for the same act. Both actions are regulated in the first, Law No. 35 of 2014 on Amendment to Law No. 23 Year 2002 regarding Child Protection, and second, Qanun No. 6 Year 2014 regarding Jinayat Law.

In fact in Aceh for sexual harassment and rape of children, law enforcement is still confused to determine its criminal law arrangements, whether to use Law No. 35 Year 2014 or Qanun No. 6 years 2014. Furthermore, the use of criminal law arrangements on these two acts affects the jurisdiction of the judiciary who will examine, hear and decide the sentence for the defendant. If law enforcers use Law No. 35 Year 2014 then the judicial institution authorized

to adjudicate is The District Court whereas if law enforcement uses Qanun No. 6 year 2014 then the judicial institution authorized to adjudicate is the TheSyar'iyah Court.

HeriKurniawan said there is still debate and dissent among law enforcers in Aceh about the use of material criminal law against both actions. Prosecutors argue that qanun is only a regional regulation so that it is not equal to Law No. 35 Year 2014 so that the prosecutor's office will file a case to the District Court while in our opinion that after the enactment of qanun, criminal acts regulated in the qanun must be submitted to the Court syar'iyah as a judiciary that hasabsolute authority for the enforcement of qanun. Furthermore, if viewed from the aspect of the duration of criminal sanctions in the form of prison in qanun is lower than the Law No. 35 year 2014. This is also a consideration in choosing the regulations used by law enforcer.

Table 2. Dualism of regulation of criminal law in Aceh can be seen from the table of judges verdict

Year	District Court	Court syar'iyah
2016	Nomor 268/Pid.Sus/2016/PN.Idi	Nomor 06/JN/2016/MS.Lgs
2016	Nomor 294/Pid.Sus/2016/PN.Ksp	Nomor 014/JN/2016/MS.Lgs
2017	Nomor 28/Pid.B/2017/PN.Lgs	Nomor 02/JN/2017/MS.Lgs

Based on the above table shows that there are still discrepancies and differences of opinion between law enforcers regarding which criminal law arrangements are used against sexual abuse and rape of children. For both acts law enforcers have no certainty of the enforcement of the criminal law that is held, so even though the legal qanunofJinayat Law has been applied, there are still sexual abuse and rape cases prosecuted by the District Court.

Table 3. Terms of the sanctions difference between the two criminal regulations

Criminal Acts	Law No 35 Year 2014 on Amendment to Law No 23 Year 2002 regarding Child Protection	Qanun No. 6 Year 2014 regardingJinayat Law
Sexual Abuse Against Children	Penal sanctions are a minimum of 5 (five) years and a maximum of 15 (fifteen) years and a maximum fine of Rp 5,000,000,000.00 (five billion rupiahs). In the case of sexual abuse done by Parents, Guardians, Nannies, educators, or educational personnel, the penalty added 1/3 (one third) of the above criminal penalty = maximum 20 years imprisonment	Criminal sanctions: at most 90 (ninety) times whips, or; a fine of at most 900 (nine hundred) grams of pure gold, or; prison at the latest 90 (Ninety months) = 7.5 years
Rape Against Children	Penal sanctions are a minimum of 5 (five) years and a maximum of 15	Criminal sanctions of at least 150 (one hundred and fifty) at

(fifteen) years and a maximum fine of Rp 5,000,000,000.00 (five billion rupiahs)	most 200 (two hundred) times of whips, or;
In the case of rape committed by the Parent, Guardian, Child Caregiver, educator, or educational staff, the penalty added 1/3 (one third) of the above criminal penalty = maximum 20 years imprisonment	a fine of at least 1,500 (one thousand five hundred) grams of pure gold or at most 2,000 (two thousand) grams of pure gold, or;
	prison at least 150 (one hundred and fifty) months at most 200 (two hundred) months = at least 12.5 years at most 16.7 years

Based on the above table shows that correct in terms of criminal punishment in the form of prison, the prison sentence in Qanun No. 6 year 2014 is lower than the imprisonment in Law No. 35 year 2014. The question arises further whether the size of the duration of imprisonment can bring justice for victims and the community? In the opinion of the author as a researcher in the field of protection of children. Up to now law enforcement on the protection of children as victims is only through the conviction of the perpetrators. There has been no implementation of compensation or the fulfillment of the right of restitution from the perpetrator against the victim. While the impacts of child victims of sexual violence is very complex. because not only the material losses suffered by victims but the loss of inmaterialil that impact long and damage the future of the child. Therefore, the hope of the victim and the community must be to the fullest possible penalty and worth the loss of the natural victim.

While to assess the deterrent effect caused to the perpetrator between whip and prison imprisonment is still difficult to conclude there must be a separate research. Until now there is no agreement between law enforcers and the policies issued by the Supreme Court in resolving the dualism of the criminal law in Aceh. The current situation is a waiver of legal certainty for both the perpetrator, the victim and the public. The neglected legal certainty results in no clarity for the direction of future law enforcement and any possible "judicial-decision" possibility to be given to a similar case in the future.

Basically if the regulation of criminal law in Aceh is qanunjinayat law is returned to the principle of the principle of Islamic personality and territorial principle then there are 4 (four) kinds of guidelines are:

a) For the Muslim community in Aceh who committed criminal acts in Aceh automatically qanunjinayat law applied to them

b) For other Muslim communities (Muslim communities in Aceh) who commit criminal acts in Aceh automatically qanunjinayat laws apply to them

c) For non-Muslim communities in Aceh who commit criminal acts in Aceh or outside Aceh does not apply qanunjinayat law so that the applicable Criminal Code or Special Act outside the Criminal Code

d) For the Muslim community in Aceh who committed criminal acts outside Aceh is not enacted qanunjinayat law so that the applicable Criminal Code or Special Act outside the Criminal Code

e) Looking at the concept of justice and legality according to Hans Kelsen it is said that to uphold on the basis of a solid of a certain social order, according to Hans the notion of "justice" means legality. A general rule is "fair" if it is actually applied, while a general rule is "unfair" if applied to a case and not applied to other similar cases. The concept of justice and legality is applied in the national law of the Indonesian nation, which means that the rule of national law can be used as an

umbrella law for other regulations of national law in accordance with the level and degree of the rule of law that has the power to bind to the material that is loaded (content material) in the rule of law. [6]

5 CONCLUSION

Dualism of regulation of criminal law takes place in Aceh. This is evidenced by the data table showing the act of sexual abuse and rape of children there are 2 (two) legal regulations: first, Law No. 35 year 2014 on Amendment to Law No. 23 year 2002 regarding Child Protection, and second, Qanun No. 6 year 2014 regardingJinayat Law. The background of this dualism is the disagreement between law enforcement in Aceh and the sanctions contained in the qanun are more rendering than the law. The dualism of this regulations impacts on the different judicial institutions that judge. This has been happening for the last 3 years since the enactment of qanun No. 6 year 2014 so far it has resulted in legal certainty for the perpetrators, victims and the neglected community.

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Analysis of Determination Factors Outcome of Livelihood of Farmer Post-Tsunami in Aceh

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Abstract. Limitations of access and loss of various life assets caused by tsunami and conflicts in Aceh faced by farmers have an influenced to their survival. This research aims to analyze the model of determination factor outcome of livelihood of farmer post-tsunami in Aceh. The sample of this study was in Aceh Province covering five areas: Aceh Barat, Aceh Besar, Pidie Jaya, Bireun and Aceh Utara. The total sample for this study was 280 farmers using stratified random sampling method. This research uses primary data obtained by survey using quesioner and secondary data. Data analysis using qualitative and quantitative methods with Structural Equation Modeling. This model used as the final model for the construct of the outcome of livelihood of farmer's determination factors as it demonstrates a good model compatibility. Its also indicates that all loading factor values have above 0.5 and all probability values are significant at a = 1%. Its indicated that all indicators can explain the existing constructs.

Keywords: Aceh, Determination Factor, Farmer, Outcome of Livelihood, Post-Tsunami

1 INTRODUCTION

Post-tsunami Aceh has been faced with severe community poverty. Limited access and loss of life assets is a serious problem facing the poor in rural areas. Tsunami disaster has also changed the family structure in Aceh. But after going through the emergency period, rehabilitation and construction for more than 10 years with spent budget trillion IDR. The impact of the tsunami on economic infrastructure and social facilities is also quite severe. More than half of wharves or seaports, fish and shrimp ponds, rice millers, agricultural land, rice fields are damaged, and livestock loss [1].

The tsunami has also destroyed the source of income of a large number of families in Aceh, including most poor families who find it most difficult to recover from their losses. Many efforts have been made, especially in the rehabilitation of housing developments for tsunami-affected and conflict-affected populations, the development of general infrastructure, and improvements in the livelihood sector. Recovery in agriculture and fisheries has also led to the potential of fisheries and agriculture in Aceh to experience various improvements in several aspects. Although its impact on the wider economic recovery of the community has

not been sufficiently significant and has not been able to provide stronger and stronger role for economic growth and income generation and welfare and sustainable community life [2].

The situation has resulted in the achievement of the livelihood of the community becomes increasingly crippled, especially the declining welfare and income of the community. The achievements of life are the outcomes and benefits that society wants in their lives. The sustainable life framework seeks to understand the various benefits of life according to the strategies, motivations, choices and factors that influence life's benefits so that it can be achieved optimally. This achievement is related to the priorities and motivations of the people in life, which they establish in their way of living conditions, since the achievements of life can only be understood by the size of society itself.

Examples of outcomes of livelihood in sustainability approaches are higher incomes, increased welfare, reduced vulnerability, better food sufficiency, more sustainable use of natural resources [3]. The achievement of this life result is also influenced by vulnerability, asset availability, and life strategy [3].

People and their families have a variety of life's achievements which very important, since the necessities of life and their inclusion in development programs are often influenced by motivation, and ideals of a life that they perceive as ideal. It also denied that the measure of welfare, or poverty alleviation in general is by increasing income alone. As an improvement to the model developed by [3], Ellis developed the model to show a more robust access function [4]. Therefore, it is necessary to analyze the validation of achievement factor of farmer's life after tsunami in Aceh by using SEM model with measurement model. The purpose of this research is to analyze the attestation of achievement factor of farmer's life after tsunami in Aceh.

2 METHODOLOGY

2.1 Population and Data Types

The population of this research is the farmers in Aceh post tsunami which covers five districts of West Aceh, Aceh Besar, Pidie Jaya, Bireun and Aceh Utara. Sampling was done purposively, and the sample size was 280 farmers. Types of data used are qualitative and quantitative data, and data sources are primary and secondary data. Primary data is cross-section data collected through direct observation and interview conducted by using questionnaire at farmer in research area and secondary data obtained from related institution

2.2 Data Analysis

The analytical tool used for this study is the Confirmatory Factor Analysis (CFA) model contained in SEM This factor validation analysis (CFA) is used to test the measurement model [5] .This analysis it will be known whether existing indicators can explain a construct [6]. This analysis will be conducted to test each known asset variable dimension based on previous studies The maximum likelihood method is used to estimate 12 indicators of 4 construct the achievement of life outcomes established Figure 2 shows the factor validation model for the achievement of life outcomes.

Data analysis is done by using model of determination (Measurement Model) which is in Structural Equation Modeling (SEM). The determination model known as the factor validation analysis model (CFA) is a process that allows researchers to use multiple indicators to obtain

an exogenous latent variable or an endogenous variable called a latent factor or latent construct. Each latent variable has various sizes or indicators. Selection of indicators and determination of each latent factor is made based on theories or studies conducted before this. With this CFA model, the researcher must first determine the number of desired factors in a set of latent variables and in which factor each of these indicators will be included before running the analysis. The CFA will show the extent to which the factor specifications predicted by the researcher correspond to the actual reality. In other words, CFA is a tool that allows us to accept or reject the existing theory.

In the form of equations, the theory of factor attestation may be represented by several equations as follows:

$$x_1 = \lambda_{x11}\,\xi_1 + \delta_1$$
$$x_2 = \lambda_{x22}\,\xi_2 + \delta_2$$
$$.$$
$$.$$
$$.$$
$$x_n = \lambda_{xn,n}\,\xi_n + \delta_n$$

$$(1)$$

Where,

$x_1 \dots x_n$	=	indicators that define construct
$\xi_1 \dots \xi_n$	=	construct specified by indicator x
$\lambda_{x11..}\lambda_{xnn}$	=	'path' representing the relationship between latent factor (ξ_1) and the determinant variable (x1).
δ	=	error term

This model of determination involves constructs with no causality and correlation between them. This model only calculates covariant estimation by using equations that represent the theory to be tested. This covariance matrix is then compared to the actual covariance matrix calculated from the indicator data. This determination model is said to be worth it if both covariance matrices are almost identical. Latent variables are associated with indicators through measurement models in the form of factor analysis. Each latent variable is modeled as a factor that underlies the related indicator [7]. Factor loading (factor loading) that connects latent variables with known indicators is labeled λ ("lambda"). The error in the measurement model is denoted by ξ (ksi). The measurement model can be illustrated in Figure 1.
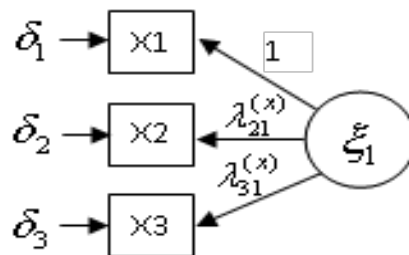
Fig. 1 SEM measurement model.

In this study using latent factor that is the achievement of farmer's life result, that can be seen in Figure 2 below. MPF is also used to know the definitive determinants to the farmers' livelihoods in Aceh.
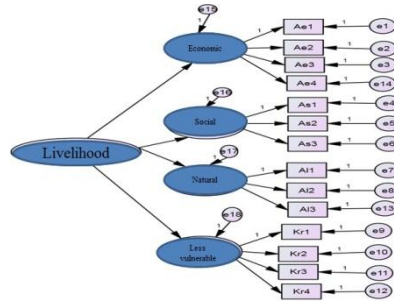
Fig. 2 Hypothesis of outcome livelihood of farmers.

2.3 Economic aspects

The Figure 3 shows the determination for achievement of farmer's life outcome rather than economic aspect and the model is determined by three indicators ie Ae_1, Ae_2, Ae_3 and Ae_4. This indicator depends on the latent variable (ηe) and the vector determination vector, e_1, e_2, e_3 and e_4.
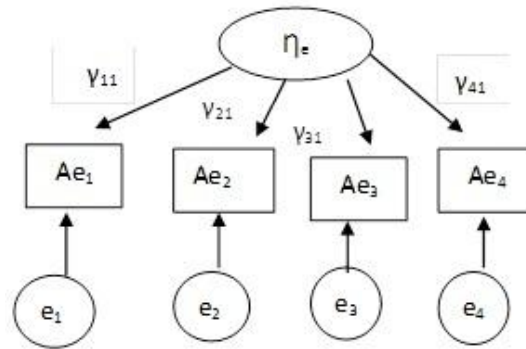
Fig. 3 The hypothesis of the model for outcome of Livelihood from the economy aspect.

This model may be written as follows:

$$Ae_1 = \gamma_{11}\,\eta_e + e_1$$

$$Ae_2 = \gamma_{21}\,\eta_e + e_2 \tag{2}$$

$$Ae_3 = \gamma_{31}\,\eta_e + e_3$$

Where,

Ae_1	=	Farmers' perception that income is increasing
Ae_2	=	Farmers' perception that deposits are increasing.
Ae_3	=	Farmers perception that there is an increase in the sale of agricultural products
ηe	=	Latent variable for achievement of life result from economic aspect obtained by farmer
γ_{11}-γ_{31}	=	The coefficient that explains the effect of latent variables for the achievement of life's life from the economic aspect that the farmer receives on indicators Ae1, Ae2 and Ae3
e_1, e_2, e_3	=	Fixed determination for indicator Ae_1, Ae_2, and Ae_3

2.4 Social Aspects

This figure 4 shows the determination for achievement of farmer's life result from social aspect and this model is determined by three indicators ie As_1, As_2, and As_3. This indicator depends on the variable attenuation (ηs) and the vector determination, e_5, e_6, and e_7.
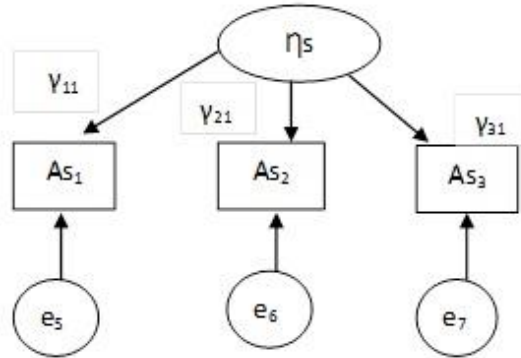
Fig. 4 The hypothesis of the model of outcome livelihood from the social aspect.

In mathematical equations, this model may be written as follows:

$$As_1 = \gamma_{11}\, \eta_s + e_5$$

$$As_2 = \gamma_{21}\, \eta_s + e_6 \qquad\qquad (3)$$

$$As_3 = \gamma_{31}\, \eta_s + e_7$$

Where,

As_1	=	Perception of farmers on social relations of society is getting better
As_2	=	Peasant perception of participation in unity as an effort to increase knowledge
As_3	=	Farmers' perceptions of participation in various religious social activities in residential areas such as recitation and congregational prayers.
ηs	=	Latent variable for capain of life result from social aspect obtained by farmer.
γ_{11}-γ_{31}	=	The coefficient that explains the influence of latent variables for the capain of the life result from the social aspect that the farmer receives on the indicators of As1, As2, and As3.
e_5, e_6, e_7	=	Fixed determination for indicators As_1, As_2, and As_3.

2.5 Natural Aspect

This Figure 5 shows the determination for achievement of farmer's life outcomes from the natural aspect and this model is determined by three indicators namely A_{l1}, A_{l2} and A_{l3}. This indicator depends on latent variables (η_l) and vector determination definition, e_8, e_9 and e_{10}.
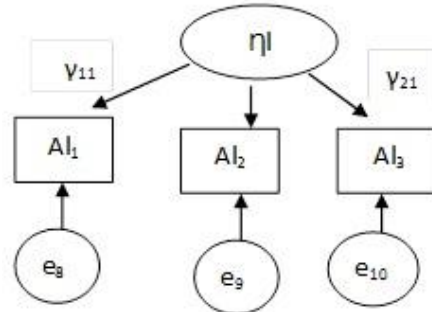
Fig. 5 The hypothesis of the model of outcome livelihood from the natural aspect.

In mathematical equations, this model may be written as follows:

$$A_{l1} = \gamma_{11} \eta_l + e_8$$
$$A_{l2} = \gamma_{21} \eta_l + e_9 \tag{4}$$
$$A_{l3} = \gamma_{31} \eta_l + e_{10}$$

where,

A_{l1}	=	Farmers perception of mangrove cultivation near coast and water supply in the effort of natural guarding around
A_{l2}	=	Farmers perceptions about the use of steel and toxins and fishing gear
A_{l3}	=	Farmers perceptions of participation in mutual assistance activities as an effort to preserve the natural environment.
ηs	=	Latent variable for the achievement of life result from the surrounding natural aspect
γ_{11}-γ_{31}	=	The coefficient that explains the influence of latent variables to achieve life outcomes from the natural aspects around with indicators A_{11}, A_{12}, and A_{13}.
e_8, e_9, e_{10}	=	Fixed determination for indicators A_{11}, A_{12}, and A_{13}.

3 RESULTS AND DISCUSSION

MPF is also used to know the definitive determinants to the achievements of farmers' livelihoods in Aceh. Figure 6. shows the model for the latent variables of the outcome of life. There are various indicators that represent every aspect of the outcome of life. This aspect summarizes the economic, social, and natural aspects and diminishes the vulnerability and is called construct. A factor validation (MPF) analysis will be carried out to test each dimension of a life-size aspect variable that has been known for certain based on previous research. The estimation was done by using the maximum likelihood (MLE) method to estimate 14 indicators of the four constructs of life outcome outcomes established. Figure 6 shows the model 1 hypothesis of validating factors for the achievement of life outcomes.

The result of model 1 analysis found that the value of $\chi 2$ (CMIN) is 240.494 with a freedom 75 freedom and an opportunity value of 0.000. In addition, other caliber values have also reached the recommended values. The value of CMIN / DF = 3.207 is more than 1 and less than 5 as suggested, GFI value = 0.939, AGFI = 0.915, NFI = 0.884, RFI = 0.859, IFI = 0.917, TLI = 0.899, CFI = 0.917. recommended, and the value of RMSEA = 0.063 is less than

0.1 as suggested. These results indicate the correspondence of data with the hypothesized model is good.

However, to increase the value of model density an MI analysis is required for this model. The research of MI values performed in the covariance section first implies the maximum MI value of 40,732 lies in the parameters connecting e10 with e12, indicating a two-way relationship between these variables.
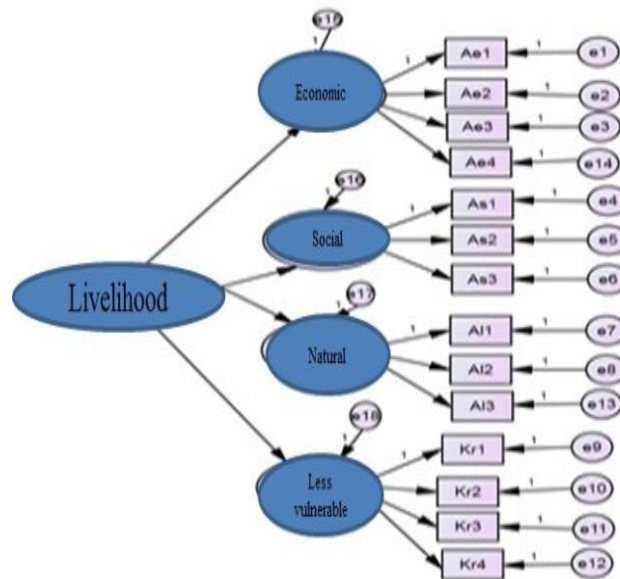
Fig. 6 Model 1 determination factor of outcomes livelihood.

This model 1 is estimated again by placing a line of two arrows to the variables e10 and e12 and this model is called model 2 (Figure 7). The value of MI is intended if the model is reexamined by determining the parameter e10 with e12 as free, the value of χ^2 will decrease by 40,732, and the budgeting value is about 0.233 (par change value). This information suggests that if there is a greater variety of farming tools available to farmers it will make it easier for them to get more crops, so that this will strengthen their economic status and ultimately help them to stay out of debt. Based on the above rationales, then model 1 must be retested.

However, according to Joreskog [8], having a factor load value of less than 0.3 must be removed from the analysis to obtain a good model equivalence. In this model the variables As1, Al2 and Kr3 have a low coefficient value that is 0.101, 0.213 and 0.181. Thus, this model is initially budgeted by removing the transformers As1, Al2 and Kr3 and called model 2 (Figure 7). As1 variable is an indicator of farmer's participation in unity, Al2 also an indicator of farmer's participation to cooperate cleaning village as effort to preserve nature around. When a Kr3 converter is an indicator of more work available. Yet all of these indicators are found to be unable to explain the constructs of social aspects, the surrounding natural aspects and diminished aspects of vulnerability.

Based on the above statement, then the original budgeted model. The results of the analysis on model 2 found that the value of χ^2 (CMIN) was reduced to 129.152 with a freedom slice of 41 and a value of 0.000. In addition, other equivalence values also exceed the

suggested value. The value of CMIN / DF = 3.150 is more than 1 and less than 5 as suggested. The value of GFI = 0.957, AGFI = 0.932, NFI = 0.934, RFI = 0.911, IFI = 0.954, TLI = 0.938, CFI = 0.954 exceeding 0.90 as suggested, and RMSEA = 0.062 less than 0.1 as suggested. These results indicate the correspondence of data with the hypothesized model is good. Thus, Model 2 is modeled as the final model for the beneficiary of life sustainability and is used for the following structured equation model.
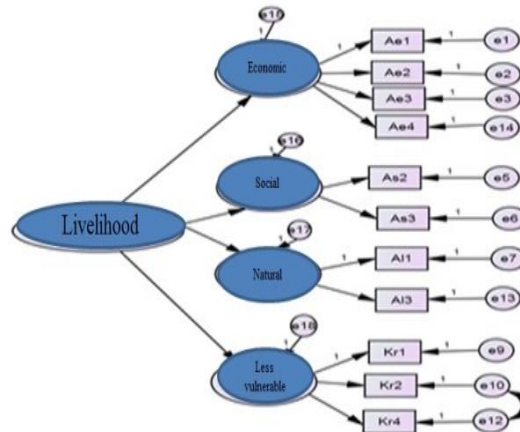
Fig. 7 Model 2 endorsement of factors for life outcomes

The results of model 2 analysis can also be seen in Table 1 which shows the regression value that all factor loading values are above 0.5 and all P values (probability) are significant at α = 1% and this indicates that all indicators can explains the existing constructs. Therefore, Model 2 is used as the final model for the beneficiary to change the achievement factor of living results and used for the following structured equation model.

Table 1. Regression Weight the indicator of outcome livelihood of the farmers

Indicator	Coeficien	S.E	C.R	P	Loading Factor
Social <-- Outcome livelihood	.066	.053	1.232	.218	.353
Natural <-- Outcome livelihood	2.345	.324	7.239	***	.994
Economic <-- Outcome livelihood	.532	.058	9.101	***	.962
Less vulnerable <-- Outcome livelihood	.958	.026	7.327	***	.991
Ae2 <-- Economic	.960	.130	7.409	***	.503
Ae3 <-- Economic	1.430	.183	7.837	***	.548
As2 <-- Social	2.941	.426	6.904	***	.996
As3 <-- Social	.340	.049	6.904	***	.501
A11 <-- Natural	4.025	.667	6.039	***	.983
Kr1 <-- Less vulnerable	2.072	.255	8.137	***	.921
Kr2 <-- Less vulnerable	.560	.068	8.246	***	.502
Ae4 <-- Economic	1.631	.190	8.573	***	.711
A13 <-- Natural	.211	.039	5.468	***	.495
Kr4 <-- Less vulnerable	.478	.059	8.072	***	.536
Ae1 <-- Economic	1.030	.144	7.146	***	.504

Table 1 describes the results of an analysis that indicators of income, savings, sales of crops, and wellbeing can explain the constructs of economic aspects. When the social aspects

of the construct can only be explained by two indicators namely social relations society and social activities that the better religion. The surrounding natural constructs can only be explained by two indicators, namely using fishing equipment as recommended and participating in the effort to plant the mangrove near the beach. For farmers also using fertilizers and pesticides according to advice and participate in cleaning water channels, especially when the rice planting season. Constructive reduced vulnerability is also only able to be explained by only three indicators that have skills other than farmers and fishermen, have a variety of agricultural tools, and do not have debt bonds with agents / traders.

The results of this study are slightly different from those of Roslina [9] and Nor Diana [10] which also uses structured equation models and analyzes the socio-economic and natural impacts with a sustainable approach to life. But basically these three impacts are indicators rather than achievement of farmers' livelihoods. For example the positive impact on the economic aspects such as increased income, increased sales and increased welfare. Social aspects also use indicators of community participation in farmer groups. When Sahri et al. [11] uses two indicators to explain the fisherman's life outcomes, which are increasing incomes and social relationships in society are getting closer.

It also illustrates that the higher the financial stages in the form of savings and access to finance, and the higher the stage of ownership of agricultural equipment and the better the social and cultural development of the community both in the form of work motivation and the stronger the influence of customary law, the higher the stage of this strategy by farmers. Sahri, et.al. [11], Roslina [9], Widodo [12], in their study found no distinction that is the relationship between vulnerability and life strategy with the outcome of livelihood.

4 CONCLUSION

Based on the results of research that has been done by using the attestation analysis of achievement factor of the farmer's life is the second model is a model that shows the correspondence of data with the model hypothesized is good. Therefore, Model 2 is used as the final model for the achievement of farmers' life result. It also shows that all factor loading values have numbers above 0.5 and all P values (probability) are significant at $\alpha = 1\%$. The P value is 0,000 which is well below 0.05 which indicates that all indicators can explain the existing constructs.

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Motivation, Learning Facility, Family Background and Achievment: Direct and Indrect Effects

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Abstract. Many studies on learning variabels have been doing for numbers of years. However the discussion on the family background, motivation, and facilities variables are assumed as key factors are rarely discussed. In this study, we tried to look through direct and indirect effects of family background, facility, motivation on   achievement. The questioners were spread out to 100 samples of students. The students were asked to fill out 20 items related to facility and motivation. While the rest of 10 items related to their family background were completed their parents at home. The result showed that motivation and family background had significant effect, either direct or indirect on achievement. However, we found different result on learning facilities. They did not predict achievement either direct or indirect effects.

Keywords: Motivation, Facilities, Family Background, Achievement.

1 INTRODUCTION

Education is needed to maintain human life. It takes important role in human life. In broad sense, it covers the entire process of life include the interaction with the environment, both formal and informal situation. While in the narrow sense, education is defined as the learning process carried out at schools involving students, teachers, and learning facilities.

We may blame the lecturer has an essential role in increasing learning achievement. However, it is not logic since the result of achievement depends on the four essential elements meanly lecturer, student, facility, and curriculum. It also prove that the professional teachers cannot change the students' behaviour and proficiency if there is no effort from the students make it change. Besides, students have a heterogeneous character make the lecturer difficult to detect or to provide equal treatment [1].

Complaints of low achievement is a ordinarily or normally discussed by all individuals either lecturers, students and researchers. The emerging matters appear since many variabels of learning for each individual are vary. Some students find it difficult to overcome them [2]. Teaching process is complex. Student is the main subject to play the important role in determining the occurrence of learning itself. this problem is an inherent variable and always affects the learning outcomes [3]. They were categorized into two part either it came from inside or environment. Inside variabels were namely earning attitudes, concentration,

confidence and motivation, learning strategies while outside variabels are facility, family, environments, curriculum and teaching method. It may be impossible to change something come from the outside but it can be possible to change and to control something come from inside of the student. [4]. However, we tried to drag 3 independent variabels in this study namely family background, learning facility, and family background. We believed that they would be intresting topics to be discussed since they were still scarcity in journals.

Family background variables was assumed had a great impact on learning achievement. The major points of family background are parents' income, education, marital status, physical health, numbers of children in the family and the opportunities of the parents to study[5][6].

Students come from a harmonious family had better achievement than students who come from the less harmonious family. This is because of spending a large amount of their time with the family members. Less harmonious family circumstances, lack of parent attention and economic conditions could cause a decline in student achievement. Therefore, the favourable family background will enable students to learn and gain optimal learning results. They will learn best when the family and community provide adequate support and motivation.

Learning facility was assumed an important role to encourage learning. Those who have well qualified learning facilities will obtain his goal faster compared to those who have shortage learning facilities.The a good study room, proper furniture, efficient learning equipment will be helpful and easier the student to learn. Learning tool that supports student to do learning activities will lead the learning process fun and obtain the expected learning outcomes. Therefore, all learning equipmentsts are important for achieving satisfactory of learning [7]. Unwell organized materials provided which are not in accordance with the needs of the students, inadequate supported facilities and infrastructure. It also assumed that family background would take a role in producing a skillful graduate.

Motivation is the spirit that arises when studying. Motivation is commonly related to encouragement to achieve the goal. It make persistent behaviour to gain its goal [8]. It is a willingness that someone has to perform in a specific way. Motivation was one of the more complex issues of the teaching. the lecturer for instance found it difficult to overcome the problem. it is still big problem or stone in the shoe for all level of educations (Pintrich and Zusho 2007). It will be a mental strength that encourages the students to learn something. It may be weak or declining. This weakness would produce a weak achievement anyway or the students become bored. They will refuse to perform or introvert.

Psycologists categorized two types of motivations: intrinsic and extrinsic. The first type is defined as doing something for his or herself or he does for his own sake. While the second type refers to doing something for drawing people attention or geting reward or victory [9]. Thus, if the learners have a good motivation, they will have willingness to achieve a good performance.

2   METHOD

Based on the research objectives, the general approach was collecting data from students of Lhokseumawe State Polytechnic. The population was all of the third semester students of Lhokseumawe State Polytechnic. The samples were 100 students suggested by Solvin. The data were taken directly from spreading questioners to the respondents. The questionnaire consisted of 30 questions and divided into 2 parts. The first part was the characteristics of the

respondents included the name and sex. The second part was the items related to family background, learning facilities, and motivation. the data were presented and quantitative by using Linkert scale as follows: strongly agree (5), agree (4) not sure (3) disagree (2) strongly disagree (1). However, the family background items were filled out by the students' parents at home.

Realiability and validity test were conducted to prove the questioner items were valid and realible. The result found the validity test of this study was bigger than 0.3 or at r > of 0.3 and realibility or the cronbach alpha test were upper 0.9. Thus, the questionnaire of this research were valid and realible.

Table 1. Reability and Validity tests

Family backgr ound (X1)	Corrected Item-Total Correlatio n	Cronbach's Alpha if Item Deleted	Facilit y (X2)	Corrected Item-Total Correlatio n	Cronbach's Alpha if Item Deleted	Moti vati on (Y)	Corrected Item-Total Correlatio n	Cronbach's Alpha if Item Deleted
X1.1	0.601	0,925	X2.1	0.320	0.928	Y	0.601	0.925
X1.2	0.721	0.923	X2.2	0.293	0.929	Y	0.721	0.923
X1.3	0.556	0.926	X2.3	0.280	0.929	Y	0.556	0.926
X1.4	0.781	0.922	X2.4	0.402	0.927	Y	0.574	0.925
X1.5	0.663	0.924	X2.5	0.487	0.926	Y	0.663	0.924
X1.6	0.448	0.927	X2.6	0.387	0..927	Y	0.667	0.924
X1.7	0.442	0.927	X2.7	0.490	0.926	Y	0.448	0.927
X1.8	0.442	0.927	X2.8	0.528	0.926	Y	0.322	0.928
X1.9	0.697	0.923	X2.9	0.597	0.925	Y	0.306	0.930
X1.10	0.651	0.924	X2.10	0.539	0.925	Y	0.651	0.924

In this study, the data collected were analyzed in two models. The first model showed the relationship between family background and facility. The coefficients model at table 2 showed that there were a correlation between each variable of family background and facility since the

significance value of both variables were at X1 equal to 0.000 and X2 equal to 0.012. They were smaller than 0.05.

Table 2. Coefficients model 1

variables	Beta	sig
Family background (X1)	0.78	0.000
Facility (X2)	-0.75	0.012

a. dependent variabel : Motivation

Model regression 2 at the coefficients at tabel 3 Showed that the significance value of the independent variables: family background = 0.004, facility = 0.374, and motivation = 0.035. These results indicate that the variables of family background and motivation variables have significant effect on achievement.

Table 3. Coefficients model 2

Variabels	Beta	Sig
Family background	-1.029	0.000
Facility	0.091	0.004
Motivation	0.740	0.035

a. dependent variabel: Achievement

The R square result at the table summary 1 for both family background and facility variabels were 0.924. it indicated that the contribution of both variabels were 92.4 % while the the remaining 7.6% was the contribution of unobserved variabels. The R square at the the table sumarry 2 all independent variabels family background, facility, and motivation got 0.13. It meaned that the contribution of all independen variabels were 10.3%.

2.1 Direct and Indrect Effects

The direct and indirect effects were futher explored using path diagram
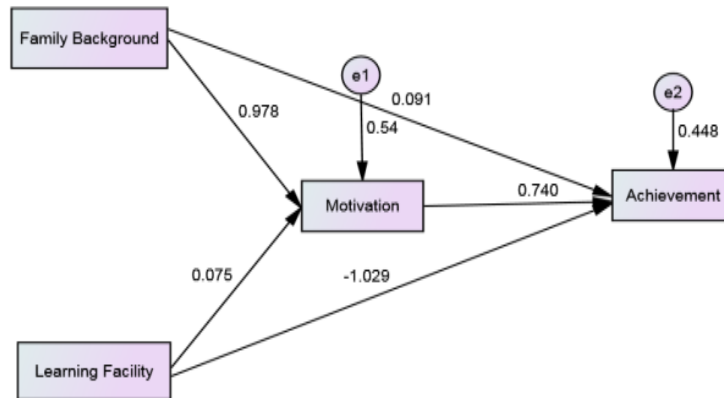
Fig. 1 direct and indirect effect of family background, learning facility and motivation on the achievemet

As described in the path diagram in the figure1, the direct effect of family background on the achivement was 0.091 while the indirect effect of the family background through the motivation to the achievement were the multiplication of Beta of both the family background and the motivation variables as shown in the Figure 1 above was 0.978 X 0.740 = 0.724 thus the total effect given by both variables were the addition of the direct effects with its indirect variables as in 0.091 + 0.724 = 0.815. it was clear enough that based on the results of the above calculation showed that the direct effects were smaller then indirect effects. It meaned that the effect of family background through motivation on achievement variables were significant. This funding was assemble with the funding reserarch done in china [6]

The direct effects of facility from side of the motivation to side of achievement were -1.029. While the indirect effects of family background through motivation to achievment was also the multiplication of both Beta as in 0.075 X 0.740 = 0.055 then the total effects given by both variabels were the addition of -1.029 + 0.724 = - 0.973. thus, there was no effects of facility either directly or indirectly effects on the achievement.

3 CONCLUSION

Learning process is influenced by many factors. It may come from inside or environment of the student. Therefore, the elements of education in polytechnic or university lectureres, managements, and stakeholders must take into account on the students'problem.. The success of the University's output is based on the student's existence in the workplace. The results above show that the student's learning progress is not located on the learning facilities but in the family background and motivation. Student motivation would be better if family support to them is good. Conducive family, parental closeness include economic, health, and social interactions are the important role to increase the student's achievement.

acknowledgements

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Modeling System Test Of English As A Foreign Language As A Web-Based Learning Media

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Abstract. This modeling test is equipped by web-based and multimedia system perform to save time and cost in learning TOEFL. The purpose of this research is to design and build the TOEFL system application as a web-based learning media in TOEFLlearning and test. The research specific target is the TOEFL system that can be used as an ICT learning medium online software website for the developing of TOEFL learning. The method used is quantitative method that starts from literature study, interview, observation, data analysis, model and system design, making of the application and system testing. The simulation TOEFL modeling has been simulated using PHP programming languages. The conclusion of this research is a web-based TOEFL simulation as a medium of online software learning in website for the development of learning TOEFL. The random question system will be worked better if the type of questions provided more on the TOEFL simulation. On the simulation, the same participants will not get the same combination of tests on different tests. This TOEFL system capable to runsign inby user-level identification process first, so that the system access is well controlled. This application can only be accessed by users who have made the sign up process.

Keywords: Model, TOEFL Learning, Web, Multimedia

1 Introduction

One of the English test models used to measure a person's ability whom English is used not as a mother tongue is *Test of English as a Foreign Language* (TOEFL) [1]. At the firt time, in many countries TOEFL used as a university entrancerequirement (Hutasulut, 2014).

Nowadays, the need for TOEFL test is increasingly around the world, hence proposed of this research is to perform a design of online TOEFL system as a web-based TOEFL learning media totest TOEFL skills. The problems that arise in this research is how to design a web-based TOEFL learning system by making random questions, the system is able to perform online TOEFL assessment based on TOEFL paper-based assessment standard, building a TOEFL database system containing a set of problem models consisting of questions, answers, and discussion of answers, and how the system handles audio listening data. The goal to be achieved is to design and build web-based learning modeling system in the form of TOEFL system application as a web-based learning media in hopes to facilitate

and ease in testing TOEFL capabilities [2]. This research is useful as a web-based learning media to test the ability of TOEFL. The results of this system service can help the learning process by answering the TOEFL questions as well as getting the discussion of the problem through the web and can help improve the quality of education, especially English. This system is also able to save time and cost in learning TOEFL**.**

2. Literature Review

2.1. System Definition

In defining the system there are two groups: one group that emphasizes the procedure and the second group that emphasizes the components or elements. Systems that emphasize the procedure are defined as a network of interconnected procedures gathered together to perform an activity or complete a particular goal. The system is interpreted as a unified element of connectedness. Some elements can be merged into a unit, group or system component with a specific function. These system components can be viewed, considered, or indeed designed to function independently as system modules [3]. The component system defines the system as interconnected and operating parts Together to achieve some goal or purpose.

2.2 TOEFL form

Generally, the TOEFL test runs for 3 hours, but for the computer-basedtake time 4.5 hour (Pamela, 2012). TOEFL Tets consist of multiple choice test containing 140 questions divided into 4 sections:

The listening comprehension section consists of 50 questions, Structure and written part of this Expression consists of 40 questions, Vocabulary and Reading Comprehension section consists of 50 questions and Writing Section.

3.Research Methods

To achieve the objectives formulated previously, the methodology used in this study is:

1. Data collection

Some of the methods to be used in data collection are: library study, interview and observation

2. Data analysis

Creating an analysis of data that has been obtained from the data collection process which is then grouped, so that becomes a structured specfication.

3. System Design

After the data collected and analyzed then done system design consisting of database design, system modeling diagram context, data flow diagram, flowchart and design of application display.

4.Application Creation

This stage is the stage of manufacture and development of applications in accordance with the design system set in the previous stage. TOEFL systemas a learning media is built with PHP and MySQL.

5.System Testing

In system testing, all of the overall system specifications will be tested. This trial process is required to ensure that the system that is created is correct, in accordance with the specified characteristics.

4. Results and Discussion

4.1. Results of system simulation

The result of this TOEFL system simulation begins when member *sign in.*Member must enter username and password.If the participant has not registered then the participant can not carry out the TOEFL test online in this system.Registration is done online by filling out the *sign up* form available on the page Home.

4.2. User Interface page

The user interface page is an interface display of every function contained in the TOEFL system as a web-based learning media. This can be seen from the results of web view capture.

4.3. Homes Page

Inside this page there are several forms of registration *sign up* form, and *sign in* form. This page is the only page that can be accessed by web visitors. As for visitors who want to perform the TOEFL test, must first fill in the required data on the *sign up* form. User interface home page display as shown in Figure 1.

Figure1.Home Page ViewsSign Up

4.4. Sign In

The *sign in* form is used to verify the user in order to access the system, after signing in, the system will check the user that will direct the user to the next page based on the user level by checking the username and password and matching the user data previously stored on Table member if the user level 1 then will be directed to the home page admin whereas if the level 0 then the user is a regular user or member will be directed to the home page member. Display form user interface form sign in shown in Figure2.

Figure2.Display Form Sign In

4.5. Contents

Contents is a means for the admin to input data related to the TOEFL problem.Forms display user interface page contents shown in Figure3.

Figure 3.Contents Page Menu View

In the input process of TOEFL problem, the first thing the admin is doing is input data into the menu type of questions. Admin just input the name of the desired type of problem then the systems stores the name of the type of question into the table type and fill in the id_type field automatically. Each additional name of the type of problem then the id_type value will increase 1 because setting auto increment. User interface menu type of question is shown in figure 4.

Figure 4. Display Menu Type of Questions

Menu part a: short conversation, is the menu used by admin to input TOEFL listening section short conversation problem such as question, answer choice, answer key, discussion,

and audio listening short conversation data. The table part a is the table used to store the listening short conversation problem, the table for storing this problem is grouped in order to facilitate the random process of the problem.

In the input form looks some data that can input like type that can be used to choose the name of the type of questions that have been entered earlier, so at this stage admin only choose the type of question he wants. Next audio, used to select the audio file short conversation that has been input to the master audio that will be discussed in the next section. Question is used to insert problem, a, b, c, d are used to input answer option, answer to enter answer key, and last explanation to enter problem discussion.

In addition to the input on this menu there is also the edit function, and delete it by clicking the button with the pencil icon to edit, and the button with the crossbar icon to delete the data part a short conversation. So the MySQL syntax used to perform the functions contained in this menu is insert, update and delete to the data contained in the table part a. This is in accordance with the design shown earlier in the DFD level 1. The display of the user interface menu of the part a short conversation menu is shown in Figure 5.

Figure 5. Display Menu Part a: Short Conversation

Menu part b: long conversation, is the menu used by admin to input TOEFL listening section long conversation in the form of questions, answer options, answer key, discussion, and audio listening short conversation data. For input about listening section long conversation is used sintak insert into table part b. The table part b is the table used to store the listening long conversation problem.

In the form input part b long conversation visible some data that can input like type that can be used to select the name of the type of questions that have been entered earlier, so at this stage the admin only live Choose the type of question he wants. Next audio, used to select the audio file short conversation that has been inputted to the master audio that will be discussed in the next section. Question is used to insert problem, a, b, c, d are used to input answer option, answer to enter answer key, and last explanation to enter problem discussion. In addition to the input on this menu there is also the edit function, and delete it by clicking the button with the pencil icon to edit, and the button with the crossbar icon to delete the data part b long conversation. So the MySQL syntax used to perform the functions contained in this menu is insert, update and delete data contained data contained in the table part b. This is in accordance with the design shown earlier in the DFD level 1. Display the user interface of the menu menu part b long conversation shown in Figure 6.

Figure 6. Display Menu Part b: Long Conversation

Menu part c: sentence completion, is menu used by admin to input TOEFL question structure and written expression sentence completion in the form of question, answer choice, answer key, and discussion. For input about structure and written expression sentence completion is used sintak insert into table part c. Table part c is the table used to store sentence completion only.

In the input menu part c sentence completion looks some data that can input like type that can be used to select the name of the type of questions that have been entered earlier, so at this stage admin only choose the type of question he wants. Question is used to insert problem, a, b, c, d are used to input answer option, answer to enter answer key, and last explanation to enter problem discussion. In addition to the input on this menu there is also an edit function, and delete it by clicking the button with the pencil icon to edit, and the button with the crossbar icon to delete the data part c sentence completion. So the MySQL syntax used to perform the functions contained in this menu is inserting, update and delete to the data contained in the table part c. This is in accordance with the design shown on the DFD level 1. Display the user interface interface of the menu part c sentence completion shown in Figure 7.

Figure 7. Display Menu Part c: Sentence Completion

Menu part d: error identifications, is menu used by admin to input TOEFL question structure and written expression error identifcation in the form of question, answer choice, answer key, and discussion. For input about structure and written expression error identifcation is used sintak insert into table part d. The table part d is the table used to store the error identification problem only.

In the form input menu part d error identification seen some data that can input like type that can be used to choose the name of the type of questions that have been entered earlier, so

at this stage admin only choose the type of question he wants. Quesion used to enter the problem, a, b, c, d are used to include answer options, answer to enter answer key, and last explanation to enter discussion of problem. In addition to the input on this menu there is also the edit function, and delete it by clicking the button with the pencil icon to edit, and the button with the crossbar icon to delete the data part d error identification. So the MySQL syntax used to perform the functions contained in this menu is inserting, update and delete to the data contained in the table part d. This is in accordance with the design shown in the DFD level 1. Display the user interface menu menu part d error identificaton shown in Figure 8.

Figure 8. Display Menu Part d: Error Identification

Menu part e: reading comprehension is the menu used by admin to input TOEFL reading comprehension questions in the form of questions, answer choices, answer key, discussion, and reading. For input reading comprehension question is used sintak insert into table part e. Table part e is the table used to store reading comprehension only.

In the form input menu part e reading comprehension looks some data that can input like type that can be used to choose the name of the type of questions that have been entered earlier, so at this stage admin only choose the type of question he wants. Reading is used to select the source text that has been inputted in the input process of the master reading.Question used to insert the problem, a, b, c, d are used to enter answer options, answer to enter answer key, and the last explanation to enter the discussion of questions. In addition to the input on this menu there is also the edit function, and delete it by clicking the button with the pencil icon to edit, and the button with the crossbar icon to delete the data part e reading comprehension. So the MySQL syntax used to perform the functions contained in this menu is insert, update and delete to the data contained in table part e.This is in accordance with the design shown in DFD level 1.The user interface form of the reading part reading menu is shown in Figure 9.
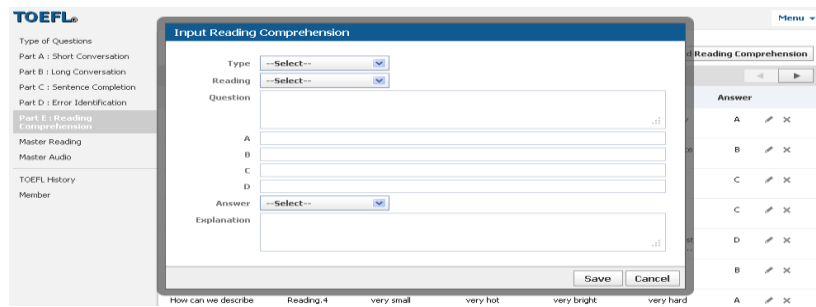
Figure 9. Display Menu Part e: Reading Comprehension

Master reading menu, used for readingtext data needs to be used for TOEFL reading comprehension.On the input menu of the master reading menu there are 3 data types used to select the desired type of title, title to give the title of the text, and reading the contents Is a text that will be used to answer questions about the reading. The table used to store data on this menu is a table of reading that is also related to table part e. Functions contained in this menu is the same as the previous menu that is, insert, update, and delete to the data contained in the master reading table.This is in accordance with the design shown in the DFD level 1. Display menu master reading shown in Figure 10.
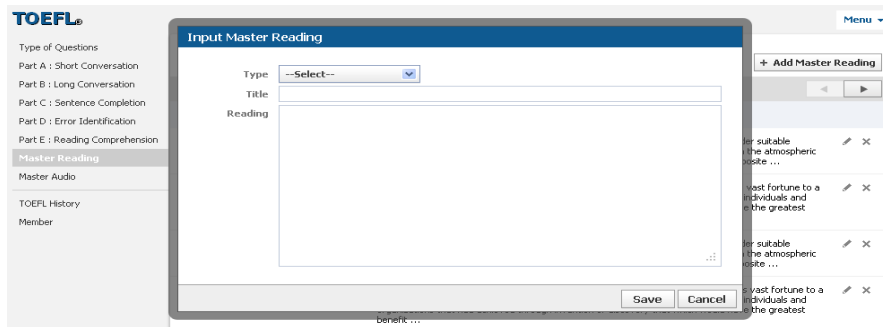
Figure 10. Display Menu Master Reading

The next menu is the audio master menu that is used for the needs of audio data input listening and used for TOEFL listening section. The data after inputted or manipulated will be stored into the audio table that also relate to the table part a and part b. This corresponds to the relation shown in the table relation discussed earlier in the design chapter. The process contained in this menu edit, delete, and input. In addition audio files that are ready to be uploaded into the system can be played by first installing plug in or additional tool used to play audio files on the web iequicktime player. The display form of the audio master menu is shown in figure 11.
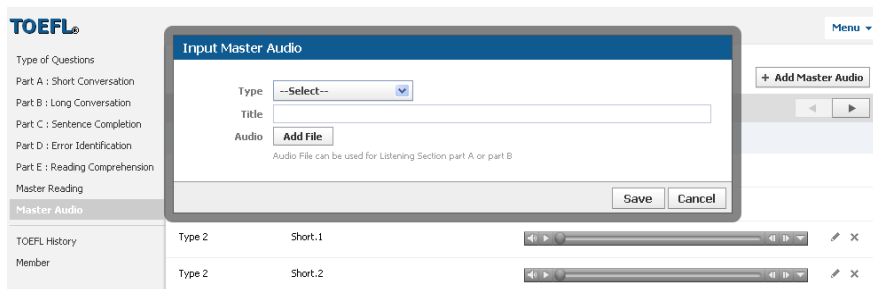
Figure 11. Display Master Audio Menu

TOEFL history menu, admin is used to view the results of score score member, and member log. When member sign in and successfully perform the TOEFL test, the details of time description data, the type of problem, score listening, structure, reading, and TOEFL score stored by the system Into the history table and data that has been stored is called for the needs of this menu. So with this menu admin can see traces of member activity in the system, and admin can monitor a number of members who go into the system and do the TOEFL test.Sintak used for Process function from the TOEFL history menu is select * from history where userid. The display form of the audio master menu is shown in figure 12.

Figure 12. TOEFL Menu display history

Member menu is used by the admin to see the identity data of members who have registered into the system. The user interface display of the member menu is shown in Figure 13.

Figure 13. Display Member Menu

4.6. Member Home Page

The home page of the member or the page that first appeared after the member successfully signed in. It is shown in Figure 14.

Figure 14.Views of Member Home Page

4.7. Begin Test

Begin test menu located on the home page admin and member, is a facility to perform TOEFL test without discussion. Each user can only perform one TOEFL test for each one of the questions provided for the begintest process. This is in accordance with the flowchart design of the begin test that has been described in the previous chapter. Before heading to the page matter, will pop up welcome as follows. Inside is the start button TOEFL test that will lead to the next page, or cancel button to cancel it. Display user interface pop up welcome begin test shown in figure 15.

Figure 15.Pop up Display Welcome Begin Test

Then will be displayed pop up section 1 listening comprehension. Pop up contains instructions to perform TOEFL test listening list Display user interface menu pop up section 1 listening comprehension shown in Figure 16.

Figure 16.Pop Up Section 1 Listening Comprehension display

After clicking the next button then the listening for short conversation will appear on the web page along with the choice of answers that will store the member's reply with the condition member must click on one of the radio buttons that indicate the answer that is considered correct by member.The user interface display of listening short conversation is shown in Figure 17.
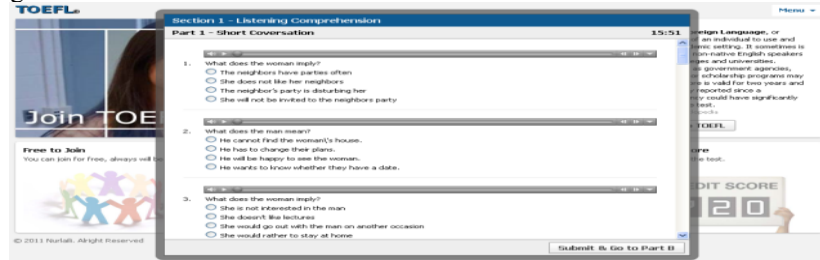
Figure 17.Listening Problem Short Conversation Problem

Furthermore, after the member answers all the short listening listening questions, the system will store the answer into the database table answer. The system will also process the answer correctly or wrongly by checking the answer key that is located in the answer field in the table part a, if the member's correct answer will be given a value of 1 and if the wrong member's answer will be given a value of 0. Display user interface pop up listening long conversation shown in figure 18.
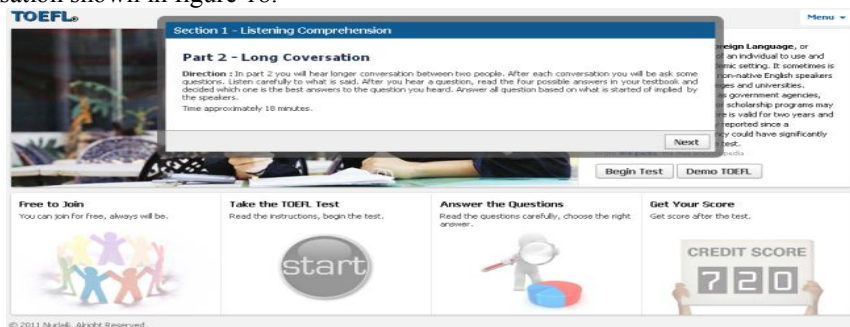
Figure 18.Display of Long Conversation Listening pop up

After the member answers all the listening long conversation questions, the system will store the answer into the database table answer. The system will also process the answer is correct or wrong by checking the answer key that is located in the answer field in the table part b as shown in Figure 19
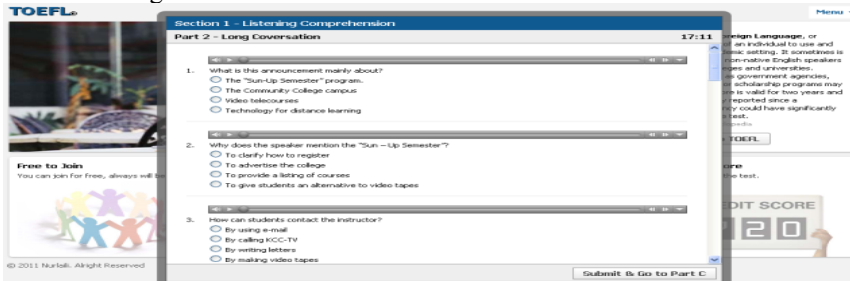
Figure 19.Long Listening Problem List Conversation

After answering the entire question, clicking on the submit button will pop up a pop up that gives instructions for working on the next question, namely section 2 structure and written expression which amounts to 40. The next button is clicked back then the question will be about structure and written expression sentence completion. The user interface display of the structure and written expression sentence completion is shown in Figure 18.
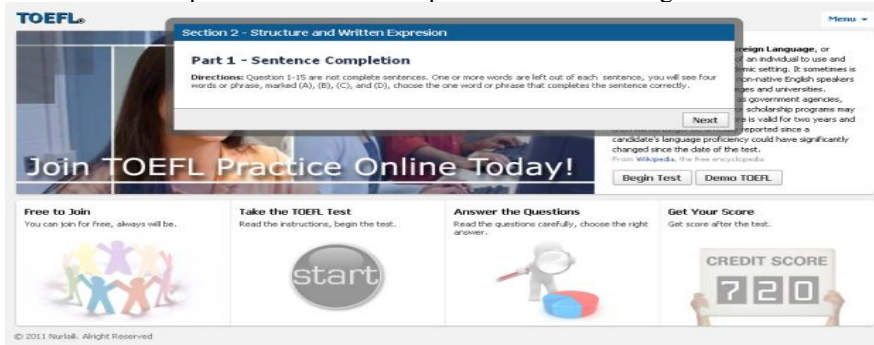
Figure 18.Pop up Structure Written Expression Sentence Completion

After the member answers all the question structure and written expression sentence completion, the system will store the answer into the database table answer. The system will also process the answer is true or wrong by checking the answer key that is located in the answer field in the table part c as shown in Figure 19.

Figure 19.Pop Up Display Structure Written Expression Error Identification

The next button is clicked again and a question about structure and written expression error identification will appear as shown in Figure 20.

Figure 20.Problem Display Structure Written Expression Error Identification

After the next button is clicked, it will appear the reading comprehension as shown in Figure 21.
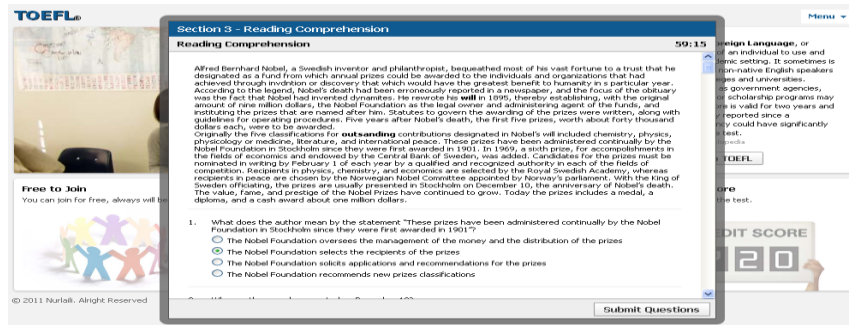
Figure 21.Reading Problem Reading Comprehension

After the member answered all questions reading comprehension, the system will store the answer into the database table answer.System will also process the answer is true or wrong by checking the answer key that is located in the answer field in the table part e. The TOEFL score derived from the calculation is done by summing the total correct answers from each part stored in the answer table and then grouped into 3 sections, then the value of each section is adjusted to the num_correct data is found in the score table to produce a TOEFL score based on PBT standards. TOEFL score for begin test is stored into the history table, and will be called when members access the account menu that is history to see the details of the report score that has been done. The TOEFL user interface display is shown in Figure 22.
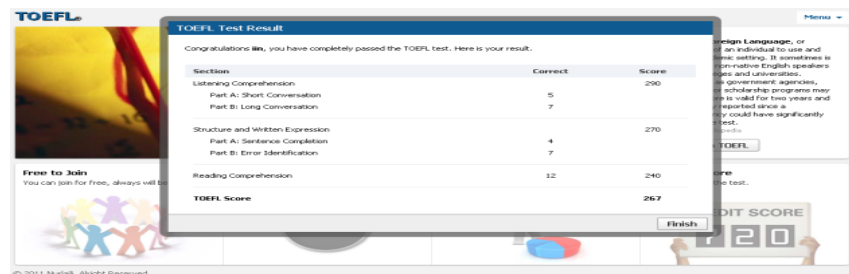
Figure 22.Display of TOEFL Results

5. Conclusion

This TOEFL system is able to run *sign in*for user-level identification process at the beginning so that the system access is well controlled. This application can only be accessed by users who have done the process of signing up. Random system question will be worked better when the type of questions provided more in variant and items of the test. The userwill not get the same combination of tests on different tests for the same participants. The TOEFL system as a learning medium is an online software in the form of a website create for the development of TOEFL learning and test.

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Analysis Self-Efficacy Prospective of Elementary School Teacher Education to Mathematics

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Abstract. Self-efficacy is one of the affective domains in mathematics that is very important because it is directly related to the student's self in accepting and studying mathematics. Therefore, this study was conducted to analyze student self-efficacy toward mathematics. The population in this study is all students of Elementary School Teacher Education STKIP Citra Bangsa Aceh Utara, and the sample is students of semesters 1 and 3 who are getting mathematics courses that is the basic concept of mathematics and high class mathematics education as much as 72 people. The results showed that overall students had a negative self-efficacy against mathematics. The findings of this study are expected to be used as a reference for lecturers related to mathematics can find a solution to improve students' self-efficacy toward mathematics to be positive for the purpose of mathematics courses can be achieved as planned.

Keywords: Self-efficacy, Mathematics

1 Introduction

Mathematics is a science that is continuously studied from the first time a person in the world of formal education that is elementary school up to college. The college, the mathematics studied is a mathematical concept related to the use or application of mathematics itself in a particular study program. The primary school teacher education, mathematics is studied in the subjects of basic concept of mathematics and high class mathematics.

Mathematics has three domains or three domains, namely cognitive domains, affective domains and psychomotor domains. The affective domain in mathematics learning consists of self-concept, mathematics anxiety, self-efficacy, effort and ability attribution, causal attribution, learning helplessness, motivation, autonomy, youesthetics [1]. Historically, many researchers in mathematics education such as [2][3][4] discussed about important aspects affecting mathematics learning. The main concerns in the learning process of mathematics are psychology, cognitive approach, and conceptualization of the affective domain. Therefore, it is concluded that self-efficacy is one of affective domains in mathematics that is very important [5].

The student's belief in his ability is important in improving student learning outcomes. A student's self-efficacy is necessary to develop. This is because through a strong confidence, a student will have a strong ability to develop the potential that is in him. This is in accordance

with Bandura [6] one's assessment of how great his ability to deal with a situation is called self-efficacy. Mathematical self-efficacy is a confidence in: the ability to represent and solve mathematical problems, how to learn/work in understanding concepts and completing tasks, and the ability to communicate mathematics with peers and teachers during learning. The ability is measured by level (difficulty level of problem), strength (endurance) in solving the problem, generality (breadth) area of the given problem [7].

Therefore, student self-efficacy is a student's positive attitude to his ability such as ability to solve math problems. One that can affect self-efficacy is the success or failure experienced by the student can be viewed as a learning experience. This learning experience will result in students' self-efficacy in solving problems so that their learning ability will increase, positive self-efficacy is required in the learning so that students can achieve their learning objectives and achieve maximum learning achievement.

The based on preliminary observations in the 1st and 3rd semesters the basic concepts of mathematics and high class mathematics education show that low mathematical self-efficacy abilities are seen when students are given a problem, so most students say they do not know how to solve them. In addition, some students ask about what formula is used to solve the problem, the numbers contained in the problem multiplied or divided, and so on. The most students do not have the confidence to answer the problem, so many of them are unable to solve it. Therefore, to ensure that it is done research on student self-efficacy analysis of mathematics, especially subjects of basic concepts of mathematics and high class mathematics education.

2   Literature Review

2.1   Self-Efficacy

Self-efficacy (SE) is defined as a person's judgment about his or her ability to achieve desired or determined performance levels, which will influence subsequent action [8]. According to Zimmerman [9], the SE is a personal assessment of a person's ability to organize and implement a work program in achieving a predetermined objective, and he seeks to assess the degree, authenticity, and strength of all activities and contexts. Therefore, SE is the opinion of a person about his ability to perform a certain activity. SE reflects how sure the student is about his or her ability to perform a particular task, so the high SE of a person in a certain section does not guarantee the high SE of someone on the other. SE indicates how strong a person's belief that they have the skills to do something, they can be sure that with other factors will make them succeed.

The SE also influences one's choice in behaviour settings, the number of their efforts to accomplish the task, and the length of time they endure in the face of obstacles. Finally, the SE affects a person's emotional reactions, such as anxiety and distress, and mindset. Thus, individuals with a low SE on a particular task are more thinking about their personal shortcomings than thinking about completing a task, which in turn will hinder the performance of successful completion of tasks [10]

The SE will make students motivated to learn through the use of self-regulation as a goal-setting process, self-monitoring, self-evaluation, and strategies used [10]. This is in accordance with the opinion of Bandura [2] who says that SE which is a central construction that will affect a person in decision making, and affect the action to be done. Someone will tend to run something if he feels competent and confident. It will also determine how far the

effort is, how long it will last if it gets into trouble, and how flexible it is in a less favorable situation. The bigger the SE person, the greater the effort, the perseverance, and the flexibility. SE also affects the mindset and emotional reactions. A person with a low SE will easily give up, tend to be stressed, depressed, and have a narrow vision of what works best to solve the problem. While the high SE, will help a person in creating a sense of calm in the face of difficult problems or activities.

The SE has three dimensions of magnitude, strength and generality. Each of these dimensions has important implications for one's performance. Magnitude refers to the sorting of tasks according to the degree of difficulty. Strength refers to the trust that exists within a person that can be realized to achieve a certain performance. Generality refers to the flexibility of SE which belongs to someone who can be applied in other situations [2]. Perception SE can be formed by interpreting information from four sources namely [3].

1. Authentic experience: is the most influential source, because the failure or success of past experience will decrease or improve a person's SE;
2. Experience of others: is the source of information needed to make judgments about oneself;
3. Social or verbal approach: it is an approach done by convincing someone that he/she has/does not have the ability to do something;
4. Psychological index: is the physical and emotional status that will affect a person's ability.

Based on the above explanation, the notion of self-efficacy in this study is one's confidence in; his ability to represent, solve mathematical problems he faces in the learning process of mathematics courses so that the desired goals achieved are measured based on 4 sources of authentic experience, other people's experiences, social or verbal approach, and psychological index.

2.2 Mathematics

Mathematics is one of basic science, very necessary in human life both in daily life and science and technology. Mathematics can also be used for the provision of plunging and socializing in the community. Someone who has learned math is expected to absorb information more rationally and think logically in the face of the situation in society. Therefore, math needs to be taught at all levels of education, from elementary to university. The primary school teacher education, mathematics is studied in the subjects of basic concept of mathematics and high class mathematics.

3 Method

This research is qualitative descriptive. Descriptive research aims to describe a phenomenon that occurs, without intending to take conclusions that apply in general (Hadi, 2000). Therefore, this study concludes about student self efficacy toward mathematics.The population of this research is all students of of Elementary School Teacher Education STKIP Citra Bangsa Aceh Utara. The sample in this study are students of semesters 1 and 3 who are getting subjects of basic concepts of mathematics and high class mathematics education which totals 72 people, but when the questionnaire 2 people were absent.The data collection in this study using questionnaires questionnaires filled by students. Methods of data analysis in this study using a questionnaire presented in the form of frequency tables and data interpretation.

4 Result and Discussion

The results of students' self-efficacy toward mathematics, especially the subjects of basic concepts of mathematics and high-class mathematics education can be described in Table 1 as follows:

Sources	Statement Number	Neutral Score	Self Efficacy Score
Authentic experience	1 s/d 9	3	3
.Experience of others	10 s/d 19	3	2
Social or verbal approach	20 s/d 29	3	3
Psychological index	30 s/d 40	3	3
Average		3	2,75

Table 1. The Scale Data Distribution of Self Efficacy
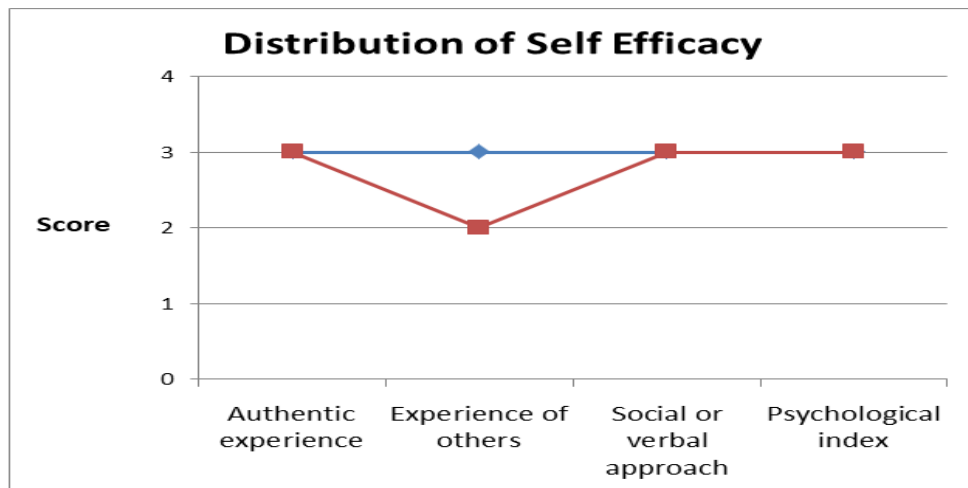
Figure 1. Data Distribution of Self Efficacy

From the table above, it is seen that in general the students showed negative self-efficacy to math. This can be seen from the average score SE students < average neutral score of 2.75 < 3. Similarly, when viewed for each aspect of SE. For the authentic experience source, social approach, and psychological index the average SE score of 3 students is equal to the neutral score of 3. For the experience aspect of others, the average SE score of 2 students is smaller than the neutral score of 3. Thus both in general and for every aspect, students have a negative self-efficacy towards math.

Analysis of self-efficacy scale scores indicates that students generally have negative self-efficacy toward math. This is a problem that requires a solution because self-efficacy is an important asset for better learning outcomes, because a person's belief that he or she is capable

of doing a particular task will influence the success of completing the task. To improve student self-efficacy, there are several strategies we can do:

1. the teach students with a special approach so as to enhance their ability to focus on their tasks.
2. the guiding students in setting goals, especially in creating short-term goals after they build long-term goals.
3. the provide rewards for student performance.
4. the combine training strategies with emphasis on goals and provide feedback to students about their learning outcomes.
5. the provide support or support to students. Positive support can come from teachers like the statement "you can do this", and others.
6. the ensure that students are not too anxious because it will actually decrease student self-efficacy.
7. the provide students with positive models such as peers and adults. Certain characteristics of the model can improve student self-efficacy. Modeling is effective for improving self-efficacy especially when students observe the success of peers who actually have similar abilities to them [7].

In addition, there is a group counseling model that is predicted to be effective in improving self-efficacy, ie cognitive behavior group counseling (KKKP). The KKKP model is seen to be effective because it suits the problems of self-efficacy, offers a specific and empirically tested technique, the time required is relatively short, and uses principles of learning such as reinforcement and social learning that can develop self-help. The KKKP model resulting from this research consists of: rational, objectives, key components, formats, sessions, counselor roles, counseling stages, and success indicators [8].

4   Conclusions

The curriculum, affective aspects are aspects that should also be considered in learning. But when compared with cognitive factors, increasing affective factors is more difficult and takes a long time. The reality can be seen in this study that the low self-efficacy of students to mathematics. The results of the self-efficacy scale score analysis conclude that both in general and for each aspect affecting self-efficacy, students have a negative self-efficacy toward math.

Given the importance of self-efficacy the need to be given the understanding to change the paradigm that mathematics is difficult. In addition, given the solutions to improve students' self-efficacy towards mathematics to be positive. Because positive self-efficacy will affect students in making decisions, and influence the actions that will do. Someone will tend to run something if he feels competent and confident. It will also determine how far the effort is, how long it will last if it gets into trouble. The higher one's self-efficacy, the greater the effort, the perseverance, and the flexibility.

Acknowledgements

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Performance Analysis of Fuzzy AHP in The Rankings

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Abstract. Analytic Hierarchy Process can solve complex multicriteria problemsinto a hierarchy. hierarchy is defined as a representation of a complex problem in a multi-level structure where the first level is the goal, followed by the factor level, criteria, sub criteria, and so on down to the last level of the alternative (Saaty, 2008). Selection of employees achievement aims to provide encouragement, dedication, loyalty, professionalism and high motivation to employee performance. In this research, Hierarchical Process Analysis Method is used to search the ranking weight, then used Fuzzy AHP method as a comparison, then tested to get employee performance accuration. Fuzzy AHP is a combination of Hierarchical Process Analysis method with fuzzy concept approach. Fuzzy AHP covers the existing weaknesses in Hierarchical Process Analysis, problems with criteria that have more subjective properties. Final conclusions Fuzzy AHP still get more value than using Hierarchy Analysis Process. The percentage of weight gain is 21%, 8%, 9%, 11%, 14%, 7%, 17%, 15%, 10%, and 14% respectively. The difference of the results obtained is due to the weight difference of each criterion value that exists. Furthermore, the calculation of accuration, test results show Fuzzy AHP method gets accuracy of 72%.

Keywords: Hierarchy Analysis Process, Fuzzy AHP, Accuration

1 Introduction

Analytic Hierarchy Process (AHP) is one of the methods that can be used in decision-making system by considering the factors of perception, preference, experience and intuition. AHP can be to combines personal judgment and values into a logical way. AHP can solve complex multicriteria problems into a hierarchy. A complex problem can be interpreted as the criteria of a multicriti- ty, the uncertainty of the problem structure, the uncertainty of opinion from the decision maker, the decision-maker of more than one person, and the inaccuracy of available data.According to [1], Hierarchy is defined as a representation of a complex problem in a multi-level structure where the first level is the goal, followed by the factor level, criteria, sub criteria, and so on down to the last level of the alternative. With a hierarchy, a complex problem can be broken down into groups that are then organized into a hierarchical form so that the problem will seem more structured and systematic.
According to [2], "Fuzzy AHP to determine the relative weights of evaluation criteria and Fuzzy TOPSIS to rank the alternatives", Fuzzy AHP to determine the relative weighting of evaluation criteria and Fuzzy Topsis to determine the accuracy of the data, whereby the

decision consists of three levels: at the highest level, the purpose of the problem lies on the second level, that is, the Criteria listed, and at the third level, the listed sub criteria; The Topsis method yields Sc1 - Sc4 (0.3333) while for Sc5 (0.2).

While the first Fuzzy Analytic Hierarchy Process requires a pairwise Comparison of criteria and sub criteria to determine its weight. Last level belongsalternative. So the criterion 1 is (0.3333333) and sub criterion 1 (0,425), sub criterion 2 (0,575) and criterion 2 produce (0,666666) from sub criterion 11 (0,644835), sub criterion 12 (0,244575) and sub criterion 3 (0.11059). This consistent comparison matrix indicates that the previous Sub criterion has fewer values than the normalized priority weighting between the two generates the main criteria and the five sub criteria and their ranking. The results showed that the weight generated using fuzzy topsis alternatives showed inaccurate data, so the solution was selected Fuzzy AHP. According to [2], "Comparison of Fuzzy AHP and Fuzzy TOPSIS Methods for Math Teachers Selection" The incorporation of Fuzzy AHP and Fuzzy Topsis Methods for mathematics teacher selection, where the results show the AHP fuzzy method for teacher selection problems mathematics proposed in a group decision based on AHP fuzzy.

First, the decision maker prepares the questionnaire form and then with other interest sharing performs the pairing comparison. Decision makers use linguistic variables, to evaluate alternative rankings with respect to each criterion and they turn them into triangular fuzzy numbers resulting in three (3) best teachers with the weight of T1 (0.31182), T2 (0.39977) and T3 (0.30968). The T2 alternative that has the highest priority weight is chosen as the best mathematics teacher choice. The alternate ranking sequence with the fuzzy AHP method is T2> T1> T3.

The best ranking weights are obtained using several criteria. Factors that support performance include Worker-made Needs, Ability, Complexity, Commitment, Feedback, Attitudes to each activity, Perseverance, Obedience and Have clear standards. The closer to the value of the given criterion the better the result.

According to [3], "Decision Support Systems for Selection of Performing Employees Based on Performance using the Analityc Hierarchy Process Method" produces 10 outstanding employees based on their performance. The results of the total weight calculation of each alternative using AHP and Fuzzy AHP, and from CR (Consistency Ratio), both results show consistent results by using AHP Alternative A Weight (0.1596), B (0.6349) and C (0.2055), while using the Azz fuzzy AHP alternative employee A (0.4869), B (0.3561) and C (0.1570). So based on AHP calculation, the choice of candidates from the highest score to terenda are candidates B, C, and A. While the calculation of Fuzzy AHP, obtained the sequence A, B and C.Based on the research descriptions, the authors looked at some of the differences in increasing the accuracy as well as the specified weights. According to (Ridyanningtias 2013), the measure of employee performance is one important factor. If you can not measure it, it causes difficulties in managing management. The effect of performance measurement has a major impact on existing human resource activities. Several performance appraisal methods, consisting of Graphic Rating Scale Method, Method of Behavioral Valuation Scale, Management Method Based on Goal (Gibson, 1994).

For that the authors conclude that differences in processing and development procedures studied by previous researchers can be appointed as a reference in analyzing this research topic, which to obtain good accuracy data using weighting criteria that will be analyzed using Fuzzy AHP in improving the accuracy of AHP techniques can applied to get a better accuracy, therefore the authors make a study with the title "Performance Analysis Of Fuzzy Analytic Hierarchy Process In The Rangkings.".

2. Methods

This research, several important points of AHP and fuzzy AHP are briefly described, among others, the data used derived from questionnaires and interviews. Of the 150 questionnaires distributed, only 100 questionnaires were returned. Furthermore, for interviews that are used as resource persons namely the chairman of Prodi, lppm chairman and chairman of the foundation of earth finance persada. Research conducted sincea years ago.

2.1. AHP

Analitic Hierarchy Process (AHP) defined as a representation of a complex problem in a multi-level structure where the first level is the goal, followed by the factor level, criteria, sub criteria, and so on down to the last level of the alternative [4]. AHP requires the selection of alternative values in pairwise comparisons because it has the nature of uncertainty and should be reconsidered in many pairwise comparison assessments (Yu, 2002).

The problem solving process using AHP method is described as follows:
1. For each value in the first column
   multiplication must be done with relative priority columns on the first element, then the value in the second column must be multiplied by the relative priority column of the second element. Do so until the first column and relative priority columns on the th menu.
2. Add each row.
3. Furthermore the result of the sum of rows
   divided by relative priority elements.
4. Sum it up with the number of elements used.
5. Next, calculate the consistency index (CI) using the formula
   CI = (λmax - n) / (n-1)
6. After the CI value is obtained, divide by Consistency Ratio (CR) using the formula:
   CR = CI / RI.

2.2. Fuzzy AHP

Decision-making models need to tolerate ambiguity because uncertainty is a common feature in many decision-making issues (Yu, 2002). Because decision makers often provide uncertain answers rather than exact values, the transformation of a qualitative preference to an approximate point may not make sense.

This decision-making is obtained by several stages. By using the Structure Hierarchy then obtained goals / goals to be achieved, the criteria used and alternatives. Structure The hierarchy used can be seen in figure 1.
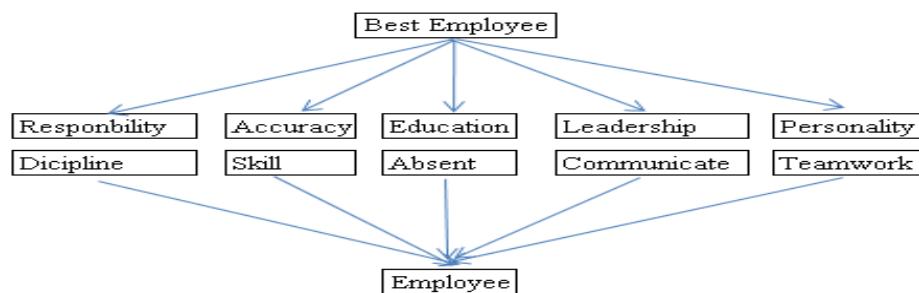
Figure 1 Hierarchy Structure

Fuzzy AHP procedure follows the rules steps by:
1.Creating a Hierarchy Structure
2. Create a Triangular Fuzzy Number (TFN);
3. Determining the value of fuzzy systesis (Si):
4. Determining the value of vector (V) and Defuzzify Ordinate value (d ');
5. Normalization of fuzzy vector weight values (W) Normalized vector weight
   values;
6. Conduct a comparison of data accuracy on AHP and Fuzzy AHP;

3. Result

This research used survey method with field data collecting technique 150 respondents and interviewed to 3 resource persons namely chairman of Prodi, Chairman of LPPM and Chairman of Bina Bumi Persada Foundation. Of the 150 questionnaires distributed, only 100 questionnaires were returned. Research conducted since January until December 2016. The stages of this study started from data collection, data processing, problem formulation, testing stages and data analysis described in the form of diagrams in Figure 2.
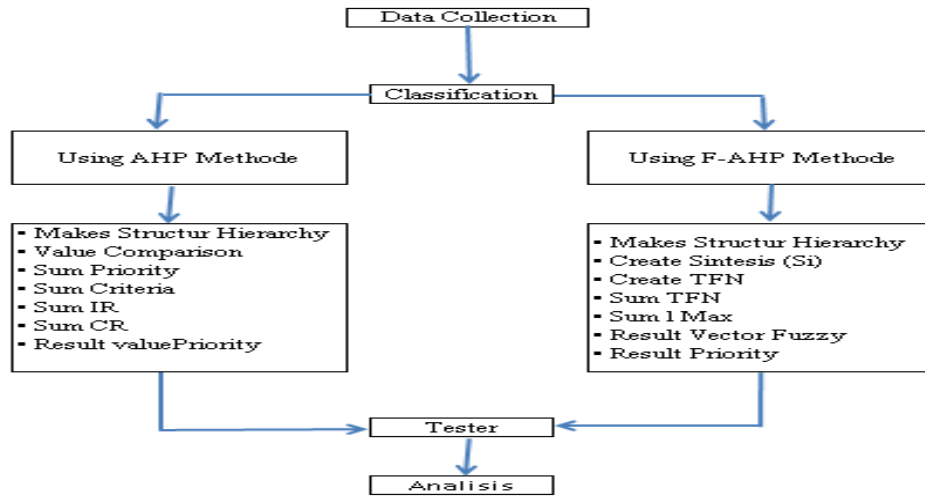
Figure 2. Flow Diagram

Data from respondent survey questionnaires using AHP and Fuzzy AHP methods are as follows:

Using AHP methods

The first stage is the comparison of criteria and alternatives, and the calculation of the weight of the value needs to be done. Thus, evaluation criteria according to the main objectives and evaluation of alternative criteria should be realized. The next step, after all these evaluation procedures, the alternative weights can be calculated. In the second step, this weight is used for AHP calculations for final evaluation. Comparison matrix for criteria. Table 1.

Table1. Value Matriks Comparison.

X1	X2	X3	X4	X5	X6	X7	X8
1	3	5	5	3	5	1	3
0,33	1	5	7	5	3	3	1
0,14	0,20	1	3	1	1	2	3
0,11	0,14	0,33	1	2	1	0,3	1
0,14	0,20	1,00	0,50	1	3	2	0,33
0,20	0,33	1,00	1,00	0,33	1	0,2	0,75
1,00	0,33	7,00	0,33	0,50	5,00	0,2	0,5
0,33	1,00	21,00	27,00	0,50	15,00	3,00	1
3,73	6,21	12,16	21,53	20,36	20,33	9,73	10,58

Calculate value matrix is normalized as follows:

X1 =   (1 / 7,2), (0,3 / 7,2), (0,3 / 7,2), (2 / 7,2), (2 / 7,2), (0,2 / 7,2), (1 / 7,2)
X2 =   (3 / 12,2), (1 / 12,2), (0,5 / 12,2), (0,3 / 12,2), (3 / 12,2), (0,33 / 12,2), (3 / 12,2)
X3 =   (3 / 13), (2 / 13), (1 / 13), (0,5 / 13), (0,5 / 13), (3 / 13), (2 / 13), (1 / 13)

$\vdots$

X8 =   (3 / 8,3), (1 / 8,3),(1 / 8,3),(0,5 / 8,3), (1/ 8,3),(0,3 / 8,3)+(0,5 / 8,3), (1 / 8,3)

Alternative weights are calculated with AHP then the weight of this value can be used on F-AHP. Thus, the AHP methodology should begin in the first step. Thus, the initialized normalized decision matrix can be used as a reference which can be seen in table 2.

Table2. Normalized Matriks values.

X1	X2	X3	X4	X5	X6	X7	X8
0,268	0,483	0,247	0,232	0,147	0,246	0,103	0,284
0,089	0,161	0,411	0,325	0,246	0,148	0,308	0,095
0,089	0,032	0,082	0,139	0,049	0,049	0,206	0,284
0,054	0,023	0,027	0,046	0,098	0,049	0,034	0,095
0,089	0,032	0,082	0,023	0,049	0,148	0,021	0,031
0,054	0,054	0,082	0,046	0,016	0,049	0,021	0,071
0,268	0,054	0,041	0,141	0,246	0,246	0,103	0,047
0,089	0,161	0,027	0,046	0,149	0,066	0,206	0,095
1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

After obtaining the value of the matrix, then determine the priority of choice (Synthesis of Priority) is done by calculating the Priority Evaluation Value which includes:

a. Calculates a factor value in a table column.

b. Calculating the value of factors in the table used scales 1 through 9 that refer to table 3. Rating Scale.

c. Divide each factor value in a column by the total value of the calculation per column.

d. Calculates the average value of a row by calculating the value of a factor per row.

Table 3. Results Amount and Priority

Goal	Amount	Prioritaty
X1	2,009	0,270
X2	1,782	0,157
X3	0,930	0,033
X4	0,426	0,057
X5	0,475	0,084
X6	0,393	0,029
X7	1,145	0,103
X8	0,839	0,266

The result of the average value of the line above is known that the priority of responsibility has the highest value, that is 0.270 but can not be set as the criteria value chosen before determining the consistency ratio level.

Next calculate the Consistency Ratio (CR), ie evaluate the consistency level of the assessment given in the pairwise comparison stage. Determine CR using the Weighted Sum Vector formula, ie by multiplying the result of the mean value of the row by each factor value in the Pairwise comparison table. To determine the value of consistency vector by dividing the value of weighted sum vector with the average value of result of Consistency Vector:

Table 4. Consistency Vector Results

X1	8,858 / 0,295	9,153
X2	5,192 / 0,205	5,397
X3	0,328 / 0,050	0,378
X4	0,522 / 0,067	0,590
X5	0,912 / 0,093	1,005
X6	0,195 / 0,044	0,238
X7	1,593 / 0,118	1,711
X8	1,908 / 0,128	2,036

Next Calculate the value of Consistency Index (CI) and lamda. The lamda value λ is the average value of the Consistency Vector.

$\lambda = 9{,}153 + 5{,}397 + 0{,}378 + 0{,}590 + 1{,}05 + 0{,}238 + 1{,}711 + 2{,}036 / 8$

$= 2{,}564$

lamda value is obtained, next step calculates the CI value.

CI = $(2{,}564 - 8) / (8 - 1) = -5{,}436 / 7 = $ **- 0,7765**

Last count CR value (Consistency Ratio). CR value is used to see the final result of whether the search criteria and alternatives in accordance with the given provisions. If the value of CR <0.10, then decision making is considered consistent, but if the alternative value is greater or inconsistent then it needs to be recalculated to get a consistent value.

Table 5. Consistency Test Results.

Criteria	Λmaks	CI	CR	Ket
X1	8,858	2,564	- 0,550	Consisten
X2	2,088	0,844	-0,938	Consisten
X3	1,665	0,904	-1,005	Consisten
X4	1,583	0,916	-1,018	Consisten
X5	1,652	0,906	-1,007	Consisten
X6	1,670	0,904	-1,004	Consisten
X7	1,758	0,891	-0,990	Consisten
X8	1,831	0,881	-0,979	Consisten

4. Discussion

Next determine the pairwise comparison matrix subcriteria. The final result can be seen in figure 4
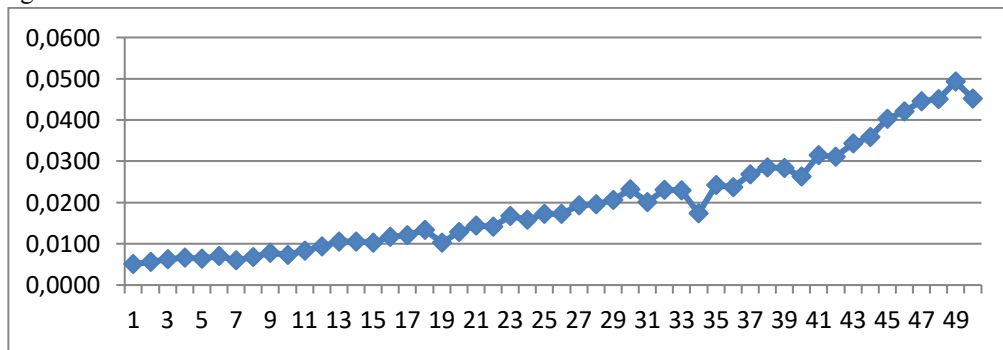
Figure 4 . Graph Resultof Matriks.

From the result matrix above, then obtained the final value for best ranking using AHP method can be seen in table 6.

Table 6. Employee Value Results

Goal	Mean Value	Rank
K41	0,0314	10
K42	0,0310	9
K43	0,0343	6
K44	0,0359	8
K45	0,0402	4
K46	0,0420	5
K47	0,0445	3
K48	0,0450	7
K49	0,0493	1
K50	0,0452	2

Using the F-AHP methodfirst stage, the criteria and the weight of the alternative importance must be compared. For that, there must be a linguistic term and an equivalent fuzzy number that shows the size of the comparison. The terms of linguistic comparison and the equivalent fuzzy numbers considered in this journal. By following the steps and calculations of the F-AHP procedure, a ranking of strategies is obtained.

Table 7. Number of Fuzzy numbers.

L	M	U	∑L	∑m	∑u
1	1	1	3	3	3
¼	1/3	1	3/12	4/12	1/12
1/3	½	1	2/6	3/6	1
1	1	1	3	3	3
1	1	1	3	3	3
1/3	½	1	2/6	3/6	1
1	1	1	1	1	1
1/3	½	1	2/6	3/6	1

The data used using the AHP method on the first test with the first 10 samples resulted in total (0.0050, 0.0057, 0.0060, 0.0067, 0.0064, 0.0070, 0.0060, 0.0067, 0.0079 and 0.0074), then the second test resulted (0.0083, 0.0093, 0.0105, 0.0102, 0.0107,0.0117, 0.0121, 0.0133, 0.0103 dan 0.0129). there is a slight increase until finally on the fifth test it produces (0.0315, 0.0311, 0.0344, 0.359, 0.0420, 0.04 02, 0.0466, 0.0451, 0.0493 and 0.0452).

Having obtained value on AHP method, then forwarded using Fuzzy AHP method. The first experiment consisted of 10 samples, the first test yielded the total (0.250, 0.457, 0.363, 0.467, 0.364, 0.270, 0.160, 0.670, 0.379 and 0.274), then the second test resulted (0.283, 0.393, 0.405, 0.202, 0.407, 0.317, 0.321, 0.133, 0.213 and 0.129). there is a slight increase but not stable, the test is repeated until finally on the fifth test it produces (0.415, 0.319, 0.344, 0.529, 0.290, 0.202, 0.618, 0.451, 0.593 and 0.952).
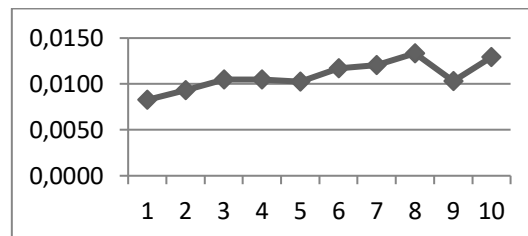
Figure 5. Image display The first Test Phase uses the AHP method
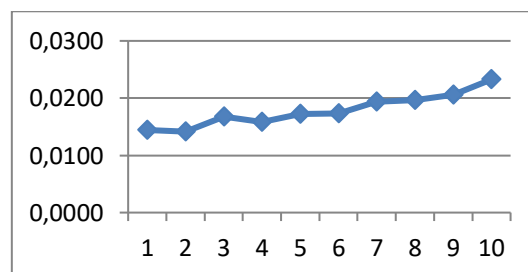
Figure 6. The image view of the Fifth Testing Stage using the AHP method
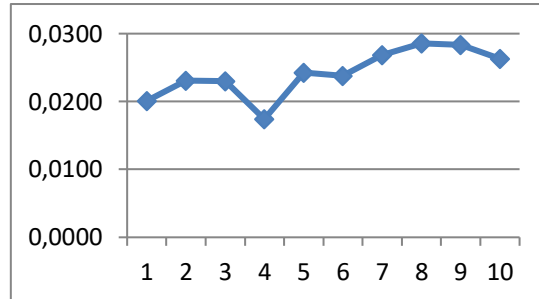
Figure 7. Graphical display First Test Phase using F-AHP
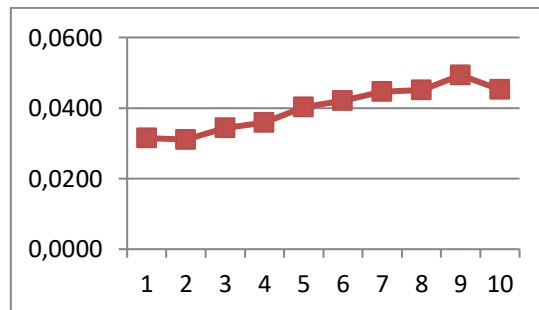
Figure 8. Graphical Views of the Fifth Testing Stage using the F-AHP method.

From the previous test results, then obtained the final value for the best ranking using F-AHP method can be seen in table 8.

Table 8. Employee Value Accuracy Results

Goal	Average	Rank
K41	0,4142	10
K42	0,4105	9
K43	0,4434	6
K44	0,4595	8
K45	0,5027	4
K46	0,5206	5
K47	0,5453	3
K48	0,5507	7
K49	0,5949	1
K50	0,5529	2

Table 8 can be seen that the highest value obtained by employee to 49 with value (0,5933) compared with other employees.

5. Conclusion

The results of decision making accuracy analysis using Fuzzy AHP show that there is a good accuracy improvement when using Fuzzy AHP method compared using AHP. The best employee rank value generated using the AHP method is 0.0493 or 49.3%. Furthermore, conducted several times testing to find accuracy using Fuzzy AHP method, it increased to 0,5949 or equal to 59,4%. Thus it can be said that by using the method of Fuzzy AHP to find the accuracy of decision making to find the best employees rank can be used as a solution as an alternative.

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The Function of Public Relations of Language Development and Construction Agency, Ministry of Education and Culture Republic Indonesia in Publishing the Language Preservation Program

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Abstract. Indonesia has 742 languages from 478 tribes, but the language and literature existed in Indonesia today will soon become extinct. Indonesia Government to protect the language and literature established the Agency of Language and Development and Reconstruction under the Ministry of Education and Culture of Republic Indonesia. The purpose of this research was to describe the function of public relations of the Agency of Language and Development and Reconstruction in publishing the program of language preservation. The study used concept of public relations functions by Cutlip and Center. The research method used was descriptive qualitative. The results of this study indicated the work performance of the public relations of the Agency of Agency of Language and Development and Reconstruction was poor in doing publication. The cause was due to lack of communication with the content providers (Preservation Agency) and content editors (Language Editor). In addition, in bureaucracy, the Public Relations could not directly involve in the language preservation program. The Public Relations department did not participate in the process of drafting, implementing, and evaluating the program.

Keywords: Government public relations, Publications, Language, Literature.

1 Introduction

Language and cultural are related and there would be connections between them [1]. Indonesia is a country with cultural diversity and one national language. Now we are in globalization era with english language as the medium. "The diversity of Indonesian culture can be seen from the number of languages that is as much as 742 languages from 478 tribes" [2]. Languages and literature in Indonesia today can be said to have entered the endangered stage. The diversity of language and literature today needs to be protected and preserved for future generations in knowing each local language. In response to this situation, in 2012 Indonesian government established Language Development and Reconstruction Agency under the Ministry of Education and Culture Republic Indonesia. The Agency of Language Development and Reconstruction of the Ministry of Education and Culture Republic of Indonesia which hereinafter will be abbreviated as Language Agency aims to protect and preserve the language and literature. Based on 2016 mapping by Language Development and Reconstruction Agency under Ministry of Education and Culture Republic of Indonesia, at least 1 language and 3 literatures are categorized as critical; 5 languages and 3 literatures are

categorized endangered; 3 literatures are categorized susceptible; 1 language and 1 literature are categorized setback. In total, 7 languages and 10 literature need to conservation and revitalization immediately. More than this, languages and literatures that categorized endangered are increasing every year.

Facing this situation the Language Agency need more publication to reach support from society in reach their goal. In 2015, the Language Agency has a PR section. Cutlip and Center state that the fuctions of public relations are: support the main management activity to reach collective goal; manage relationship between organization and stakeholders; identify things related to public opinion, public perception toward the organization; do public service and suggestion to top management; and create two ways communication between management and their stakeholders [3]. According to Amiruddin, the fuction of government public relations are: develop government policy; deliver public sevice and spreading mesagge or information relating to national policy and program to society; become proactive communicator and mediator in bridging institution interest and accomodating the aspiration; create condusif and dinamyc climate do to stability in political security and national development program [4]. Spreading mesagge or information can be said as publishing. In publishing, public relations officer can use and combine some media. Traditional such as event, exhibition, discussion, field visit; print media such as poster; mass media such as newspaper, radio, television; and new media such as website and social media [5]. The steps in publishing are: situasion analysis, objective set, formulate strategy, budgeting, staffing [6]. This study aims to evaluate how the functions of public relations, especially in publishing language and literature preservation programs.

2 Method

The approach of this research is descriptive qualitative. According to Creswell (1998), Qualitative research is a complex picture, analysing words, detailed reports from respondents' views, and conducting studies on natural situations. Qualitative research is descriptive research and tends to use analysis with inductive approach [7],[8]. The sources of Primary data in this research are:The Head of Cooperation and Public Relations Agency,The Head of Preservation Division,Staff of Public Relations, andThe Chairman of "11th Annual of Communication Days" *Saskta Bahasa* as society representative who has interest in language and literature.

While the secondary data used in this study is from literature study, data of the institution, and internet. The data used by the researchers in this study are collected through: nonparticipant observation and in-depth interviews. Data collecting did at Public Relations Division of Agency of Language Development and Reconstruction of the Ministry of Education and Culture Republic Indonesia, Jl. Dasinapati Barat 4, Rawamangun, East Jakarta. Research did from September 15 th until December 15, 2018.

3 Result and Discussion

In preparation process, Public Relations of The Language Agency must follow strict bureaucratic procedures and should continue to coordinate with the language editor as editor of the publication's content. Often, the language editors are not on time in completing the

edits, so it extend the time and hamper the publication process. Moreover, one of the factors that hampers this publication process is due to the Language Preservation that sometimes takes a long time and late in delivering the material or content to be published by the Public Relations of the Language Agency.

Then, after coordination, the Public Relations publishes the program through offline media (in the form of brochures and banners) and online media (official website and social media). The challenges faced in the process delivery of this information was because the Public Relations of Language Agency does not involved directly in creating the content information that will be delivered. The Public Relations only plays a role to spread the information. Another obstacles, according to the Public Relations agency, is the content presented by the Preservation Agency which is still less varied and not interesting.

In addition, the information delivery there is still not maximized, because not many people know the Language and Literature Preservation program. The information through offline media publications is still not widespread, so that only certain people that be able to receive the information related to the publication of the Language Agency. Meanwhile, in online media publication the official website and social media, such as Facebook, Twitter, Instagram, and Youtube are still not updated regularly, so then not many social media users know about the publication in social media.

In publishing process, the Public Relations of Language Agency spreads the information to the public. The Public Relations of Language Agency divides the target recipients through the publications used, i.e. offline and online publication media. The offline publication media is intended for those of middle age and above and those in an area where the internet stability is still not very good. This target type communicants usually tend to be easier to obtain information through offline media, including brochures and posters created by the Language Agency. While the online media is aimed at young people who are very active and Internet user, especially in using social media. This target type of communicants tend to be easier to obtain latest information quickly through social media.

One of the ways conducted by the Language Agency in spreading the publication of language and literature preservation program is by synergizing with universities. This activity is one way to target young communicants which is in the objectives of the Language Preservation Agency that have mapped the communicant targets for the publication of the language and literature preservation programs. In addition, at the end of the event the Language Agency also distributes some publications in the form of books, posters, and journals to several students and lecturers.

However, it is unfortunate to see and mapthe target recipients that carried out by the Preservation Agency is not maximal. In many cases, government officer already invited universities anda industries in Triple Helix formula [9]. Triple helix has become commont strategy of many governments in developing innovation policies [10]. That is because the mapping process had not been done by the Public Relations of the Language Agency by them self, but also academician and business actors. Instead, the function of viewing and mapping theseactorswere still done by the Language Preservation Agency, so the Public Relations of the Language Agency did not able to know and analyse it from where, who, and how the public will receive the publications related to the Language and Literature Preservation program.

Feedback process. After the Public Agency of the Language Agency disseminates information to the public, they will await the response from the public. The ideal response is not just about a person's attitude changes or the actions one takes after getting information. The response here is directed to the changes in knowledge and insight of someone who at first

does not the information at all until understand it about the program of Language and Literature Preservation. In order to find out the responses that arise from the public, the Public Relations of the Language Agency can see it from the interactions and responses that appear in social media related to the publication that already published by Literature and Language Preservation programs. The problem of this process, the Public Relations of the Language Agency has not been able to know exactly how to see the knowledge change from the public who obtained the information through offline media, because the Public Relations of the Language Agency did not go along directly to the field to follow and establish the program of Language and Literature Preservation in various areas. In the implementation of this program, only the Language Preservation Agency that go directly to the field and know the response of the public. Moreover, it is unfortunate that the Language Preservation Agency rarely reports or notifies the activities results and the public responses to the Public Relations of the Language Agency.

In fact, knowing the response from the public is one form of material evaluation of public relations Agency to evaluate the Language and Literature Preservation program. Meanwhile, the publications distributed by the Public Relations of the Language Agency have not been fully seen or known regarding the response from the public, especially on direct publications to local communities that joined in the program of Language and Literature Preservation. Thus, the Public Relation of the Language Agency is lack of evaluation material, although this evaluation is needed to improve the function of public relations to publish information better than before.

Based on the above discussion, the researchers can conclude that the Public Relations Agency's function in publicizing the program of Language and Literature Protection has not been maximized.

In addition, one of the factors that hampers this publication process is that language preservation Agency is sometimes takes a long time and late in delivering materials and contents to then be published by Public Relations Agency. Another reason is because not many people know the Language and Literature Preservation program due to the publication through offline media is still not widespread, so that only certain people who can receive the information related to the Publication Agency. Whereas, in the online publication media, including the official website and social media, such as; Facebook, Twitter, Instagram, and Youtube, were still not updated regularly or in other words, the publications presented are limited to old information, so not many people well known the Language Agency in social media.

So far, the function of viewing and mapping these actorsare still done by the Language Preservation Agency, so the Public Relation of the Language Agency cannot know and analyse it which from, who the public, and how the public will receive publications related to the Language and Literary Preservation program. On the contrary, from the organism side in this process, only some people know about the Language and Literature Preservation program. Most of the people who do not know about this program are among others; people whose profession except of writers, language lovers, academics, or in educational backgrounds and so on. Thus, indirectly it means that the publication is only known by the people of certain circles, and the publication has not reach the target intended because it is not suit the target marked and the initial goal to be achieved by the Language Agency. In this case Language Agency can learn from other countries that with triple helix, innovation system is not only complex function and interactions among various organizational actors, including government, enterprises, universities and research institutes, but also interplays between these actors and

institutions which may include govermental policies and social norms especially when they are in different national and cultural context [10].

In the program implementation, only the Language Protection that go directly to the field and know the public response. Also, the Language Preservation Agency rarely reports or notifies the activities results and the public responses to the Public Relations of the Language Agency. In fact, knowing the response from the public is one form of material evaluation for Public Relations of the Language Agency in doing publication of the Language Preservation program better.

Furthermore, the researcher concludes that, the result of this research entitled "The Function of Public Relations of Language Development and Construction Agency, Ministry of Education and Culture Republic Indonesia in Publishing the Language Preservation Program" was not maximal and an evaluation was needed from all parties to improve the function of public relations of the Language Agency in the future.

4 Conclusions

The Function of the Public Relations of Language Development and Construction Agency had not maximum in publishing the Language and Literature Preservation Program. The Publications of Public Relations Agency of Language Development and Construction Agency, especially publications through conventional media such as brochures, books, and banners had not been maximize because the Public Relations did not directly involve in the implementation program of language and literature preservation. Thus, the Public Relations could not know how the response appeared in the public and could not know the evaluation needed from the publication.

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Characteristics of The Company and Tax Avoidance Manufacturing Company in
Food and Beverage Industry Sector
Listed in Indonesia Stock Exchange Period 2012-2016

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Abstract. Tax evasion is to avoid taxes by exploiting loopholes contained in legal tax laws. This study aims to examine the effect of the characteristics of the company proxied by profitability, leverage, size, capital intensity, and inventory intensity against tax avoidance in manufacturing companies of food and beverage industry sector listed in Indonesia Stock Exchange period 2012-2016. The sample of this research consists of 11 manufacturing companies of food and beverage industry sector listed in BEI period 2012-2016 by using sampling method of purposive sampling. The analysis technique used in this research is multiple linear regression analysis. The result of the analysis shows that the variab characteristics of the company proxied by profitability, capital intensity, inventory intensity have a significant effect on tax avoidance, no significant effect on tax avoidance. While the variable characteristics of the company in proxies by size and leverage have no effect on tax avoidance.

Keywords: Profitability, leverage, size, capital intensity, inventory intensity and tax evasion

1 Introduction

Tax is the pulse of a country's development. National development requires a lot of funds. Therefore, the government through the Directorate General of Taxes (DGT) seeks to increase state revenues in the tax sector. According to data from the Central Bureau of Statistics (BPS), almost 70% of revenues from the State Budget (APBN) comes from tax revenues. For the state, taxes are an important revenue source that will be used to finance state expenditures, both routine expenditures and development expenditures. Conversely, for the company, the tax is a burden that will reduce the profit before tax. Thus, companies often attempt to make the minimum tax payment possible.

Events related to tax evasion can be seen from the case of Panama Papers which reveal the dark practices of thousands of stealth companies and the behavior of thousands of super-rich people around the world in their financial management. Panama Papers also reveals how the rich people are trying to avoid taxes by saving money or doing business abroad. Panama is only one of dozens of tax haven states that provide facilities for corporations, super-rich people and other criminals to avoid and evade taxes [1].

Panama Papers shows that the potential for tax revenues of Indonesia is evaporating very large amounts. This shows that the world including Indonesia is already in an era of tax evasion. This should be a momentum for the Government of Indonesia to immediately eradicate the practice of tax evasion, tax evasion and money laundering practices by Indonesian taxpayers, both individuals and legal entities.

Panama Papers also shows the poor financial system and global economy. Economic system, must be done rearrangement. Indonesia needs to pioneer changes in global financial governance related to taxation system, cessation of taxation and banking data confidentiality regime, exchange of interstate information and strengthening of law, administration and institutional taxation.

The potential tax evaporated from Indonesia due to the practice of illegal money laundering each year is predicted by Global Financial Integrity (GFI) of almost IDR 200 trillion each year. The high rate of illegal money flow from Indonesia is due to the low level of taxpayer compliance (rich, super rich, and corporate) , the high prevalence of tax corruption, the practice of embezzlement and tax evasion by complicated methods of financial finance, the low performance of Indonesian tax authorities. Publish What You Pay Coalition (PWYP) states that Indonesia is in the 7th position of countries from countries that have the highest flow of money forbidden. In the period of 2003-2012, Indonesia failed to deliver Rp 187,844 million (IDR 1,699 trillion with an average exchange rate of IDR 9,000 / USD) or an average of USD 18.7784 million (IDR 167 trillion per year). With the same method of calculation, PWYP Indonesia records the total estimated flow of illicit money in Indonesia in 2014 of IDR. 2.277 trillionor equivalent to 11.7% of the total APBN-P Year 2014.

In response to the emergency issue of this tax crime, the Just Tax Forum asks the government to also cancel the plan of giving tax amnesty to the super taxpayer because it will be counter-productive to the effort of optimizing tax revenue. It will also be a step back in taxation-money laundering law enforcement. In addition, tax forgiveness will lower the level of taxpayer compliance to pay taxes, tax forgiveness will weaken the government's' prestige in the presence of super-rich and corporate and tax pardons will hurt the small-to-medium taxpayers (salariat, monthly wage) during this obedient tax pay. This is discussed in the Fair Tax Forum. The Fair Tax Forum comprises a number of institutions, including Perkumpulan Prakarsa, Seknas PWYP Indonesia, International NGO for Indonesia Development (INFID), Transparency International Indonesia (TII), ASPPUK, The Habibie Center, ICW (Indonesia Corruption Watch), IGJ (Indonesian for Global Justice), IHCS (Indonesian Human Rights Committee for Social Justice), ILR (Indonesian Legal Roundtable), P3M (Association of Pesantren and Community Development), YAPPIKA and YLKI (Indonesian Consumer Service Foundation).

According to the above description, Panama Papers should be a momentum for the Government of Indonesia to immediately eradicate the practice of tax evasion, tax evasion, and money laundering by Indonesian taxpayers, both individuals and legal entities.

In tax avoidance practice, the taxpayer does not clearly violate the law or interpret the law but is inconsistent with the intent and purpose of the law. Tax avoidance practices undertaken by the management of a company solely.

1.1 Research Purposes

The purpose of this study to know empirically to analyze the influence of company characteristics with proxy profitability, leverage, size, capital intensity, and inventory intensity against tax avoidance).

2 Literature Review

2.1 Tax Avoidance

According (Nurfadilah *et al.*, 2015), tax avoidance is an arrangement to minimize or eliminate the tax burden by considering the resulting taxes [2]. According to Suandy (2013), tax avoidance is a legal tax-deductible undertaking by utilizing provisions in the field of taxation optimally, such as exceptions and deductions that are permitted as well as the benefits of unregulated matters and weaknesses is in the applicable tax laws. Tax avoidance can be measured by Effective Tax Rate (ETR) [3]. One way to measure how well a company manages its taxes is by looking at its effective rates. Tax evasion in this study was measured using Effective Tax Rate (ETR) by calculating the income tax expense paid divided by commercial profit before tax [3]. The greater the value of ETR then the lower the rate of tax evasion of a company.

2.2 Company Characteristics

Company characteristic is a characteristic or attribute attached to an entity [4]. The characteristics of the company can be seen from various aspects, including the profitability of the company, the level of liquidity, financial leverage, share ownership, firm size, type of business or industry and others, Zadeh and Eskandari, (2012) in (Mulyani, Darminto and N.P, 2014) [5]. In this study the characteristics of companies used through proxy profitability, leverage, size, capital intensity, and inventory intensity.

2.3 Profitability

Profitability is the ability of a company to earn profit (profit) in a certain period. According (Fahmi, 2013), profitability is a ratio that measures the effectiveness of management as a whole indicated by the size of the level of profit gained in relation to sales and investment. The better the profitability ratio, the better the ability to capture the high profits of the company. An approach that can reflect the company's profitability is return on assets (ROA) [6].

2.4 Leverage

Leverage or solvency is a measure of how much assets owned by the company is financed by debt [7]. According to(Ariawan and Setiawan, 2017), Leverage is a ratio that shows the amount of debt owned by the company or the level of debt used by the company to finance its operating activities [8]. In this research, leverage ratio is measured using Debt to Total Asset Ratio (DAR). Debt to Total Asset Ratio (DAR) is one of the ratios used to measure the amount of company assets in which the ratio is used to measure how much the company's assets are financed by total debt [7].

2.5 Size of Company

Company size as a scale or value that can classify a company into categories large or small based on total assets, log size, and so on. The larger the size of the company, the transactions will be more complex, Respect and Marfua'ah [9]. Large firms have greater access and wider

access to external sources of funding, so getting a loan will be easier because large firms have a greater chance of winning the competition or staying in the industry [10]. The size of the company is measured based on the total assets owned by the company. this consideration is because the total assets of the company is relatively more stable than the amount of sales and market capitalization value.

2.6 Capital Intensity

Capital intensity describes how much of a company's wealth is invested in fixed assets. The intensity of ownership of a fixed asset may affect the company's tax expense due to depreciation expense attached to fixed assets. Depreciation expense incurred on the ownership of a fixed asset will affect the company's taxes, it is because depreciation expense is one of the burdens that reduce taxes Blocher, 2007 [11]. Capital intensity ratio is an investment activity conducted by a company related to investment in the form of fixed assets (capital intensity) and inventory (inventory intensity). The ratio of capital intensity can show the level of efficiency of the company in using its assets to generate sales [12].

2.7 Inventory Intensity

Inventory intensity is one of the components of assets that is measured by comparing the total inventory with total assets owned by the company, [9]. The higher the inventory intensity, the more effective and efficient the company will be in managing its inventory. The Inventory Intensity Ratio shows the effectiveness and efficiency of a company to manage its investment in inventories reflected in the number of times that inventory is played during a given period [13]. If the inventory intensity of firms is high then the level of costs will decrease and increase the amount of profit, the higher the inventory intensity will increase the level of corporate tax aggressiveness [11].

2.8 Framework

This research focuses on veriabel which is expected to influence tax avoidance that is influence of company characteristic which proxied by profitability, leverage, size, capital intensity and inventory intensity at manufacturing company sub sector of consumption industry listed on BEI in 2014- 2016. Here is a picture of the theoretical framework developed by researchers as follows:
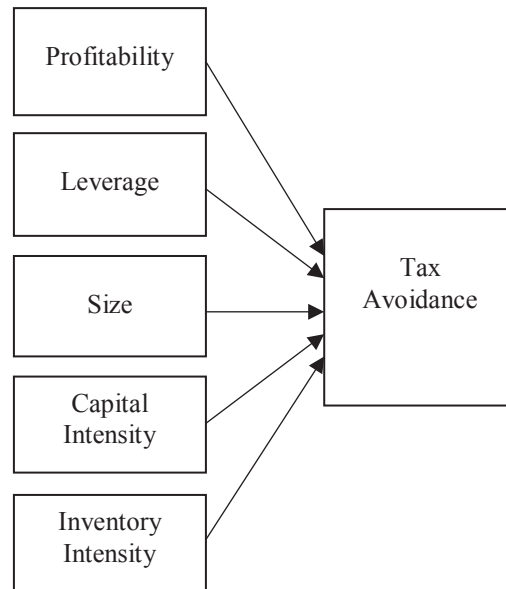
Fig. 1. Theoretical framework.

2.9 Research Hypothesis

Based on the indication of the problem, the foundation of the theory and previous research, the proposed hypothesis is as follows:

Profitability is one measure for the performance of a company. Profitability of a company shows the ability to generate profit in certain period at a certain level of sales, assets and capital stock. Profitability consists of several ratios, one of which is return on assets (ROA). Return on assets serves to measure the effectiveness of the company in the use of its resources, Siahaan (2004), in [7]. This ratio is most often highlighted in the analysis of financial statements because it can show the success of a company in generating profits within a certain period. The higher the ROA, the greater the profit earned by the company. Related research conducted by Darmawan (2014) and Dewinta and Setiawan (2016) that the ROA has a positive effect on tax avoidance [14], [7]. Based on the description, the hypothesis in this study are as follows:

H1:Company Characteristics Proxy Profitability has an effect on tax avoidance.

Leverage is a ratio to measure the extent to which firms use debt to finance investments. Leverage is measured by using the ratio of debt to equity ratio (DER). Debt toi equity ratio (DER) is the ratio of total debt to total equity of the company as a source of funding, [7]. It can be concluded that the higher the value of the leverage ratio, the higher the amount of debt funding from third parties used by the company and the higher the interest cost arising from the debt. In this case, high interest costs will give effect to the reduction of corporate tax. Related research conducted by(Koming Ayu Praditasari and Ery Setiawan, 2017) and (Ariawan and Setiawan, 2017) which in his research showed that leverage has a positive effect

on tax avoidance [15],[8]. Based on the description in the above, the hypothesis used in this study are:

H2: Characteristics of Proxy Leverage companies influence tax avoidance.

Large companies are better able to use their resources to make better tax planning. However, the company can not always use its power to perform better tax planning because of the limits of the possibility of being the spotlight and the target of the regulatory decision - political cost theory [16]. Company size is a classification of a company based on the amount of assets it has. Large companies are also considered mature and relatively easier to gain access to capital markets [17]. Then it can be concluded the greater the asset the greater the size of the company. Siregar and Widyawati (2016) conducted a study related to the influence of corporate characteristics against tax evasion [9]. The results show that firm size has a positive effect on tax avoidance rate. Based on the description, the hypothesis used in this study are as follows:

H3: Company Characteristics Proxy Size has an effect on tax evasion.

Capital intensity is the ratio between fixed assets such as equipment, machinery and property to total assets, which represents the size of the company's assets invested in fixed assets required by the company to operate as indicated in percentages, [12]. In research conducted by Dewinta and Setiawan (2016) that capital intensity have a positive effect on tax avoidance [7]. Based on the research, the hypothesis used in this research is:

H4: Company Characteristics Proxy Capital Intensity has an effect on tax evasion.

Understanding of inventory intensity ratio is the effectiveness and efficiency of a company to manage its investment in inventory reflected in several times that inventory is played during a certain period (Etty and Rasita, 2005 in [9]. Inventory intensity ratio is one part of the asset that is proxied by comparing the total inventory with the total assets owned by the firm. Companies that invest in inventory in warehouses will cause the establishment of maintenance and storage costs of the inventory resulting in the company's total expenses will increase so it will be able to reduce the company's profit [12]. The results of research conducted by (Nugroho, Ahmar and Darmansyah, 2016), inventory intensity has a significant effect on tax avoidance (Tax Avoidance) Based on the result of the research, the hypothesis for this research is [11]:

H5: Characteristics of Proxy Inventory intensity companies have an effect on tax.

3   Research Method

3.1   Data collection technique

This study uses secondary data collected by writer that is in the form of financial statement data of manufacturing company of industrial sector of consumer goods listed in Indonesia Stock Exchange (BEI) year 2014 until period of year 2016, which have complete data in that period and published in website Bursa Efek Indonesia with the website http://www.idx.co.id/.

3.2   Population and Sample Research

The population in this research is manufacturing company of industrial sector of consumer goods listed in Indonesia Stock Exchange (BEI) from 2014 until 2016, which the data can be

measured through the characteristic of companies that proxies through profitability, leverage, size, capital intensity and inventory intensity.

The sample in this research use Purposive Sampling technique. The criteria in the selection of this study sample, as follows:

1. Manufacturing Companies of the Consumer Goods Sector Industry listed on the Indonesia Stock Exchange (BEI) during the observation period, ie 2014-2016.

2. Manufacturing Company in the Consumer Goods Industry Sector which suffered losses in 2014-2016 has no tax burden.

3. Companies with incomplete financial statements.

3.3 Research model

The method of research in this study the authors use multiple linear regression because the authors analyze the influence of some independent variables on one dependent variable. The structural equation for the multiple linear regression analysis model is:

$$Y= \alpha + \beta 1 X1+ \beta 2 X2 + \beta 3 X3 + \beta 4 X4 + \beta 5 X5 + \varepsilon$$

As explain as:
Y = Taxable Avoidance Variable
α = Constants
β1 = Regression coefficients Proportional company characteristics Profitability
β2 = Regression coefficient Characteristics of Leverage proxy companies
β3 = Regression coefficient Characteristics of proxy companies Size
β4 = Regression coefficients Characteristics of proxy firms Capital Intensity
β5 = Regression coefficient Characteristics of proxy firms Inventory Intensity
X1 = Profitability
X2 = Leverage
X3 = Size
X4 = Capital Intensity
X5 = Inventory Intensity
ε = Error

3.4 Operational Research Variables

This study uses five independent variables, namely Profitability, Leverage, Size, Capital Intensity, Inventory Intensity and one dependent variable is tax avoidance (Tax Avoidance). The variables are as follow:

Table 1. Operasional Variable.

Variable	Indicator	Scale	Data Source
Tax Avoidance (Y) (Nugroho, Ahmar and Darmansyah, 2016)	$ETR = \dfrac{tax\ expense}{Earning\ before\ tax}$	Rasio	Financial statements

Profitability (X$_1$) (Ariawan and Setiawan, 2017)	ROA $= \dfrac{Net\ Income\ After\ Tax}{Total\ Assets}$	Rasio	Financial statements
Leverage (X$_2$) (Dewinta and Setiawan, 2016)	DAR $= \dfrac{Total\ liabilities}{Total\ Assets}$	Rasio	Financial statements
Size (X$_3$) (Christina Widhya Utami, 2013) [18]	SZE $= LN\ (Total\ Assets)$	Rasio	Financial statements
Capital Intensity (X$_4$) (Darmawan, 2014)	CAP $= \dfrac{Total\ net\ Fixed\ Assets}{Total\ Assets}$	Rasio	Financial statements
Inventory Intensity (X$_5$) (Andini dan Sukartha, 2017)	$INV = \dfrac{Total\ Inventory}{Total\ Assets}$	Rasio	Financial statements

3.5 Classic Assumption Test

3.5.1 Normality test

The following results of the normality test using the Kolmogorov-Smirnov Test One-Sample test.

Table 2. One-Sample Kolmogorov-Smirnov Test.

		Unstandardized Residual
N		55
Normal Parameters[a,b]	Mean	0E-7
	Std. Deviation	,03411472
Most Extreme Differences	Absolute	,060
	Positive	,060
	Negative	-,043
Kolmogorov-Smirnov Z		,443
Asymp. Sig. (2-tailed)		,989

a. Test distribution is Normal
b. Calculated from data

Based on the One Sample Kolmogorov-Smirnov table seen on Asymp. Sig. (2-tailed) of 0.989. The significance value greater than 0.05 indicates that the data is normally distributed and this data is feasible for research.

3.5.2 Multicollinearity Test

The following results are presented Multicollinearity test.

Table 3. Coefficients[a]

Model	Collinearity Statistics	
	Tolerance	VIF
Constant		
ROA	,320	3,123
LEV	,384	2,605
SZE	,422	2,368
CAP	,286	3,492
INV	,315	3,172

a. Dependent Variabel: ETR

From the results of multicolinearity testing in table 4.9 above, can be seen the value of VIF and Tolerance in the regression model in the test. It can be seen that the Company Characteristic variables consisting of ROA, LEV, SZE, CAP, INV proxies show VIF values smaller than 10 and tolerance rates show above 0.10, so it can be said that this regression model does not have multicollinearity problem.

3.5.3 Heteroscedasticity Test

The following results of Heteroscedasticity test

Table 4. Test Glejser.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	,153	,094		1,628	,110
ROA	-,100	,073	-,331	-1,378	,174
1 LEV	-,021	,032	-,142	-,647	,521
SZE	-,003	,003	-,279	-1,336	,188
CAP	-,022	,030	-,183	-,720	,475
INV	-,001	,059	-,005	-,021	,984

a. Dependent Variable: Abs_Res

Based on the results of SPSS output in the above table, seen from the sig column for profitability, leverage, Size, Capital Intensity and Inventory Intensity> 0,05 so it can not conclude heteroskedastisitas.

3.5.4 Autocorrelation Test

The following results are submittedAutocorrelation test.

Table 5. Model Summary[b].

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,457[a]	,209	,128	,03581	2,178

a. Predictors: (Constant), INV, LEV, SZE, ROA, CAP

b. Dependent Variable: ETR

By looking at the autocorrelation test output, it shows that the Durbin Watson (DW) value in the statistical calculation is 2.178. From the Durbin Watson table with the number of samples (N) is 55, the free variable (K) is 5. There is a upper limit value (dU) of 1.7681 and the lower limit value (dL) of 1.3743. In this autocorrelation test analysis with Durbin Watson (dU (1,7681) <DW (2,178) <2,2319 there is no autocorrelation.

3.5.5 Determination Coefficient Test (R2)

The following results of Coefficient Determination test.

Table 6. Model Summary[b].

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,457[a]	,209	,128	,03581	2,178

a. Predictors: (Constant), INV, LEV, SZE, ROA, CAP
b. Dependent Variable: ETR

Based on the above table, the value of Adjusted R Square (R2) is equal to 0.128 or (12.8%). It can be concluded that 12.8% of the tax avoidance value of food and beverage manufacturing companies is determined by the characteristics of firms proxied by profitability, leverage, size, capital intensity, inventory intensity while the remaining 87.2% (100% - 12.8%) due to other variables outside the study.

3.5.6 Analysis of Model Feasibility Test Result

The following results of the feasibility test of the Model.

Table 7. ANNOVA.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,017	5	,003	2,588	,037[b]
	Residual	,063	49	,001		
	Total	,079	54			

a. Dependent Variable: ETR
b. Predictors: (Constant), INV, LEV, SZE, ROA, CAP

From the above explanation, the result of F test in this research shows that the conclusion obtained is Ha accepted, which means that the Company Characteristic proxied by profitability, leverage, size, capital intensity and inventory intensity simultaneously have significant effect on tax avoidance (Tax Avoidance). So it can be concluded the model is worth using.

3.5.7 Hypothesis Testing Research (Test T)

Hypothesis testing in this study aims to determine whether or not the influence of independent variables individually to the dependent variable tested at a significant level of 0.05 (Ghozali, 2013)

Table 8. Test T.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,561	,173		3,234	,002		
	ROA	-,369	,134	-,617	-2,746	,008	,320	3,123
	LEV	-,029	,059	-,102	-,497	,621	,384	2,605
	SZE	-,006	,005	-,245	-1,255	,215	,422	2,368
	CAP	-,136	,056	-,573	-2,413	,020	,286	3,492
	INV	-,279	,109	-,578	-2,554	,014	,315	3,172

a. Dependent Variable: ETR

Researchers formulate regression model as follows:
Y= 0,561 - 0,369(X1) - 0,029(X2)- 0,006(X3) - 0,136(X4) -0,279(X5)ε
As explain:
α = Value of Constant, ie Y if X1, X2, X3, X4, X5 = 0
X1 - X5 = Regression coefficient of each Independent Variable
ε = Error (interference factor)

3.6 Interpretation of Research Results

3.6.1 Influence Characteristics of proxy companies Profitability against Tax Avoidance.

Corporate Characteristics ROA proxy has a negative effect on tax avoidance which means higher profitability level, the lower the tax avoidance level (Tax Avoidance). The high value of ROA cause the company's performance better. The value of profitability will affect the actions taken by the company. Management considers the availability of information from the value of profitability, and considers the implications and implications of actions taken implicitly and explicitly including actions to practice tax avoidance. Errors arising from improper action taking will affect the company's image [19]. Theory of reasoned action explains how firm behavior is influenced by a basic consideration of the desired behavior. Companies with good profitability are assumed not to tax avoidance because the company's image will be bad if the company does the practice. This is in line with the results of research conducted by (Khusniyah Tri Ambarukmi, 2017) which states that profitability has a significant negative effect on tax avoidance [12]. But the results of this study are not in line with the results of research conducted by (Siregar and Widyawati, 2016) which states profitability has no effect on tax avoidance [9].

3.6.2 Influence Characteristics of leverage proxy companies Against Tax Avoidance.

Company Characteristics of leverage proxy has no significant effect on Tax Avoidance. Due to the large amount of funding a company can not determine the practice of tax avoidance. This is because the use of debt to the company is to meet the operational needs and investment companies, so the size of the leverage does not affect the avoidance of taxes. The results of this study are in line with the research conducted by (Nurfadilah *et al.*, 2015), namely Leverage has no effect on tax avoidance [2] and (Ngadiman and Puspitasari, 2014) stated that Leverage has no significant effect [20]. However, the results of this study are not in line with research conducted by (Koming Ayu Praditasari and Ery Setiawan, 2017) and (Ariawan and Setiawan, 2017) proving that leverage partially positively affect tax avoidance [15], [8].

3.6.3 Influence Characteristics of proxy company Size against Tax Avoidance

Not have a significant effect on Tax avoidance. Companies that belong to large-scale companies will have abundant resources that can be used for specific purposes [14]. The size of the company (Size) shows the stability and ability of the company to conduct its economic activities. Whether large or small, the size of the company, if the company's records and bookkeeping properly and in accordance with company policies and regulations, then no effect on tax evasion. This research is in line with research conducted by (Nurfadilah *et al.*, 2015) Declared that firm size (Size) has no significant effect on tax avoidance (Tax Avoidance) [2]. However, this study is not in line with research conducted (Dharma and Ardiana, 2016) which states that size has a significant effect tax avoidance [3].

3.6.4 Influence Characteristics of the company's proxy Inventory Intensity against Tax Avoidance

Characteristics of proxy capital intensity companies have a negative and significant effect on tax evasion. That is, the higher the capital intensity then the tax evasion of companies will be lower. The greater the amount of capital invested the greater the tax avoidance by the company. Rodriguez and Arias (in (Zulaikha, 2014) say that the company's fixed assets allow

the company to reduce its taxes due to depreciation arising from fixed assets annually [21]. This is because the depreciation expense of this fixed asset will directly reduce the company's profit on which the company's tax calculation is based. The results of this study support the results of (Putri and Launtania, 2016) states that Capital Intensity effect on tax avoidance (Tax Avoidance) [13]. While the results of this study are not in line that is done (Siregar and Widyawati, 2016) which states capital intensity has no positive effect on tax avoidance [9].

3.6.5 Influence Characteristics of proxy companies Capital Intensity Tax Avoidance (Tax Avoidance)

Characteristics of INV Company proxies have a negative effect on tax evasion (ETR). In other words, if the inventory intensity of the company increases then it will affect the level of tax evasion by the company. Capital intensity and inventory intensity are the asset mix asset variables that become substitutes for each other. High inventory intensity will increase the company's net profit because the costs contained in the inventory can be efficient. The Company will increase the ending inventory to reduce inventory intensity and increase the costs contained within the company to reduce the company's profit so that its tax burden decreases. The results of this study are in line with the research (Nugroho, Ahmar and Darmansyah, 2016), states that Inventory Intensity affect tax avoidance (Tax Avoidance) [11]. While this research is not in line with (Khusniyah Tri Ambarukmi, 2017)(Putri and Launtania, 2016), states that Inventory Intensity has no effect on tax avoidance (Tax Avoidance) [12],[13].

4   Conclusions

Based on data the result described in the previous chapter, it can be concluded that:
1. Characteristics of Profitability proxy companies have a negative effect on tax avoidance.
2. Characteristics of Leverage proxy companies have no effect on tax evasion.
3. Characteristics of proxy companies Size has no effect on tax avoidance.
4. Characteristics of Capital Intensity proxy companies have a negative effect on tax avoidance
5. Characteristics of proxy companies Inventory Intensity negatively affect the avoidance of taxes

4.1   Managerial Implications

In research to reduce the tax burden the management can perform various ways such as tax avoidance. This is not in line with the research conducted there are four variables that have no effect, including:
1. For Sub Sector of Food and Beverage Companies Expected to be additional information for the characteristics of the company that there is potential in tax avoidance (Tax Avoidance), Because it will have an impact on the financial sector causingequalities between the budget and other consequences associated with it, such as tariff increase taxes and the state of inflation as well as for the economic sector cause stagnation (stalled) economic growth or rotation wheel economy.

2. For Investors

Can be a reference in making investment decisions by knowing the detection of companies that do tax avoidance (Tax Avoidance).

3. For Regulators

Can be a reference government in the preparation of regulations on tax avoidance (Tax Avoidance), so that State tax revenue has increased.

4.2 Limitations of Research

Limitations of this study are:

1. In this study only tested the characteristics of the company proxied by Profitability, Leverage, Size, Capital Intensity and Inventory Intensity.
2. The observation time period in the study was conducted at 5 years (2012-2016).
3. The sample of research involves only 11 manufacturing companies with the Food and Beverage Industry sector listed on the Indonesia Stock Exchange (BEI).

4.3 Suggestion

Based on the conclusions and limitations of the research mentioned above, some suggestions may be given as follows:

1. Further research is expected to conduct research on companies listed on the Indonesia Stock Exchange (BEI) engaged in a broader field and not limited to food and beverage manufacturing.
2. For future researchers who will examine the same thing by considering other factors such as sales growth, audit committee, and others.
3. Further research not only uses the Effective Tax Rate (ETR) as a measurement in the search for tax avoidance, it should be added with other measurements such as Cash Effective Tax Rate (CETR), and the timeframe should be extended to find out the long-term research impact and get a prediction which is more appropriate.
4. The next researcher is expected to use a sample of the company and a longer study period in order to obtain better results.

For firms the object of the study is expected to evaluate the performance of the company, and not to avoid tax evasion, since tax evasion will lead to tax witnesses. And for the government it is expected that the fiscal increase the supervision or monitoring of companies that report their tax obligations and ensure that the company applies the applicable Financial Accounting Standards, so that no companies will avoid taxes.

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Optimization of Degree Regenced Segment Lines Detection Using Ant Colony Optimization Algorithm

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Abstract. Edge detection is an important operation in digital image analysis to get a better image as needed. In the edge detection process to determine the location of the points that are the edge of the object. The purpose of edge detection is to detect borders that constrain two areas of image, object and background. In this paper will be done pre-image processing by eliminating noise using Geometric Mean Filter algorithm then will be done edge detection using compass operators and will be calculated MSE and PSNR, then as a comparison with line detection with Hough Transform algorithm and edge detection with Ant Colony algorithm. The results obtained are reduced error and increase Peak to Noise Ratio (PSNR).

Keywords: Edge detection, Ant Colony optimization, Compass operator

1 Introduction

To get the image information analyzed, an image edge detection process is required. Until now, it is known that image edge detection method is still less than optimal because it produces incomplete, unclear, or disconnected image edges. Therefore, an image edge detection method should be developed so that the information intensity is incomplete because the edges of the disconnected image can be reduced. Ant Colony Optimization (ACO) is an optimization algorithm based on ant colony behavior. ACO uses a probabilistic approach to the graph problem. By using ACO, the problem of calculating process duration in determining the optimal path in terms of graph can be reduced. ACO is the optimal path search method on parallel search-based graphs and each agent has the ability to view and remember it.

2. Methods

2.1. Edge Detection

The edge of the image is a change in the intensity value of gray/fast (large) at close range. While the edge detection in the image is an automated process that can recognize the edges of the image object. Edge detection is an operation performed to detect edges that limit two different areas of homogeneous imagery [1]. Edge detection on images is a process that produces the edges of a drawing object, which aims to:

1. To mark the part that becomes the detail of the image.
2. Fixed the details of blurred images, which occurred due to errors or effects of the image acquisition process.
3. And change the 2D image into curve shape.

2.2. Compass Operator

The compass operator is a routine operator used in image processing problems. this operator performs gradient calculations on 8 wind direction by using convolution matrix S, N, SE, NW, W, E, SW and NE.

2.3. Ant Colony Optimization (ACO) algorithm

The working principle of ACO is that the ant always leaves a special chemical (pheromone) on the path through it during the trip [3]. The pheromone left by the ant at a point it passes will be used by the ant behind to guide it on the way. The more ants that pass through these pathways the more pheromones will be, so the possibility of other ants following the path will be greater. Furthermore, the pheromone left by the ants on the road will evaporate over time.

2.4. Hough Transformation

The Hough Transformation was first introduced by Paul Hough in 1962 to detect a straight line. Hough Transformation is a picture transformation technique that can be used to isolate or in other words acquire the image feature. Since the purpose of transformation is to get more specific features, Classical Hough Transform is the most common technique used to detect curved objects such as lines, circles, ellipses and parabolas. The main advantage of the Hough transform is that it can detect a margin with a gap at the feature boundary and is relatively unaffected by noise or noise. By using the parametric form fromHough transform and uses the poll to determine the exact parameter value. If in the picture there are several lines intersecting at one point, then when the point is transformed into the parameter space m-c it will be found that the transformation on the parameter space m-c is a straight line with the line.

2.5. The Scheme of System

To maximize the results of image detection, then performed advanced image processing of edge detection results with Ant Colony Optimization algorithm (ACO). Prior to edge detection, the input image is first processed to remove noise using the Geometric Mean Filter algorithm and add contrast with the Histogram Equalization algorithm. Then the image of the processing and the image of the edge detection results are modeled into an ant colony. Transforming the input image's result to the ant colony will be optimized with ACO. The transformed colony is then transformed back into an output image. The tested images are evaluated for performance using

ground truth imagery.Compatible edge detection performance of Compass operator and line edge detection with Hough Transform and ACO algorithms are evaluated based on the results of image processing and ground truth imagery.

In this study the algorithm for image processing of edge detection results is Ant Colony Optimization (ACO) with the following stages:

a. Reading of image pixel values

Before the image processing done, firstly done pixel image value reading which likes true color 24 bit image. The reading serves to create the red, green and blue (RGB) color matrix images.

b. Preprocessing the image.

Prior to edge detection, the input image is first processed by increasing its contrast with the Histogram Equalization algorithm and eliminating noise using the Geometric Mean Filter algorithm.

c. Image edge detection with the Compass operator.

In the image prapengolahan done edge detection with the Kompas operator which aims to reinforce the edges of objects in the image. Edge detection operator This compass uses the eight-point wind kernel.

d. Detect lines and circles on the image with the Hough Transform algorithm

In the image edge detection results with the operator Compass done detection lines and circles to make improvements to the lines and circles of objects on the image is disconnected (degraded).

e. Image Edge Detection with ACO Algorithm

In the process of image edge detection with ACO algorithm, the input image needs to be transformed into a graph. ACO algorithm is only able to do optimization if the problem is graph. The two-dimensional image input image is converted to gray image. Then the pixel value is taken to be a graph node. The node represents the places that ants can visit that have the corresponding pixel information. The node is connected to neighboring pixels according to the original image. Of the overall pixels that have been converted to nodes, are evaluated to determine the endpoint. At each endpoint is placed one ant for the initial location of the graph search. Then created tabulist which is the visibility matrix of paths that exist between the nodes. The value of the tabulist determines which node each destination will move

f. In image edge detection result with ACO algorithm is calculated value of MSE and PSNR that is difference value of initial image before processed with image result of process.

2.6. Mean Square Error (MSE) and Peak Signal to Noise Ratio (PSNR)

The MSE in the statistics is the mean square of error which is the difference between the original image and the processing image. The smaller the MSE value the similarity level between the original image and the higher processing image the MSE is used to measure the average error derived from the amount to be estimated. The formula for calculating MSE can be seen as equation 2.9 [4].

$$MSE = \frac{1}{N} \sum_{i=1}^{n} (S - S_e)^2$$

2.7. Data Set


```
                    Start

              Input Citra Asli

          Pembacaan Nilai Piksel Citra

      Kontras Citra Histogram Equalization

      Reduksi Noise Geometric Mean Filter

          Deteksi Tepi Kompas ──────┐
                                     │
                            Transformasi Hough
                                     │
                                    ACO
                                     │
          Hitung MSE dan PSNR ◄──────┘

                  Citra Hasil

                    Stop
```
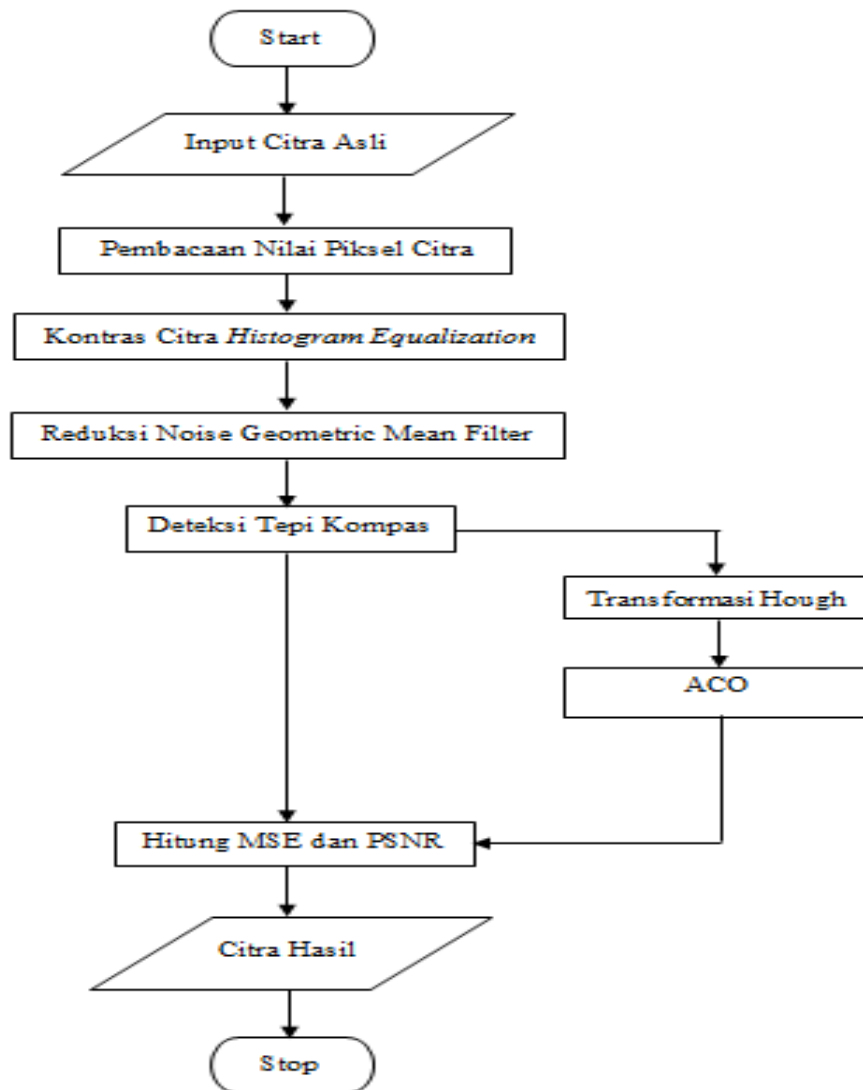
Figure 1. Dataset

3. Result

The result of image segmentation test with the ant colony optimization algorithm is a test with 400 x 300 pixel image dimension which yields mse, psnr and segmented image.
The mse and pnsr values of the image segmentation using ant colony optimization can be seen in the following table:

Table 1. The threshold values of MSE and PSNR Compass Edge Detection Algorithm

No	File Cover	Size (kbyte)	Parameter	
			MSE	PSNR
1	Image 1	30,95	14783,98	17,63
2	Image 2	55,39	5326,37	13,20
3	Image 3	25,54	10956,15	16,33
4	Image 4	147,71	11577,97	16,57
5	Image 5	9,97	6791,76	14,25
6	Image 6	48,67	14652,47	17,59
7	Image 7	19,93	6418,92	14,00
8	Image 8	38,71	19274,65	18,78
9	Image 9	22,85	4584,58	12,55
10	Image 10	55,29	5387,97	13,25
	Average		9975,48	15,41

Table 2. The threshold values of MSE and PSNR The Result of Combination Algorithm

No	File Cover	Size (kbyte)	Parameter	
			MSE	PSNR
1	Image 1	30,95	0,1183	33,3323
2	Image 2	55,39	0,1244	33,1161
3	Image 3	25,54	0,1094	33,6752
4	Image 4	147,71	0,1348	32,7680
5	Image 5	9,97	0,1150	33,4552
6	Image 6	48,67	0,1225	33,1812
7	Image 7	19,93	0,1169	33,3839
8	Image 8	38,71	0,1153	33,4458
9	Image 9	22,85	0,1411	32,5680
10	Image 10	55,29	0,1169	33,3867
	Average		0,1214	33,2312

4. Conclusions

From the results of the research, it can be seen that the results by using the compass algorithm only are very different from using a combination algorithm that is the compass algorithm, hough transformation and ant colony algorithm, thus from Mean Square Error (MSE) and Peak Signal to Noise Ratio (PSNR) the combination algorithm can be seen better.

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The Increasing of Soybeans Production on Dry Land Using Intercropping System

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Abstract. Soybean production in Indonesia is still low, meanwhile the demand of soybeans keeps increasing every year. The utilization of dry land based on intercropping system is one of solutions to achieve the production target. The research employedfield experiment with Group Randomized Design (hereafter RAK shorten from RancanganAcakKelompok) of non-factorial by conducting cropping pattern I(soybeans, corns, and red chillies were planted in one plot), cropping patternII (soybeans were planted in two rows in one plot; corns were planted in two rows in one plot, and red chillies were planted in two rows in one plot). Cropping pattern III (soybeans were planted, and next to the soybeans, corns and red chillies were planted in three rows in one plot). The research was conducted based on the observation on the number of pods per plant, the number of piths of pods per plant, and the weight of 100 seeds. The result of research shows that on the average number of podsper plant, piths of pods per plant, and the weight of 100 seeds, the development tends to be linear.

Keywords: Soybeans, dry land, intercropping

1 Introduction

The need of soybean keeps increasing meanwhile the productivity of soybeans is still low due to the factor of high import every year. The situation is worsening by the shrinkle of agriculture land because of land competition between soybeans and other *palawija* crops (other crops besides rice that is usually planted in a rice field, such as nut, corns, and so forth). The situation happens since Indonesian country does not have specific land to plant soybeanslike ricefield have to plant paddy. One of the solutions to develop soybeans is by utilizing dry land using intercropping system.

Dry land is one of agroecosystems which has big potency for agriculture businesses; one of those is *palawija* crops. However, dry land has low fertility level, particularly the erosion lands thus layers of soil becomes thin and is low of organic substances [1]. By intercropping system, it is expected that symbiosis happens among plants in order to increase soil fertility.

In this research, intercropping system was using corns and red chillies. The aim of cropping pattern arrangement based on intercropping system is to enable the land surface to be covered in order to reduce evaporation. Corns have large land cover because the morphology

of bigger plants is expected to reduce evaporation so that the water needs for soybeans can be fulfilled.

Water shortage happens because of limit amount of water from its environment [2]. The plant with lack of water supply on root area and the excessive water requirement by leaves will cause evaporationacceleration [3]. Plants have different responses regarding to water shortage based on physiological, morphological aspects, growing levels, and productivity. Water deficiency suffered by plants will influence their growth and cell development, synthesis of protein, and synthesis of cell wall [4].

Developed Soybean varietal in this research was *kipas putih*which is local varietal from Aceh that has potency to be local excellent varietal because it has adapted and is appropriate to land condition in Aceh. *Kipas Putih*is resistance from falling down, rust leaf tolerance, and adapts well on dry land and rain-fed rice-field therefore it is very appropriate to be developed on dry land.

The result of research reveals that soybeans planted with intercropping of cornsare able to increase their production 50% higher if compared with monoculture system. Soybean planting as intercropping on corn crop is also able to improve the land fertility because there is fixation of N if compared with monoculturesystem of corns (Research and Development Body of Agriculture, 2015). It is expected that this research becomes a cultivation technology which enables to increase soybean production in the future.

2   Methods

The implementation of field research employed Group Randomized Design (hereafter RAK shorten from Random Design Group) of non-factorial. The treatment of **cropping pattern I** was that soy beans, corns, and red chillies were planted together in one plot, which size of plot was9 m x 4 m. The distance planting of corn was100 cm x 30 cm; the distance planting of soybeans was50 cm x 30 cm; the distance planting of red chillies was 100 cm x 50 cm. The treatment of cropping patternIIwasthatsoybeans were planted in one plot with two rows; The distance planting was100 cm x 30 cm; corns were planted in one plot with two rows, the distance planting was 50 cm x 30 cm; red chillies were planted in one plot with two rows, the distance planting was 100 cm x 50 cm. The third treatment wascropping patternIII, which soybeans were planted in three rows with planting distance was100 cm x 30 cm, corns were planted next to the soybeans in three rows which planting distance was 50 cm x 30 cm,and red chillies with three rows with planting distance was 100 cm x 50 cm. Control treatment wasasthe comparison which three commodities were planted in monoculture way: planting distance of corns was 100 x 30 cm; planting distance of soybeans was 50 cm x 30 cm andplanting distance of red chillies was 100 cm x 50 cm, with size of plot was 9 m x 4 m. Each cropping pattern had three arrangement combinations of treatments with three repetitions with total of 27 units of experiment plots for one cropping pattern plot. The size of plots was900 cm x 400 cm, the distance among plots was 50; in cropping pattern I, planting distance was 100 cm x 30 cm; the planting distance of soybeans was 100 cm x 30 cm, and the planting distance of red chillies was 100 cm x 50 cm. In cropping pattern II and III, planting distances of corns were 100 cm x 30 cm; planting distance of soybeans was 50 cm x 30 cm, and planting distance of red chillies was 100 cm x 50 cm. The arrangement of planting distance of intercropping of corns with soybeans and red chillieswas on cropping pattern system. Whole experiment units were repeated three times.

3   Research Implementation

The cultivated land for planting should be cleaned up first from grass and other dirt,and then the soil was treated using tractor and was flattened. Furthermore, the plots were made with size of each plot was9 m x 4 m, the distance among beds was 50 cm and the distance among blockswas 50 cm. The soybean seed planting with distance of 50 cm x 30 cm, corns were done by dibble sticks with distance 100 cm x 30 cm, and each hole was planted with two seeds of corns, red chillies were planted with distance 100 cm x 50 cm. The spacing was done in order to allow the optimal growing condition of soybean, corn, and red chilli plants.

The maintenance of soybeans, corns, and red chillies consisted of weed control, sticthing, and pests and deseases control. The watering was done twice a day in morning and afternoon in order to prevent the plants from water deficiency however watering was not done during rainy days. The stitching aimed to change the plants which were growing in abnormal way or regarding to dead seeds, the stiching was done for one week after planting period. The pest and disease control were done if corns, red chillies, and soybeans were affected by pests and diseases. The harvest of soybeans was done at the age 85-90 days after planting time, the ripen plants with physiologic form characterized by 95 % of pods was already in brown colour, the leaves turned to dry and fall, as well as the age of plants was adequate to be harvested.

4   Result and Discussion

4.1.   The Number of Pods Per Year

The average calculation of the number of pods persoybean planting using dry land optimally based on intercropping treatment of corns and red chillies indicates that the development tends to be linear (figure 36).

Figure36 shows that those samples3, 5 on planting 1 (one) rowhas increasing number of pods per soybean planting as the rows of corns and red chillies increase. Meanwhile, on samples of rows 1, 6, 12, the increasing number of pods per plants is up to 2 (dua) rows of intercropping of corns and red chillies, however the increasing of 3 (three) rows of intercropping does not contribute the effect on the increasing number of pods per soybean plant.

The different responses of number of pods per plant are because thoseare influenced by variety of development vegetative periods of varietal and environmental condition. This research used*kipas putih* varietal which has the stem growth of semi-determinate.The development of stem keeps continuing well although the plants have flowered. Thus it affects on the competition to result photosynthesis, and the potency of miscarriage of flower is bigger. The percentage of success of flowers to form pods determines the number of pods per plant.

Intercropping system influences the environmental condition of soybean growth which is the length of days and the temperature. It was found on planting 2(two) rows of soybeans which caused the increasing number of pods per plant on samples 8, 10 with the increasing rows of corns and red chillies. Meanwhile on samples 2, 12, it shows that there is no increasing number of pods per soybean plant with the increasing rows of corns and red chillies as intercropping plants.

The increasing number of rows of corns as intercropping reduces the reception of sunlight by soybeans. The morphology of taller corns causes changes the length of the day and temperature in soybean rows. The length of the day in soybeans' rows exceeded the critical limit which causes the decreasing number of pods per plant of soybeans with the increasing number of rows of corns and red chillies.

It is shown that on samples, 4, 6, 10 on the planting of 3 (three) rows, the increasing number of pods per plant of soybeans is up to 2 (two) rows of intercropping of corns and red chillies. The increasing number of intercropping becomes3 (three) rows of corns and red chillies does not cause the increasing number of pods per plant.

Soybean varietal will flower if the dark period received daily is less than 10 hours. On the other hand, the soybean plants will flower fast if the dark period is between 14-16 hours per day(Adie & Krisnawati, 2008). The effect on changeof length of the day and temperature in rows of soybeans is that the percentage of flower becoming pods is not optimal.
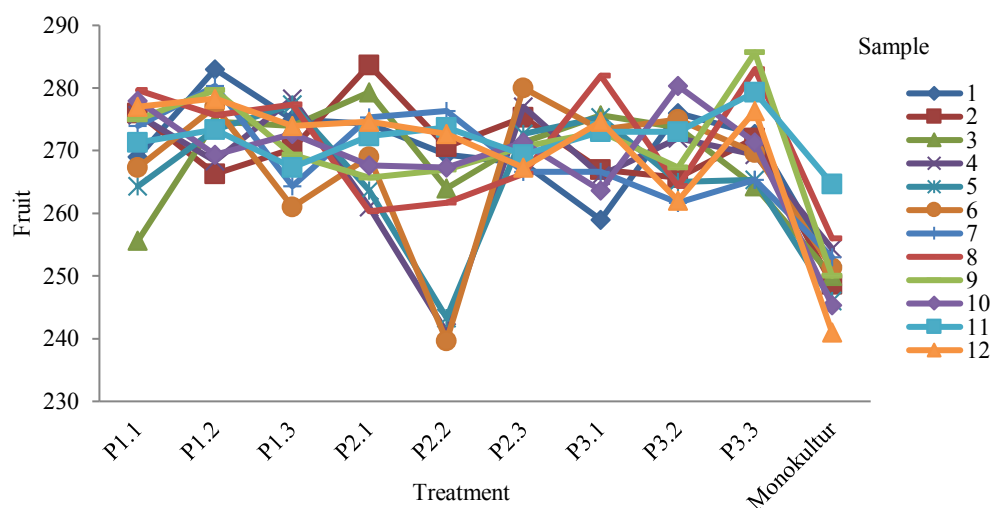
Graphic Information:
From sample1 to 12 for cropping patterns I, II and III of all repetitions.

$y = -1{,}64x + 278{,}8$
$R^2 = 0{,}309$

$y = -1{,}323x + 271{,}9$
$R^2 = 0{,}118$

$y = -1{,}014x + 275{,}9$
$R^2 = 0{,}105$

$y = -1{,}666x + 278{,}7$
$R^2 = 0{,}305$

$y = -0{,}436x + 268{,}7$
$R^2 = 0{,}011$

$y = -1{,}513x + 277{,}0$
$R^2 = 0{,}228$

$y = -0{,}780x + 272{,}5$
$R^2 = 0{,}061$

$y = -2{,}078x + 279{,}8$
$R^2 = 0{,}595$

$y = 0{,}049x + 271{,}4$
$R^2 = 0{,}001$

$$y = -1,004x + 271,8 \qquad y = -0,951x + 275,8 \qquad y = -2,444x + 283,2$$
$$R^2 = 0,069 \qquad\qquad R^2 = 0,083 \qquad\qquad R^2 = 0,433$$

Figure 36. The average number of pods per soybean plant on intercropping pattern of corns and red chillies.

4.2. Total Piths of Pods Per Plant

The average calculation of total piths of pods per soybean plant on the optimally used dry land based on intercropping treatment of corns and red chillies shows that the development tends to be linear (figure 37).

Figure 37 shows that the samples 11, 12on planting 1 (one) rowshave increasing number of piths of pods per soybean plant as the number of rows of corns and red chillies as intercropping increases. The number of pods varies in one of flowering, and one pod in general contains from 1-3 seeds per pod. It is caused by the research site on dry land which has chemical fertility and low rainfall. However the average number of piths of pods per plant is higher than monoculture system as the control.

Pod filling is the critical period for soybeans in achieving the number piths of pods per plant optimally. The fresh weight and the maximum size of seed will be attained from 5-15 days after flowering [5]. The water shortage happens because dry land is identic with low groundwater content and the air temperature is high. The research location which is hilly and windy speed is high causing low rainfall. The increasing number of rows of intercropping of corns and red chillies causes the creasing competition among sample plants. It can be seen on samples 8, 9, 10 that the number of piths of pods increases per plant just 2 (two) rows of corns and red chillies. The increasing of 3 (three) rows does not cause the increasing number of piths of pods per plant.

The increasing number of soybeans into 2 (two) rows has caused the increasing number of piths of pods with the increasing rows of corns and red chillies as intercropping which only happens on sample 10. On the other hand, the samples 3, 4, 5, 6, which cause the increasing number of piths of pods only on 2 (two) rows ofcorns and red chillies and the raising number of rows became 3 (three) rows of corns and red chillies do not cause the increasing number of pith of pods per plant.

The planting 3 (three) rows of soybeans causes the increasing number of piths of pods per plant on samples 7, 9, 10. However on the other samples, the increasing number of piths of pods per soybean plant does not occur as the number of rows of corns and red chillies increases. The raising population by increasing number of rows of soybeans cause the competition on the water demand, nutrient, and sunlight higher. It is assumed that the factor that affects the decreasing number of piths of pods because dry land has low chemical fertility and low groundwater content.

The research was conducted on dry land with hilly topography and thin layer organic substance. The soil layer becomes thin and the level of organic substance is low because the land is eroded [6]. Organic substance has crucial role in improving chemical character, physic, and soil biology. Although the contribution of soil organic matter as substance resource is relatively low, its role is prominent as the source of NPK and other essential resources such as C, Zn, Cu, Mo, Ca, Mg, and Si [7].

The pest-sucking attack on pods during filling phase became main factor that many samples were not able to increase the number of piths of pods per plant. The research on the field was difficult to accommodate the land free of pest and disease however the preventive action using pesticide had been done even the result was not maximal in controlling the pest-sucking attack on the pods.

The loss of production due to the pest-sucking attack reaches up to 79% [8]. The attack happens during pod formation and after pod formation completely. It causes the shrink of seeds, deflated seed, and pod miscarriage [9]. The other effect is the black spits on the seeds that cause the quality of the seeds decreases [10].
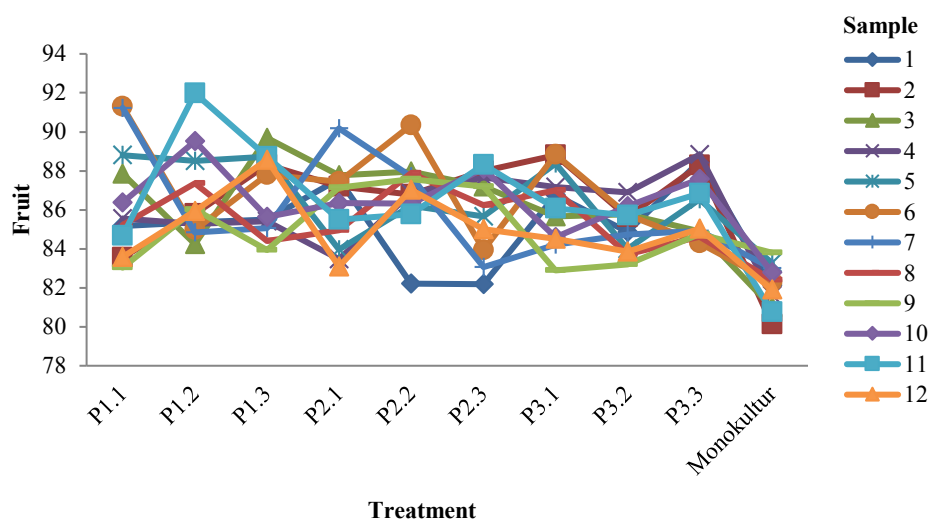
Graphic information:
From samples 1 to samples 12 for cropping patterns of I, II and III of all repetition

$y = -0,066x + 85,38$
$R^2 = 0,007$

$y = -0,452x + 88,89$
$R^2 = 0,405$

$y = -0,112x + 85,57$
$R^2 = 0,033$

$y = -0,126x + 86,94$
$R^2 = 0,020$

$y = -0,595x + 89,97$
$R^2 = 0,378$

$y = -0,281x + 87,88$
$R^2 = 0,211$

$y = -0,508x + 88,99$
$R^2 = 0,391$

$y = -0,591x + 89,14$
$R^2 = 0,393$

$y = -0,497x + 89,17$
$R^2 = 0,265$

$y = 0,051x + 85,59$
$R^2 = 0,005$

$y = -0,262x + 86,82$
$R^2 = 0,212$

$y = -0,259x + 86,27$
$R^2 = 0,161$

Figure 37.   The average calculation of number of pith of pods of soybeans on intercropping patterns of corns and red chillies.

4.3. Weight of 100 Seeds

The average calculation of weight of 100 seeds of soybeans on the optimized dry land utilization based on intercropping treatment of corns and red chillies shows that the development tends to be linear (Figure38).

Figure 38 shows sample 1 on planting 1 (one) row that weight of 100 seeds of soybeans increases as the number of rows of corns and red chillies increases. However the increasing is not significant which it is assumed that the strategic location of samples, and attains the input production maximally during the growth period so that the weight of 100 seeds is higher than other samples.

Furthermore, on samples 6, 11 weight of 100 seeds increases up to 2 (two) rows of corns and red chillies. The increasing of 3 (three) rows of corns and red chillies as intercropping does not cause the increasing of weight of 100 seeds of soybeans. It happened on samples 4, 8, 10with the absence of weight of 100 seeds of soybeans which were planted based on intercropping of corns and red chillies.

The planting of intercropping in 1 (one) row of soybeans with some rows of corns and soybeans does not enable to increase the weight of 100 seeds in significant way. However the average weight of 100 seeds based on intercropping system is higher than monoculture system as the control. It indicates that the symbiosisin intercropping system of corns and red chillies is needed to investigate further.

The increasing rows of soybeans that become 2 (two) rows causes the increasing of weight of 100 seeds only on sample 3, 8. In contrary, samples 6, 7 10, has increasing only 2 (two)rowsofcorns and red chillies but the increasing of 3 (three) rows of corns and red chillies does not cause the increasing weight of 100 seeds of soybeans. In fact, at the sample 12, it does not cause the increasing weight of 100 seeds of soybeans with the increasing rows of corns and red chillies as intercropping plants.

By the increasing of soybeans in 2 (two)rows, the population becomeshigher.Meanwhile the filling and ripen periods are critical phases to gain weight of 100 seeds optimally. The water demand, nutrient, and sunlight are required at the same time but dry land is only able to provide the limited water supply. It causes the increasing number of rows of soybeans and intercropping plants thus the weight of 100 seeds does not increase.

The planting of 3 (three) rows which can be seen at sample 11 on the planting of 3 (three) rows causesthe increasing weight of 100 seeds of soybeans as the rows of corns and red chillies increase. On the other hand, on the samples 4, 5, 6, 12, the increasing weight of 100 seeds just happens on 2 (two) rows of corns and red chillies. The increasing of 3 (three)rowscorns and red chillies as intercropping plantsdoes not increase the weight of 100 seeds of soybeans.

Most of the seeds are composed of cotyledon and are coated by *testa* (peel seed) and in between them, there is endosperm layer [11]. Cotyledon is endosperm that is resulted from the process of fertilization between male gametes and the core of embryo [12]. Endosperm cells are the cells which contain large amount of carbohydrate and fat as the result of photosynthesis process [12]. The weight of 100 seeds relies heavily from the amount of those carbohydrate and fat.
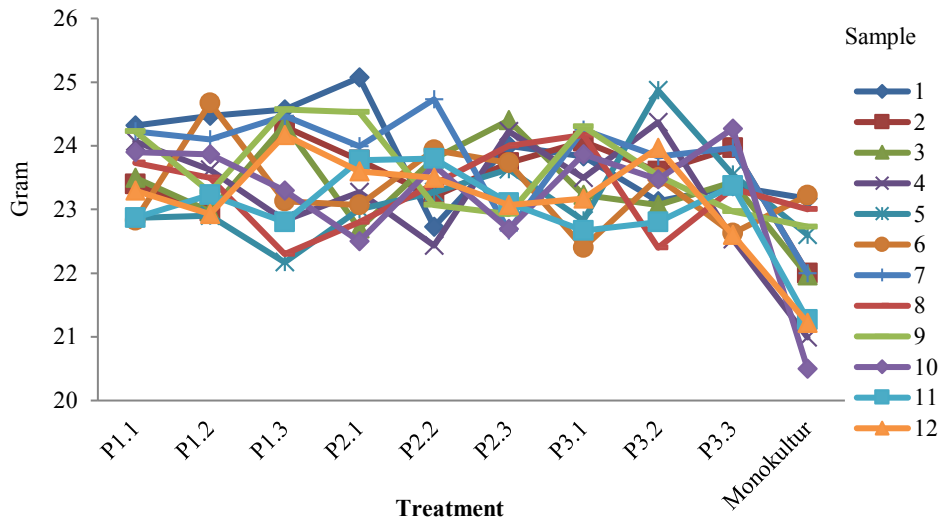
Graphic Information :
From samples 1 to samples 12 for cropping patterns of I, II and III of all repetition

y = -0,168x + 24,79 R² = 0,457	y = 0,093x + 22,65 R² = 0,148	⁹ y = -0,131x + 24,33 R² = 0,302
y = -0,046x + 23,75 R² = 0,045	y = -0,067x + 23,68 R² = 0,092	1 y = -0,144x + 24,00 0 R² = 0,158
y = -0,089x + 23,83 R² = 0,135	y = -0,154x + 24,67 R² = 0,308	1 y = -0,105x + 23,54 1 R² = 0,199
y = -0,152x + 24,02 R² = 0,201	y = -0,015x + 23,34 R² = 0,005	1 y = -0,143x + 23,94 2 R² = 0,278

Figure 38.   The average weight of 100 seeds of soybeans on intercropping patterns of corns and red chillies.

5   Conclusions

1.   The using of intercropping system of corns and red chillies has potency to increase soybean production which can be found from the number of pods per plant, the number of piths of pods per plant, and the weight of 100 seeds.

2.   The planting on 2 (dua) rows of soybeans with 1 (one) row intercropping of corns and soybeans as the optimal dense population is in order to increase soybean production.

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The Empirical Study of Parents Perceptions on Exposure of Expert System to Recognize The Children Disease

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Abstract. The development of computers has transformed many changes very rapidly nowadays, it is simultaneously with the increasingly complex human needs. The advancement of an expert system is concerned to be used by parents to assist them in efforts to detect early childhood illnesses before medical treatment is done. This study aims to obtain a conclusion of measurement of acceptance of pediatric disease expert system. The partial testing of perceived is established usefulness and perceived ease of use variables has a positive result on attitude toward using on system usage. The positive influence is interpreted the better the perceived usefulness perceived user (user perceived usefulness) formed the more assured the attitude of the user (attitude toward using) in using the system. On the contrary, the research results is shown the perceived ease of use has no positive result on actual system usage on system usage. This is because the user response to the way the operation of the system is still said to be complicated and inflexible.

Keywords: Expert System, Children Disease, perceived usefulness, perceived ease of use, attitude toward using, actual system usage

1 Introduction

The computer advancement has undergone many changes very rapidly, along with the increasingly complex human needs. Computers have been used broadly in various fields now, for example: business, healthcare, education, psychology, games and so on. The experts are encouraged to further to develop computers in order to help human work or even exceed the ability of human labor.

Health is a valuable thing for humans because they experiences health problems. Children are very defenseless to germs and a lack of sensitivity to the symptoms of a disease is a fear for the parents themselves. The general parents are not always trained medically so they are less able to understand the sign of a disease and determine it. The allegedly system computer construction can be utilized by parents to solve this problem.

The expert system (ES) is an area of artificial intelligence (AI), and advanced by the artificial intelligence society in the midle of 1960s. The behind fundamental idea of Expert System is simply transferred skill from human to computer expertize. The information is stored on the computer and the user requests specific recommendation from the computer as

required. Computers can think and come to certain conclusions. Then, like a consultant, it advises and explains, if asked, the logic behind the suggestion [1]. The Expert System, the AI core, is defined by Edward Feigenbaum of StanfordUniversity as "an intelligent computer program that uses knowledge and inference procedures to solve quite difficult problems that require significant human expertise for their solutions". This definition is understood as one of the most accepted definitions of Expert Systems [2]. In its development, the Expert Support System (MDSS) is an emerging technology that can improve the accuracy of diagnostic decisions by enhancing the natural capabilities of human diagnostic experts in complex medical diagnostic processes [3].

The theoretically fact is the computer is able to solve problems on the other hand the necessity of systems that can help parents in detecting the disease of children. It will confirm the results of disease analysis based on temporary symptoms to the parents then need to develop the system by placing the user needs as a basis of consideration. Evaluating a user's acceptance system is an important step in order to perform for a successful system development. This study aims to obtain a conclusion of measurement of acceptance of pediatric disease expert system.

2 Related Research

The previous studies have been considerably attempted to measure the extent to which the intelligent system is acceptable to the user community. Davis (1993) in his research discusses the reason users accept or reject the information system and method user acceptance is typically affected by the features of the design of the built system. The field study is applied of 112 users against two systems was established to examine hypothetical models through questionnaires. The results concluded that attitudes toward use, perceived usefulness and perceived ease of use fully mediate the effect of system design features on their use [4]. Horan et al., (2004) established a model of concept for online detection of systems by physicians and examined the socio-structural model of work using a national look at of 141 physicians [5]. Zheng (2006) uses an approach that mixing the evaluation by combining the quantitative model development trajectories with qualitative assessment to analyse the adoption of clinical measurement technology and leprosy acceptance behavior [6]. Al-Nassar et al., (2011) investigated several factors that influence the use of EMR in Jordan and consequently provide the right conclusions for decision-makers to consider applying a better EMR system. From the analysis, it shows that there is a significant association among new technology and perceived technology that makes peoples believe that health care professionals look after to consider adopting new technology as a positive as long as it results in improved efficiency and quality [7]. Gallant et al., (2010) studied the website at the hospital and concluded that all factors such as perceived usefulness, perceived ease of use, trust and privacy are highly relevant to the e-health context [8]. Esmaeilzadeh et al., (2013) identifies several factors that influence the adoption of Health Information Technology professionals (IT). pediatric disease expert system [9].

3 The Research Method

The explanatory research is used and built a prototype of an expert system used to detect childhood illness. The researchers install the Dempster Shafer theory in our prototype [10]. Shafer's Dempster theory is a combination, representation and propagation of uncertainty, the theory has some characteristics that are institutive in accordance with the way an expert thinks. In general the Dempster Shafer theory is written in an interval: [Belief, Plausibility]. Belief (Bel) is a measure of the strength of evidence in favor of a set of propositions. If the value is 0 then indicates that there is no evidence, and if value 1 indicates a certainty. Plausibility (Pls) reduces the level of certainty of the evidence. Plausibility is 0 to 1. If X is convinced, it can be said that Bel (X) = 1, so the above formula values from Pls (X) = 0.

The study will explain the causal relationship between research variables through hypothesis testing. It will test the hypothesis proposed and expected to expound the relationship and influence of the variables. The quantitative approach is used of surveys were conducted in an effort to collect primary data. Primary data was obtained by distributing questionnaires to a number of respondents who previously had tried to use a prototype built system. The questionnaire contains some statements and questions. The research is used Technological Acceptance Model (TAM) model to analyze factors influencing acceptance of system usage [11]. Hypothesis testing is done by using path analysis (path analysis) as the development of multiple regression analysis with significance level = 0.05. Figures 1 and 2 show the research model. There are two substructure that must be tested are:
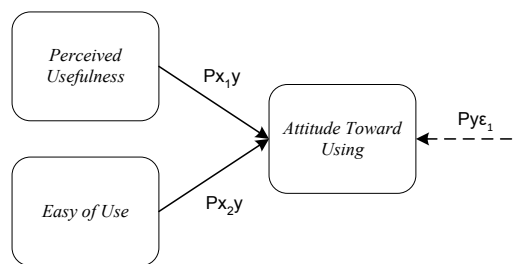
Fig. 1. Substructure 1 on Y.

Sub structural 1 tested the effect of perceived usefulness (X1), perceived ease of use (X2) to attitude toward using (Y).
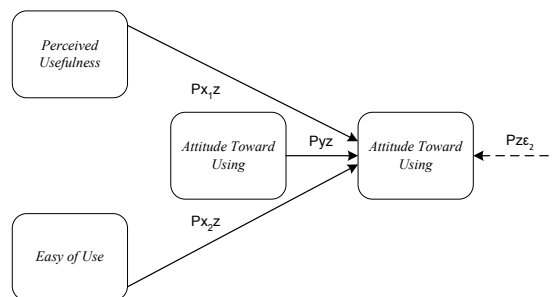
Fig. 2. Substructure 2 against Z

Substructure 2 which tests the effect of perceived usefulness (X1), perceived ease of use (X2) and attitude toward using (Y) against actual system usage (Z).

Indicators of each of the collisions used in this study are presented in table 1. Measurements to the items of each indicator using the Likert scale of 5 points. Likert scale is used to measure attitudes, opinions and perceptions of a person or group of people against each indicator in a range of scales.

4 Result and Discussion

The primary data is obtained from the spread of questionnaires or specified questionnaires sample as has been previously stated. The questionnaire was made in Bahasa Indonesia and printed 100 questionnaires. Questionnaires were distributed to married people, have children and they are applied to manage the electronics device such as smartphones or computers in Kosambi district, Tangerang. Questionnaires were distributed twice. The first questionnaire distributed to approximately 50 respondents, the results of the questionnaire is tested the validity and reliability test using SPSS software (Statistical Product and Service). If the test results meet the desired criteria then the dissemination done to 50 other respondents.

Table 1. Constructive research indicators

Construct	Indicator	No Item
perceived usefulness	Work more quickly	1
	Job Performance	2
	Increase productivity	3
	Effectiveness	4
	Makes job easier	5
	Useful	6
perceived ease of use	Ease of learning	7
	Controllable	8
	Understandable and clear	9
	Flexible	10
	Ease of understanding	11
	Easy to use	12
attitude toward using	Interacted comfortably	13
	Applied delightfully	14
	Managed Enjoyably	15
	Interesting	16
actual system usage	Applied fully	17
	Frequency of use	18
	Satisfaction of use	19, 20

Referred on the respondents' responses on the results of the questionnaire data collected, the validity tests results are conducted using software SPSS (Statistical Product and Service) is presented in table 2.

Based on the responses of respondents on the results of the questionnaire data collected, the reliability test performed using software SPSS (Statistical Product and Service). The results obtained for reliability testing are presented in Table 3.

The Heteroscedasticity tests were performed to define the residual observation variance inequality was observed to another. Based on the responses of respondents on the results of data collected questionnaires. The test result is conducted using SPSS software. (Statistical Product and Service) is shown in Figure 3.

The simultaneous influence test is used to expose the independent variables synchronously or simultaneously affect the dependent variable. Based on the responses of respondents on the results of the questionnaire data collected and the simultaneous hypothesis test results are presented in table 4 (substructure 1) and table 5 (substructure 2).

Table 2. Instrument validity test results.

Variable	Question Code	Person Product	Criteria
perceived usefulness	PU1	.623	High
	PU2	.515	Moderate
	PU3	.633	High
	PU4	.617	High
	PU5	.523	Moderate
	PU6	.534	Moderate
perceived ease of use	PEOU1	.546	Moderate
	PEOU2	.616	High
	PEOU3	.648	High
	PEOU4	.629	High
	PEOU5	.671	High
	PEOU6	.617	High
attitude toward using	ATU1	.560	Moderate
	ATU1	.527	Moderate
	ATU1	.471	Moderate
	ATU1	.492	Moderate
attitude toward using	ASU1	.694	High
	ASU2	.599	Moderate
	ASU3	.610	High
	ASU4	.659	High

Table 3. Instrument reliability test results.

Variable	Cronbach's Alpha	Description
X1: perceived usefulness	.812	Reliable
X2: perceived easy of use	.842	Reliable
Y1: attitude toward using	.723	Reliable
Z1: actual system usage	.817	Reliable
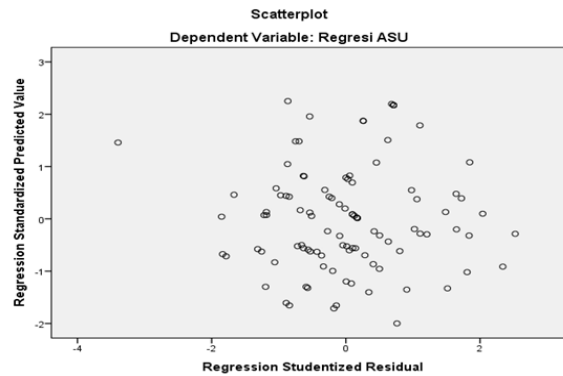
Fig. 3. Results scatter plot heteroscedasticity test.

Table 4. Simultaneous hypothesis test results sub structure1.

ANOVA^a

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regresion	77.610	2	38.805	175.978	.000^b
1	Residual	21.390	97	.221		
	Total	99.000	99			

a. Dependent Variable: Regression ATU

b. Predictors: (Constant), Regression PEOU, Regression PU

Table 5. Results of sub structural simultaneous hypothesis test 2.

ANOVA^a

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regresion	49.501	3	16.500	32.001	.000^b
1	Residual	49.499	96	.516		
	Total	99.000	99			

a. Dependent Variable: Regression ASU

b. Predictors: (Constant), Regression ATU, Regression PU, Regression PEOU

The Sig value is shown in the ANOVA table of 0.000b. Meanwhile, The ANOVA table has a value smaller than the significant value that has been set that is 0.005 based on table 4 and table 5. It can be concluded that there is influence between independent variables together to dependent variable and individual testing can be done.

The Individual influence test is applied to determine the partial influence of independent variables to the dependent variable. the results of individual hypothesis testing is presented in table 6 (substructure 1) and table 7 (substructure 2), it is reflected on the responses of respondents on the results of the questionnaire data collected

Table 6. Individual hypothesis test results sub structure 1.

	Model	Standardized Coefficients Beta	T	Sig.
1	(Constant)		.000	1.000
	Regression PU	.334	5.051	.000
	Regression PEOU	.619	9.360	.000

a. Dependent Variable: Regression ATU

The results is shown the Sig value Based on table 6. PU regression in the table of 0.000, where the value of Sig. in the table has a value smaller than the predefined significance value of 0.05, so it can be achieve the influence of variable perceived usefulness toward attitude toward using variable on the use of expert system diagnosis of child disease and Sig value. PEOU regression on the table of 0.000, so it can be concluded that there is influence of perceived ease of use variable to attitude toward using variable on the use of expert system diagnosis of childhood disease.

The results is shown the Sig value Based on table 7. PU regression in the table of 0.000, where the value of Sig. in the table has a value smaller than the predefined significance value of 0.05, so it can be concluded that there is influence of perceived usefulness variable to actual system use variable on the use of expert system diagnoses childhood disease and Sig value. PEOU regression in the table of 0.732, so it can be concluded that there is no effect of perceived ease of use variable against actual system use variable on the use of expert system diagnosis of childhood disease and Sig value. ATU regression in the table of 0.631, so it can be concluded that there is no effect of attitude toward using variable on actual system use variable on the use of expert system diagnosis of childhood disease.

The comprehensive influence of each variable can be seen from the path diagram presented in figure 4.
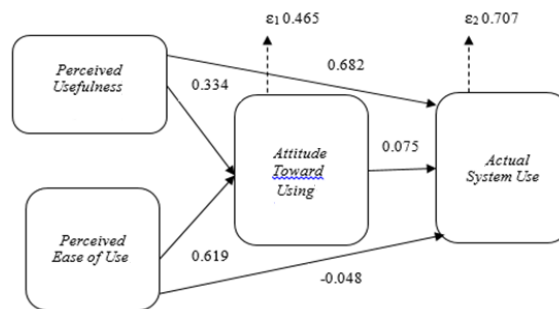
Fig. 4. Results of Line Chart Analysis

5 Conclusion

After confirming and testing of the hypothesis, the research results can be concluded as follows:

1. The partial testing of perceived usefulness variables has a positive effect on attitude toward using on system usage. The interpretation positive influence gives the better the perceived usefulness perceived user (user perceived usefulness) formed the more assured the attitude of the user (attitude toward using) in using the system.

2. The partial testing of perceived usefulness variables has a positive effect on attitude toward using on the use. The interpretation positive influence gives the better the perceived user perception of perceived (perceived ease of use) that is formed then the more confident the attitude of the user (attitude toward using) in using the system.

3. The partial testing of perceived usefulness variables has a positive effect on actual system usage on system usage. This means that the more productive a system is made, the higher the frequency of users accessing the system. These attitudes and behaviors will then affect the intentions of the users to use the future diagnostic disease system of children in the future.

4. The partial testing of attitude toward using variable has no positive effect on actual system usage on system usage. This is probably because the user is still less confident with the results released by the system. The average interpretation of each indicator for attitude toward using variable is good in data.

5. The simultaneous testing is found perceived usefulness variables, perceived ease of use and attitude toward using on actual system usage had a positive impact on system usage.

6. The partial testing of perceived ease of use variables did not have a positive effect on actual system usage on system usage. This is because the user response to the way the system's operation is still said to be complicated and inflexible.

6 Limitations and Further Research

Technological Acceptance Model is most extensively accepted by many researchers but this study can be made substantially after the actual expert systems are built and surveyed to ensure actual acceptability and it is not just related on their attitude to the prototype built in this study so that there is a real picture. This will further enhance the testing of the expert system's effectiveness, usability and functionality and the quality of information.

Moreover, it is recommended to develop the new models and utilized the power of the Technological Acceptance Model and throw away its weaknesses. For an important work, geopolitical zones must be considered in the future to gain a broader view of the attitudes and opinions of the public towards the application of expert systems.

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Cocoa Beans Digital Image Classification Based On Color Features using Multiclass Ensemble Least-Squares Support Vector Machine

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Abstract. This research aims to determine the quality of cocoa beans through their fermentation status of their digital images. Samples of cocoa beans were scattered on a bright white paper under a controlled lighting condition. A compact digital camera was used to capture the images. The images were then processed to extract their color parameters. Classification process begins with an analysis of cocoa beans image based on color feature extraction. Parameters of visual classification of cocoa beans were obtained by extraction of color feature parameters, i.e.: Red (R), Green (G), Blue (B), Hue (H), Saturation (S) and Value (V). Then the beans are classified into 3 classes, i.e., Fermented Beans, Un-Fermented Beans and Moldy Beans. The classification process using the Multiclass Ensemble Least-Squares Support Vector Machine (MELS-SVM) method starts with the training process to get the model, and then the model is used in the testing process to get accuracy. The classification model of input parameters from our 1,604 cocoa beans images based on the color features obtained accuracy of 99.281%.

Keywords: The Cocoa Beans Digital Image, Multiclass Ensemble Least-Squares, Vector Machine

1   Introduction

Indonesia is one of the producers of cocoa beans [1], most of cocoa production exported to America, Singapore, Malaysia, Brazil, and China. Indonesia's cocoa beans production significantly increases, but the quality produced is very low and various of them are less fermented, not dry enough, beans size is evently high skin content, high acidity, taste is very diverse and inconsistent. This is reflected in the relatively low price of Indonesian cocoa beans and discounted prices compared to similar products from other producer countries [2]. Cocoa plant (Theobroma cacao L.) is one of the important plantation commodities as a source of industrial raw materials trade commodities that can increase the country's foreign exchange and income of cocoa farmers.

Indonesian cocoa farmers generally apply a variety of fermentation ways in terms of beans quantity, fermentation means and time. Fermentation is done in baskets, simple wooden crates

or plastic bags. What farmers do is not real fermentation because most farmers keep the harvested beans in plastic bags for 1-2 days then dried by drying in direct sunlight on cement floors, mats or woven bamboo. The requirements or conditions used to determine the quality of cocoa beans in Indonesia are contained in the Indonesian national standard of cocoa beans SNI 2323-2008. The Indonesian national standard regulates the classification of the quality of dry cocoa beans as well as general requirements and in particular to maintain the consistency of the quality of the cocoa beans produced. At the exporter level, the separation is carried out by using machinery primarily for the classification of cocoa beans. The results of this cocoa bean sorting will be determined by taking samples of cocoa beans to be analyzed in the laboratory in accordance with the standards of cocoa beans quality classification.[3]

Quality examination of cocoa beans is done using traditional and manual procedures, namely by using the visual method on cocoa beans by choosing one by one cocoa beans. The human vision must accurately see the object on the surface of the cocoa beans. In plain view, a human without special knowledge can differentiate and classify cocoa beans. Usually, they only armed with experience and knowledge gained ealier. However, manual checks have limitations such as tired eyes and different analytical results of each examiner.

This classification system has two important aspects, image analysis and pattern recognition. Image analysis has standard techniques for identifying, measuring, and acquiring large quantities of quantitative data. Image processing techniques include image capture, pre-processing, interpretation, quantization and image classification. But unfortunately, the resulting image is still not in accordance with the results expected by the user. Therefore, the existence of a process that can process an image is needed by the user. The discipline that gave birth to the techniques to process the image is called Digital Image Processing (Digital Image Processing). [4].

2   Literature Review

Image processing techniques have been widely used in the field of agriculture such as determining the type of defects of coffee beans, edamame quality determination, quality inspection of RSS rubber, mango quality determination, identification of maturity level of lemon and mangosteen, identification of defective cocoa beans, quality determination of cocoa beans.

I Wayan Astika, Mohamad Solahudin, Andri Kurniawan, Yunindri Wulandari (2010), use ANN structures to develop the relationship between input parameters, quality components of cocoa beans and outputs. ANN classified cocoa beans into 3 parameters namely: Fermented Beans, Un-Fermented Beans and Moldy Beans.The classification of fermentation status has an accuracy of 88.54%, which consists of95.62% for fermented beans,81.72% for moldy beans, and71.43% for non fermented beans.[5]

S. Nurmuslimah (2016), created a software system that starts with taking pictures of files to display on the system interface, image is processed using edge detection sobel to get numeric data value. Furthermore, these data are used as data input training Neural Network Backpropagation. After training data is obtained, then the data is used for the testing process. From the testing process, the output of the created system is able to provide information about the quality of cocoa beans. Using Backpropagation method with alpha = 0.6, hidden layer = 3, fault tolerance = 0.0001, target = 0.9, resulting in a system that has a level of accuracy of (76%) has an error rate (24%) in determining the quality of cocoa beans.[6]

Data mining is a process that uses statistical techniques, calculations, artificial intelligence and machine learning to extract and identify useful information and related knowledge from large databases [7]. SVM initially can only classify data in two classes. However, further research SVM was developed so that it can classify data over two classes (multiclass) [8]. Classifying M-classes means predicting the class label $C_m, m = 1, \dots, M$ one way to solve the M-class problem by formulating it into binary L classification problems [9].

SVM concept is simply described as trying to find the best hyperplane that serves as a separator of two classes in the input space. Pattern which is a member of two classes: +1 and -1 and share alternate field separators. The best dividing fields can not only separate the data but also have the largest margins. Margin is the distance between the field of separator (hyperplane) with the closest pattern of each class.

Let $\{x_1, \dots, x_n\}$ be the dataset and $y_i \in \{+1, -1\}$ is the class label of the x_i data. The two classes are separated by a pair of parallel bounding plane. The first delimiter field limits the first class while the second delimiter field limits the second class, so it is obtained [9]:

$x_i. w + b \geq +1$ for $y_i = +1$

$x_i. w + b \leq -1$ for $y_i = -1$ \hspace{2cm} (1)

The best dividing fields with the largest margin values can be formulated into quadratic programming problems:

$$\min_{w,b,\xi} \frac{1}{2} \|w\|^2 + C \sum_{i=1}^{l} \xi_i \hspace{2cm} (2)$$

with constraints $y_i(x_i. w + b) \geq 1 - \xi_i$ and $\xi_i \geq 0$, where $l = 1, \dots, n$ is a slack slack variable that determines the level of misclassification of the data samples. While $C > 0$ is a parameter.

Method for classifying data that can not be separated linearly is kernel method. The kernel method transforms the data into the feature space dimension so that it can be linearly separated on the feature space. The kernel method can be formulated:

$$K(x_i. x_j) = \varphi(x_i). \varphi(x_j) \hspace{2cm} (3)$$

Commonly used kernel functions are as follows:

a. The linear kernel: $K(x_i, x_j) = x_i^T x_j$

b. Kernel polynomial:

$$K(x_i, x_j) = (\gamma. x_i^T x_j + r)^p, \gamma \geq 2$$

c. RBF Kernel (Radial Basis Function): $K(x_i, x_j) = exp\left(-\gamma \|x_i - x_j\|^2\right), \gamma > 0$

LS-SVM was first introduced by Suykens and Vandewalle in 1999. LS-SVM is one of the SVM modifications that solves linear equations. If the SVM separator field is given as in (3), then for LS-SVM is given as follows:

$$\min_{w,b,\xi} \frac{1}{2} \|w\|^2 + \frac{C}{2} \xi^T \xi \hspace{2cm} (4)$$

with constraint $y_i(x_i. w + b) \geq 1 - \xi_i$

The above equation can be solved after forming Lagrangian:

$L = \frac{1}{2} \|w\|^2 + \frac{C}{2} \xi^T \xi - \sum_{i=1}^{l} \alpha_i \left(y_i(\varphi(x_i). w + b) - 1 + \xi_i \right)$

\hspace{1cm} (5)

where α_i is a Lagrangian multiplier whose value can be either positive or negative.

To optimize the conditions in (5), a decrease of w, b, ξ, and α is equal to zero. The results of the process are as follows:

$$\frac{\partial L}{\partial w} = 0 \rightarrow w = \sum_{i=1}^{l} \alpha_i y_i \varphi(x_i) \hspace{2cm} (6)$$

$$\frac{\partial L}{\partial b} = 0 \rightarrow \sum_{i=1}^{l} \alpha_i y_i = 0 \hspace{2cm} (7)$$

$$\frac{\partial L}{\partial \xi} = 0 \ \rightarrow \alpha = \gamma \xi_i, \ i = 1, \dots, N \tag{8}$$

$$\frac{\partial L}{\partial \alpha} = 0 \ \rightarrow y_i(\varphi(x_i).w + b) - 1 + \xi_i = 0, i = 1, \dots, N$$

Using the One Against All (OAA) method, a binary binary model is constructed k (k is the number of classes). Each i-class model is trained by using the entire data. For example, there is a classification problem with 3 classes. For training use 3 pieces of binary classification. Its objective function:

$$\min_{w_i, b_i, \xi_{t,i}} \frac{1}{2} \sum_i^m (w_i)^T w_i + \frac{C}{2} \sum_i^m \xi_{t,i}^2 \tag{10}$$

with constraint $y_{t,i}(\varphi_i(x_t)(w_i)^T + b_i) \geq 1 - \xi_{t,i}$.

Confusion matrix is a table that states the amount of test data that is correctly classified and the amount of test data being misclassified

True Posstive (TP), ie the number of documents from class 1 is correctly classified as class 1.

True Negative (TN), ie the number of documents from class 0 is are correctly classified as class 0.

False Positive (FP), ie the number of documents from class 0 incorrectly classified as class 1.

False Negative (FN) is the number of documents from class 1 that are misclassified as class 0.

The calculation of accuracy is expressed by the equation:

$$\text{Akurasi} = \frac{TP + TN}{TP + FN + FP + TN} \times 100\%$$

The calculation of sensitivity is expressed by the equation:

$$\text{Sensitivity} = \frac{TP}{TP + FN} \times 100\%$$

The calculation of false discovery rate is expressed by the equation:

$$\text{False Discovery Rate} = \frac{FP}{FP + TP} \times 100\%$$

3 Methods

The process of classifying cocoa beans is explained by the following activities:
1. Cocoa bean image capture
2. Extraction of morphological features using image processing.
3. Conducting the training process to obtain the classification model
4. Conducting the classification process using test data
5. From the classification process in obtaining the results of the classification of cocoa beans based on morphological features.

3.1 Cocoa Beans Color Features

The most commonly used color feature models are RGB and HSV components. Digital image of cocoa beans that have been taken, processed using grayscale and thresholding and then done edge detection by using kernel sobel to detect the edge of the image. After that the

process of segmentation by masking and separating the image of cocoa beans per unit of seed. The separated cocoa bean image was then extracted by color extracting feature by extracting RGB mean data and HSV mean data

Figure 1. Results of the image analysis process for color features using matlab software

3.2 Dataset

Based on the color features are divided into three classes namely, first class for fermentedbeans, second grade for unfermented beans, and third grade for moldy beans. Attributes for dataset 1 consist of six pieces: Red (R), Green (G), Blue (B), Hue (H), Saturation (S) and Value (V). The data sample for dataset 1 is 1,604 items.

Variables used in this research are:

y_i=class of dataset that is class 1, class 2, class 3 and class 4.

x_i =data processed by LSSVM technique, xi consists of Red (R), Green (G), Blue (B), Hue (H), Saturation (S) dan Value (V).

α=Lagrange multiplier.

w =normal field to support vector.

b =distance of the bounding plane to the center point.

Values of α and b will be obtained after the training is completed. Value of α is then used to find the value of w.

3.3 Classification Process

The classification process is divided into two, training and testing process. The data used is the data of color feature extraction and morphological features as much as 100% data so it is expected to get the accuracy of multiclass classification on LS-SVM. Training process aims to build the MELS-SVM model by finding the parameters, ie values α, w, and b. After forming the MELS-SVM model, proceed with the testing process on the data to see the accuracy of the LS-SVM technique using the One Against All method.

Based on the workflow, the classification process begins with the training process on the train data to obtain α and b values using the Matlab r2016a software and the additional toolbox LSSVMlabv which can be downloaded on the site http://www.esat.kuleuven.be/sista/lssvmlab/ toolbox.html. In the training process that generates α and b values, the RBF kernel is used. Furthermore, after the obtained values of α and b, the next step is to find the value of w then the value of w and b are used to arrange the separator function.

After getting the separation function model from the training post, proceed to the testing process. The testing process begins by inserting the item values (xi) of the test data, then obtaining the prediction class. From this prediction class will be calculated the accuracy level of the method by finding the total class that is correctly predicted by the class of the test data.

3.4 Multiclass Algorithm Methods

The analysis used in this multiclass classification is the One Against All classification method. The multilingas method algorithm as follows:
1. Dataset input.
2. Identify the input dataset
   a. The values of the training data feature (x_i)
   b. Class of training data (yi)
   c. Values feature test data (xt_i)
   d. Class of test data (yt_i)
3. Initiate objects on LS-SVM before performing the training process with the initlssvm function
   a. Specify data of training data feature (x_i)
   b. Specifies the training data class (y_i),
   c. Choose a classifier to classify data
   d. Selects the *kernel* and its parameters to use
4. Selecting the multilingual method code used (*code_OneVsAll* for *One Against All*)
5. Conduct training process with trainlssvm function
6. Calculating values *w*
7. Make predictions based on the model obtained and determine data feature test data (xt_i) with simlssvm function
8. Create a *confusion matrix*
9. Calculate the level of accuracy with the formula:

$$\lambda = \frac{C}{N} \times 100\%$$

where C is the correct total of predictions and N is the total of all data tested.

3.5 Implementation Results on Dataset

The separator function for the one against all method with the RBF (Radial Basis Function) kernel using the parameter $\sigma = 0.5$ for dataset is as follows:

$$f_1(\boldsymbol{x}) = \boldsymbol{x}_i.\boldsymbol{w_1} + b = \boldsymbol{x}_i.\begin{pmatrix} 1{,}125.403 \\ 721.711 \\ 435.615 \\ -1{,}554.422 \\ 1{,}125.771 \\ 1{,}095.667 \end{pmatrix} + (-0{,}3984) \tag{1.1}$$

$$f_2(\boldsymbol{x}) = \boldsymbol{x}_i.\boldsymbol{w_2} + b = \boldsymbol{x}_i.\begin{pmatrix} 1{,}619.742 \\ 609.163 \\ 41.341 \\ -1{,}635.054 \\ 2{,}123.341 \\ 1{,}601.980 \end{pmatrix} + (-0{,}3596) \tag{1.2}$$

$$f_3(\boldsymbol{x}) = \boldsymbol{x}_i.\boldsymbol{w_3} + b = \boldsymbol{x}_i.\begin{pmatrix} -504.880 \\ 32.212 \\ 218.410 \\ -93.875 \\ -733.038 \\ -523.391 \end{pmatrix} + (-0{,}0372) \tag{1.3}$$

4   Results And Discussion

Values of *w* and *b* are based on RBF kernel and its parameters for the use of the One Against All method on dataset can be seen on table 1.

Table 1: *w* and *b* values

Nilai *w*			Nilai *b*		
w_1	w_2	w_3	b_1	b_2	b_3
1,125.403	1,619.742	−504.880			
721.711	609.163	32.212			
435.615	41.341	218.410	−0,3984	−0,3596	−0,2420
1,554.422	−1,635.054	−93.875			
1,125.771	2,123.341	−733.038			
1,095.667	1,601.980	−523.391			
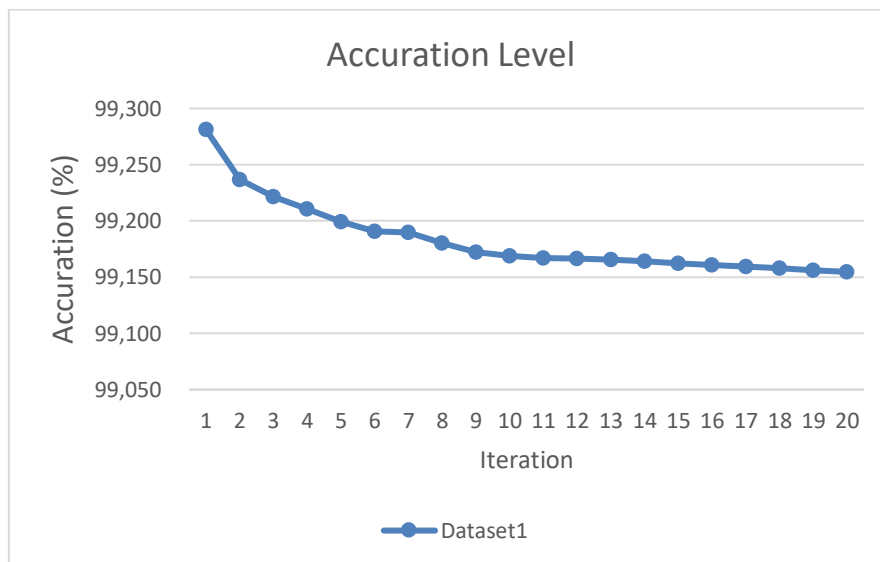
Figure 2. Accuracy level graph of One Against All method for each kernel in dataset

Based on Table 1 and Figure 2, the use of RBF kernel types and using the parameter σ = 0.5 has the highest accuracy on dataset has the highest accuracy (99.281). Accuracy for classification with the number of classes : 3 classes, i.e.: Fermented Beans, Un-Fermented Beans and Moldy Beans.
.

5   Conclusions

This research, the cocoa beans image is processed using grayscale and thresholding and then edge detection is done by using a sobel kernel to detect the edges of the image. After

segmentation process which can extract feature that produces data based on the extraction of color feature, which resulting color feature parameters : Red (R), Green (G), Blue (B), Hue (H), Saturation (S) and Value (V).

The accuracy level is derived from the number of data items categorized into the correct class by the LSSVM model. The level of accuracy using one against all method on datasets with RBF type (Radial Basis Function) using parameter $\sigma = 0.5$ resulting 99,281%. With three class classification, ie. Fermented Beans, Un-Fermented Beans and Moldy Beans.

Acknowledgements

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Effect of Extraction Treatment on MOR and MOE Binder Less Particle Board From Coconut Fiber

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Abstract. This research is to develop environmentally friendly particle board and technology and products, both in terms of raw materials and also process technology and products that will be produced. In terms of raw materials, coconut fiber is used from smallholder estates, while in terms of technology and products, we have developed a technology for making binder less particle board. The physical and mechanical properties in particular the MOR and MOE values of the binder less particle board are strongly influenced by the preliminary treatment and forged time. The effect of preliminary treatment of raw materials from binder less particle board coconut fibber can be known by calculating the MOR and MOE values on the particle board. This research is to find the right way of making particle board without adhesive by doing the extraction process. Methods used are methods without treatment, boiling, steaming and immersion. Characterization includes density, water absorption, thickness, MOR and MOE. The results of this study indicate that steam extraction treatment can increase the MOR and MOE values along with the addition of 10- to 15-minute welding time of 70 kgf / cm^2 to 79 kgf / cm^2 and MOE value of 18,000 -19,300 kgf / cm^2.

Keywords: Particle board, Coconut Fiber, MOE, MOR

1 INTRODUCTION

Indonesia is an agricultural country where most of the population is farmers. One of them is traditional farmers engaged in the field of coconut plantation. Processing of coconut waste especially coconut husk for household use not maximal utilization. So far, the use of coconut fiber is only used for doormat, brush, broom and others.

Industries engaged in the management of timber forest products have constraints in meeting the supply of raw materials. Because it is developed composite products that are environmentally friendly and able to become alternative wood raw materials so as to increase the added value and profit. Particle board is one kind of composite board product developed to improve the efficiency of the utilization of wood and non timber raw materials, as well as lignocelluloses and hemicelluloses materials [1].

Meanwhile, in terms of environmental aspects, particle board technology currently used still has a number of problems, especially those related to the use of adhesives. Since most

adhesives are used formaldehyde-based [2], [3], the particle board product has the potential to generate formaldehyde emissions during its use. Formaldehyde compounds can cause cancer, irritation of the eyes and oesophagus and the occurrence of respiratory distress [4]. Thus in terms of the basic ingredients of manufacture and adhesives used are not friendly to the environment.

Attempts to find new, more environmentally friendly products are, among others, by developing adhesives using renewable feedstock's, such as lignin and tannin [5]. Methods that have been developed include steam injection method, enzymatic treatment, and wood surface oxidation method. The preliminary treatment through steam to the kenaf core can improve the mechanical properties of particle-free MOE particles [6].

Natural fiber lignocelluloses derived from non-wood fiber there are abundant one of which by-product of coconut plantation is coconut husk. Considering the benefits of very slim coconut fiber to be developed, it will be interesting to do some research, how to make coconut coir more useful, one of them is the use of particle board which is then used for household or industrial needs [7].

Coconut fiber has a chemical component that is almost the same as the elements of the constituent elements of wood. Coconut fiber is a lignin material that contains lignin 29.23 % [8], thus can be utilized for particle board feedstock, through his research on binder less particle board of coconut fiber with pre-treatment through boiling invisible can increase the value of MOE. [4] states that in the process of making the particle board it is shown that the pre-treatment either extracted by heating or cooling on the particle can improve the properties of the board.

Research on the manufacture of binder less particle board from bamboo and sengon wood by oxidation method and boiling treatment is done [9]. The results showed that particle boards using formaldehyde adhesives had lower stability and mechanical properties than the binder less particle board.

The development of particle board by using steam heat injection was developed intensively by [10]. The results of [11] shows that in making binder less particle board of kenaf cores with the use of heat steam injection method obtained particle board with a very high stickiness value that is at board density of 0.65 gcm^{-3} or more.

The business of making binder less particle board is also developed by another method that is through oxidation of particles or wood fibers by using hydrogen peroxide and catalyst. Compared with the enzymatic treatment and heat-up injection system, research with this method appears not to be intensively conducted. Research production of binder less particle board from Castor Cake Meal has been successfully performed by [12] through variations of pressure and temperature of felts able to improve the physical properties of binder less particle board. The preliminary treatment of binder less particle board from OPEFB can improve its physical properties [13].

The quality of binder less particle board can be influenced by several factors such as extractive removal treatment and wick time used. [6] in his research stated that the modulus value of fracture increased on particle board by using the waste material of sawdust mahogany after boiling treatment. The results showed that the mechanical properties of the particle board increased in high density and the cultivar saqie and the particle surface were smooth. [14].

The target of this research is to get a product that can be applied in the development of bio composite technology. The following table 1. Are JIS A 5905: 2003 and 2006 testing of physical and mechanical properties of particle board.

Table 1. Testing standards for physical and mechanical properties of particle board

No	Physical and Mechanical Properties	JIS A 5905:2003	SNI 03-2105-2006
1	Density	0.40 – 0.90 g/cm^3	0.40 – 0.90 g/cm^3
2	Water content	5 – 13%	Maximum 14%
3	thickness	Maximum 12%	Maximum 12%
4	firmness broken	Minimum 20 000 kgf/cm^2	Minimum 20 400 kgf/cm^2
5	MOR	Minimum 80 kgf/ cm^2	Minimum 82 kgf/ cm^2
6	MOE	Minimum 30 kgf/ cm^2	Minimum 31 kgf/ cm^2

The physical and mechanical strength of the particle board is strongly influenced by its chemical structure. Table 2 below is a chemical composition of coconut fiber.

Table 2. Chemical Composition of coconut fiber

No	Component	Coir (%)	Coir fiber (%)
1	Water	26.00	5.25
2	Pectin	14.25	3.00
3	Hemicellulose	8.50	0.25
4	Lignin	29.23	45.84
5	Cellulose	21.07	43.44

2 METHODS

Metedology used with the selection of tools and materials and work procedures as follows

2.1 Tools and Materials

This study included into the type of experimental research in the laboratory. This study uses several tools, among others, test equipment: Bending Equipment-MOE and MOR (Type: SC-2 DE, cap.2000 kgf) and Hot Press. Measuring instruments: Digital scales, measuring cups, rulers, clocks. Dryer: oven. K3 tools: gloves and masks. Tools: particle filter, steamer, stove, gas, mold, aluminium foil, stirrer, spoon. Cleaner: lap. The research material is coconut fiber.

2.2 Measurement

This research is done through the stage of material preparation, extraction process, sample printing and sample testing as shown 1. below.
The following is a picture 1 for his research procedure.
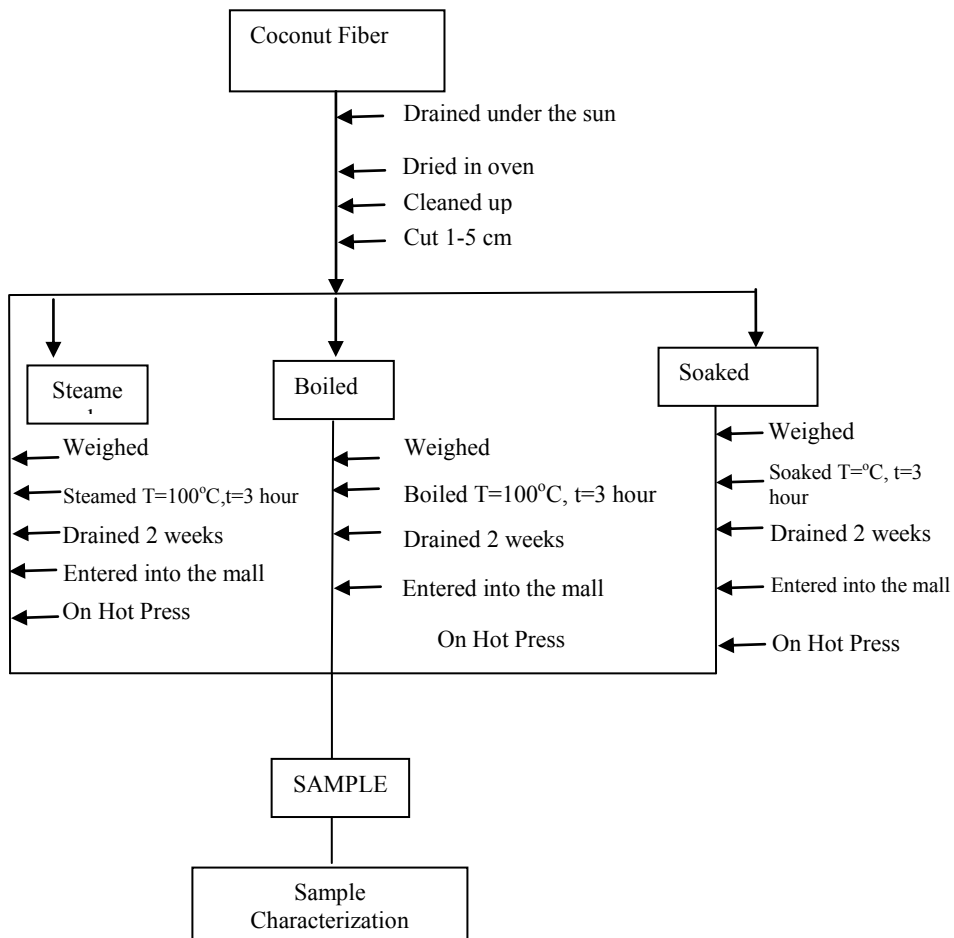
Fig. 1 Research flow diagram

2.3 Particle board Characteristics

2.3.1 Density

To know the physical properties of the particle board, density testing (ρ), water absorption (KA) and thickness (PT) are as follows: Density (ρ). The density test was carried out in dry conditions, and then the sample weighed the weight and measured the average length, width and thickness to determine the volume value. The formula used is:

$$\rho = \frac{m}{v} \qquad (1)$$

Where:
ρ = density (g/ cm^3)
m = density (g)
v = volume (cm^3)

2.3.2 Water Absorption (KA)

Water absorption is calculated by the formula:

$$KA = \frac{m_1 - m_2}{m_2} \times 100\%$$
(2)

Where:
KA = water absorption (%)
M_1 = sample weight before immersion
M_2 = sample weight after immersion

2.3.3 Thickness

Calculated by the formula:

$$PT = \frac{T_2 - T_1}{T_1} \times 100\%$$
(3)

2.3.4 Testing of Mechanical Properties

Strong bending testing is done with Universal Testing Machine.
 a. **Modulus of Repture (MOR)**

Calculated by the formula:

$$\sigma = \frac{3PL}{2bd^2}$$
(4)

Where:
σ = strong bending (kgf / cm^2)
P = Maximum load weight (kgf)
L = distance of buffer (cm)
b = width of test sample (cm)
Thick test sample (cm)

 b. **Modulus of Elasticity (MOE)**

Strong bending test (Modulus of Elasticity), using the formula:

$$MOE = \frac{\Delta PL^3}{4\Delta Ybd^3}$$
(5)

Where:
MOE = Modulus of Elasticity (kgf / cm^2)
P = load (kgf)
L = distance of buffer
b = sample width (cm)
d = sample thickness (cm)
ΔY = flexibility in load (cm)

3 RESULTS

Density test results, water absorption and thickness test. Density or density of the masses is the ratio of mass to the volume or the amount of mass of matter per unit volume. Density is one of physical properties very influential on the quality of particle board. The density is directly related to the porosity, is the proportion of the empty cavity volume, the higher the board density the higher the stiffness and strength. Data from particle board density testing were calculated using equation 2.1. Here is a table of test results and calculation of the average density value.

Table 3. Density values, water absorption and thickness of the particle board

Parameter Test	Treatment									
	Without Treatment		Boiling		Steaming		Immersion		Without Treatment + Starch	
	Duration of Forging (minute)									
	10	15	10	15	10	15	10	15	10	15
Density Average (g/cm^3)	0,604	0,68	0,59	0,56	0,69	0,724	0,559	0,69	0,60	0,62
Average water absorption (%)	7,50	6,6	7,72	6,3	5,11	4,20	7,60	6,92	6,20	6,00
Average Thickness (%)	13,26	12,7	13,3	12,4	11,0	10,08	12,69	11,9	11,4	10,69

Test Results MOR and MOE

The result of testing of mechanical properties on binder less particle board from this research is done by MOR and MOE test. The MOR and MOE test values of binder less particle board of coconut fiber are shown in table 4 below :

Table 4. MOR and MOE values of binder less particle board of coconut fiber.

Parameter Test	Treatment									
	Without Treatment		Boiling		Steaming		Immersion		Without Treatment + Starch	
	Duration of Forging (minute)									
	10	15	10	15	10	15	10	15	10	15
MOR (kgf/cm^2)	60	63	62	67	70	79	60	64	59	62
MOE (kgf/cm^2)	12.800	13.000	13.000	14.500	18.000	19.300	11.800	12000	12.000	12.500

4 DISCUSSION

From the research that has been done then obtained data test results. From this data can be calculated physical properties such as density, moisture content, thickness development and mechanical properties such as flexural strength (MOR) and strength elasticity (MOE).

4.1 Physical Characteristics of Particle board

The value of the obtained density is lower than the expected target density. The expected density is 0.75 g/cm^3, whereas the density is 0.559 to 0.724 g/cm^3. Although the density presented did not match the target, the density still met the JIS standard, Is particle board density 0.40-0.90 g/cm^3. Here is figure 2 Effect of extraction treatment on binder less particle board coconut fiber.
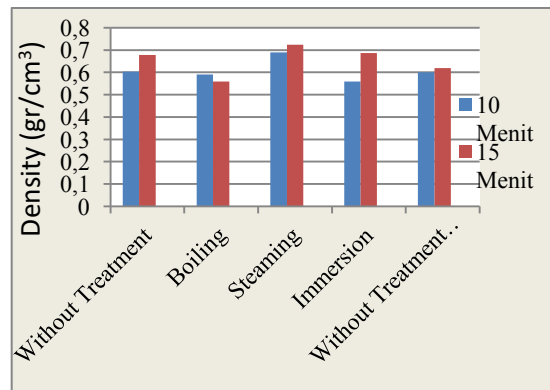
Fig. 2 Effect of extraction treatment on particle board density values of coconut fiber.

Coconut fibers that experience the process of boiling extraction show darker fiber colour and size becomes more subtle, than before. However, coconut fiber after the steaming process tends to be brighter. While the immersion process is darker than the steaming process but brighter than the boiling process. This indicates that the extractive content of coconut fiber is dissolved during the boiling process more than the steaming and soaking process. In addition, a relatively long boiling time of 3 hours and direct contact between the particles and boiling water makes the fiber becomes smoother and slightly crushed.

The time factor of the forging has a significant effect on the density of particle board without adhesive, which increases in value with the increase of felting time. Similar results are also demonstrated by [4], [10], where particle board density increases with increasing heat for 7 to 20 minutes on mahogany particles and kenaf core. The steaming treatment can increase the density value at the time of forging 10 to 15 minutes. The density value obtained in this steaming process is 0.690 - 0.700 g/cm^3. Longer quenching time provides an opportunity for particles to contact each other well and more compressed.

The moisture value of the test results and the calculation of an binder less particles of coconut fiber after 7 days of conditioning ranged from 5.11% to 7.70%, this can be seen in Figure 3 which already meets the required particle water particle moisture by [15] standard is 5% - 13%.
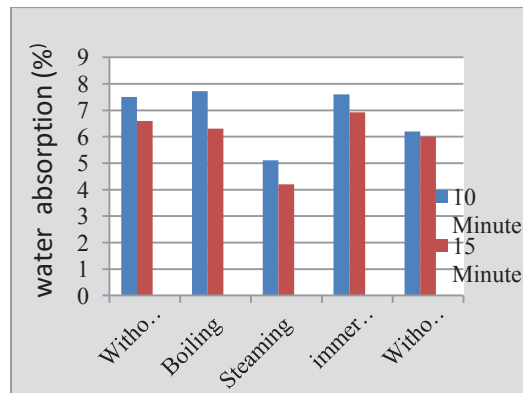
Fig. 3 The effect of the extraction treatment on the water absorption on the particle board .

Based on the picture of 3 samples on the steaming treatment has decreased the value of water absorption when compared with the sample without treatment and samples using starch has increased the value of water content. This is because in the manufacture of particle board using starch flour with a mixture of water. The moisture value of boards is more influenced by the internal structure of the board than the nature of the bonding board [16] The relatively short averaging time is about 10-15 minutes, the extraction treatment can decrease the water absorption of the board. The value of particle board thickness development in this study ranged between 10.68% - 13.32%. While the maximum standard 12 % [15] . Furthermore, the effect of coconut fiber extraction treatment on the thickness development test of the particle board is shown in Figure 4.
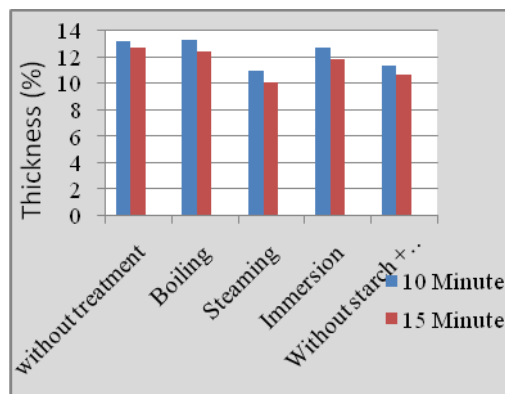
Fig. 4 The effect of the extraction treatment on the thickness of the binder less particle board coconut fiber

4.2 Mechanical Characteristics of Particle Board

The MOR (Modulus of Rupture) and MOE (Modulus of Elasticity) tests are used to look at the mechanical properties of the particles. The fracture modulus (MOR) value of particle board experiments in this study ranged from 59 kgf/cm^2 - 79 kgf/cm^2. Figure 5 Effect of extraction treatment on MOR values.
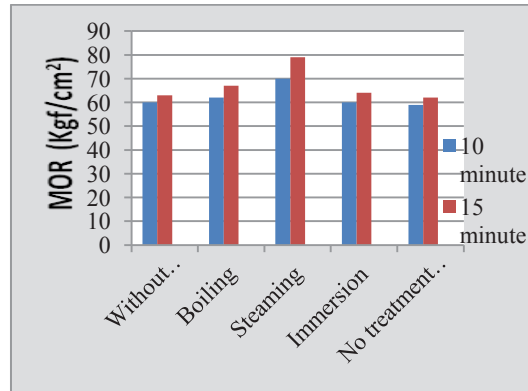
Fig. 5 Effect of preliminary treatment (extraction) on MOR values

Based on figure 5 it is known that the extraction treatment showed a significant effect on the value of the MOR. The extraction treatment by steaming on the coconut fiber provides a higher fracture modulus value compared with boiling and immersion or without treatment. Over time forging can decrease the value of the broken modulus. In boiling treatment, it is suspected that there is a significant chemical degradation process, especially at long enough forging time, thereby decreasing the value of the broken modulus (MOR).

It is also supported by darker-colored fibers after the boiling process. There are many possible chemical reactions that take place. These chemical reactions can be summarized as follows: degradation of hemicelluloses and cellulose that form simple sugars and other decompositions, thermal degradation of cell wall matrix, bond formation between carbohydrate and lignin polymers and increased cellulose crystallization. According to research [17], steaming treatment on EFB may increase the MOR value of the boiling treatment.

The following illustrates 6. Effect of the extraction treatment on MOE strength of binder less particle board of coconut fiber.
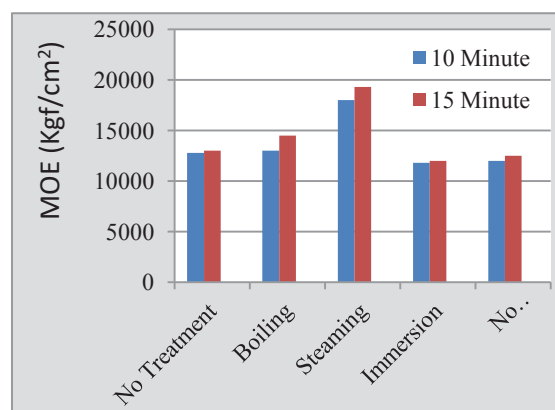
Fig. 6 Effect of extraction treatment on MOE value

Test results and calculations show that the elasticity modulus value of gluten free particle board (MOE) of this coconut fiber shows that the effect of the extraction treatment and the timing of the impacts on the MOE value. In this steaming process, the value of MOE increases with the increase of felting time.[18] in his research obtained some increase in MOE values from particle board from elephant grass along with increased wax time from 5 to 14 minutes. It is assumed that the longer the heat forging will be the greater the thermoplastic component in the coconut fiber so that will increase the MOE. Plasticity may be derived from thermoplastic extractive substances which will soften during heat treatment. On the other hand, a boiling extraction process followed by a 15 minute long forged time indicates the lowest MOE value. It is assumed that the boiling process occurs degradation chemical components in the fiber cause damage to the fiber so that the effect on the low value of MOE.

5 CONCLUSIONS

Based on the results of the analysis and discussion of this study can be drawn some conclusions as follows:
1. The interaction between the extraction treatment and the time of the fitting effect on the physical properties of particle board without adhesive, the average density ranges from 0,559-0,724 kg/cm^3, average water absorption4,20 - 7,72% and mean of thickness of 10.08 - 13.32%.
2. The treatment of extraction and time of impact affect the properties of elasticity modulus (MOE) and fracture strength (MOR) particle board, MOE average value 18000-19.300 kgf/cm^2, while the MOR value is 70 kgf/cm^2 to 79 kgf/cm^2
3. The steaming extraction treatment has the best physical and mechanical properties in accordance with JIS A 5905; 2003 standard.

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The Impact of Lecturer Research Productivity on University Rank In West Papua

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Abstract. This study aimed to analyze the impact of research productivity of lecturer published in Scopus and Google Scholar indexed journal on university rank. The populations of this study were 14 universities in West Papua. Samples were 7 universities chosen based on the number of publication using purposive sampling technique, while, the data were analyzed qualitatively. The result showed that most of universities in West Papua published their research in Google Scholar indexed journal and only two universities in West Papua published their research in Scopus indexed journal. Furthermore, based on the SINTA score, the most productive university in West Papua was the UniversitasPapua which had the most publication in Scopus and Google Scholar indexed journals. As the conclusion, most of the universities in West Papua were in low category in research publication.

Keywords: Research Productivity, University Rank, West Papua.

1 Introduction

Minister of Research, Technology and Higher Education of the Republic of Indonesia stated that one of best way in increasing the spirit of lecturers in doing publication was by issued a regulation of research allowance. Research publication was the important indicator to establish the rank of a university [1]. The quality of a university was also determined by the number of research publication of their lecturer [2].

Quality, quantity and motivation of lecturers in doing a research became a benchmark key in academic achievement of a university. The research university sometimes became an

indicator of best quality university [3][4][5]. Furthermore, [6[and [2] stated that the productivity in research publication became an important factor to get a World Class University predicate.

Most of universities in West Papua were categorized as low level universities in research publication. However, there were some universities had published their research in Scopus and in Google Scholar indexed journal. The spirit of the lecturers and head of university were still low in doing research publication. Consequently, the universities in West Papua were not able to increase their rank as the most productive university in research publication.Yueh-Leun Hu, Guang-Chu Hung [3]. The strongest universities, usually becauseof their research prowess and reputation for excellence, are seen as centers. African universities for example, have found it extremely challenging and complex to findtheir footing on the global higher education stage - they barely register on world institutional rankings and league tables and produce a tiny percentage of the world'sresearch output.

Ridwan Hamal; Lenny M. Tamunu; Ajis S.A.Djaha, [4] the frequency of research publication will impact the existence of research institution. Meanwhile, to support the research publication, the research institution needed to be prepared. Margaretha and Saragih, (2012) The experiences and educations background had positive effect on lecturers research quality. Furthermore, [2] stated that the quality of research publication had a big effect on establishing the rank of a university. This study aimed to analyzed the quality and productivity of research publication of university in West Papua.

2   Methods

The primary data of this study were the universities in West Papua which had some publication in Scopus indexed journal and in Google Scholar indexed journal. Then, the data were analyzed qualitatively. The populations of this study were 14 universities in West Papua and the samples consisted of 7 universities selected using purposive sampling.

3   Result and Discussion

The data of this study was described as in the following table.

Table 1:The Research Publication of University

No.	University	Scopus	Google Scholar	SINTA Score	Rank
1	UniversitasMuhammadiyahSorong	1	20	1	878
2	STKIP MuhammadiyahSorong	0	48	28	321
3	Universitas Kristen Papua	0	11	0	3503
4	Universitas Papua	61	1075	402	81
5	STKIP MuhammadiyahManokwari	0	4	0	3534
6	SekolahTingggillmuKesehatan Papua	0	2	0	3528
7	PoliteknikKatolik Saint Paul	0	14	0	3551

Source: Sinta2.ristekdikti.go.id

Based on the data above, it can be seen that the rank of a university was determined by the SINTA score were collected from the publication of a research in Scopus and Google Scholar indexed journal. The publication in Scopus indexed journal had the highest impact on university rank. All of universities in Indonesia,particularly, in Indonesia were compete in

gain the best rank among the others. Altbach, Reisberg and Rumbley, (2009)stated that Universities compete for status and ranking, and generally for funding from governmental or private sources. While competition has always been a force in academe and can helpproduce excellence, it can also contribute to a decline in a sense of academic community, mission and traditional values.

In West Papua, The most productive university, had 61 publication in Scopus indexed journal and 1075 publications on Google Scholar indexed journal, was the Universitas Papua. All of the publications were the contribution of 97 researchers. It collected 402 SINTA scores and was the first rank university in West Papua.

The second rank university in West Papua was the STKIP MuhammadiyahSorong. It had 48 publications on Google Scholar indexed journal and did not have any publication in Scopus indexed journal. The university collected 28 SINTA scores. The score was the contribution of 3 verified authors.

UniversitasMuhammadiyahSorong as the 3[th]rank university in West Papua published their research in Scopus and Google Scholar journal. It consisted of 1 publication in Scopus indexed journal and 20 publication in Google Scholar indexed journal. The SINTA score of the university was 1 and was the contribution of a verified author. This university was the second university which had publication in Scopus indexed journal after the Universitas Papua. Nationally, Universitas Muhammadiyah was in the 878 rank as the most productive university.

Furthermore, the most productive university in West Papua, respectively was as follow; Universitas Kristen Papua as the fourth rank university had 11 publications in Google Scholar indexed journal. Sekolah Tinngi Ilmu Kesehatan Papua as the fifth rank university published 2 researchers in Google Scholar. While, the STKIP MuhammadiyahManokwari was in sixth place and had published 4 researches in Google Scholar indexed journal. The last rank for the productive university in West Papua was the PoliteknikKatolik Saint Paul and published its 14 researches in Google Scholar indexed journal. All of the universities above had no publication in Scopus indexed journal.

To calculate the SINTA score of a publication, the researchers used SINTA Score Formulas follow. (Sinta.ristekdikti.go.id)

Table 2. SINTA Score Calculation

Scoring Indicator	code	Scoring Quality
Number of Articles in Scopus indexed	A	40
Number of Non-Articles in Scopus indexed	B	15
Number of Citation in Google Scholar indexed Journal	C	1
Number of Citation in Scopus	D	4
H-Index Quality (Google Scholar)	E	4
H-Index Scopus Quality	F	16

The following graphics showed the publication in Scopus and Google Scholar indexed journal of universities in West Papua.

Figure1: The publication Scopus and Google Scholar indexed Journal

The graph showed that the SINTA score and the rank of a university was not only determined by the number of publications, but also determined by the verified authors of a university. These phenomena should be a motivation for the lecturers and the head of universities to give a contribution in increasing the rank of a university. Reward and punishment were needed to motivate the lecturers in doing research and publication. An effective way to increase the lecturer productivity in doing a research was by given reward to the productive researcher [2]. While, Teixeira and Koryakina [7] stated The wealth of nations and universities plays a key role in determining the quality and centrality of a university or academic system.

The lacks of publication of a university commonly were caused by some factors. First, some lecturers of a university had no experience of online journal. Next, most of lecturers lack of experiences of international and reputable journal. The last, some of universities lecturers were lack of English. Hu and Gill [3] stated that the research university sometimes became an indicator of best quality university and a research became a benchmark key in academic achievement of a university.
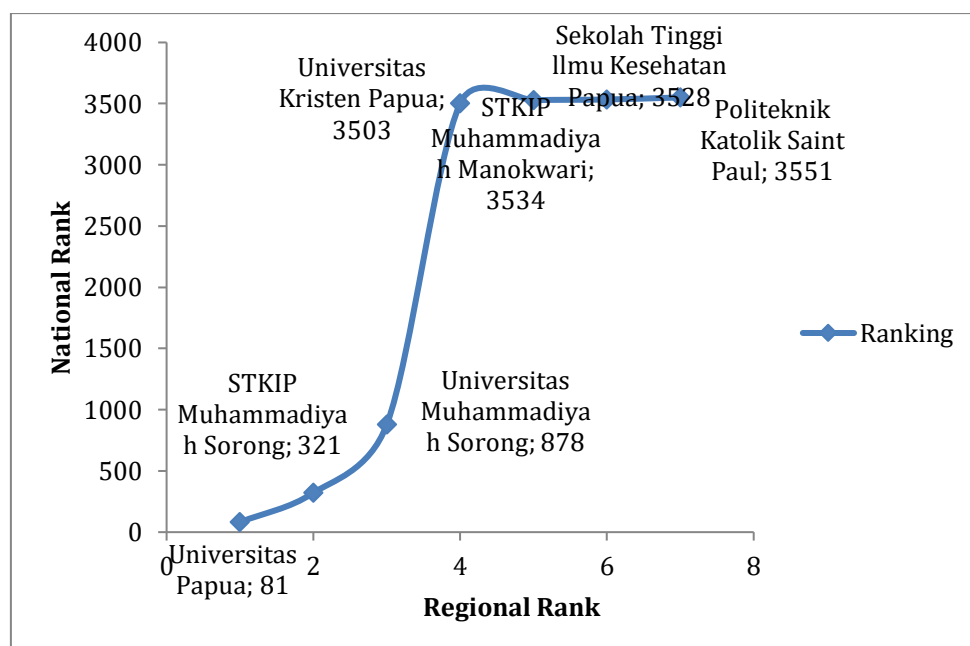
Source: Sinta2.ristekdikti.go.id

Figure 2: The Rank of University Based on it research

The graph above showed that, nationally, Universitas Papua was in 81st and in West Papua, this university was in the 1st place. STKIP Muhammadiyah was in 321 ranks as the most productive university in Indonesia, while, in West Papua this university was in the 2nd rank. UniversitasMuhammadiyah, regionally, was in 3rd place as the most productive university in West Papua and in 878 place in national scale. Universitas Kristen Papua as the 4th rank university in West Papua was in 3503 in national rank. STKIP MuhammadiyahManokwari was in 3535 position as the most productive university in Indonesia and in 5thposition as the most productive university in West Papua. SekolahTinggiIlmuKesehatan Papua and PoliteknikKatolik Saint Paul as the 6th and 7th rank universities in West Papua were in 3528 and 3551 position as the most productive university in Indonesia.

There was significance difference in the rank of university in West Papua. STKIP Muhammadiyah as the 2nd rank university in West Papua had a significance different to the 1st rank university, Universitas Papua, in national rank.[2] stated that the productivity in research publication became an important factor to get a World Class University predicate.

4   Conclusion

Based on the data analysis, it can be concluded that most of universities in West Papua were less productive in publication, particularly, in international or in reputable journal. There were only two universities in West Papua which had publication in Scopus.

The number of publication was an indicator of unproductive of the universities in research publication. The publication in Scopus indexed journal had the highest SINTA score or impact

in increasing the rank of a university. The number of verified author of a university also had contribution in getting the SINTA score or in determining the rank of a university.

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On Identifying Facial Expression using Multiclass Ensemble Least-Squares Support Vector Machine

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Abstract. Facial expression is one of behavior characteristics of human-being. The use of biometrics technology system with facial expression characteristics makes it possible to recognize a person's mood or emotion. The basic components of facial expression analysis system are face detection, face image extraction, facial classification and facial expressions recognition. This paper uses Linear Discriminant Analysis (LDA) algorithm to extract facial features with expression parameters, i.e., happy, sad, neutral, angry, fear, and disgusted. Then Multiclass Ensemble Least-Squares Support Vector Machine (MELS-SVM) is used for the classification process of facial expression. The result of MELS-SVM model obtained from our 185 different expression images of 10 persons showed high accuracy level of 99.998% using RBF kernel.

Keywords: The Facial Expression, Multiclass Ensemble Least-Squares, Vector Machine

1 Introduction

Expression is one form of nonverbal communication that is the result of one or more movements or muscle position on the face and can convey the emotional state of a person to the person who observes it. Through facial expressions, it can be understood emotions that are churning on the individual self. Facial expression is one of the characteristics of behavior. The use of biometrics technology system with facial expression characteristics makes it possible to recognize a person's mood or emotion.

Research on facial recognition has been started since the 1970s [1]. In generalthere are 4 stages in the face recognition system is the acquisition of face image, preprocessing, feature extraction and classification of the face image. Of the four stages, the feature extraction and classification stages are the most important stages in facial recognition systems [2].

There are many feature extraction methods that have been developed to build facial recognition systems. Of all these methods, each has its own advantages and disadvantages. There are methods that require fast computing time but sacrifice recognition accuracy, and there is also a method with a high degree of recognition accuracy but requires a long computational time. Both computational time and accuracy of the face recognition system are both influenced by the method used at the feature extraction stage [2] and the method used in the classification stage [3]. Therefore, to optimize computational time without sacrificing

recognition accuracy, this research builds facial recognition recognition system by focusing on both phases of feature extraction stage and classification step.

This method is performed by using Linear Discriminant Analysis (LDA) algorithm to extract facial expressions of each image and Multiclass Ensemble Least-Square Support Vector Machine for facial classification.

2 Literature Review

Previous research as a basis, support or reference in this research comes from national and international academic journals published by various universities. In previous research and research that is now done there are some similarities and differences, i.e.

Yubo WANG, Haizhou AI, Bo WU, Chang HUANG, Department of Computer Science and Technology, Tsinghua University, China conducted a study entitled "Real Time Facial Expression Recognition with Adaboost". In this study the researchers proposed a new method of recognition of facial expressions. The facial expressions are extracted from the human face by the expression classifier learned from the Haar feature based on the LUT Weak Classifiers. The expression recognition system consists of three modules, face detection, facial feature landmark extraction and facial expression recognition. This system is applied automatically can recognize seven expressions in real time that include anger, disgust, fear, pleasure, neutrality, sadness and surprise. [4]

RedaShbib, Shikun Zhou, School of Engineering, University of Portsmouth, United Kingdom conducted a study entitled "Facial Expression Analysis using Active Shape Model". In this study the introduction of facial expressions using the Active Shape Model method by adopting AdaBoost classifier and Haar-Like feature to detect images. The one where AdaBoost classifier is a feature of the Support Vector Machine (SVM) method. [5]

Data mining is a process that uses statistical techniques, calculations, artificial intelligence and machine learning to extract and identify useful information and related knowledge from large databases [5]. SVM initially can only classify data in two classes. However, further research SVM was developed so that it can classify data over two classes (multiclass) [6]. Classifying M-classes means predicting the class label $C_m, m = 1, \ldots, M$ one way to solve the M-class problem by formulating it into binary L classification problems [7].

SVM concept is simply described as trying to find the best hyperplane that serves as a separator of two classes in the input space. Pattern which is a member of two classes: +1 and -1 and share alternate field separators. The best dividing fields can notonly separate the data but also have the largest margins. Margin is the distance between the field of separator (hyperplane) with the closest pattern of each class.

Let $\{x_1, \ldots, x_n\}$ be the dataset and $y_i \in \{+1, -1\}$ is the class label of the x_i data. The two classes are separated by a pair of parallel bounding plane. The first delimiter field limits the first class while the second delimiter field limits the second class, so it is obtained [8]:

$$x_i . w + b \geq +1 \text{ for } y_i = +1$$
$$x_i . w + b \leq -1 \text{ for } y_i = -1 \tag{1}$$

The best dividing fields with the largest margin values can be formulated into quadratic programming problems:

$$\min_{w,b,\xi} \frac{1}{2} \|w\|^2 + C \sum_{i=1}^{l} \xi_i \tag{2}$$

with constraints $y_i(x_i. w + b) \geq 1 - \xi_i$ and $\xi_i \geq 0$, where $l = 1,..,n$ is a slack slack variable that determines the level of misclassification of the data samples. While $C > 0$ is a parameter.

Method for classifying data that can not be separated linearly is kernel method. The kernel method transforms the data into the feature space dimension so that it can be linearly separated on the feature space. The kernel method can be formulated:

$$K(x_i. x_j) = \varphi(x_i). \varphi(x_j) \tag{3}$$

Commonly used kernel functions are as follows:
a. The linear kernel: $K(x_i, x_j) = x_i^T x_j$
b. Kernel polynomial:

$$K(x_i, x_j) = (\gamma. x_i^T x_j + r)^p, \gamma \geq 2$$

c. RBF Kernel (Radial Basis Function): $K(x_i, x_j) = exp\left(-\gamma \|x_i - x_j\|^2\right), \gamma > 0$

LS-SVM was first introduced by Suykens and Vandewalle in 1999. LS-SVM is one of the SVM modifications that solves linear equations. If the SVM separator field is given as in (3), then for LS-SVM is given as follows:

$$\min_{w,b,\xi} \frac{1}{2} \|w\|^2 + \frac{C}{2} \xi^T \xi \tag{4}$$

with constraint $y_i(x_i. w + b) \geq 1 - \xi_i$

The above equation can be solved after forming Lagrangian:

$$L = \frac{1}{2} \|w\|^2 + \frac{C}{2} \xi^T \xi - \sum_{i=1}^{l} \alpha_i (y_i(\varphi(x_i). w + b) - 1 + \xi_i) \tag{5}$$

where α_i is a Lagrangian multiplier whose value can be either positive or negative.

To optimize the conditions in (5), a decrease of w, b, ξ, and α is equal to zero. The results of the process are as follows:

$$\frac{\partial L}{\partial w} = 0 \rightarrow w = \sum_{i=1}^{l} \alpha_i y_i \varphi(x_i) \tag{6}$$

$$\frac{\partial L}{\partial b} = 0 \rightarrow \sum_{i=1}^{l} \alpha_i y_i = 0 \tag{7}$$

$$\frac{\partial L}{\partial \xi} = 0 \rightarrow \alpha = \gamma \xi_i, \ i = 1, ..., N \tag{8}$$

$$\frac{\partial L}{\partial \alpha} = 0 \rightarrow y_i(\varphi(x_i). w + b) - 1 + \xi_i = 0, i = 1, ..., N \tag{9}$$

Using the One Against All (OAA) method, a binary binary model is constructed k (k is the number of classes). Each i-class model is trained by using the entire data. For example, there is a classification problem with 3 classes. For training use 3 pieces of binary classification. Its objective function:

$$\min_{w_i, b_i, \xi_{t,i}} \frac{1}{2} \sum_i^m (w_i)^T w_i + \frac{C}{2} \sum_i^m \xi_{t,i}^2 \tag{10}$$

with constraint $y_{t,i}(\varphi_i(x_t)(w_i)^T + b_i) \geq 1 - \xi_{t,i}$.

Confusion matrix is a table that states the amount of test data that is correctly classified and the amount of test data being misclassified.

True Posstive (TP), ie the number of documents from class 1 is correctly classified as class 1.
True Negative (TN), ie the number of documents from class 0 is are correctly classified as class 0.
False Positive (FP), ie the number of documents from class 0 incorrectly classified as class 1.
False Negative (FN) is the number of documents from class 1 that are misclassified as class 0.

The calculation of accuracy is expressed by the equation:

$$Akurasi = \frac{TP + TN}{TP + FN + FP + TN} \times 100\%$$

The calculation of sensitivity is expressed by the equation:

$$Sensitivity = \frac{TP}{TP + FN} \times 100\%$$

The calculation of false discovery rate is expressed by the equation:

$$False\ Discovery\ Rate = \frac{FP}{FP + TP} \times 100\%$$

3   Methods

The process of facial classification is explained by the following activities:
1. Face image capture
2. Face image processing
3. LDA feature extraction
4. Perform Data Training Process
5. Pattern model Classification in get after doing the data training process.
6. Conducting Testing Process / Data Classification after obtained model pattern from result of training process data.

3.1   Linear Discriminant Analysis (LDA)

The sequence of features extraction process using LDA as follows:
1. Enter the record number of training pose into the variable.
    NumberPoseTraining= InputLda.PostPoseTraining;
2. Enter the record number of classes into variables.
    Number of Classes = InputLda.Number of Classes;
3. Calculate the total amount of sample data.
    Number of Data = Number of Classes * NumberPoseTraining;
4. Cut the number of columns by the number of classes.
    NewProjectionsProject = InputLda.ProjectionMatric (: 1,:AmountData-TotalClass);
5. Forming Lda input
    Data EntryLda = double (InputLda.Faceline Training) * NewProject Projection;
6. Calculate the average of each class, from first grade to last class.
    Counter = 1;
    For k = 1NumberPoseTraining: NumberData
    Start = k
    Up = k + NumberPoseTraining-1;
    Avg Class (Counter,:) = mean (Data EntryLda (Start: Until, :));
    Counter = Counter + 1;
    end
7. Calculate the total averages.
    FlatAll = mean (Data EntryLda);
8. Calculating Between-Class Scatter (Sb)
    Sb = 0;
    for k = 1: Number Class

Zk = Classes (k,:) – AvgEverything;
Sb = Sb + Zk '* Zk ;.
end

9. Calculating Within-Class Scatter (Sw).
Sw = 0;
for j = 1: Number Class
for k = 1: NumberData
Zm = DataInputLda (k ':) - Avg Class (j' :);
Sw = Sw + NumberPoseTraining * Zm '* Zm;
end
end

10. Calculate eigen vector and eigen value.
[LdaVector, LdaEigValue] = svd (Sb * inv (Sw));

11. Reduced features up to number = Number of Classes-1.
wf1d = transpose (LdaVector(:, 1: NumberClass-1));

12. Calculate the matrix weight.
To obtain the weight of the new projection matrix value used to project the test data when the image test is performed with the command:
WeightMatric = ZeroMean '.*ProjectionMatric;
AveragePM = mean (ProjectionMatric);
AverageWM = mean (weightMatric);

3.2 Dataset

This type of research is simulation. Beginning with problem formulation, face detection, feature extraction using LDA algorithm, and facial expression classification process using Multiclass Ensemble Least-Square Support Vector Machine (MELS-SVM).

The data used in this research is data about facial expressions. The facial image used is the Olivetty Research laboratory known as ORL and Jaffe Image. Both data can be downloaded on the following sites:

1. http://www.kasrl.org/jaffe.html [9]
2. http://www.cl.cam.ac.uk/research/dtg/attarchive/facedatabase.html [10]

This study uses 1 dataset with the output of facial expression. This type of expression is divided into six classes namely, first class angry, second class disgust, third class fear, fourth class happy, fifth class neutral, sixth grade sad. The sample data on this dataset amounts to 240 images of facial expressions.

3.3 Classification Process

In the process of expression classification, starting with image taking of the file, then image is processed using image processing software to get numerical data value which will be used as input data for learning process and validation. After the learning data in the next can be the result of data learning is used for the testing process.

3.4 Multiclass Algorithm Methods

The analysis used in this multiclass classification is the One Against All classification method. The multilingas method algorithm as follows:

1. Dataset input.
2. Identify the input dataset
   a. The values of the training data feature (x_i)
   b. Class of training data (yi)
   c. Values feature test data (xt_i)
   d. Class of test data (yt_i)
3. Initiate objects on LS-SVM before performing the training process with the initlssvm function
   a. Specify data of training data feature (x_i)
   b. Specifies the training data class (y_i),
   c. Choose a classifier to classify data
   d. Selects the *kernel* and its parameters to use
4. Selecting the multilingual method code used (*code_OneVsAll* for *One Against All*)
5. Conduct training process with trainlssvm function
6. Calculating values w
7. Make predictions based on the model obtained and determine data feature test data (xt_i) with simlssvm function
8. Create a *confusion matrix*
9. Calculate the level of accuracy with the formula:

$$\lambda = \frac{C}{N} \times 100\%$$

where C is the correct total of predictions and N is the total of all data tested.

3.5   Implementation Results on Dataset

The separator function for the one against all method with the RBF (Radial Basis Function) kernel using the parameter $\sigma = 0.5$ for dataset is as follows:

$$f_1(\pmb{x}) = \pmb{x}_i . \pmb{w_1} + b = \pmb{x}_i . \begin{pmatrix} 31,1296 \\ 372,7066 \\ 82,6486 \\ 36,3001 \end{pmatrix} + (-0.9835),$$

(1.1)

$$f_2(\pmb{x}) = \pmb{x}_i . \pmb{w_2} + b = \pmb{x}_i . \begin{pmatrix} 132,8017 \\ 345,0284 \\ -22,2973 \\ 131,2886 \end{pmatrix} + (-0.3442),$$

(1.2)

$$f_3(\pmb{x}) = \pmb{x}_i . \pmb{w_3} + b = \pmb{x}_i . \begin{pmatrix} 57,8676 \\ 408,6087 \\ 77,2790 \\ 61,6941 \end{pmatrix} + (-0.4530).$$

(1.3)

$$f_4(x) = x_i.w_1 + b = x_i. \begin{pmatrix} -59{,}5390 \\ 435{,}8195 \\ 98{,}1523 \\ -59{,}0268 \end{pmatrix} + (-0{,}4588),$$

(1.4)

$$f_5(x) = x_i.w_2 + b = x_i. \begin{pmatrix} 6{,}5393 \\ 401{,}7964 \\ 81{,}7738 \\ 3{,}9947 \end{pmatrix} + (-1{,}0626),$$

(1.5)

$$f_6(x) = x_i.w_3 + b = x_i. \begin{pmatrix} -24{,}7938 \\ 445{,}8366 \\ 65{,}8424 \\ -24{,}0753 \end{pmatrix} + (-0{,}7571),$$

(1.6)

(1.6)

4 Results and Discussion

The values of w and b based on the kernel type and their parameters for the use of the One Against All method on the expression dataset can be seen in table 1:

Table 1: w and b values

kernel dan parameter		w value			b value		
		w_1	w_2	w_3	b_1	b_2	b_3
RBF	$\alpha = 0.5$	31,1296 372,7066 82,6486 36,3001	132,8017 345,0284 −22,2973 131,2886	57,8676 408,6087 77,2790 61,6941	−0.9835	−0.3442	−0.4530

Table. 1 Continued

kernel dan parameter		w value			b value		
		w_4	w_5	w_6	b_4	b_5	b_6
RBF	$\alpha = 0.5$	−59,5390 435,8195 98,1523 −59,0268	6,5393 401,7964 81,7738 3,9947	−24,7938 445,8366 65,8424 −24,0753	−0.4588	−1.0626	−0.7571
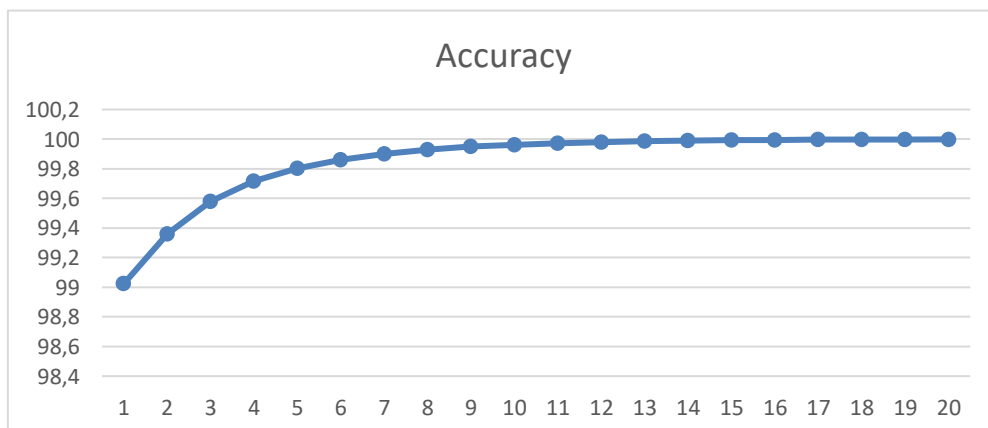
Figure 1: Accuracy level graph of the One Against All method for each kernel in dataset
Based on Table 1 and Figure 1, the use of RBF kernel types and using the parameter σ = 0.5 has the highest accuracy on dataset has the highest accuracy (99.99832). Accuracy for classification with the number of classes : 6 classes.
.

5   Conclusions

From the research that has been done, it can be concluded that this research uses multiclass ensemble ensemble least-squares support vector machine method. The image of the face is extracted using Linear Discriminant Analysis (LDA) algorithm to take the value of Projection Matrix and Weight Matrix. Then the classification process using multiclass ensemble least-squares support vector machine method, to get the model of the image training and testing results of the image testing. The final result of this research by using RBF kernel with accuracy level that is (99.99832).

Acknowledgements

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The Estimation of Ensemble Logistic Regression using Newton Raphson Parameter

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Abstract. The large volume of customer data in the credit industry makes the development of an effective credit scoring model extremely important. The use of an ensemble model on statistical methods to solve credit scoring problems managed to get the best predictive performance. ensemble performance can still be improved by estimating the parameters using nonlinear equations. This paper proposes the estimation of ensemble Logistic Regression using Newton Raphson parameter. The results showed that proposed method successfully achieved the best performance by improving the performance of a single classification with an increase of 2% accuracy

Keywords: Credit Scoring; Logistic Regression; Ensemble Bagging.

1 Introduction

Credit is a business activity that many done by the bank and become the largest source of income as well as the greatest risk. therefore the stability of banks is strongly influenced by the success in managing credit.

Credit Score is a technology that seeks to minimize the risk of credit borrowers who are unable to make timely payments. Credit Score is a classification problem that divides two potential borrowers into approved borrowers and unapproved borrowers based on several characteristics [1], such as age, economic conditions, social status, guarantees, etc. Objective.

Classification statistical method adopted in the credit scoring industry is Logistic Regression that is relatively easy to understand and implement. In research [2] estimating artificial neural networks and proposing a model in credit ratings. Logistic Regression models have better performance percentages than other methods of classifying good and bad borrowers. Research [3] learn about the latest classification algorithms on the application of credit cases. The conclusion shows that for the case of credit score, the Logistic Regression method gets better results.

On the ensemble, several sets of training are used to solve the same problem and the result of a single classification will be combined with the ensemble method into a single classifier to improve performance [4]. Research [5] divide the three data partitions to see the chi-square performance. The focus of this research lies in the selection of features and the research show

that the accuracy of the classification performance was obtained on the data partition with 70% for training data and 30% test data.

Research [6] proposed to analyze the accuracy of ensemble method in classifying customers using three ensemble methods of AdaBoost, Bagging, Random Forest but in this research still using a single standard classification of the ensemble method of decision tree. In [7] applied the feature selection method on the german dataset and incorporated a single classification with a greedy stepwise search method but this study reduced the attributes from 20 to 14.

Research [8] performs ensemble bagging and boosting by using ANN as a single classification. ANN ensemble shows accurate results and low generalization errors but bagging has disadvantages when the number of attributes and data bit small. In [9] it examines the use of SVM and KNN as a basic classifier and uses ensemble bagging and boosting to improve the accuracy of basic classification. The results show advantage of ensemble model in terms of accuracy. Research [10] proposed a systematic homogeneous and heterogeneous ensemble model based on three classifications of LR, ANN and SVM.

The results show that the heterogeneous ensemble classifier provides high predictive accuracy with low error than homogeneous and singular clustering but in this study, no estimates were obtained on ensemble by bagging technique.

In this research is proposed ensemble Logistic Regression method with bagging technique for credit scoring. the bagging technique is used because it reduces the overfitting problem and does not depend on single classifier and bagging techniques more effectively on unstable learning algorithms. the focus of this study is to estimate the ensemble Logistic Regression using the Newton Raphson parameter. Newton Raphson is chosen because it can solve nonlinear data types by interpreting the initial value for its maximum function.

2   Methods

2.1   Classification

Single classification in this study using logistic regression. which is a statistical method used to solve classification and regression problems [11]. Logistic Regression is used to make example of binary result variable, usually, it is represented by 1 or 0. The scores of the models use binary numbers where 1 for good debtor and 2 for bad debtors and each independent variable gives dependence on each score [12]. The function of the classifier shown by equation:

$$log\left(\frac{p}{1-p}\right) = \sum_{i=1}^{i=n} \beta^{(i)} * x^{(i)} + e = \beta^T x + e \tag{1}$$

Where $\beta = (\beta^{(1)}, \beta^{(2)}, \dots, \beta^{(n)})$ is coefficient vector of hyperplane. The probability of customer stop on equation (1) can be simply formulated as in the following eqution (2).

$$p = \frac{e^{\beta^T x + e}}{1 + e^{\beta^T x + e}} \tag{2}$$

To obtain an estimate of Logistic Regression parameters can be done in two ways namely by Maximum Likelihood Estimation (MLE) and Newton Raphson. However, this study uses the parameters of Newton Raphson.

Newton Rhapson is a method for solving nonlinear equations such as solving likelihood equations in Logistic Regression models [13]. The newton rhapson method requires an initial estimate of its maximum function value, which is an estimate using a polynomial approach of degree two. In this case to determine the $\hat{\beta}$ value of β which is the maximum function of $g(\beta)$ Suppose $q' = \left(\frac{\partial g}{\partial \beta_1}, \frac{\partial g}{\partial \beta_2}, \dots\right)$, and suppose H is denoted as a matrix with members $h_{ab} = \frac{\partial g}{\partial \beta_{1,\partial \beta_2}}$ suppose $q^{(t)}$ and $H^{(t)}$ is a form of evaluation of $\beta^{(t)}$ estimate to t at $\hat{\beta}$. In step t in the iteration process (t = 0, 1, 2, ...).

2.2   Classification Ensembles

The focus of this classification is to solve similar problems by combining a set of classifications to obtain a more accurate classification [14]. The ensemble method can reduce classification errors effectively, and is believed to perform well compared to the use of a single classifier. Compared to an individual classifier the learn and train one data only. in contrast to the ensemble classification. from the original data, classification ensemble doing the learning and training of various data and the training results will build the hypothesis and produce better accuracy [15].

Some ensemble classifiers techniques have been developed such as random forest, rotation forest, boosting, and bagging. because the focus of this research is using ensemble bagging, then the ensemble bagging classification will be presented.

Bagging is an algorithm that provides good performance and is very easy to apply. Number of the different bag (n-bag) obtained through training data and the results of the training dataset on every bag will be stuffed with randomly generated data from the training dataset [10].

Bagging (Bootstrap Aggregating) algorithm creates M bootstrap samples $T_1, T_2, \dots, T_M$ randomly drawn from the original training set T of size n[10]. Each bootstrap sample T_i of size n is then used to train a base classifier Ci. Predictions on new observations are made by taking the majority vote of the ensemble C^* built from $C_1, C_2, \dots, C_M$ [16].

Ensemble bagging algorithm

a single classification algorithm $C_t(x)$ will be given a training set of size n.

- Input sequence of training samples $(x_1 : y_1), \dots (x_n : y_n)$ with labels $y \in Y = (-1,1)$
- Initialize probability for each example in learning set $D_1(i) = \frac{1}{n}$ and set $t = 1$.
- Loop while $t < B = 100$ ensemble members
- Form training set of size n by sampling with replacement from distribution D_t
- Get hypothesis $ht : X \to Y$
- Set $t = t + 1$
  End of loop
- Output the final ensemble hypothesis

$$C^*(x_i) = h_{final}(x_1) = argmax \sum_{t=1}^{B} I(C_t(x) = y).$$

(3)

2.3   Performance Evaluation

The performance evaluation of classification method can be seen from the level of classification error. To count mark of classification error can use confusion matrix, the confusion matrix is usually called with contingency table like on Table 1.

Table 1.Confusion Matrix/ Contingency Table

Actual/Prediction	Good debtors	Bad debtors
Good debtors	True Positive (TP)	False Negative (FN)
Bad debtors	False Positive (FP)	True Negative (TN)

The accuracy level is defined as the degree of proximity between the predicted data with the actual data or the ratio of the amount of data that is correctly classified as shown by equation (3).

$$accuracy = \frac{TP + TN}{TN + FP + FN + TP} \tag{4}$$

3   Experimental

3.1   Dataset

To evaluation the accuracy of the proposed model uses two data ie German and Australian datasets. in the credit research literature, these two datasets are used to test the model and is available in UCI machine learning repository. Generally, the dataset can be seen in Table 2.

Table 2. Description Of Dataset

Dataset	Number of debtor	Good debtors	Bad debtors	Number of Attributes
German dataset	1000	700	300	20
Australian dataset	690	307	383	14

Both datasets will be divided into 70% data training and 30% data testing to see the classification results of the proposed model.

3.2   Normalization Data

The data must be transformed from different value scales to eliminate redundancy and build data models at the same interval. The dataset attribute is normalized with values 0 for 'bad' customer and 1 for 'good' customer.

3.3   Implementation

The focus of this study is to see the use of Newton Raphson parameters from ensemble Logistic Regression classification because the estimation of Newton Raphson parameter can

improve the performance of ensemble Logistic Regression classification. Logistic Regression will be used as a single classification and ensemble technique used is bagging.

4 Results

To see the performance of the proposed method uses test processes with python programming language. The level of accuracy based on an estimation of Newton Raphson parameter of ensemble Logistic Regression.

Table 3. Classification Results

Classification	German Dataset	Australian Dataset
Logistic Regression	77 %	85.9 %
EnsembleLogistic Regression	79.6 %	86.9 %

Table III shows the classification results on the Australian dataset and German dataset. The Australian dataset, single logistic regression model generates classification accuracy of 85.9% and German dataset, generates classification accuracy of 77.0%.

Shows the results of the proposed model that is an estimation of ensemble Logistic Regression using Newton Raphson parameter. The proposed method successfully achieved the best performance by improving the performance of single classification with 79.6% accuracy for German dataset and 86.9% of Australia dataset of the results obtained, the increase is not very significant due to the australian dataset only increased by 1% and the german dataset only increased by 2.6%. but in this study obtained when the number of iterations 10 to 50 affects the accuracy of the accuracy of the ensemble classification Logistic Regression but if iteration> 50 accuracy value becomes constant. the proposed method is sensitive to small amounts of data.

5 Conclusions

In this research is proposed ensemble Logistic Regression method with Bagging technique for credit scoring. the focus of this study is to estimate the ensemble Logistic Regression using the Newton Raphson parameter. The proposed method successfully achieved the best performance of a single classification. to credit data accuracy german yield 79.6% and 86.9% Australian dataset. The number of iterations 10 to 50 affects the accuracy of the classification but when the iteration > 50 constant accuracy value and in this study the proposed method is sensitive to the small amount of data.

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The Hand-Add Operator Workload Analysis at Production Workstation With 10 Pulse Method at PT.XYZ

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Abstract. PT. XYZ is one of company whom produce various food for pet. This research aims to analyze the level of hand-add operator workload at the production workstation. Hand-add operator feel sick at their part of body during 8 workhours. This research using 10 pulse method. The result is workload category at the production workstation is heavy and need repairement immediately.

Keywords: Workload, Ergonomic, Work Pulse.

1 Introduction

Work has different load depends on variety and duration. All activity need muscle and mind power. It may be an external and internal load. Over workload cause fatigue and disease cause work.

PT. XYZ is one of the companies that produce pet food, there are 8 workhours in 3 shift. Production target is 1900 tons/day. Production workstation has many steps such as measurement, mixing, cooling, filtering, and packing. All the step not always using automatic machine especially in mixing hand-add they using a manual system. Transportation material using hand truck from store to bin mixer.

Hand adds Station include 5 operators, 2 operators are handling material into bin mixer and 3 operators bring material from the store near bin mixer approximately 10 meters with stand and sit position. All the activity need much energy plus it does repeatedly without enough rest hours. This situation makes operators fatigue and cause decreasing productivity.

Based on the background of problems that have been described previously, then the focus of the discussion in this study is how the workload of operators hand add on the production of PT. XYZ.The purpose of this research is to know the workload of hand add operators on the production of PT. XYZ.

The benefits that the authors expect from this study is to apply the theory of workload analysis of physiology in knowing the workload on hand add in operators PT. XYZ.

2   Literature Review

Occupational physiology is the study of the function of the human body at work, the basis of the development of ergonomics. Workload is the burden received by the operator due to the implementation of work. This work load is accepted by the body due to carrying out a work activity. Workload may affect the physiological reactions of operators. Workload is a job that is charged to a good worker in the form of physical burden and mental burden which is his responsibility.

2.1   Factors Affecting the Workload

The human body is designed to perform daily work activities. The presence of muscle mass weighing almost more than half the body weight, allows us to be able to move and do the job. Work, on the one hand, has significance for the progress and improvement of achievement, thus achieving a productive life as a purpose in life. On the other hand, work means the body will receive the burden from outside the body. In other words that every job is a burden to the concerned. The burden can be either physical or mental.

Workload or workload is an effort that must be issued by a person to meet the demand of the job. Capacity is the capacity/capacity of the human. This capacity can be measured from the physical and mental condition of a person. The workload is the size (portion) of the limited operational capacity required to perform certain work.From an ergonomic standpoint, any workload received by a person must be appropriate or balanced in both the physical, as well as cognitive, and human limitations of the load. Working ability of a workforce differs from one to the other and depends on the skill level, physical fitness, age and body size of the worker concerned.

That in general the relationship between workload and work capacity is influenced by various factors that are very complex, both internal and external factors.

2.2   Working Measurement With Physiological Method

In a physical work, humans will produce changes in oxygen consumption, heart rate, body temperature and changes in chemical compounds in the body.

Physical work is grouped by Davis and Miller namely: (1) Total body-wide work, which uses most muscles typically involves two-thirds or three-quarter of the body's muscles. (2) Work muscles that require energy expenditure because the muscles are used less.(3) Working static muscle, the muscle used to produce the force but without mechanical work requires partial muscle contraction.

Physiological measurement studies are intended to address: (1) New knowledge about human performance.(2) More monitor the behavior or properties of champion athletes.(3) Helping one's physical constraints.

Criteria that can be used to determine the effect of work on humans in a work system, namely: physiology criteria, psychological criteriaand criteria of work, namely: (1) The physiology criteria include the rate of heart rate, oxygen consumption, blood pressure, evaporation rate, body temperature, and chemical composition in the blood. This criterion is

used to know the changing function of body tools.(2) Psychological criteria include testing the psychological level of the worker, such as the level of saturation, emotion, motivation, attitude and others. Psychological criteria are used to determine the psychological changes that arise during work. (3) Criteria of the work include: the work obtained from the workers. This criterion is used to determine the effect of all working conditions by looking at the work obtained from the worker.

2.3 Energy Level

There are three levels of common physiological work: rest, aerobic work limits and anaerobic work. At resting stages of energy expenditure is necessary to maintain a body life called base metabolic rate.

It measures the ratio of oxygen that enters the lungs to the outgoing carbon dioxide. Body weight and surface area are decisive factors expressed in calories/surface /hour area. The average human body weighs 65 kg and has a surface area of 1.77 meters square requires energy of 1 kilocalorie per minute. Work is called aerobics when the oxygen supply is perfect, the system will be deprived of oxygen and work becomes Anaerobic. This is influenced by physiological activity that can be improved through exercise.

2.4 Physical and mental work

Physics work is a work that requires physical energy of human muscles as a source of energy (power). Physical work is also called "manual operation" where the performance of work will depend entirely on the human being that serves as a source of power (power) or work controller. Physical work can also be connoted with heavy work or rough work because it requires a strong human effort during the working period. In the physical work of energy consumption is a major factor that used as a benchmark determinant of weight and light of a job. Broadly speaking, human activities can be classified into physical work and mental work.

While mental work is a work that involves the thought process of our brain. This work will result in mental fatigue when the work is in a long time, not caused by physical activity directly but the result of our brain work.

2.5   Workload Assessment Based on Working Pulse

Measurement of pulse during work is a method for assessing cardiovasculair strains. One of the tools that can be used to calculate the pulse is telemetry by using Electro Cardio Graph (ECG) stimulation. If the equipment is not available, it can be recorded manually using stopwatch with 10 pulse method.

The formula calculates the working pulse:

$$\text{Pulse (Pulse / Minute)} \frac{10 \ Pulse}{\text{time calculation}} \ x \ 60 \quad (1)$$

The sensitivity of the pulse to the changes in loading received by the body is quite high. The pulse will soon change in tune with the change in loading, either from mechanical, physical or chemical loading.Energy consumption alone is not enough to estimate the physical workload. The use of work pulse to assess the weight of the workload has several advantages, in addition

to easy, fast and cheap is also not required expensive equipment and the results are quite reliable and do not disturb or hurt people who checked.

Energy consumption alone is not enough to estimate the physical workload. The use of work pulse to assess the weight of the workload has several advantages, in addition to easy, fast and cheap is also not required expensive equipment and the results are quite reliable and do not disturb or hurt people who checked.

Increased pulse rate has a very important role in increasing output from rest to maximum work. Potential increase in pulse rate from rest to maximum work. Defined as Reverse Heart Rate (HR Reverse) expressed in percentage which can be calculated using the following formula:

$$\% \ HR \ Reserv = \frac{\text{working pulse} - \text{resting pulse}}{\text{maximum pulse} - \text{resting pulse}} \ x100$$

(2)

3   Materials and Methods

The research methodology contains the steps to be taken during the study and is useful as a reference for systematic action.The research steps undertaken on practical work are as follows:(1) Start, (2) Field Observation,(3) ProblemFormulation, (4)Determining Research Objectives, (5) Data Collection,(6) Data Processing, (7) Analysis of Results,(8) Conclusions and Suggestions.

This research was conducted at PT. XYZ. The research period started in July 2017 until August 2017. The object of this research is the animal feed manufacturing industry with the marketing area to various regions both local and abroad. Data collection techniques used in this study include: (1) Primary DataPrimary data is data obtained through observation with the stakeholders in PT. XYZ. The data collected is the resting pulse and the working pulse of the hand-add operator PT. XYZ, (2) Secondary Data. Secondary data is data obtained from other sources (data that have been obtained and recorded by other party) that is data of raw material, production data, number of employee absentee, data about company establishment, organizational structure, and its business field and production process at PT . XYZ journals related to workload, used to support practical work in solving problems.

Data collection in this research is done by direct observation by measuring pulse nadioperator hand add padabagian production of PT. XYZ.Operation Pulse Measurement Data. The data obtained from the measurement of DNI (Pulse Pulse and DNK (Pulse of Work) can be seen in the following table below:

1. The DNI measurement shall be conducted at 8.00 Western Indonesia Time
2. The 1st DNK measurement was conducted at 9:10 pm
3. The second DNK measurement is done at 10:20 pm
4. The 3rd DNK measurement is done at 11.30 WIB.

4   Results

4.1   Analysis of DNI Calculation Result, DNK andCVL Operator 1
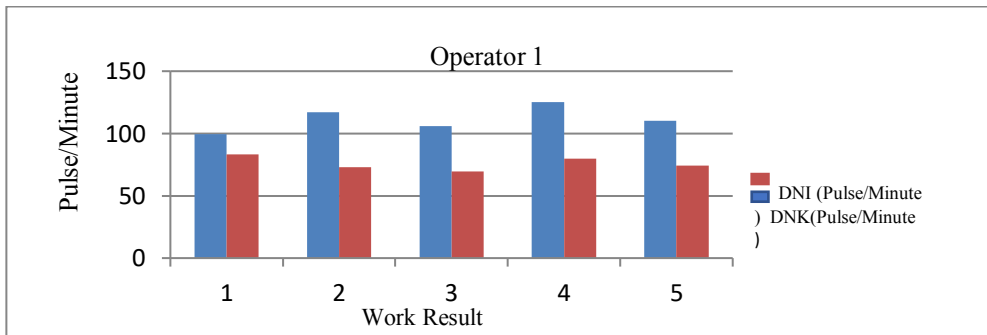
Figure 1. DNI Graph, DNK and CVL Operator 1 For 5 Days

Based on the calculation of the pulse operator 1 who was 24 years old had male gender for 5 days ie on day 1 DNI of 83.44 pulse / minute DNK of 99.37 beats / minute, day 2 DNI of 73.08 pulse / minute DNK equal to 117,01 pulse / minute, day 3 DNI equal to 69,52 pulse / minute DNK equal to 105,73, day 4 DNI equal to 80 beats / minute DNK equal to 125,35 beats / minute and day 5 DNI equal to 74, 07 pulse / minute DNK of 109.99 beats / min and has an average value of 111.49, is included in the category of medium workload with the classification of 100-125 beats / minute. and with the calculation of cardiovascular results obtained 29.60% This result belongs to the category acceptable level with the classification% CVL <30%.

4.2   Analysis of DNI Calculation Result, DNK and CVLOperator 2
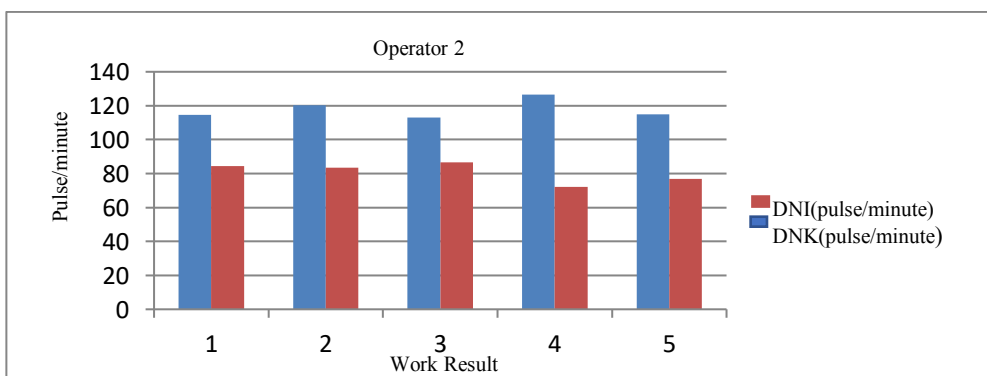
Figure 2. DNI Graph, DNK and CVL Operator 2 For 5 Days

Based on the calculation of the pulse of operator 2 who aged 24 years have male gender for 5 days ie on day 1 DNI of 84.38 beats / minute, DNK day of 114.70 beats / minute, day to 2DNI of 83.79 beats / minute DNK equal to 120,32 beats / min, day to 3DNI equal to 86,58 pulse / minute DNK equal to 112,99 beats/minute, day to 4DNI equal to 72,28 pulse/minute DNK equal

to 126,51 beats/minute, day 5 DNI of 76.92 pulse / minute DNK of 114.82 beats / min and has an average value of 117.86, is included in the category of medium workload with the classification of 100-125 beats / minute. and with the calculation of cardiovascular results obtained 31.89% This result belongs to the category of moderate level with a classification of 30% <X <60%.

4.3 Analysis of DNI Calculation Result, DNK and CVL Operator 3
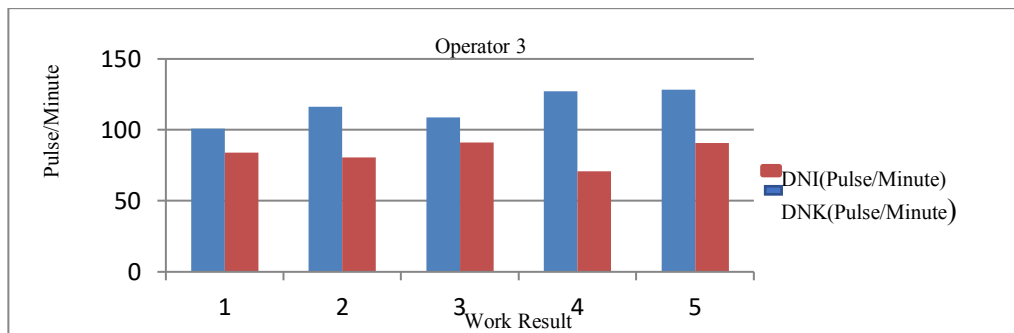
Figure 3. DNI Graph, DNK and CVL Operator 3 For 5 Days

Based on the calculation of the pulse of operator 3 who was 28 years old had male gender for 5 days ie on day 1 DNI of 84.15 beats / minute, DNK of 100.76 beats / minute, day 2DNI of 80.75 beats / minute DNK equal to 116,43 beats / min, day to 3DNI equal to 91,18 pulse / minute DNK equal to 108,85 beats / minute, day to 4DNI equal to 70,92 pulse / minute DNK equal to 127,03 pulse / minute, day 5 DNI of 90.90 pulse / minute DNK of 128.36 beats / min and has an average value of 116.28, is included in the category of medium workload with the classification of 100-125 beats / minute. and with the calculation of cardiovascular results obtained 26.97% This result belongs to the category of moderate level with a classification of 30% <X <60%.

4.4 Analysis of DNI Calculation Result, DNK and CVL Operator 4
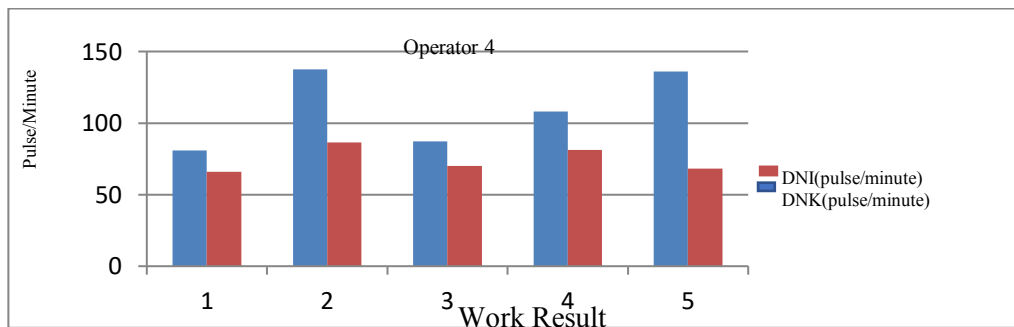
Figure 4. DNI Graph, DNK and CVL Operator 4 For 5 Days

Based on the calculation of the operator's 4-year-old pulse rate, the male gender for 5 days is on day 1 DNI of 65.93 beats / minute, DNK day is 81.04 beats / min, day 2DNI is 83.33 beats / min DNK of 137.46 pulse / min, day to 3DNI of 69.93 pulse / minute DNK of 87.27 pulse / minute, day to 4DNI of 81.08 pulse / minute DNK of 107.9 beats / minute, day 5 DNI of 68.18 pulse / minute DNK of 136.16 beats / min and has an average value of 109.996 is included in the category of medium workload with the classification of 100-125 beats / minute. and with the calculation of cardiovascular results obtained 30.23% This result belongs to the category of moderate level with a classification of 30% <X <60%.

4.5   Analysis of DNI Calculation Result, DNK and CVLOperator 5
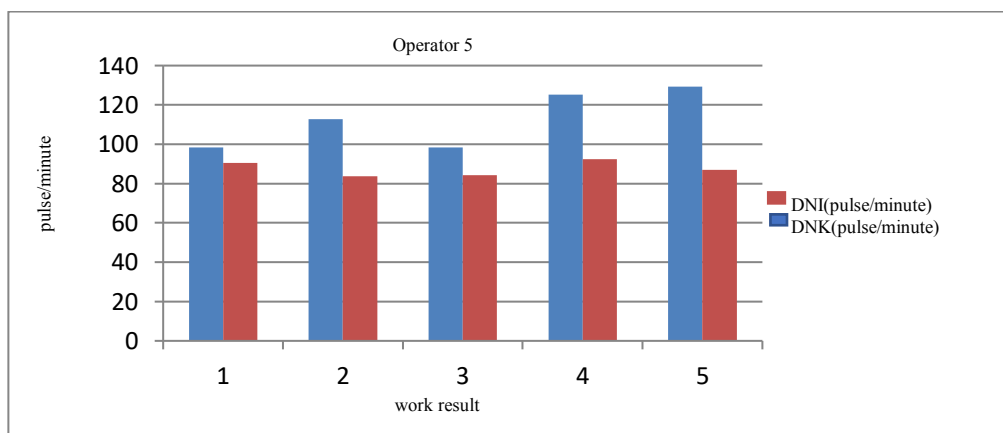
Figure 5. DNI Graph, DNK and CVL Operator 5 For 5 Days

Based on the calculation of the operator's 5-year-old pulse rate, the male gender for 5 days was on day 1 DNI of 90.49 beats / minute, DNK of 98.37 beats / min, day 2nd was 83.79 beats / minute DNK of 112.64 beats / min, day to 3DNI of 84.38 pulse / minute DNK of 98.39 beats / minute, day to 4DNI of 92.44 pulse / minute DNK of 125.14 pulse / min, day 5 DNI equal to 86,95 pulse / minute DNK of 129,27 beats / min and has average value of 112,76 is included in medium work load category with classification 100-125 beats / minute. and with the calculation of cardiovascular results obtained 23.15% This result belongs to the category acceptable level with a classification of 30% <X <60%.

5   Conclusions

1. Based on the calculation of the pulse operator 1 who aged 24 years have male gender for 5 days then obtained the average pulse rate of 111.49 beats/minute, is included in the category of medium workload with the classification of 100-125 beats/minute and with the calculation of cardiovascular load results obtained 29.60% This result belongs to the category acceptable level with the classification% CVL <30%.
2. Based on the calculation of the pulse of operator 2 who aged 24 years have male gender for 5 days, then obtained the average results of 117.86 pulse / minute, this is included in the category of medium workload with the classification of 100-125 beats/minute and with the

calculation of cardiovascular load results obtained 31.89% This result belongs to the category of moderate level with a classification of 30% <X<60%.

3. Based on the calculation of the pulse of operator 3 who was 28 years old had male gender for 5 days, then got the average result of 116,28 beats / minute, this included in medium work load category with classification 100-125 pulse/minute and with the calculation ofcardiovascularload obtained results 26.97% These results fall into the category of acceptable levels with a classification of 30% <X<60%.

4. Based on the calculation of the operator's 4-year-old pulse rate has male gender for 5 days, it is obtained an average of 109.996 is included in the category of medium workload with the classification of 100-125 beats/minute and with the calculation of cardiovascularload obtained results 30, 23% This result belongs to the moderate level category with a classification of 30% <X<60%.

5. Based on the calculation of the operator's 5-year-old pulse rate of 5 for male sex, the average yield of 112.76 was included in the medium work load category with the classification of 100-125 beats/min and with the calculation of cardiovascular load obtained results 23.15% This result is included in the category acceptable level with a classification of 30% <X<60%.

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Zigbee-110 Applications on Wireless Two Robot Humanoid Communications for Mobile Phone

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Abstract. This study aims to realize and analyze the performance of communication system between 2 pieces of dancing robot using Zigbee-110 on humanoid robot. With this wireless communication system synchronization of movement in both robots will be achieved. The test results show the robot to move dancing through Zigbee-110 communication from robot A to robot B and robot B to robot A can successfully receive and send the appropriate data. The robot can communicate from robot A to robot B with a predetermined distance of 100 cm and robot B to robot A with a distance of 75 cm in accordance with the provisions of the contest KRSI (Indonesian Art Robot Contest) 2015. Test results also show the greater the data received then the value of throughput is also greater and the greater the time required to communicate between the two robots. The thermal noise value affects the emergence of communication failure between the two robots.

Keywords: Wireless communication, ZigBee-110, robot humanoid, software roboplus.

1 Introduction

Humanoid robot is a robot formed based on the appearance of the human body [1]. In general, humanoid robots have body parts such as head, body, two arms and two legs. Humanoid robots are generally made to perform primitive behaviour from humans. One of the human capabilities that a humanoid robot wants to adopt is dancing.

In research Sulistyo (2015) has created a communication system between two humanoid robots that dance. With this communication is expected to improve the movement system between the two robots in performing the synchronization of dance movements following the movement of human dance in general [2]. The development of robotics, especially the development of humanoid robot is now very much, but no one has applied wireless communication technology between the two robots. So with this wireless communication synchronization movement on both robots can be achieved.

This study discusses the performance analysis of communication systems of two humanoid robots on Zig-110. This system uses the method of half duplex communication data sent using wireless. Implementation of this system is to reduce the use of cable in communication data sent periodically, the data sent with a predetermined time when the robot is active then read the data and send it and the robot will move [3].

The name ZigBee stands for two words: zigzag and bee, which means the bees are flying with a change of direction [4]. Technically speaking, however, ZigBee is a specification for high-level communication protocols related to Wireless Personal Area Networks (WPANs)

[5]. ZigBee devices are often used to connect other devices with a wireless system. ZigBee technology is able to manage its own network and able to manage the exchange of data. ZigBee network is also widely applied to embedded systems (embedded applications), such as the control of industrial equipment wirelessly, wireless sensors and others.

2 System Designing

Designing a zigbee-110 application on communication 2 Robots for dancing and running are controlled by the CM-530 controller. The reason for using Zigbee as a wireless controller is because it has several advantages, such as concise (does not require cable installation and flexibility between space), cost-effective and easy software configuration [6]. The discussion includes hardware design consisting of mechanical and electronic robot systems, and software design, ie system flowchart design and program flowchart to be embedded in CM-530 controllers.

2.1 System Block Diagram

The block diagram of the transmitter and receiver system is shown in Figure. 1 and 2.
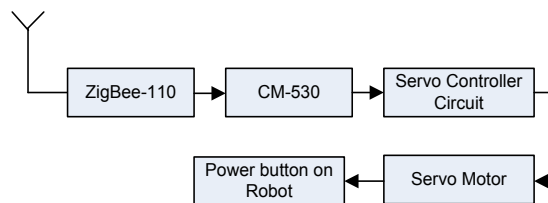
Fig. 1. Transmitter block diagram.
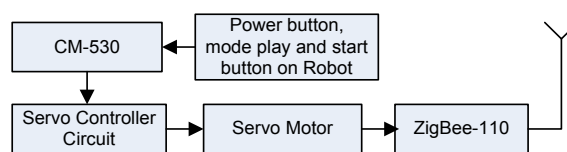
Fig. 2. Receiver block diagram.

Push Button on the robot will send the analog signal data to the CM-530 controller that can be processed and send data to the servo controller circuit so as to cause dancing movement. Via Zigbee-110 on robot 1 will transmit digital signal data to Zigbee-110 robot 2 receiver and can be processed by CM-530. The data from CM-530 is then transmitted to the servo controller circuit which will drive the servo motor, resulting in dance movements and running on the humanoid robot according to the sent command.

The CM-530 controller is a microcontroller that controls and processes the input and output data of the actuator. From the input side, there is a switch On/ Off is in use to turn on and off the power on the robot.

2.2 Mechanical Design

The design of robotic mechanical systems is done by modifying the standard mechanical A-type bioloid robot, with the shape shown in Figure 3.
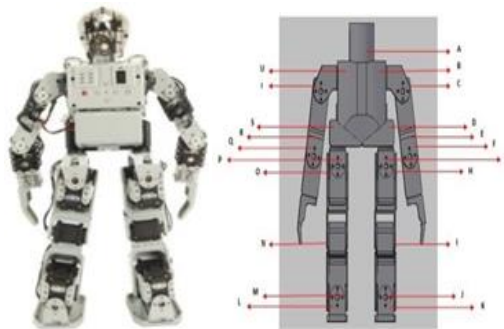
Fig. 3. Bioloid Premium Robot Type A before being modified.

Description of dots Joints Freedom:
A: Joints to the Head
B & U: Joints on Shoulders
C & T: Upper Arm Sleeve
D & S: Joints on Hips
E & R: Joints on Arms under pitch
F & Q: Joints on Arms Under Roll
G & P: Joints in the Thigh Roll
H & O: Joints on the Thigh Pitch
I & N: Joints on the knee
J & M: Joints on the Pitch wrist
K & L: Joints on Wrist Roll

The design of robotic mechanical systems is done after modifying the standard mechanical A-type bioloid robot. Modifications made consist of: 1. The addition of three servo motor 12 volts on the head. Used so that the robot head can move left and right and move up and down. 2. Added 12 volt servo motor on right and left wrist. Used for the palm of the hand to move. 3. The addition of frames on the robot knees using Bioloid Premium frame. Used for robots to increase in height where the size is adjusted with the rules KRSI (Indonesian Art Robot Contest) in 2015. 4. The shape of the robot palm is modified by using aluminum material. Used to resemble human hands. 5. The shape of the foot of the robot is modified by using aluminum material. The robot's foot is made to minimize the falling. The physical shape of the robot after it is modified as shown in Figure 4.
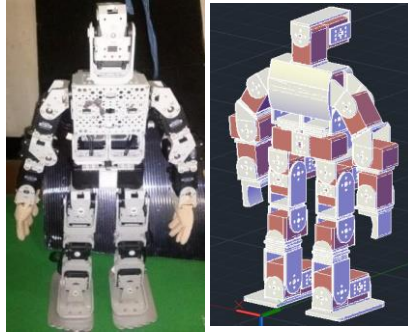
Fig. 4. Bioloid Premium Robot Type A after modification.

2.3 The Whole System Block

The whole system set is shown in figure 5.
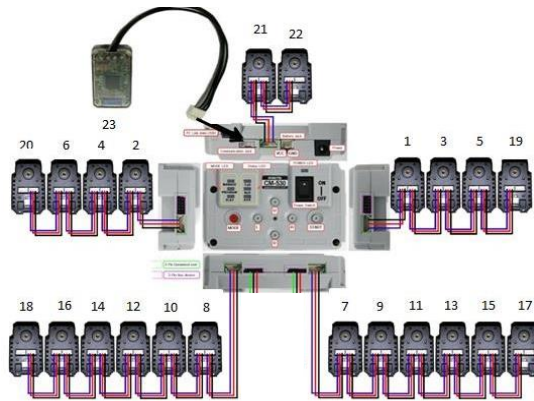
Fig. 5. The whole system set.

Description of the whole system is shown in Table 1.

Table 1. Description of the whole system.

	Aspect
1	Servo left shoulder
2	Servo right shoulder
3	Servo hip left
4	Right hip servo
5	Servo upper left arm
6	Servo upper arm right
7	Servo left forearm
8	Servo right forearm
9	Servo groin left roll

10	Servo groin right roll
11	Servo groin left pitch
12	Servo groin right pitch
13	Servo left knee
14	Right knee servo
15	Servo left ankle roll
16	Servo right ankle roll
17	Servo left pitch ankle
18	Servo right pitch ankle
19	Left wrist servo
20	Right wrist servo
21	Servo head look right left
22	Servo head up nod down
23	The zigbee-110 module
24	Gyroscope Sensor

2.4 ZigBee-110 Communication Module

ZIG-110 is a communication module that can be used to build a simple PAN (Personal Area Network) for communication between devices. MCU (Micro Controller Unit) and ZigBee IC have been integrated in ZIG-110 Set. The ZIG-110 Set module operates at a 2.4 GHz frequency to communicate through the UART interface. Equipped with packaging for protection and cable with 4 pin connector for connection with other compatible devices.

Fig. 6. Overall system set.

2.5 Motor Servo Dinamyxel AX-12A

Servo motors serve to regulate the movement of robots. Servo motors used in this robot is a servo motor type AX-12. AX-12 is one type of precision servo motor. AX-12 has gear arrangement and circuit controller contained in 1 package. This controller cicuit serves as the brain of each servo that works for feedback to improve motor rotation, besides this controller is useful for communication with CM-510. With the circuit control of each servo, it can be seen the variables contained in the servo. Starting from the large turning angle, rotational speed, and large torque to the temperature on the servo motor. In addition, the control circuit on the AX-12 serves as a safety motor 27 that is used and also serves as a communication between the server with a master control that is CM-510.

2.6 System Flow Diagram

System flow diagram of Robotic humanoid communication robot design with the zigbee-110 communication module shown in Figures 7 and 8.
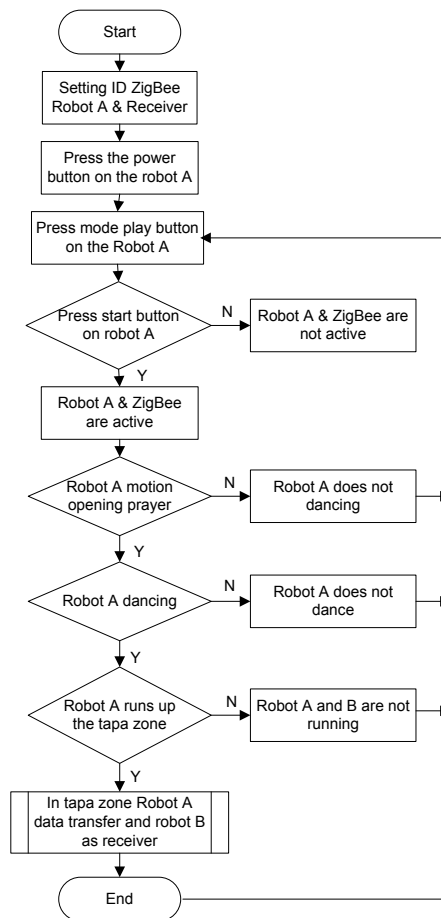
Fig. 7. Flowchart Robot A.

In the flowchart of wireless communication robot A, robot B data transfer and robot A as receiver. If robot A and robot B are not running, both robots are reset. In the main programming flow diagram of wireless communication robot B there are two robot communication program, robot B data transfer and robot A as receiver.
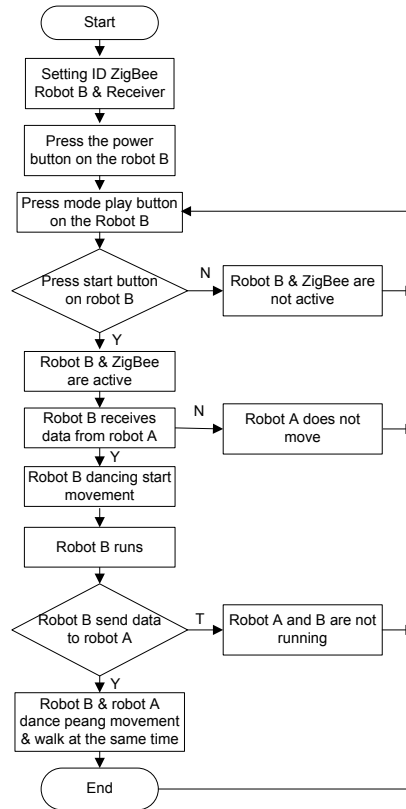
Fig. 8. Robot flow diagram B.

3 Testing and Analysis

3.1 Dynamixel servo motor testing

Testing of servo motors is done to know the relation between widths of PWM pulse given to rotation angle servo motor. The equipment used in this test is AX-12A servo motor, CM-530 controller, and laptop-operated roboplus manager software.
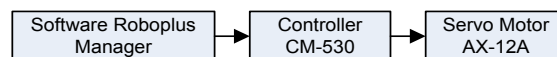
Fig. 9. Block diagram of servo motor servo AX-12A.

Fig. 10. display the position of the servo motor.

3.2 Testing Zigbee-110 Communication Robot A to Robot B

In the design of communication systems of two robots in this study using two modules Zigbee-110 that connected in robot A and robot B.
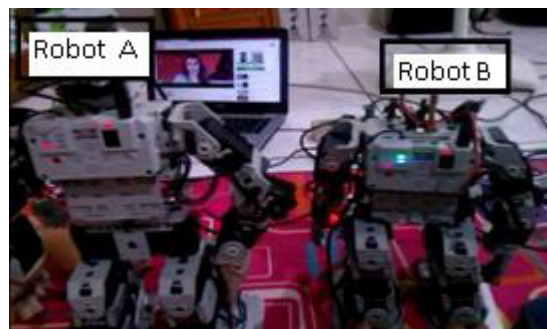
Fig. 11. Communication robot A to robot B.

The Zigbee-110 module test is performed to know that each Zigbee-110 module can send and receive data properly. Figure 8 shows the led on the robot B receives the communication data from robot A. The zigbee-110 test starts from the robotic zone A. A communicates up to the start zone of robot B, zigbee testing of the middle zones of the robot B to the robot A in the tapa zone. Testing aims to determine the communication from robot A to robot B to perform the motion of dance.

Table 2. Throughput of robot A to robot B.

Data received	Distance (cm)	Duration (sekon)	Throughput	Thermal Noise
65535	100	14,87	4407,20	$1,76 \times 10^{-17}$
16384	100	26,43	619,90	$2,48 \times 10^{-18}$
4096	100	14,68	279,02	$1,12 \times 10^{-18}$
1024	100	25,04	40,89	$1,64 \times 10^{-19}$
256	100	14,50	17,66	$7,07 \times 10^{-20}$
64	100	10,27	10,27	$4,11 \times 10^{-20}$
16	100	4,16	4,16	$2,48 \times 10^{-20}$

The test results from each data received robot communication A and robot B on throughput and thermal noise, the greater the data received the greater the throuhput value with a small thermal noise then the communication has a good performance as shown in table 2 and figure 12.
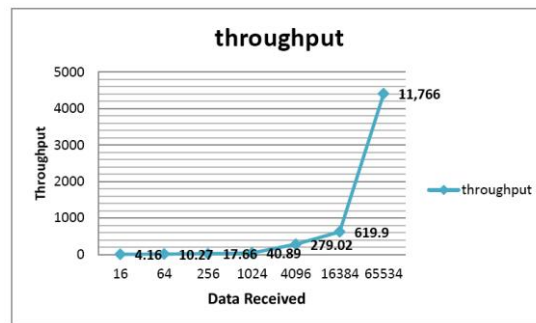
Fig. 12. Graphs Throughput of robot A to robot B.

From the graph of throughput with the received data it appears that the greater the data received, then the value of throughput is also large then the communication network has a good performance and also for time graph with the data received, the greater the data received the greater the time required for communicate between the two robots, as shown in figure 13.
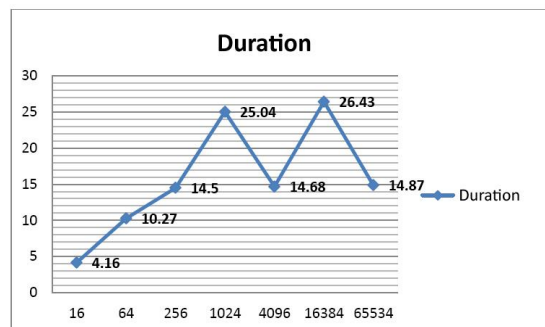
Fig. 13. Time frame graph of robot A to robot B.

3.3 Testing Zigbee-110 robot B communication to robot A

The Zigbee-110 module test is performed to know that each Zigbee-110 module can send and receive data well, From Figure 11 showing the led on the robot communication B sends the data and robot A receives the data.
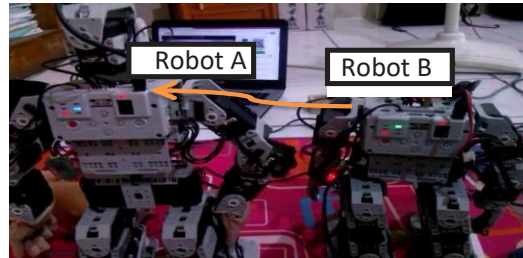
Fig. 14. Communication robot B to robot A.

The test results of each data received robot communication B and robot A on throughput and thermal noise, the greater the data received the greater the throughputvalue with small thermal noise then the communication has a good performance as shown in table 3 and figure 15.

Table 3. Robot B throughput B to robot A.

Data received	Distance (cm)	Throughput	Thermal Noise
32768	13,23	8989.85	$9,92 \times 10^{-18}$
8192	21,50	381.023	$1,53 \times 10^{-18}$
2048	12,94	158.27	$6,34 \times 10^{-19}$
512	21,42	23.903	$9,57 \times 10^{-20}$
128	12,78	10.02	$4,01 \times 10^{-20}$
32	2,01	15.893	$6,36 \times 10^{-20}$
10	12,49	0.80064	$3,20 \times 10^{-21}$
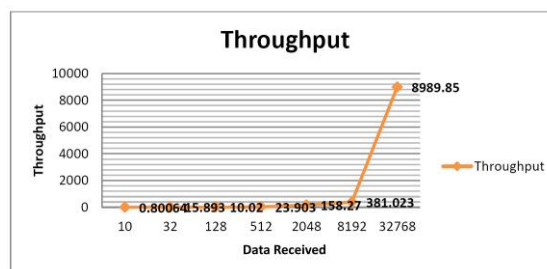
Fig. 15. Graph of throughput of robot B to robot A

From the picture throughput graph to the data the greater the data received then the throughput value is also greater than the communication network has a good performance and also the time graph with the data received, the greater the data received the greater the time required, as shown in the picture 15 and table 3.
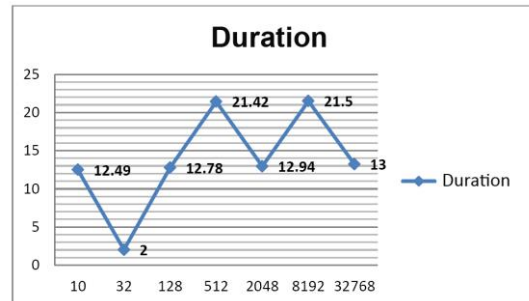
Fig. 16. Time frame graph of robot B to robot A.

4 Conclusions

From the design and testing system that has been done, can be drawn conclusion as follows:
1. For each pattern of movement done robot, data and position of each servo motor actuator angle can be known.
2. Wireless communication model zigbee-110 on robot A and robot B can receive the same data in accordance with the data transmitted.
3. From testing robot A to robot B and robot B to robot A, the greater the data received then the value of throughput is also greater.
4. The greater the data received the greater the time required to communicate between the two robots, and the value of thermal noise affects the emergence of communication failure between two robots.
5. A robot can send data to robot B and robot B can send data also to robot A and can perform the dance moves as desired.

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Effect of Return on Assets, Debt to Equity Ratio, Earning Per Share, Dividend Payout Ratio, Price to Book Value and Earning Growth to Price Earnings Rasio (In Companies Incorporated in the LQ45 Index for the Period 2011 - 2015)

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Abstract. One of the fundamental analysis most commonly used by investors and securities analysts in assessing the price of a stock is by Price Earnings Ratio (PER) approach, which illustrates the willingness of an investor to pay a certain amount for each IDR earnings company. The purpose of this study is to analyze the variables that affect the Price Earnings Ratio of companies incorporated in the LQ 45 period 2011-2016. The variables are Return on Assets, Debt to Equity Ratio, Earning per Share, Dividend Payout Ratio, Price to Book Value and Earning Growth. Sampling was done by purposive sampling and resulted 22 companies. The analysis technique use multiple linear regression. Hypothesis testing is done by using t test and model feasibility test. The result of research shows that the variable of Return On Assets, Dividend Payout Ratio, and Price To Book Value have positive and significant effect to Price Earnings Ratio, while Debt to Equity Ratio, Earning Per Share and Earning Growth variables have negative and not significant effect on Price Earnings Ratio. The coefficient of determination of 0.865 which means that the ability of the regression model to predict is 86.5%.

Keywords: Return on Assets, Debt to Equity Ratio, Dividend Payout Ratio, Price to Book Value, Price Earnings Ratio.

1 Introduction

Capital market as a market for various financial instruments or long-term securities that can be traded, either in the form of debt or equity, issued by the government, public authorities, or private companies. So that the capital market is a financial institution that can be used as a medium of financing for developing companies to offer their valuable letter either in the form of bonds or in the form of shares with an intermediary company underwriter.

One of the most preferred investment options in the stock market is stock. One of the characteristics that can be selected by an investor is LQ 45 index stock in Indonesia Stock Exchange. Every three months will be reviewed the movement of stock rankings used in the calculation index LQ 45. Substitution of shares will be done every six months, ie every early February and August.

This research emphasizes on fundamental analysis that is by using Price Earnings Ratio (PER) approach also called Earning Multiplier. Price Earnings Ratio (PER) is used to assess the fairness of stock prices, because PER facilitates or helps judgment in analyzing stock investments. Previous studies on the relationship between several components of financial variables to Price Earnings Ratio were performed by Yulia et al. [1], Djazuli and Kiptiyah [2], Permatasari and Yonowati [3], Susanto and Wiksuana [4], Kartika Sari and Gusti Putu Wirawati [5]. Among these studies there are still inconsistencies from previous studies in some variables such as Return on Assets (ROA), Debt to Equity Ratio (DER), Earning per Share (EPS), Dividend Payout Ratio (DPR), Price to Book Value (PBV) and Earning Growth (EG).

1.1 Theoretical Review

This analysis will compare the intrinsic value of a stock to its market price in order to determine whether the stock's price already reflects its intrinsic value or not. The intrinsic value of a stock is determined by the fundamental factors influencing the basic idea of this approach is that the stock price will be influenced by the firm's performance. The performance of the company itself is influenced by macro industrial and economic conditions [6].

1.1.1 Price Earnings Ratio

Basically this ratiogives an indication of the time period needed to return the funds at the level of stock prices and corporate profits at a certain period. Therefore, this ratio illustrates the willingness of an investor to pay a certain amount for each rupiah of corporate profits.

1.1.2 Return on Assets

Like, Fahmi (2015) say , the ratio to see the extent to which the investment or total assets that have been implanted able to provide returns on profits as expected [7]. This like Sjahrial(2012) told [8].

1.1.3 Debt to Equity Ratio

According to Kasmir (2015), the ratio used to assess debt with equity [9].

1.1.4 Earning Per Share

According to Fahmi(2015), this ratiodescribesa form of profit given to the shareholders of each share shares owned [7].

1.1.5 Dividend Payout Ratio

The ratio shows the comparison between cash dividends per share and earnings per share or this represents the amount of profit per share in dividends [10].

1.1.6 Price to Book Value

Harjadi (2013) say,this ratio describes how much the market appreciates the value of a company's books. PBV does not contain information about the company's ability to generate profits [11].

1.1.7 Earnings Growth

Earning Growth or profit growth represents the company's growth from year to year. Profit growth to be studied is the growth of earnings per share , like Sjahrial (2012) told [8].

1.2 Restricting The Problem

1. This research is limited toReturn on Assets, Debt to Equity Ratio, Earning per Share, Dividend Payout Ratio, Price to Book Value and Earning Growth.
2. Companies incorporated in the LQ 45 Index listed on the Stock Exchange and have published the financial statements continuously in the period 2011-2015.
3. Share price is the average stock price of Closing Price during January – December

1.3 Formulation of the Problem

1. Does Return on Assets have a significant effect on Price Earnings Ratio?
2. Does Debt to Equity Ratio have a significant effect on Price Earnings Ratio?
3. Does Earning per Share have a significant effect on Price Earnings Ratio?
4. Does Dividend Payout Ratio, significant effect on Price Earnings Ratio?
5. Does Price to Book Value have a significant effect on Price Earnings Ratio?
6. Does Earning Growth have a significant effect on Price Earnings Ratio?

1.4 Research Hypotheses

H1: Return On Assets effect on Price Earnings Ratio
H2: Debt to Equity Ratio has an effect on Price Earnings Ratio
H3: Earning Per Sharehas an effect on Price Earnings Ratio
H4: Dividend Payout Ratio effect on Price Earnings Ratio
H5: Price to Book Value has an effect on Price Earnings Ratio
H6: Earning Growth effect on Price Earnings Ratio

1.4.1 Framework of Thinking
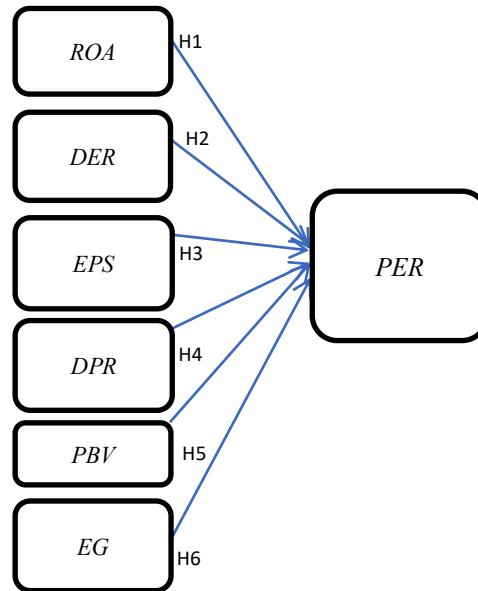
Fig. 1. Framework of Thinking.

2 Research Methodology

This research is a type of quantitative research by analyzing secondary data and the population is 45 companies incorporated in LQ 45 Index. Researchers use documentary type data obtained from Indonesia Stock Exchange which became the subject of this study. Sources of data arefinancial reports.

Data analysis with multiple regression analysis with SPSS 20 program and with Multicolinierity Test, Autocorrelation test, Normality Test and Heteroskedasticity Test and Hypothesis Testing with t test and model feasibility test.

2.1 Sample Research

Purposive sampling technique is used in this research where the technique of determining the sample with certain considerations. The considerations implied in determining the sample of this study are: (1) Companies incorporated in the LQ 45 Index listed on the Stock Exchange which have the most complete financial statements and have been published in 2011-2015. (2) Companies are still operating during the observation period (2011 to 2015). Based on these two criteria, the sample of 22 companies in the LQ 45. Index listed in the Indonesia Stock Exchange for 2011-2015 period is obtained.

3 Results of Research

3.1 Normality Test

Table 1. Normality Test.

One-Sample Kolmogorov-Smirnov Test

		Unstandardiz ed Residual
N		110
Normal Parameters[a,b]	Mean	.0500698
	Std. Deviation	.19146961
Most Extreme Differences	Absolute	.043
	Positive	.034
	Negative	-.043
Kolmogorov-Smirnov Z		.455
Asymp. Sig. (2-tailed)		.986

a. Test distribution is Normal.

b. Calculated from data.

Source: SPSS version 20 results.

In table 1 seen significant value of 0.986> 0.05 so it can be said that this model is normally distributed.

3.2 Autocorrelation Test

Table 2. Autocorrelation Test.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.794[a]	.630	.625	.31264	.630	112.449	1	66	.000	
2	.809[b]	.655	.645	.30416	.025	4.729	1	65	.033	
3	.933[c]	.871	.865	.18749	.216	107.076	1	64	.000	1.763

a. Predictors: (Constant), LN_X5_PBV

b. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA

c. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA, LN_X2_DER

d. Dependent Variable: LN_Y_PER

Source: SPSS version 20 results.

Based on Table 2 then DW calculated equal to 1.763 between dL of 1.4217 and dU 1.8032 which means it can be concluded the model does not occur autocorrelation.

Table 3. Run Test.

Runs Test

	Unstandardized Residual
Test Value[a]	.04991
Cases < Test Value	55
Cases >= Test Value	55
Total Cases	110
Number of Runs	53
Z	-.575
Asymp. Sig. (2-tailed)	.565

a. Median

Based on table 3 then it can be seen Run test results with significant value of 0,565> 0,05 therefore this model is free from Autocorrelation problem.

3.3 Multicolinearity Test

Table 4. Multicolinearity Test.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	2.125	.070		30.156	.000	1.984	2.265					
	LN_X5_PBV	.493	.046	.794	10.604	.000	.400	.585	.794	.794	.794	1.000	1.000
2	(Constant)	1.759	.182		9.687	.000	1.396	2.122					
	LN_X5_PBV	.564	.056	.908	10.105	.000	.452	.675	.794	.782	.736	.656	1.524
	LN_X1_ROA	-.112	.052	-.196	-2.175	.033	-.216	-.009	.337	-.260	-.158	.656	1.524
3	(Constant)	-.110	.213		-.520	.605	-.535	.314					
	LN_X5_PBV	.893	.047	1.439	19.061	.000	.799	.986	.794	.922	.856	.354	2.827
	LN_X1_ROA	-.734	.068	-1.277	-10.795	.000	-.870	-.598	.337	-.803	-.485	.144	6.945
	LN_X2_DER	-.406	.039	-.997	-10.348	.000	-.484	-.327	-.160	-.791	-.465	.217	4.607

a. Dependent Variable: LN_Y_PER

Source: SPSS version 20 results.

Based on table 4 it can be seen that the value of variance inflation factor (VIF) of each independent variable has a VIF of no more than 10 and a Tolerance value of not less than 0.1. Thus, it can be concluded that all independent variables (Price to Book Value and Return On Assets and Debt to Equity Ratio) does not occur multicollinearity problems and can be used as research data.

3.4 Heteroscedasticity Test

From Figure 2, the scatterplot shows that the points spread randomly, do not form a certain clear pattern, and spread either above or below the number 0 on the Y axis, it can be concluded that there is no heteroscedasticity in this regression model, so the model is feasible used.
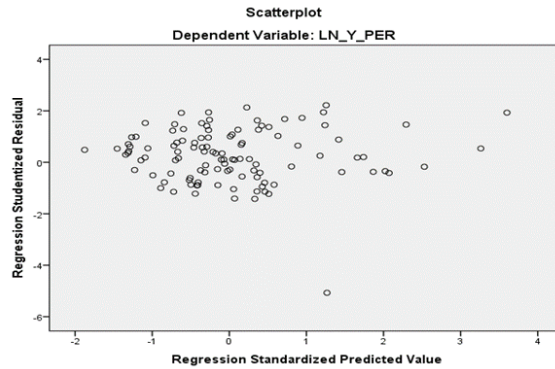
Fig. 2. Heteroscedasticity Test.

3.5 Determination Coefficient Analysis

Table 5. Determination Coefficient.

Model Summary^d

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.794ᵃ	.630	.625	.31264	.630	112.449	1	66	.000	
2	.809ᵇ	.655	.645	.30416	.025	4.729	1	65	.033	
3	.933ᶜ	.871	.865	.18749	.216	107.076	1	64	.000	1.763

a. Predictors: (Constant), LN_X5_PBV

b. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA

c. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA, LN_X2_DER

d. Dependent Variable: LN_Y_PER

Source: SPSS version 20 results.

From table 5 Adjusted R Square equal to 0,865 or 86,5%, meaning fluctuation of PER can be explained by PBV, ROA and DER and the rest 13,5% (100% - 86.5%) is explained by other things outside the research model such as Company Size, Return On Equity and so on.

3.6 Multiple Linear Regression Analysis

Table 6. Multiple Linear Regression.

Coefficients^a

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	2.125	.070		30.156	.000	1.984	2.265					
	LN_X5_PBV	.493	.046	.794	10.604	.000	.400	.585	.794	.794	.794	1.000	1.000
2	(Constant)	1.759	.182		9.687	.000	1.396	2.122					
	LN_X5_PBV	.564	.056	.908	10.105	.000	.452	.675	.794	.782	.736	.656	1.524
	LN_X1_ROA	-.112	.052	-.196	-2.175	.033	-.216	-.009	.337	-.260	-.158	.656	1.524
3	(Constant)	-.110	.213		-.520	.605	-.535	.314					
	LN_X5_PBV	.893	.047	1.439	19.061	.000	.799	.986	.794	.922	.856	.354	2.827
	LN_X1_ROA	-.734	.068	-1.277	-10.795	.000	-.870	-.598	.337	-.803	-.485	.144	6.945
	LN_X2_DER	-.406	.039	-.997	-10.348	.000	-.484	-.327	-.160	-.791	-.465	.217	4.607

a. Dependent Variable: LN_Y_PER

Source: SPSS version 20 results.

Based on table 6 can be seen the regression equation:

$$Y\_PER = -110 - 0.734LN\_X1\_ROA - 0.406LN\_X2\_DER + 0.893LN\_X5\_PBV \qquad (1)$$

The regression equation can be interpreted as follows:
- Constant is -110: it means that if ROA, DER and PBV value is 0, then PER value is -110
- Regression coefficient of ROA equal to -0.734: means if other independent variables are fixed and if ROA increases 1 unit, then PER will decrease by 0.734.
- Regression coefficient of DER is -0,040: it means that if other independent variables are fixed and if DER increases 1 unit, then PER will decrease by 0,040.
- Regression coefficient of PBV is 0.893: it means that if other independent variables are fixed and if PBV increases 1 unit, then PER will decrease by 0.893.

Table 7. t Test.

Coefficients^a

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	2.125	.070		30.156	.000	1.984	2.265					
	LN_X5_PBV	.493	.046	.794	10.604	.000	.400	.585	.794	.794	.794	1.000	1.000
2	(Constant)	1.759	.182		9.687	.000	1.396	2.122					
	LN_X5_PBV	.564	.056	.908	10.105	.000	.452	.675	.794	.782	.736	.656	1.524
	LN_X1_ROA	-.112	.052	-.196	-2.175	.033	-.216	-.009	.337	-.260	-.158	.656	1.524
3	(Constant)	-.110	.213		-.520	.605	-.535	.314					
	LN_X5_PBV	.893	.047	1.439	19.061	.000	.799	.986	.794	.922	.856	.354	2.827
	LN_X1_ROA	-.734	.068	-1.277	-10.795	.000	-.870	-.598	.337	-.803	-.485	.144	6.945
	LN_X2_DER	-.406	.039	-.997	-10.348	.000	-.484	-.327	-.160	-.791	-.465	.217	4.607

a. Dependent Variable: LN_Y_PER

Source: SPSS version 20 results

From table 7 the results are as follows:
1. Sig value. variable ROA of 0,000 <0.05 which means the variable ROA effect on PER
2. Sig value. variable DER of 0,000 <0,05 which means DER variable has an effect on PER
3. Sig value. PBV variable is 0.000 <0,05 which means PBV variable has an effect on PER

Table 8. Model Feasibility Test.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.991	1	10.991	112.449	.000^b
	Residual	6.451	66	.098		
	Total	17.442	67			
2	Regression	11.429	2	5.714	61.766	.000^c
	Residual	6.014	65	.093		
	Total	17.442	67			
3	Regression	15.193	3	5.064	144.069	.000^d
	Residual	2.250	64	.035		
	Total	17.442	67			

a. Dependent Variable: LN_Y_PER
b. Predictors: (Constant), LN_X5_PBV
c. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA
d. Predictors: (Constant), LN_X5_PBV, LN_X1_ROA, LN_X2_DER

Source: SPSS version 20 results.

From table 8, the result of Sig value. 0.000 <0.05 which means there is a significant influence between ROA,DER, EPS, DPR, PBV and EGsimultaneously to PER.

3.7 Interpretation of Research Results

a. Effect ROA against PER :
    Return On Asset has a significant effect on Price Earning Ratio. If ROA is high, then the company has the ability to generate profits so that investors will be more confident that investing will be profitable. This research is in line with research conducted by Permataari and Yonowati [3], Yulia et al., [1], Susanto and Wiksuana [4] that ROA has a significant effect on PER.

b. Effect DER against PER
    Debt to Equity Ratio significantly influence Price Earning Ratio (PER). Increased debt will result in an increased risk so that market confidence in the growth prospects of the company will be reduced and create a low share price and result in a smaller PER. The greater this ratio, the more unfavorable it will be because the greater the risk borne of the failure that may occur in the company for both creditors and shareholders. This research is in line with research conducted by Yulia et al(2014) that DER have a significant effect on PER [1].

c. Effect of EPS on PER
    Earnings Per Share has no significant effect on Price Earning Ratio. EPS is not a reflection of company profits. Companies that have the same EPS, but if the amount of total assets are different there aslo the profit. This research is in line with research conducted by Yulia et al(2014) that EPS has no significant effect on PER [1].

d. Effect of DPR on PER
    Dividend Payout Ratio does not significantly affect the Price Earning Ratio. Changes on the dividend payout ratio can affect the PER change. A company makes a profit but its dividend is not distributed to investors because it is invested / bought assets. If dividend income of a company's stock is unstable then the stock price is unstable as well. This research is in line with research conducted by Yulia et al(2014) that DPR has no significant effect on PER [1].

e. Effect of PBV on PER
    Price to Book Value significantly influence Price Earning Ratio. The greater the value of PBV, the higher the value of the firm. So that makes the investors interested to invest funds into the company. This will have an impact on the increasing number of investors who are interested in the shares of the company and resulted in rising prices in the capital market. This research is in line with research conducted by Yulia et al(2014) that PBV has significant effect on PER [1].

f. Effect of EG on PER
    The results that have been done, it is known that Earning Growth has no significant effect on Price Earning Ratio. The average company has a negative profit growth so that Earning per Share does not reflect corporate earnings. Companies that have the same Earning per Share, total assets are different then the profit is different. This research is in line with research conducted by Yulia et al (2014) and (Djazuli and Kiptiyah, 2009) that EG has no significant effect on PER [1], [2].

4 Conclusion

There is a significant influence between variable ROA, DER and PBV to PERand no significant influence between variable EPS, DPR and EG to PER in companies incorporated in Index LQ 45. Investors should consider the variable ROA, DER and PBV if they want to invest in shares of companies and companies incorporated in the LQ 45 Index should increase the EPS, DPR and EG in order to attract investors to invest in stocks. The next researcher is to add other independent variables which influence to PER, that is, among others: Return On Equity, Company Size as well as using companies engaged in some sectors and other sub-sectors, for further research get better and useful results.

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Analysis of Automatically Switched Optical Network (ASON) Protection System in Jakarta – Bogor Fiber-Optic Transmission Link

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Abstract.The use of protection on fiber-optic network was to prevent the possibility of failures it was required reliable protection system to keep the service running. The process to find appropriate protection systems on Synchronous Digital Hierarchy (SDH) and Wavelength Division Multiplexing (WDM) networks was based on traffic distribution capacity, network topology, and economic considerations. There were several types of protection: Multiplex Section Protection (MSP), Sub-Network Connection Protection (SNCP), and Automatically Switched Optical Network (ASON). The protection system discussed in this thesis was Automatically Switched Optical Network (ASON) used by Mora Telematika Indonesia Inc. The test results and analysis conducted on the main line and ASON protection were revealed that ASON protection quality which able to handle multiple fault so that the traffic automatically moved to the protection line via Depok = 15.1324 ms, via Graha = 26.6358 ms, and via BSD = 49.6828 ms; in accordance with standardization of Service Level Agreement (SLA) with switching time provider <50 ms which was in the same quality between throughput, frame loss, jitter and the main line. Thus ASON protection kept the traffic running normally.

Keywords: Protection System, SDH, WDM, MSP, SNCP, ASON.

1 Introduction

The usage of fiber-optic transmission media as the backbone of Synchronous Digital Hierarchy (SDH) and Wavelength Division Multiplexing (WDM) technology that able to provide large traffic capacity is to prevent the worst possible system failure due to the damage of fiber-optic cable, and thus it needs reliable protection system to keep the service running[1], [2]. The protection system is chosen based on the needs of traffic, network topology, and economic considerations[3].

In principle, this protection system provides or takes some network capacity to be allocated as capacity in the backup channel. In this study, the system of Automatically Switched Optical Network (ASON) Jakarta – Bogor was developed for analyzing the switching time that is required for automatic restore and latency comparison which occurs in each router from ASON protection system on fiber-optic transmission network in the area of Jakarta –Bogor, along with the feasibility of ASON protection system.

2 Research Methodology

2.1 Automatically Switched Optical Network (ASON)

ASON is an Optical Transport Network (OTN) that has the ability to establish a dynamic connection [4], [5]. ASON definition is set in ITU-T G.8081/Y.1353 on Terms and Definitions for Automatically Switched Optical Network (ASON). The recommendation explains all the terms, definitions, and abbreviations used in ASON recommendations [6]. ASON protection system is able to overcome multiple fault cases which each connected line can be used simultaneously, and if fiber failure (fiber cut) occurred, the traffic will automatically move through the normal connected lines [7].

2.2 ASON Architecture

ASON architecture is divided into three parts (planes), i.e. transport plane, control plane, and management plane [5], as shown in Figure 1
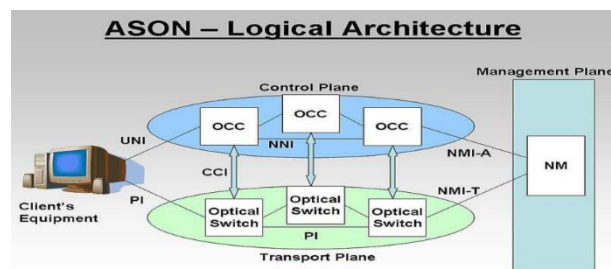
Fig. 1. Architecture of ASON [8]

o   **Transport Plane**

Transport plane is also known as data plane which represents the use of network resources to convey information among users.

o   **Control Plane**

Control plane includes the process of signaling, routing, and link management. Signaling performs the development process, disconnections, and modifies connections.

o   **Management Plane**

Management plane provides network management functions on transport plane and control plane, and the system as a whole. [9], [10] ASON uses a restoration or protection system and both that isPRC (Protection Restoration Combine) as its fault handling. While the backbone network is still using ring topology, in which the redundancy process uses the protection system (SNCP/MSP). With this topology, it is not possible for the network to have multiple

fault handling. The condition of multiple fault handling is shown as in Figure 2in which the mesh service topology will still run even though there are three failure links.
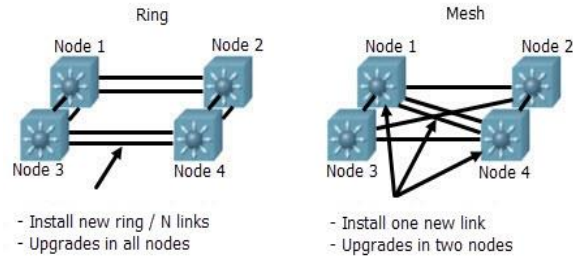
Fig. 2. Comparison of Ring and Mesh Topologies [11]

2.3 Service Level Agreement (SLA)

Service Level Agreement or commonly known as SLA is part of the overall service agreement between 2 (two) entities for performance improvement or in other words the delivery time must be fixed during the contract period. These two entities are typically known as service providers and clients that may concern legal agreement due to money involvement or any formal contracts between internal business units.

2.4 Quality of Service (QoS)

Quality of Service (QoS) or service quality is a network mechanism that allows applications or services to operate as expected. QoS is related to customer satisfaction on using the network. Some of QoS parameters are throughput, packet loss or frame loss, latency or delay, and jitter. The following QoS standards are used by Mora Telematika Indonesia, Inc., such as throughput, packet or frame loss, latency or delay, and jitter [12]:

2.4.1 Throughput

Throughput is the effective rate of data transfer which the data is measured in bps. Throughput can be calculated using equation 1:

Table 1. Throughput Standardization.

Category	Throughput (%)
Very Good	100
Good	95
Moderate	90
Poor	< 85

$$P = \frac{s}{t} \quad \text{or}$$

$$Throughput = \frac{packet\ data\ received}{total\ of\ observation\ time} \qquad (1)$$

where:
t = time used in transmitting data (seconds)
s = data size received (bit)
P = actual throughput at time of data transmission (bits per second)

2.4.2 Packet or Frame Loss

Packet loss or frame loss is a parameter that indicates the loosing number of packets or frame during the data transmission from the source (sender) to the destination (receiver). Packet loss can be calculated using equation 2:

Table 2. Packet loss Standardization.

Category	Packet loss (%)
Very Good	0
Good	1
Moderate	3
Poor	5

$$Packet\ Loss = \frac{(data\ packet\ sent - data\ packet\ received)}{data\ packet\ sent} \times 100\% \qquad (2)$$

2.4.3 Latency or Delay

Latency is the amount of time for data packet to move across a network connection. Latency can be calculated using equation 3:

Table 3. Latency Standardization.

Category	Latency (ms)
Very Good	< 6
Good	6 s/d 9
Moderate	9 s/d 12
Poor	>12

$$Latency = [Lsf + Lwi + Lsw + Lq] \qquad (3)$$

$$Lsf = \frac{frame\ packet\ size}{Bandwidth} \qquad (4)$$

$$Lwi = \frac{Distance}{Propagation\ Speed} \qquad (5)$$

where:
Lsf = *Store and Forward Latency*
Lwi = *Wireline Latency*
Lsw = *Switch Fabric Latency*
Lq = *Queuing Latency*

2.4.4 Jitter

Jitter is a delay variation due to time difference or interval between packet arrivals in Jitter recipient that can be calculated using equation 6:

Table 4. Jitter Standardization.

Category	Jitter (ms)
Very Good	0
Good	0 s/d 3
Moderate	3 s/d 6
Poor	>6

$$Jitter = \frac{total\ of\ delay\ variation}{total\ of\ received\ packet} \tag{6}$$

$$Total\ of\ delay\ variation =\\ delay - (average\ delay) \tag{7}$$

2.5 Implementation of Automatically Switched Optical Network Jakarta – Bogor Link

2.5.1 Flow Chart of Traffic Restoration

In Figure 3, if a Fiber Failure or FO cut is detected in Jakarta – Bogor route, enabling the closest protection line will return the traffic to normal.
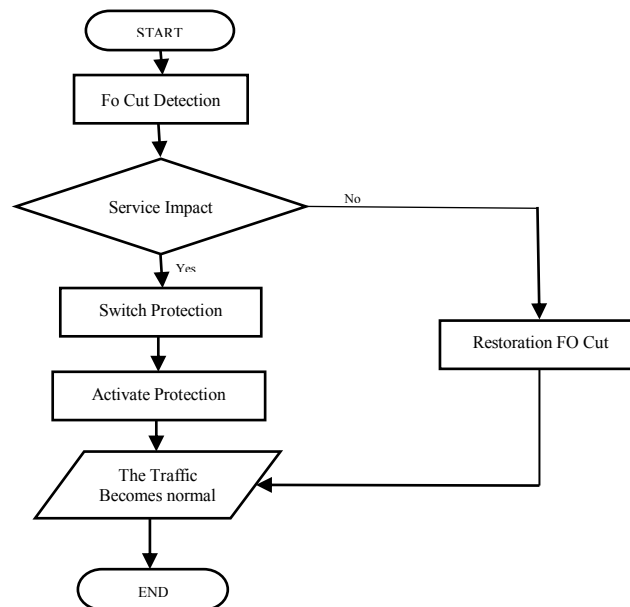
Fig. 3. Flow Chart of Traffic Restoration.

(Start-FO cut detected-service impact-Y. switch to nearest protection-enable the protection-traffic back to normal-finish; N. Wait for FO cut restoration-traffic back to normal-finish)

2.5.2 Flow Chart of Traffic Restoration

Jakarta – Bogor Network Topology is in direct core as shown in Figure 4, the traffic will be at high risk of interference if there is a fiber failure.

Fig. 4. Topology Core Jakarta – Bogor.

In the beginning, Jakarta – Bogor transmission network was formed by SDX 1xSTM64.

2.5.3 Survivability Network Jakarta-Bogor

Table 5 is a collection of fiber failure cases occurredin Jakarta – Bogor network during December 2016 up to March 2017.

Table 5. Historical Fiber Failure Data in Jakarta - Bogor Section.

Section	Downtime	Uptime	Over-all down-time	Route Cause (Source)	Detail Problem	Action Taken
2 Core DWDM Sec-tion Jakar-ta – Bogor Down	Dec 4, 2016 16:13:00	Dec 5, 2016 02:33:00	10h 20m	Bad core	Patch core problem at Jakarta	Link Back to normal after replace patch core
2 Core DWDM sec-tion Jakar ta – Bogor Down	Dec 14, 2016 04:03:00	Dec 16, 2016 05:46:00	2D 1h 43m	PU Activity	FO cut section Cyber – Bogor, cut point 4 Km from POP Bogor	Link up after fiber splicing
2 Core SDH sec-tion Jakar-ta – Bogor Down	Dec 14, 2016 16:00:00	Mar 13, 2017 20:31:00	89D 4h 31m	PU Activity	FO cut section Cyber – Bogor, cut point at 3.8 KM from Jakarta	Link up after fiber splicing
2 Core DWDM sec-tion Jakar-ta – Bogor Flicker	Jan 6, 2017 16:15:00	Jan 6, 2017 16:20:00	5m	Unknown	Detect alarm LOS section	Link back to normal before any further

					Jakarta – Bogor	action
2 Core DWDM section Jakar-ta – Bogor Down	Feb 19, 2017 01:31:00	Feb 19, 2017 14:43:00	13h 12m	PU Activity	FO cut section Cyber – Bogor, cut point at 21km from Bogor	Link up after fiber splicing
2 Core DWDM section Jakar-ta – Bogor Flicker	Feb 28, 2017 22:53:00	Feb 28, 2017 23:02:00	9 m	Unknown	Detect alarm LOS section Jakarta - Bogor	Link back to normal after any further action
2 Core DWDM section Jakar-ta – Bogor Down	Mar 1, 2017 11:18:00	Mar 1, 2017 17:25:00	6h 7m	Patch core problem	Patch core problem at Jakarta	Link Back to normal after replace patch core

2.5.4 ASON Design Jakarta – Bogor

This protection system technology is one of the protection system used by Mora Telematika IndonesiaInc.The use of Automatically Switched Optical Network (ASON) technology is based on the establishment of optical cable infrastructure that connects the city of Jakarta – Bogor – Depok –Tangerang – Bekasi (JABODETABEK) that each city has been integrated to more than one city destination as shown in Figure 5.
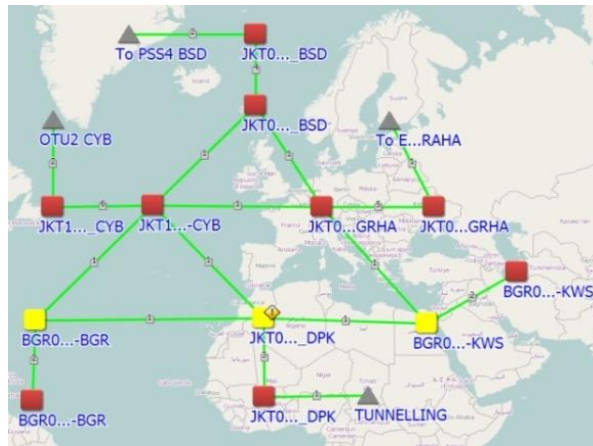
Fig. 5. Backbone Topology of JABODETABEK.

2.5.5 ASON Configuration and Implementation Jakarta – Bogor Link

In applying this ASON configuration, there are some things to be concerned; determining the service definition that includes the capacity or rate and the allocation of the end-to-end port. In Jakarta – Bogorlink, this can be determined by the direction and purpose of the port, here are to create an ASON configuration in OMS:
1. Determining Jakarta – Bogor service definition link that will be used.
2. Configuring the Transmission Parameters such as:
    • Action on LOS
    • Container
    • Signal Type
3. Configuring ASON, the main thing in ASON configuration is Default Priority and Default Setup Priority, which is as a priority link to occupy the protection allocation in ASON.
4. Configuring Assurance, this configuration aims to enable Performance Monitoring within 15 minutes and 24 hours. So that the links quality can be seen in case of failure occurs on the transmission network.
5. Implementing the configured link.

The result of Jakarta – Bogor ASON link that has been implemented can be seen in the highlight of CSO as in figure 6.
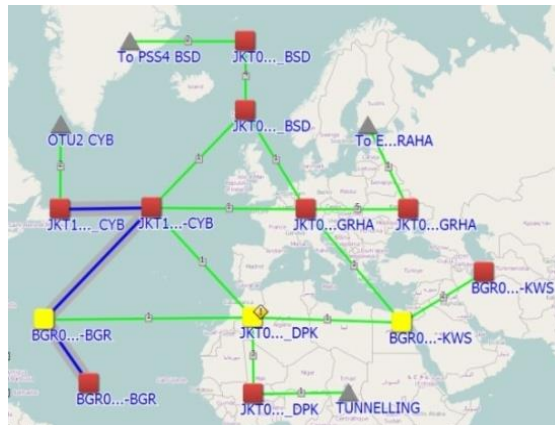
Fig. 6. ASON Highlight Jakarta – Bogor.

After the implementation ofASON protection system in Jakarta – BogorLink, it has the ability to cope with the traffic down if there is any fiber failure and has the ability to handle multiple fault cases if a fiber failure happens in the other line.

2.5.6 BERTest

Bit Error Rate Test is commonly used to find out numbers of errors that occur in communication networks, either in networks based on SDH technology, PDH, DSL, Fiber

Channel and Ethernet. The parameters on BERTest are Throughput, Frame Loss, Latency, Jitter, and Switching time.

2.5.7 Standardization of Service Level Agreement (SLA)

Here are the SLA offered by Mora Telematika Indonesia, Inc.:

Table 6. Historical Fiber Failure Data in Jakarta - Bogor Section.

Availability %	Downtime Per Year	Downtime Per Month	Downtime Per Week
90	36,5 D	72 h	16,8 h
95	18,25 D	36 h	8,4 h
97	10,96 D	21,6 h	5,04 h
98	7,30 D	14,4 h	3,36 h
99	3,65 D	7,20 h	1,68 h
99,5	1,83 D	3,60 h	50,4 m
99,8	17,52 h	86,23 m	20,16 m
99,9	8,76 h	43,8 m	10,1 m
99,95	4,38 h	21,56 m	5,04 m
99,99	52,56 m	4,32 m	1,01 m
99,999	5,26 m	25,9 s	6,05 s
99,9999	31,5 s	2,59 s	0,605 s
99,99999	3,15 s	0,259 s	0,0605 s

For example, a customer with 99% SLA; that means a standard service offered by Mora Telematika Indonesia, Inc. is 99% in a month and the remaining 1% of the service is considered to be normal to be down. In 1 month, if there are 30 days, which 1 day is 24 hours, then in 1 month = 30 days x 24 hours = 720 hours is 100% up service. If it is 99%, then the service standard is 99% x 720 hours = 712.8 hours, which the rest 7.2 hours is considered as normal if the service go down (off) in 1 month. Referring to table 5, when a disruption happens to the transmission media network Jakarta – Bogor, its completion will take quite a long time so that SLA standardization is not possible to be reached. Thus to maintain the commitment of theSLA offered, in order to prevent the long traffic downtime, it is needed to implement ASON protection system.

2.5.8 Standardization of Link Performance

Standardization of link performance, besides referring to the value of Quality of Service (QoS), is also seen from the switching time that required to restore the traffic. Here are the standardization parameters used by Mora Telematika Indonesia, Inc [12].

Table 7. Normal Link Parameter.

Parameter	Value	Unit
Throughput	100	%
Frame Loss	0	%
Latency	< 6	ms

Jitter	< 0	ms
Switching Time	< 50	ms

3 Test and Analysis of Ason Protection System

3.1 Configuration Test of ASON Jakarta – Bogor Link

Figure 7 is ASON Jakarta – Bogorconfiguration test image that is applied using BERTest.

Fig. 7. Configuration Test.

3.2 Line Analysis of Jakarta – Bogor Main Link

3.2.1   Throughput

Figure 8 is the result of throughput measurement:
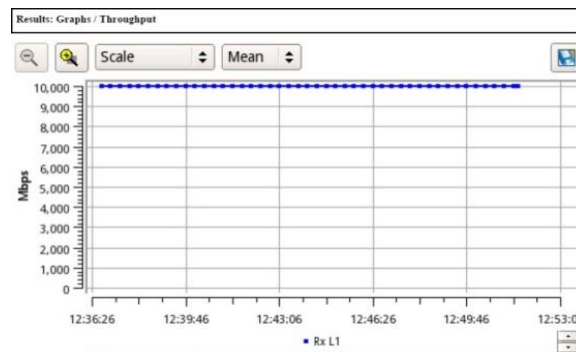
Fig. 8. Throughput Measurement of Jakarta – Bogor Main Link.

From the throughput measurement, it can be calculated using equation 1. A received packet from a total of 15 minutes test time is 1,122,616,156,800 Bytes or 1,122 Tera Byte.

S = 1,122,616,156,800 Byte x 8 = 8,980,929,254,400 bits; and
t = 15 minutes x 60 = 900 s
Then the throughput (P) received is:

$$Throughput = \frac{data\ packet\ received}{total\ of\ observation\ time} = \frac{8{,}980{,}929{,}254{,}400\ b}{900\ s}$$
$$= 9{,}978{,}810{,}283\ bps \cong 9.979\ Gbps$$

3.2.2 Frame Loss or Packet Loss

Figure 9 is the result of frame loss or packet loss measurements on Jakarta – Bogor main link network.

Fig. 9. Graphic of Frame Loss Measurement on Jakarta – Bogor Main Link.

From Figure 9 and Figure 10 the measurements line of Jakarta – Bogor main link fiber-optic transmission network with 10Gbps bandwidth has a frame loss or packet loss 0%, which means with 100% success rate then all packets transmitted in the network are sent perfectly without any packet missing in its transmission.

Fig. 10. Frame or Packet Loss Main Link Jakarta – Bogor.

From the measurement data of packet loss, it can be calculated by using equation 2.2. The packet sent = 1,000 and Packet received = 1,000.
Then the packet loss is:

$$Packet\ Loss = \frac{(data\ packet\ sent - data\ packet\ received)}{data\ packet\ sent}\ x\ 100\%$$

$$= \frac{(1,000 - 1,000)}{1,000} \; x \; 100\% = 0\%$$

3.2.3 Latency or delay

The measurements are conducted by sending packets or pinging repeatedly 1,000 times with the default load of 9,600 bits, Switch Fabric Latency (Lsw) of 0.0512 ms and Queuing Latency (Lq) = 0 ms. Below in figures 11 and 12 are the results of latency or delay measurements:

Fig. 11. Graphic of Latency Measurement of Jakarta – Bogor Main Link.

In Figure 11 the graphic of Latency Main Link measurement of fiber-optic transmission network from Jakarta – Bogor, the current latency can be seen 3000μs or 3ms. From the results of ping test Jakarta – Bogor in figure 12 also can be seen the minimum Latency = 3 ms, maximum = 53 ms, and average = 3 ms.
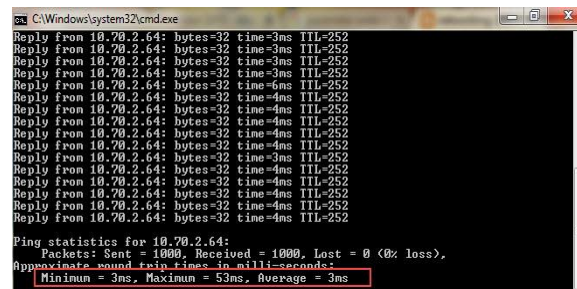
Fig. 12. Latency in Jakarta – Bogor Main Link.

From the measurement data conducted with bandwidth 10 Gbps, it can be calculated using equations 2.3, 2.4, and 2.5. With the known data as follows:

Frame packet size = 9,600 bit x 1,000 = 9,600,000 bits
Bandwidth = 10 Gbps = 10,000,000,000 bps
Distance of Jakarta – Bogor = 92 Km = 92,000 m

Then the number of Store and Forward Latency (Lsf) and Wireline Latencty (Lwi) are:

$$Lsf = \frac{frame\ packet\ size}{Bandwidth} = \frac{9,600,000\ bit}{10,000,000,000\ bps}$$

For Lwi number:

$$Lwi = \frac{Distance}{Propagation\ Speed} = \frac{92,000\ m}{3x10^8\ \frac{m}{s}}$$

From the calculation data above, it is known the latency number is as follows:
$Latency = [Lsf + Lwi + Lsw + Lq]$ x 3 hop= $[0.96 + 0.3067 + 0.0512 + 0]$ x 3 = 1.3179
x 3 = 3.9537 ms

3.2.4 Jitter

Figure 13 shows the results of jitter measurements.
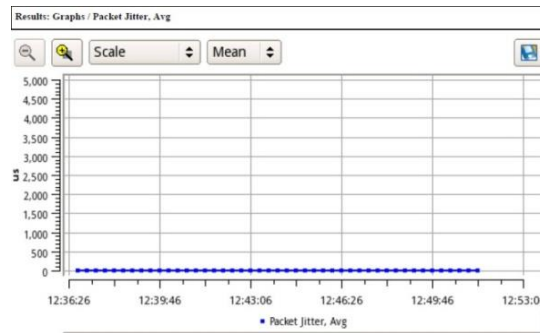
Fig. 13. Jitter in Jakarta – Bogor Main Link.

From the result of jitter measurement at Figure 13, it was seen the jitter value equal to 0 μs
with data of total packet received 1,122,616,156,800 Byte and total variation delay 3,9537 ms,
thus it can be calculated using equation 2.6.

$$Jitter = \frac{total\ of\ delay\ variation}{total\ of\ received\ packet} = \frac{3.9537\ x\ 10^{-3}}{1,122,616,156,800} \cong 3.5219$$
$$\cong 3.5219\ femto\ second\ (fs)$$

From the measurement data of QoS in Jakarta – Bogor main link with throughput parameter,
frame loss or packet loss, latency, and jitter, there is difference in the calculation result which
can be seen in table 8 below:

Table 8. Measurement and Calculation Results of QoS in Jakarta – Bogor Main Link.

QoS Parameter	Measurement	Calculation
Throughput	10 Gbps	9.979 Gbps
Frame Loss	0 %	0 %
Latency	3 ms	3.9537 ms
Jitter	0 μs	3.5219 fs

3.3 Line Analysis of Jakarta – Bogor Protection Link

3.3.1   Jakarta – Bogor Protection Link via Depok

Here in Figure 14 was seen when Jakarta – Bogor main line went down and the traffic was going through Depok.
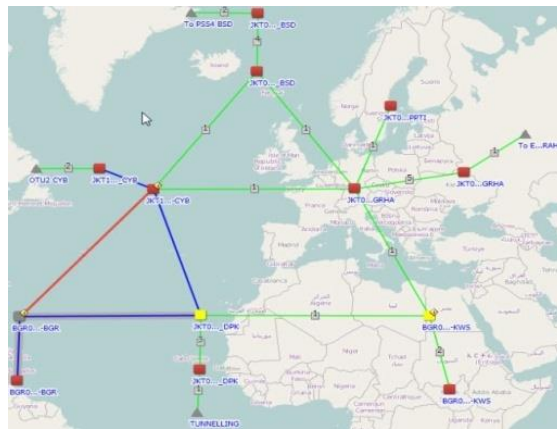
Fig. 14. Jakarta – Bogor Traffic via Depok.

3.3.2 Jakarta – Bogor Protection Link via Graha – Kota Wisata – Depok

When double failure occurred inJakarta – Bogor main line and protection line via Depok, the traffic will automatically move to another closer protection lineswitchare Jakarta – Grha – Kota Wisata – Depok – Bogor, as shown in Figure 15.

Fig. 15. Jakarta – Bogor Traffic via Graha.

3.3.3 Jakarta – Bogor Protection Link via BSD – Graha – KotaWisata – Depok

When a triple failure occurredinJakarta – Bogor main line, protection line via Depok, and protection line via Graha,the traffic will automatically move to another protection lines that are Jakarta – BSD – Graha – Kota Wisata – Depok – Bogor, as seen in Figure 16.

Fig. 16. Jakarta – Bogor Traffic via BSD.

From the measurement data of switching time and QoS at the line of Jakarta – Bogor protection link via Depok, Graha, and BSD, there are differences between the measurement and the calculation result which can be seen in table 9 below:

Table 9. Measurement and Calculation Results QoS Protection Link Jakarta – Bogor.

QoS Parameter	via Depok		via Graha		via BSD	
	Measure	Calculati	Measure	Calculati	Measure	Calculati

	ment	on	ment	on	ment	on
Swi-tching Time	15,132 4.0 µs	15.1 324 ms	26,6 358 µs	26.6 358 ms	49,6 828 µs	49.6 828 ms
Throughput	10 Gbps	9.979 Gbps	10 Gbps	9.979 Gbps	10 Gbps	9.979 Gbps
Fra-me Loss	0%	0%	0%	0%	0%	0%
La-tency	5 ms	5.2048 ms	9 ms	8.5872 ms	12 ms	13.7284 ms
Jitter	0 µs	4.6363 fs	0 µs	7.6493 fs	0 µs	0.0123 ps

4 Conclusion

Based on the theory, calculation, simulation, and analysis in this thesis, there are conclusions as follows:

1. From the test and analysis results of QoS performed on ASON protection system in Jakarta – Bogor through the protection line via Depok, Graha, and BSD, it revealed the same result as QoS throughput = 10 Gbps; frame loss = 0%; and jitter = 0 µs.But there is a difference in latency due to the addition of distance and node traversed. When it throughthe main line, the latency = 3 ms;via Depok, Latency = 5 ms;via Graha, Latency = 9 ms;and via BSD, latency = 12 ms. However, it did not affect the performance quality of throughput, frame loss, and jitter. Thus, ASON protection system wascapable to fill thetraffic needs on the main line.

2. From the test results and switching time analysis performed on ASON protection system in Jakarta – Bogor through the protection line via Depok, the switching time = 15.1324 ms;via Graha,the switching time = 26.6358 ms; and via BSD,the switching time = 49.6828 ms. It can be concluded that the time required for the traffic to automatically switch when an interruption happened on the main line was <50 ms, thus the Service Level Agreement (SLA) standardization was maintained.

3. From the test and analysis results of ASON protection system, it can be concluded that ASON protection system was feasible to be applied because itscapability to handle multiple fault cases which was able to move automatically into the available protection line, thus able tokeep the traffic running normally.

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Precision of Determinant in Auditor's Opinions

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Abstract. This study aimed to analyze the influence of spiritual intelligence, professional ethics, professional skepticism, and indepence in the accuracy of givingaudit opinion. The sample of this study was the auditors who work on 14 (fourteen) Public Accounting Firm (CPA) in the area of DKI Jakarta. The data were collected by distributing 105 (a hundred and five) questionnaires, but only 94 (ninety-four) questionnaires could be processed. The data were analyzed by using multiple linear regression method with the help of Statistical Package for the Social Sciences version 19 and Microsoft Excel 2010 program. The test result showed that all independent variables such as spiritual intelligence, professional ethics, professional skepticism, and independence had a significant effect on the accuracy of audit opinion decisions. The limitations on data collection was the utilization of survey method only without conducting conversations, thus for further research, it was recommended to use an experimental method which then followed by doing interviews.

Keywords: Spiritual Intelligence, Professional Ethics, Professional Skepticism, Independence, and Accuracy of Auditor Opinion.

1 Introduction

The auditor's duty to examine the financial reports and provide fair opinion of a business entity's financial reports should be based on the standards established by Institute of Public Accountants Indonesia (IAPI) that consists of general standards, field work standards, and report standards to support professionalism. The final result of the audit process of company's financial reports isthe right and appropriate audit opinion based on the criteria specified in Professional Standard of Public Accountant(SPAP) that is fundamental to avoid the misleading audit result for the stakeholders (company head, shareholders, government, creditors, and employees) in the decision-making, therefore the audit should be done as appropriate as possible [1]. According to Sutton (1993), auditors who have quality in their profession are able to assure the report (information) reliability, so that the audit report can be used by the auditor to communicate with the society [2].

One of the recent major cases was occurred due to lack of auditors' independence and professional skepticism in giving opinion that revealed in the late 2011 on Olympus Corporation. This Japanese camera producer concealed losses worth US $ 1.5 billion by engineeringfinancial reports and considering it as an asset. It was begun in the 1990s when theOlympus Auditor was Arthur Andersen Japan affiliate. After Andersen fell in 2002, global accounting groups KPMG acquired this company in Japan and became auditor until 2009. Then Olympus switched to Ernst & Young at the end of the year. Financial Times in October

2011 reported an odd opinion of KPMG related to Olympus's financial accounting. There was no dispute between KPMG and Olympus that exposed to the public, but later revealed in the November 4, 2011 on Daily Telegraph article. Similar on Ernst & Young's opinion that did not reveal any problems asCPA KPMG and CPA Ernst & Young considered to be failed in detecting any cheating done by Olympus Corporation. Thus during the audit of Olympus Corporation's financial report, those three CPA always present the financial statements by stating unqualified opinion which was supposed to be qualified opinion [3]. Finance Minister Sri Mulyani has set a sanction freezing business to eight public accountants and public accounting firm in 2009, one of which is Drs. Basyirudin Nur. Accountant has committed violation of Accountant Professional Standards Public (SPAP) on the implementation of public audits at PT. Samcon in 2008 that has the potential to have a significant effect on the opinion of independent auditors. The sanctions are based on Minister of Finance's regulation no.17/PMK.01/2008 concerning public accountant services [4].

Based on the above phenomenon, it can be concluded that the auditors Arthur Andersen, KPMG, and Ernest & Young were not competent enough in auditing the financial statements of Olympus Corporation as they were fail to detect and reveal any cheating of Olympus Corporation and lack of independence and professional skepticism in giving audit opinion so that the auditor's opinion of those three CPAs regarding Olympus Corporation audit report was not presented properly.

The importance of audit opinion given by the auditor for a company induces an auditor to must obtain high spiritual intelligence. According to Hanafi (2002)"Auditors must have high spiritual intelligence so they will be really intelligent and able to synergize two other intelligence elements they have, hence any work they do will be more meaningful. The meaning appears in an organization will support every working auditor to develop themselves more. Thus, an auditor who has good spiritual intelligence and able to synergize all the components of intelligence he owns can easily consider in giving opinion precisely.

The basic thing that must be concerned by auditor is the profession ethics. The implementation of professional work cannot be separated from ethics because professional behavior is required for the profession to be trusted by society. Professional ethics are rules or standards of members'behavior of a profession. If the auditor has high ethical awareness then the auditor tends to be professional that suits the professional ethics code and auditing standards (Suharni, 2017) [6].

1.1 Research Framework

This study aims to analyze the spiritual intelligence, professional ethics, professional skepticism, and independence as determinant ofthe precision inaudit opinion. The theoretical framework is as follows:
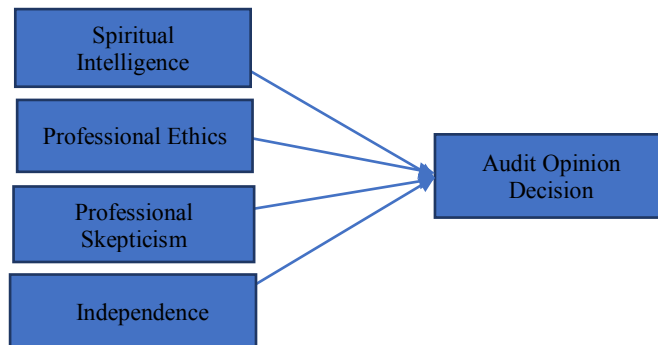
Fig. 1. Theoretical framework.

1.2 Literature and Hypothesis Review

Here are presented some basic theories that underlying this study along with the explanation of related variables and the relations between independent variables and dependent variable.

1.2.1 Theory of Cognitive Dissonance

The basic hypothesis of cognitive dissonance theory is that the dissonance will cause psychological discomfort, it will motivate a person to eliminate the dissonance and reach consonance. Dissonance is the presence of an inconsistency and a discomfort feeling that forces people to escape from the uneasiness with unmeasurable impacts. One of the requirements for professionalauditor was professional skepticism which one has to be able to collect sufficient audit evidence and not easily accept the client's explanation as a basis for providing an appropriate audit opinion in the financial reports. Cognitive dissonance occurs when the auditor has high confidence to the client that causes his professional skepticism to be at low level. Meanwhile, Standar Profesional Akuntan Publik (SPAP) require the auditor to be skeptical.

1.2.2 Attribution Theory

Attribution theory emphasizes the idea that a person is motivated by a pleasant outcome to feel better about himself. Attribution refers to the cause of an event or the results obtained on the basis of individual perceptions. Attribution theory is used to explain the factors that affect the success of a company, such as giving the right opinion that suits actual condition. Thus, the auditor should obtain sufficient and competent evidence with skepticism and independence, and carry out the audit procedures with consideration of risk and material [7]. Attribution theory also explains the behavior of the auditor in giving opinion that it is determined by the combination of internal forces, i.e. factors that come from within a person, such as professional skepticism and independence, and external forces which come from the outside body such as difficulties in work.

1.2.3 Accuracy of Auditor Opinion

According to Özcan (2016): "The accuracy in giving audit opinion must be in accordance with the criteria set in SPAP, it is important that the audit result does not mislead the interested clients (company leaders, shareholders, creditor governments, and employees) in the decision making" [8]. Tuanakota (2013)states that Audit Opinion is part of the final stage in the audit process based on audit findings. Its dimensions include: unqualified opinions, modified unqualified opinions, qualified opinions, adverse opinions, and disclaimer of opinions [9].

1.2.4 Spiritual Intelligence

According to Hanafi (2002), spiritual intelligence is a moral attitude that considered as noble by the doer. A person who has high spiritual intelligence will have high ethical behavior as well. Suharni (2017) states that spiritual intelligence is the ability to give spiritual meaning to thoughts, behaviors, and activities, and able to synergize the Intellectual Quotient (IQ) and Emotional Quotient (EQ). The dimensions are: flexible, self-conscious, face and exploit suffer, overcome and transcend pain, quality of life, aversion to causing harm, have questioning mind, and independent. If the auditor has high spiritual Intelligence, scandals and manipulation act that might bedonewill not occur. The higher the spiritual intelligence of auditors, the more their ability to survive in facingthe difficulties on their duties and able to synergize all the components of intelligence they own, then the auditors can easily consider in giving their opinion appropriately [6]. The result research of Hanafi (2002) and Suharni (2017)shows that professional ethics and spiritual intelligence have significant positive effect on the auditor's opinion.

Ha1: Spiritual Intelligence has a significant positive effect on the Accuracy of Auditor's Opinion.

1.2.5 Professional Ethics

According to Nurdira (2015), professional ethics are the values of behavior or behavioral rules accepted and used by organizations of professional accountants such as personality, professional skills, and responsibility, code of conduct, and interpretation and refinement of the Code. Its dimensions include: Principles of integrity, principles of objectivity, principles of competence, principles, confidentiality, and principles of professional conduct. Auditors who uphold the Professional Ethics are expected to not commit fraud, thus able to provide an audit opinion objectively and appropriately. The higher the compliance level of auditor to the ethics code of his profession, the more accurate the audit opinions stated [10].

Ha2: Professional Ethics has a significant positive effect on the Accuracy of Auditor's Opinion

1.2.6 Professional Skepticism

According to Husnianto (2017): "Professional skepticism is a person's attitude to consider and assess an event to seek the truth of the event, try to seek the evidence, clarification, and adjustment with various perspectives and arguments" [1]. According to SPAP (2011), professional skepticism is an attitude that includes questioning minds, aware of conditions that

may indicate possible misstatement either caused by fraud or error, and critical assessment of audit evidence. The dimensions include: ethical factors, situational and experience factors. The implementation of professional proficiency with precision and thoroughness emphasizes the responsibility of every auditor to observe the fieldwork standards and the report standards. The skeptical attitude of the auditor is expected to reflect their professional skills [11]. The result research of Nelson (2009)shows that professional accountability and skepticism have significant positive effect on the accuracy of audit opinion [12].

Ha3: Professional Skepticism has a significant positive effect on the Accuracy of Auditor's Opinion.

1.2.7 Independence

Tepalagul & Lin (2015) defines Independence as impartiality attitude which is not under the influence or pressure of certain parties in making decisions or actions. Independence can also be interpreted as a state or position in which a personis not bound by any party, and does not carry the interests of certain parties. The dimensions include: Independence in fact or independence in mind and independence in appearance [13]. Lu (2006) studies point that independence has a positive effect on the accuracy of auditor's opinion. This indicates that the more independent an auditor, the more freedom the auditor get from the influence of others, so this is needed to improve the auditor's ability to objectively assess and obtain impartial judgment in determining the accuracy of the opinion given [14].

Ha4: Independence has a significant positive effect on the Accuracy of Auditor's Opinion.

2 Method

2.1 Data and Samples

The primary data in this research werecollected by spreading questioners to auditor of Public Accountant Office in DKI Jakarta which registered at Institute of Public Accountant in Indonesia 2017, with numbers of sample up to 14 Public Accounting Firm. Sampling using convenience sampling technique with sample criteria as follows:1) Public Accounting Firm (KAP) located in DKI Jakarta, 2) Public Accounting Firm that can be reached by researchers, 3) Public Accounting Firm willing to receive questionnaire.

2.2 Data Analysis

The analysis tools used to test and analyze the variables include the classical assumption test and multiple linear regression test using Stastical Product and Service Solution (SPSS) ver 19. Presentation of research results include descriptive data, descriptive statistics, classical assumption test results, the results of regression testing and hypothesis testing.

3 Results and Discussion

3.1 Descriptive Data

The sample of this study was 14 Public Accounting Firm presented as follows:

Table 1. Research Sample.

No.	Public Accountant Office	Address
1	Cpa Mulyamin, Suryanto & Lianny	Intiland Tower 7th Fl. Jl. JenderalSudirmanKav. 32 South Jakarta 10220.
2	Cpa Noor Salim, Nursehan, Sinarahardja	Jl. Anggrek 3 No. 28 Larangan Indah, South Jakarta.
3	Cpa Hertanto,Grace, Karunawan	Palma Tower, 18th Fl. Lot F & G Jl. RAKartiniII-S Kav.06 TB SimatupangSouth Jakarta, Indonesia, 12310.
4	Cpa Doli, Bambang, Sulistyanto, Dadang	Jl. MampangPrapatan VIII, No. R 25B, Tegal Parang,MampangPrapatan, South Jakarta 12790.
5	Cpa Riza, Adi, Syahril &Friends	Jl. Anggrek Garuda IX, Palmerah, West Jakarta 11480.
6	Cpa Drs Moch.Zainuddi Sukmadi	Jl. Anggrek Garuda Raya Blok 1 No. 3, Slipi, West Jakarta.
7	Cpa Faisal Riza, Ak, Ca, Cpa	Jl. Joglo Raya Blok H 7 No. 37 Botanic Junction, West Jakarta.
8	Cpa Drs. Chaeroni &Friends	Jl. Anggrek Nelimurni II Blok C No. 5 Kemanggisan, Palmerah, West Jakarta
9	Cpa Drs R. Sunaryono &Jailani	Wisma IWT 3rd Fl. Suite 308 Jl. ArjunaSelatan Kav 75 KebonJeruk, West Jakarta.
10	Cpa Jansen & Ramdan	Gedung Jaya 4th Fl. Jl. M.H. Thamrin No. 12 Central Jakarta 10340.
11	Cpa Tjahjadi & Tamara	Gedung Jaya 7th Fl. Jl. M.H Thamrin No. 12 Central Jakarta 10340.
12	Cpa Yuwono, H &Friends	Jl. Arabika 8 AA2 No. 2 Pondok Kopi, East Jakarta 13460.
13	Cpa Adam Nugroho	Jl. ElangThainesia C2 No. 8 Jatiwaringin, East Jakarta 13620.
14	Cpa Drs A.S Akhmadwijaya	KomplekTuguPermai Blok B1 No. 5 Jl. H. Murtado, TanjungPriuk, North Jakarta

3.2 Descriptive Statistics

Table 2. Frequency Distribution of Respondents Profile by Gender.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Laki-laki	51	54,3	54,3	54,3
	Perempuan	43	45,7	45,7	100,0
	Total	94	100,0	100,0	

Based on the respondent's gender, it could be seen that the number of male respondents were 51 persons and the number of female respondents were 43 persons. Thus in conclusion, the average employee who working Public Accounting Firm by gender is male.

3.3 Regression Testing Results

The calculation results of multiple linear regression equation through SPSS ver.19.0 could be seen in table 3 as follows:

Table 3. Multiple Linear Regression Equation.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19,676	4,949		3,976	,000
	Kecerdasan Spiritual	,481	,165	,393	2,908	,005
	Etika Profesi	,797	,288	,276	2,771	,007
	Skeptisisme Profesional	-2,811	,591	-1,040	-4,759	,000
	Independensi	2,180	,501	,918	4,348	,000

a. Dependent Variable: Ketepatan Pemberian Opini Auditor

Based on table 3 above, it could be obtained that the regression equation as follows:

$$Y = 19{,}676 + 0{,}481X1 + 0{,}797X2 - 2{,}811X3 + 2{,}180X4 + \varepsilon \tag{1}$$

3.4 Results of Hypothesis Testing

Based on the output in Table 3 that spiritual intelligence variable had coefficient value of 0.481 and Sig output was known to be 0.005, then the conclusion of Ha1 was accepted. This study isconsistent with previous research conducted by Hanafi (2010) indicating that spiritual intelligencehas a positive and significant effect on the accuracy of giving auditor opinion, where the higher the auditor's spiritual intelligence the more able it can survive in the face of difficulties during the task so that it will affect the conclusion examination as outlined in the form of auditor's opinion [5].

Professional Ethics had a coefficient value of 0.797 and the known output sig was 0.007 then the conclusion of Ha2 was accepted. This research is consistent with previous research conducted by Nurdira (2015)shows professional ethics have a positive and significant effect on the accuracy of giving opinion of auditor, where the higher level of auditor compliance to the code of ethics of his profession, the more accurate also given opinionby the auditor. Professional Skepticism had a coefficient value of -2.811 and a known output sig was 0.000,

then the conclusion of Ha3 was accepted [10]. This research is inconsistent with previous research conducted by Husnianto (2017) shows professional ethics has a positive and significant effect on the accuracy of giving opinion of auditor, where the higher level of auditor compliance to the code of ethics of his profession, the more accurate also given opinionby the auditor [1].

Independence had coefficient value of 2,180 and sig output was known to be 0,000, hence the conclusion ofHa4 was accepted. This study is consistent with previous research conducted by Tepalagul & Lin (2015) showing that if an auditor has a high degree of independence in the assignment of an audit, then it can affect an auditor in determining the accuracy of an opinion given. This means that spiritual intelligence, professional ethics, and independence had significant positive effect but professional skepticism had significant negative effect on the accuracy of auditor's opinion [13].

4 Conclusion

An auditor who has high spiritual intelligence is a person who has a strong principle and vision as well as capable to manage and survive in facing the difficulties that will affect his work performance in providing audit opinions.

Professional ethics is a medium of self-regulation that is crucial to implement the profession as expected by society. This is because every auditor is also demanded to uphold the professional ethics that has been established by Indonesian Institute of Public Accountants in order to avoid any unfair competition. By upholding the professional ethics, it is hoped that there will be no fraud among the auditors sothen capable in providing auditor's opinion that is completely based on the financial statements presented by the client.

An auditor who has professional skepticism will not take for granted the client's explanation but will ask questions to greatly obtain an answer with the most accurate audit evidence. Seeking audit evidence is necessary to clarify the opinions that will be given by the auditor to support the accuracy of audit opinion. Although the professional skepticism in deciding the audit results was in high level, the lack of capability in seeking audit evidence may affected the audit opinion that given improperly.

The higher an auditor's independence, the more freedom the auditor get from other's influence, thus will improve his ability to objectively assess and use his judgment to be impartial to anyone during the audit process.

The implication is that the auditors of the Public Accounting Firm, whether large or small, whether affiliated or not affiliated, must have high spiritual, professional intelligence and independence in order to be able to manage and survive in the face of adversity to the maximum evidence that will affect the audit / giving the auditor's opinion exactly according to the actual circumstances.

4.1 Limitations of Research

The limitations of this study was the usage of survey method only without followed by conducting interviews or other methods. It is suggested for further research to do analyzing with experimental method followed by interview.

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Implementation Strategy of Integrated e-Government Communications Policy by Batang Regent Yoyok Riyo Sudibyo

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Abstract. The Regency Government of Batang, Central Java led by YoyokRiyoSudibyo at the time of period 2012-2017. He had built bureaucratic modernization, improvement in public services, civil empowerment, and transparency of Regional Budget (APBD) to eradicate corruption, collusion, and nepotism (KKN) through an integrated e-government (e-Gov) system. Corruption involving regional heads in post-reformation Indonesia had gradually increased. The Corruption Eradication Commission's (KPK) statistics recorded that from 2004 up to June 2017, there were 78 regional heads involved in corruption cases of APBD i.e. 18 governors and 60 mayors or regents along with his deputy. This research used qualitative descriptive method, case study, and data triangulation. The purpose of this research is to analyze the following policy strategy e-government integrated communication policy processes and the process of making its policies. The regent was build the system of information integrated data consist of based service technology and information plus Information Management and Documentation Officer (PPID), Budget Festival (FA) and Public Service Quality Improvement Unit (UPKP2), aimed at building bureaucratic reform, prevent corruption and improve public service.

Keywords: Communication policy, organizational communication, e-government.

1 Introduction

Corruption that involving regional heads in post-reformation Indonesia has gradually increased. The Corruption Eradication Commission's (KPK) statistics recorded 78 regional heads were involved in corruption cases of APBD which were 18 governors and 60 mayors or regent along with his deputy.

Supervision and transparency are not optimal in the Governmentespecially regarding budget accountability has triggered the corruption cases among bureaucrats in local government. The thriving corruption cases in the region cannot be denied as a negative impact of regional autonomy (otda).

Transparency is essential in realizing good public governance in regard to 'clean', democratic, and effective governance. This can be applied as long as the roles of government, private institutions, and citizen are in balance.

The Regent of BatangYoyok Riyo Sudibyo who began his duty in 2012 tried to build the public trust. This was determined due to the previous regent who caught in APBD (regional budget) corruption cases.

Various breakthroughs were conducted, such as implementing integrated electronic-based public services (integrated e-government) -for further written as e-Gov based on current development and information communication technology (ICT) development including e-Planning, e-Budgeting, SIMDAKeu (information system of regional management in finance), e-Procurement, and Simpelbang (information system of reports monitoring and evaluation), as well as establishing Documentation and Information Management Officers (PPID) and Public Service for Quality Improvement Unit (UPKP2), and holding Budget Festival (FA).

FA Batang is the responsibility of previous year's utilization of APBD in transparency, dialogically, and directly related to the APBD usage accountability along with development programs to the citizen. Basically, the accountability of APBD is reported to DPRD (Legislative Council). Batang Budget Festival 2016 showcased local budget management followed by dozens of Regional Device Organizations (OPD) and villages by providing booth.

By holding Budget Festival, Yoyok won Bung Hatta Anti-Corruption Award 2015 with the Mayor of Surabaya, Tri Rismaharini. Batang regency, which claimed to be the pioneer of Budget Festival and successfully strengthening the development of e-government system in Indonesia has become the study centre forother government, from districts and cities up to provinces level. Karanganyar regency adopted Budget Festival Batang 2016 yet showcasing the current year budget.

The implementation of e-Gov in the public sector is becoming urgent. Heryana and Dewi (2013) reveal that the implementation of e-Gov has a positive and significant impactin realizing good governance [1].

Besides that, application of e-Government is part of social changes to build public participation and promote reform institutional bureaucracy civil and prevent KKN [2].

This innovation of Yoyok by holding Budget Festival and PPID are to comply with Law No. 14/2008 on Public Information Openness (KIP).

1.1 Literature Review

1.1.1 Communications Policy

Organization need various strategic plan of a network of functional communication through the activities of communication in accordance vision and mission to achieve the goals. Of these efforts in Andre (2000) explored in communication policy in accordance with agreement in the organization. In other words, communications policy is strategic plan from an organization through a communications network organization functional in achieving its objectives.

According to Unesco communication policy (Aritonang, 2011) is a collection of the norms and normal the principle that made to support the smooth system communication [3]. From definition of above, communication policy made after the formation of a communication system in a state to accomplish a purpose by influence or change the behavior of the people. Communications policy is connected to the development of social, politic, and economy of a country. Abrar (2008) quoted chakravartty and sarikakis (2006) expressing communication policy have a context , the domain and paradigm. Context means the linkage of communications policy with certain aspects such as economic politics, communication politics, environmental politics, and others. This context is important incommunications policy as it determines for the communication policy domain [4].

The domain of communications policy contains the content value in communication policies such as globalization, global economy, and its kind. Domain is a functional context of

communication policy. For example, related to economic politics, the domain of communication policy is the global economy. Meanwhile, the paradigm is an ideal framework of the intended communication policy, such as the establishment of information society, the strength of civil society, and others. The communications policy has five criteria:1) Have specific purpose, 2) Contained of government officials acts, 3) Demonstrate the actions taken by government, 4) Positive or negative, and 5) Authoritative. Communication policy, sociologically, aims to place the communication process as part of social dynamics that benefit society. The purpose of communication policy supports the smooth communication system within a country [4].

Communications policy is inseparable from public policy. Dye (2008) states, "public policy is an attitude or government decision to do something or otherwise." If the government chooses to carry out the programs there must be a purpose and that policy is concerned with all government actions which is not only statements or wishes of government officials or the government itself. Instead what the government choose not to do is also a state policy. Public policy according to Dunn (2003)is a decision or government action that regulates or influences the actions of individuals in citizen community [5]. From both explanation above, the researcher understands that public policy is an act of government or not to act in influencing or managing individuals and groups of to reach the purpose. In implementing public policy, a number of stages as the work procedure is required to achieve goals and targets.

Dunn (2003) outlines five stages in the interdependent public policy-making process as follows:Setting the agenda; at this stage the policy maker are elected and appointed to classify the issue on the public agenda; Policy formulation; officials formulate a substitute for policy problems and review the need to make executive orders, judicial decisions, and legislative action; Policy adoption; alternative policies were adopted with support from the legislative majority, consensus among director of institutions, or judicial decisions; Policy Implementation: the policies that have been taken are determined after the administrative units mobilize the financial and human resources; Policy evaluation; the audit and accounting units of government assess with the view of determining the executive, legislative, and judicial boards that comply with the laws in policy decisions and goals achievements [5].

1.1.2   The Theory Bureaucracy Weber

Communication as basis of life. Every aspect of human life influenced the way of communicating with others. Communication is facility information, education, aims to influence others and process of changing the conduct of others. Lasswell in Mulyana (2008) mention five of an element in processes of communication that is sources (a communicator), message (can be meaning the form of or symbols), a channel or medium, recipients of a message (communicant) and effects [6].

Individuals in a relationship, group, organisations and the community was involved in communication process through a response and create a message to allow in adapting to its environment. Rogers said the organization is collection of individuals are working to achieve a joint purpose [7]. Individuals are interacting through communication marking the establishment of the organization. Every individual requires the ability to communicate in relationships, society, group or organization to convey a message with a particular purpose. This means that the communication within an organization is an absolute thing in realizing the objectives of the Organization, in addition to various other aspects.

The organization's communications as a effort to sending and receiving messages in either a formal group or organization informal group organization. Organizational communication at

the District Government of the Batang Regency can be analyzed through a communication policy strategy e-gov is integrated in APBD governance in an era of Regent Yoyok Riyo Sudibyo.This is in accordance of essence of the theory bureaucracyof Weber who insists on the role of the individual as initiator in an organization [8]. According to Weber, organization is a system interpersonal activities designed to set individual duty. The organization as bureaucracy. There are three the basic principles in bureaucracy i.e authority, specialization and regulations. If those it was not applied, impossible bureaucracy can be achieved. From the explanation above , researcher confine in looked at how Regent Yoyok acting rationally to achieve its goal by applying communication policy e-gov integrated as the subject this research. It is connected with the Theory of Bureaucracy Weber which includes factors authority, specialization and rules in a bureaucracy.

1.1.3   E-Government

Government uses information technology to make a change for the contact with the community, the business world and all aspects of concerned.This is in accordance with the definition issued by World Bank about electronic government [9]. Implementation of technology in e government aimed at stepping up the quality of public services . Kumar and Best, (2006) E-Gov. can be applied at the level of executive, legislative, judicial, or public administration. E-Gov. information system service covers government to government , citizen and business. Application e-gov believed to be able to rebuild the relationship between the community and the government [10].

Corruption prevention , collusion and nepotism by creating transparent, effective and efficient in indonesia in the post reformation era through the application of e-government. Government regulations in accordance Inpres No. 3/2003 explained the goal of the application of e government to create a transparent government, effective and efficient. In particular, e-Gov. is a public information system applied by government in transforming relationships with the public, private, and various related parties that supported with ICT devices as the current development in globalization era that aims to improve the quality of effective, efficient, transparent, and democratic public services in realizing the accountable, participatory, and KKN-free governance [11]. Center for Democracy and Technology and Infodev (Hasibuan, 2007) outlines mechanism e-government in three stages: 1) Publish: The government uses information technology to opening access information to the public; 2) Interact: build community participation in government [12].

For example, create an interactive site with the citizen, as well as bridge interfaces connection with other institution; 3) Transact: the government provides various online public services. For example, create public transactions service site, as well as interoperability of applications and data with other institutions It requires assurance and commitment from stakeholders including the regional head to work those three stages successfully as expected and of course with the concern of current condition in infrastructure, service activities, budget, and human resource. The problems of this research are: a) The increase of national budget (APBN) and regional budget (APBD) have not been supported by the transparent budget management that is easily triggered corruption, collusion, and nepotisms, particularly in local government; b) Some citizens are still at difficulty to access public information about budget governance including local financial management and development. Based on the problem identification, the problem limitations in this study are: a) Communications policy strategy of Batang Regent Yoyok Riyo Sudibyo to open public information regarding financial management and development; b) Communication policy and policy-making process of

integrated e-government communication. Based on the problem identification and limitation, the problem formulation in this research are: a) How is the strategy of integrated e-government communication policy in the reign of Batang Regent Yoyok Riyo Sudibyo ? b) How is the process of the communication policy and policy-making of integrated e-government communication?

2 Methods

This research is done at Batang Regency in 2017, Central Java, with a qualitative approach descriptive and case studies. A qualitative approach according to Moleong (2013) research is aimed at a grasp phenomena by the subject of study in the context of natural using scientific method. The understanding will be reached on a general qualitative research against social reality [13].

Researcher is interested in researching the phenomenon of transparency in the governance of APBD by the Regent Yoyok through the application of data integration between information systems.

While the method of research with case studies according to Kriyantono (2006)aims to comprehensively explain the various aspects of theobject of research is the goal of systematically research case studies [14].

In this research, the technique of data collection was carried out from interviews with Yoyok Riyo Sudibyo and his staff, the local house of representatives, NGO's anti corruption, and the community. Researcher also conducting observations and documentation.

Data analyzed in interpretive and triangulation of data. Analysis interpretive used to formulate communication policy e-gov integrated.

3 Results and Discussion

This research was conducted with qualitative approach, its implementation was focused on organizational communication regarding the strategy of e-Gov. communication policy through analysis of integrated e-Gov. communication policy and its policy making.

3.1 The Strategy of Integrated E-Gov Communication Policy

The field of government administration e-gov integrated at the local government a stem at the era of Yoyok includes: e-Planning; electronics-based Information Systems of Regional Development Planning,e-Budgeting; a web-based system to facilitate the agenda of APBD,SIMDA (Information System of Regional Management) Finance,e-Procurement; a web-based system for goods procurement and services, Simpelbang; an integrated information system of General Plan of Procurement (RUP),SIMDA Goods,e-SAKIP; an accountability system of government performance. This system is an integrated planning system, budgeting system, and performance report system that in line with the implementation of financial accountability system and Simpeg which is a personnel information management system, as well as PPID, Budget Festival, and UPKP2.

The figure 1 is the government implementation on integrated e-Gov administration in the reign of Batang Regent Yoyok Riyo Sudibyo.
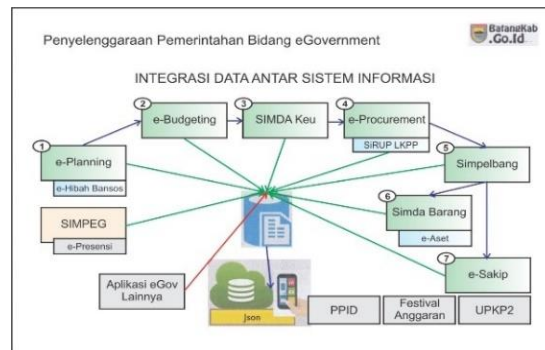
Fig. 1. Government Implementation of e-Gov in the Reign of Yoyok Riyo Sudibyo.

3.2 Information Management and Documentation Officer (PPID)

The need of information for individual becomes important in personal and social development which is also the main thing in national defensenational defense. The right to obtain of information is a human right and the need for public information is one of the important features on democratic country. The task of PPID is to provide the access of public information for information applicant. According the mandate in article 13 Law No. 14/ 2008, Batang regency formed PPID through BupatiBatang Decision number 485.2/240/2013 on the establishment of PPID. The government shall fulfill the public right of public information that assured on the KIP Law. This Act regulates: 1)every individual has the right to obtain information; (2) the obligations of the government to provide and serve information requests promptly, timely, in low cost, and in simple ways; (3) exceptions are strict and limited; (4) government responsibility to manage the system of documentation and information. The figure 2 is PPID of the rod was quoted as saying in the PPID of Batang.

Fig. 2. PPID Batang.

3.3 Budget Festival (FA)

Festival, according to Stoeltje (1992) in Indriasari(2009) is a periodic social event that is coordinated and involved directly or indirectly by a community/organization in order to create a mutual exchange of views between one to the other [15]. The festival according to Kaeppler (1987) is an important medium of communication to build and empower regional characteristics, and as recognition of a cultural identity. Developing areas usually hold the festival for those purposes. Festival as an event aims as a medium of communication for a city in displaying particular characteristics as the uniqueness of the region. The implementation of the festival is expected to encourage the development in all fields and increasing the investment and reputation of the region. Every activity including the implementation of government activities requires an allocated budget from APBN or APBD to finance the development.

Budget Festival is communication media in order to realize the transparency of local budget utilization and recent working plan for a certain period that involved money, which is presented to the public as a routine activity of Batang regency. Transparency of APBD management through Budget Festivals as an implementation of governance according to Law No. 28/1999 concerning the governments enforcement transparent, accountable, effective and effisien. The figure 3 is pictures of the festival budget 2016.

Fig. 3. Festival Budget 2016.

3.4 Public Service Quality Improvement Unit

In strengthening the integrated e-Gov., Yoyok established UPKP2 based on Regent's Regulation No. 90/2012 on Improving the Quality of Public Service in Batang regency. Public service an important aspect in applying effective governance, efficient, accountable and transparent and as a bridge to community welfare. In addition the levels of trust public is strongly influenced by the service provided regional governments or centerr.Government regulation regarding public service issued to create transparent government , accountable, effective and effisien. The regulations include Law No. 14/2008 on KIP, Law No. 25/2009 on Public Service, Government Regulation No. 65/2005 on Guidelines for Preparation and Implementation of Public Services, Presidential Regulation No. 55/2012 concerning National

Strategy for Long Term Prevention and Eradication of Corruption in 2012-2025 and for medium term in 2012-2014. In general, this ad hoc institution aims to build public trustof the government apparatus in Batang regency which marked by the process of service improvement for Prosperous Batang citizen. According to Regent Regulation No. 90/2012, UPKP2 as the authorities who receivethe reports and/or public complaints, conduct surveys on citizen reports/complaints, analyze the causes of complaints, and develop action plans for real service improvements, as well as monitor the work performance of service implementers and evaluate the service outcomes and also recommend the regent regarding the improvement of the public service quality.

3.5 Analysis of Communications Policy

Communication policy is a strategic plan of an organization to reachcertain goals. Communications policy is influenced by the social, political, and economic development of a country. Chakravartty and Sarikakis (2006) in Abrar (2008) point out that communication policies have context, domains, and paradigms [4]. As a whole content of the context, domain, and paradigm, integrated e-Gov. communications policy as explained by Batang Regent period 2012-2017 Yoyok is as follows: "The government continues to realize good governance, one of them is through the accurate and adequate public information transparency about the government to the public in order to prevent KKN. This is realized by the government by issuing various regulations related to public services that one of the goals is for the community prosperity.

"Communication activities are also included as political activities. Communication according to Barnlund (Nimmo, 2005) is a transactions process of an individual in creating and giving meaning to realize the individual goals [16]. Integrated e-Gov. communication policy was applied through meetings and socialization that comes from the idea of Batang Regent Yoyok. Initially, the communication that used to work tend to be in one way, but then developed into transactional communication after Regent Yoyokdevelop the network with the competent authorities.Among them were the Corruption Eradication Commission (KPK), Transparency International Indonesia (TII), Indonesian Corruption Watch (ICW), Ombudsman Republic of Indonesia, Development Finance Comptroller(BPKP), Indonesian Forum for Budget Transparency (FITRA), Villages, Disadvantaged Regions and Transmigration Minister RI, Mayor of Surabaya Tri Rismaharini, and others within which an exchange of ideas, knowledge, and information commonly occurred. There are two ways in analyzing the communication policy: positive public policy and normative analysis. Cohcran and Malone (1992) in Abrar (2008)describe positive public policy as to emphasize the work of policy process, while normative analysis (Cohcran, 1992) is more focused on the assessment that should be included in the policy [4].

Lasswell in Mulyana (2008) states there are five elements in the communication process i.e. source (sender of message/communicator), message (as meaning, form, or symbol), channel or media used by the sender, the message recipient (communicant)and the effect [6]. Communication is a tool of power that leads to political interests. Sources or political communicators seek influences through communication [16]. Related to Laswell's theory on integrated e-Gov. communications policy process, Batang Regent Yoyok who was supported by a number of political parties played the role as communicator to convey ideas in order to open broad access in the budget transparency and integrated e-Gov.-based public services. Communicants including the staff of Batang regency, society, parliament, government institutions, and anti-corruption NGOs. The expected effects are to build public trust, close the

opportunities of corruption, and learning center for other areas. The analysis of communication policy based on normative policy is related to prescribed norms and rules in society according to the Constitution of 1945 and Pancasila. The process of integrated e-Gov. communication policy is made as in the table 1.

Table 1. Integrated E-Gov Communication Policy Process.

Communicator	Message	Channel	Communicant	Effect
Regent of Batang in period 2012-2017,YoyokRiyo Sudibyo	The implementation of effective governance, efficient, accountable and transparent.	Integrated E-Gov. Meeting. Socialization.	PNS of Batang Regency DPRD.	The Improvement of public services quality.
Location: BatangRegency.	Prevent and eradicate KKN.	Discussion. Press conference.	Institutional government. NGOs.	The citizen is critical of the government.
		Advertising in mass media.	Citizen. Professional.	Policy adoption by the stakeholders.

3.6 Analysis of Communication Policy Decision Making

The integrated e-Gov. policy initiated by Batang Regent Yoyok is a political policy aimed at building a communicative tradition between the district government and the citizens in administering the government proportionally and professionally. This political activity is implemented in the policy-making process.

(Dunn, 2003) outlines five stages of the interdependent of public policy making process that arranged in the time order: agenda formulation, policy formulation, policy adoption, policy implementation, and evaluation as follows [5]:

1. Arrangement of agenda. (Abrar, 2008)there are three activities that must be done 1) build perception among stakeholders about the problem to be solved, 2) create problem limitation, and 3) mobilize supports in order to put in the issues in the government agenda [4]. Of the integrated e-Gov, Yoyok explains as follows: "Other than implementing an electronic-based public service system, I also established UPKP2, PPID, and Budget Festival as part of direct transparency and accountability to the people regarding the usage of APBD as my commitment for the society. Of which to eradicate *KKN* and also to build public participation."

2. Stages of communication policy formulation is closely related to the prevailing communication system within a country [4]. Yoyok's efforts to implement integrated e-Gov. refers to a number of regulations. In particular, electronic-based public services is based on Presidential Instruction (Inpres) No. 3/2003 on national policies and strategies for e-Gov. development. PPID is as mandated by Article 13 of Law No. 14/ 2008 on KIP and established through Batang Regent Decision No. 485.2/240/2013 on the establishment of PPID. UPKP2 is

based on Law No. 25/2009 on Public Services which is firmed through Regional Law No. 90/2012. Of Budget Festival, there is no specific regulation yet referred to RPJMD of Batang regency allocated in DPKAD budget.

3. Stages of policies adoption; the Regent Yoyok claimed that integrated e-Gov. implementation is supported by legislatives, aside from society, bureaucrats, professionals, and anti-corruption NGOs such as FITRA, ICW, and TII.

4. Stages of policy Implementation; integrated e-Gov. policy is carried out in Batang district government during Yoyok era which according to vision and mission to create electronic-based government system supported by PPID, FA, and UPKP2.

5. Policy evaluation; Evaluation is an activity of analyzing and presenting information about the evaluation object, ensuring the appropriateness of strategic action to the initial design or strategic formulation set. Of Budget Festival 2016 which is part of e-Gov. integration did not run as planned due to lack of team cooperation.

4   Conclusion

Based on the research conducted, there are some conclusions as follows:

1. Integrated e-government communication policy is a political policy initiated by Yoyok as a communicator in conveying messages to his staff as part of bureaucratic reform and improvement of IT-based public services, and also supported by PPID, Budget Festival, and UPKP2 as part of data integration between information systems.

2. Strategies policies communication e-government integrated by Regent of Yoyok moderated in data integration between information system, aimed at building bureaucratic reform, prevent corruption and improve public service.

3. The policy making process of integrated e-government communications according to Dunn (2003) begins with the agenda preparation that carries the theme of bureaucracy reformation, transparency and development of APBD governance, and also the improvement of public and participative services.

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The Concept of Local Wisdom on the House Planning Prototype Specially for the State Border Officers in Sanggau Regency

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Abstract. The concept of local wisdom is seen from anthropological, historical, and particularly the field of architecture (built environment). Local wisdom is an element of the cultural traditions of people's society, which appear to be parts that are placed in the physical order of buildings (architecture) and the (urban) region in the geography of the nation. From his explanation, it can be seen that local wisdom is the application of tradition which substituted in physical artifacts. The concept of local wisdom that was very important to the preparation of this prototype is the uniformity of society buildings around the border region which as to not cause social jealousy in the society. In order to realize the Special House for State Border Officers in a healthy environment, safe, harmonious, and well-ordered as well as able to support a good housing, it is necessary to prepare the Prototype of Special House for state Border Officer as a reference in Physical building development that concern to quality, local support, the spatial layout of the region, and local wisdom. Therefore, it is necessary to formulate the Prototype of the Special at Border region as a reference of Design preparation/ Detail Engineering Design (DED) of special house at Border region that is appropriate, healthy, harmonious, and meet the need of the society as well as concern to spatial layout, environmental conditions and wisdom local premises.

Keywords: Local Wisdom, Special House, State Border.

1 Introduction

The border area is the entrance of a country, thus more attention is required. Development as well as facilities such as education, health, transportation, information and so forth should be sufficient. Communities in the border areas should be more concerned about their needs, so they are not isolated from the outside world. Improving the health condition of residential environments for the provision of healthy houses and the sanitation of household environments in border villages and border buffers; the management of reservoirs, ponds and other water reservoirs for the prevention of endemic diseases is of paramount importance in advancing communities in the border region.

The Border people in doing their duties is difficult to obtain a decent and affordable residence due to the rising of house prices and houses on the border are not yet available. To meet the needs of appropriate, healthy, and affordable residences for people at the State Border, The Government through the Ministry of Public Works and Public Housing

encourages the building of Special house for citizen at the State Borders. It is hoped that the fulfillment of housing requirement for the citizen at the State border, it is able to improve the work performance, quality of life, and economy [1].

In order to realize the Special House for State Border Officers in a healthy environment, safe, harmonious, and well-ordered as well as able to support a good housing, it is necessary to prepare the Prototype of Special House for state Border Officer as a reference in Physical building development that concern to quality, local support, the spatial layout of the region, and local wisdom [2].

The Border Area that is determined to be the prototype object, namely: Entikong District, Sanggau Regency; West Kalimantan. Entikong is a sub-district in Sanggau District, West Kalimantan, Indonesia. Entikong has a land border route with Malaysian state especially Sarawak, so the land line is often called silk route because it can be passed directly by bus either from Indonesia or from Malaysia without having to through the river and sea, by therefore many migrant workers who come from Java and Sumatra who use the border of Entikong. The majority of tribes in Entikong Subdistrict are Dayak, Malay, Javanese, Batak, Padang, and others. The majority embraced Christianity Catholicism, Protestant Christianity, Islam, and Konghuchu. The livelihoods of the people are rice farmers, sahang (pepper), cocoa, rubber and part of the traditional gold mining.
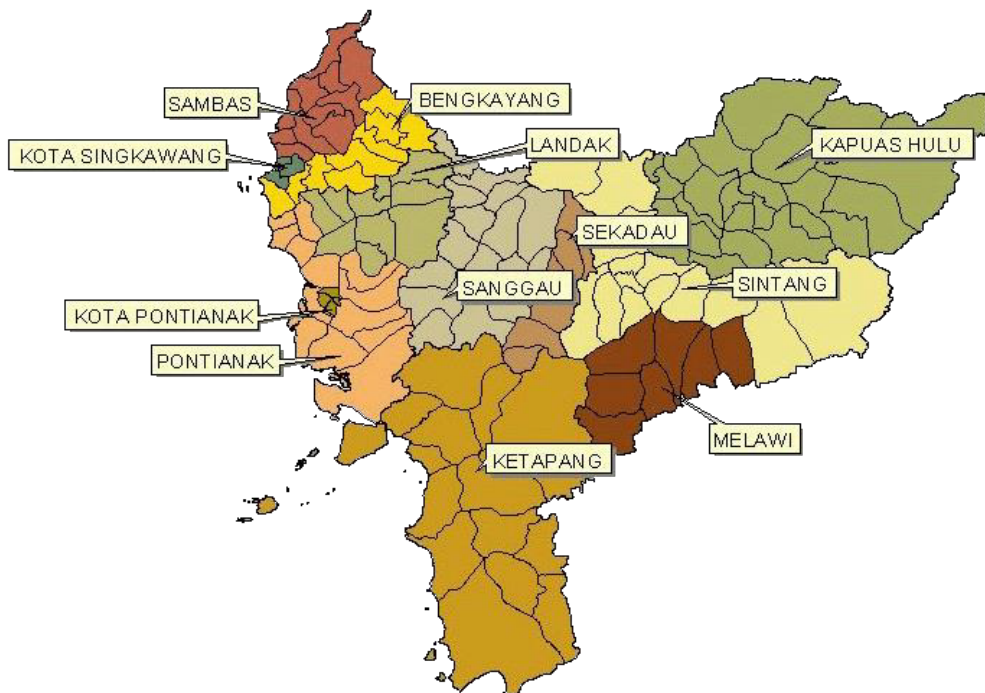
Fig. 1. Location of Sanggau Regency in West Kalimantan Province.

Entikong District is included in Sanggau District. Sanggau District is one of the Regions Level II in the province of West Kalimantan. Sanggau Regency is one of the areas located in the middle and located in the northern part of West Kalimantan province with an area of 12,857.70 km² with a density of 29 people per km². Seen from the geographical location of the sanggau district lies between 1 ° 10 "North Latitude and 0 ° 35" South and between Latitudes 109 ° 45 ", 111 ° 11" East Longitude [3]. This area is the birthplace of the current Governor of West Kalimantan, Cornelis M.H.

The border area in Sanggau Regency consists of 2 locations, Entikong located in Entikong Subdistrict and Balai Karangan in Sekayam Subdistrict. These two locations are located at the northernmost tip of Sanggau Regency which borders directly with Malaysia, precisely Sarawak border.

Entikong Subdistrict with sub district capital in Entikong village has an area of 506.89 km2 with population in 2006 is 12.828 Soul and Brutto density is 25 soul / km2. Administratively, Entikong District consists of 5 villages and 18 hamlets. This sub district is approximately 147 km from the capital of Sanggau Regency. The existing infrastructure consists of State road 14.5 km, district road 41.7 km, village road 83.37 km. Available educational facilities consist of 1 unit of kindergarten, 18 units of elementary school, 2 units of junior school and 2 units of high school. Health facilities consist of 1 unit of public health center (puskesmas) and 1 unit of subsidiary puskesmas.

To get to Entikong from Pontianak, it can be reached by way of trans Kalimantan south axis to Tayan sub-district then cross to North pass Batang Tarang, Sosok, Kembayan and finally enter Entikong through trans Kalimantan road North axis. Trans Kalimantan road both

south axis and north in general condition is good. Distance from Pontianak to Entikong 310 km with travel time is approximately 7 hours.

Basic facilities and infrastructure such as transportation, education, health, clean water, electricity, telecommunications, and economic facilities are still very limited. Until now, Entikong sub-district still has status as a lagging area. This condition resulted in the disparity of the welfare of the Entikong community with the Sarawak people. There are some areas that cannot be reached by land transportation (isolated area).

Fig. 2. Postal Area of Cross Country Inspection in Entikong.

Fig. 3. Conditions of Entikong Housing [4].

The maxim of this research is the establishment of a prototype of a relief house on the border of the country, so that it can be a reference in the construction of Special Homes in the State Border which is appropriate as well as in a healthy, safe, and harmonious environment.

2 Research Method

The methodology used is by using quantitative method which is a method that describes the existing situation in the field by involving all stakeholders in the preparation of prototype special house. The data collected includes primary and secondary data. Then the data is analyzed by using qualitative approach that is to tell and explain the findings based on field survey.

The approach of study in this study is a qualitative approach that is an approach to conduct research that oriented on the symptoms of a natural phenomenon because of its orientation, so it is naturalistic and fundamental or initial and cannot be done in the laboratory yet must be conducted in the field. Therefore, this kind of research is called field study [5]. Implementation of this prototype preparation through the preparation stage includes focus group discussion activities with local government and vice custom leaders. The next stages are field survey activities to obtain data and information, public consultation, as well as preparation and discussion of planning concepts.

3 Result and Discusion

3.1 Understanding the Concept of Local Wisdom

Local wisdom in architecture can be seen from time and place that the local wisdom in terms of architecture comes from the past within the local people that carry out the value of local wisdom in persistent and continuous until now. Because the context of local wisdom applies to the local environment, based on local community thinking and who influence it, so that in each local wisdom to the other will be different and local in characteristic [6] and [2] So it needs a study of the wisdom of architectural locality regarding the wisdom values that can be applied in accordance with today conditions. Thus, architectural civilization is not trapped in the past, as science and architecture continue to evolve, automatically there will be changes in the development.

3.2 Concepts of Philosophy and Traditional Intercultural Approach

3.2.1 House Architecture in Betang

Each tribe in Indonesia has a characteristic form in the local architecture, known as a traditional house. Traditional house is the center of cultural networks, social relations, traditional law, prohibitions, myths, and religions covering all indigenous peoples. Traditional houses provide the main focus for the family and the community and which is the heart of the departure from its inhabitants for various activities. Traditional houses in Indonesia are not from architectural designs, yet most residents build their own homes or the local people work together with the direction of homeowners or carpenters [7].
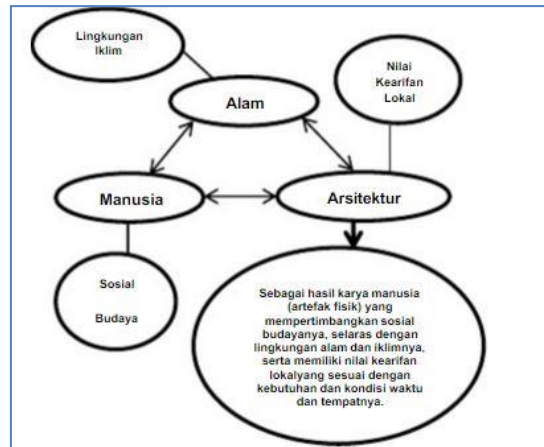
Fig. 4. Scheme of Human Relations, Nature, Architecture.

With few exceptions, the Indonesian archipelago share a custom of ancestral Austronesian ancestors in Taiwan 6000 years ago, and traditional Indonesian houses showcases some characteristics such as wood construction, the variety, and the elaboration of roof structures. The building that shows the early Austronesian style is a communal longhouse on stage, with tilted sloping roofs and heavy gable beams, as seen on the houses of Bataks and Tongkonan houses of Toraja. The diversity of the basic forms of long communal houses, among which are found among Dayak communities in Entikong, West Kalimantan; Sebatik, North Kalimantan; Sangihe, North Sulawesi; and Belu, East Nusa Tenggara. The type of longhouse is not found in Skouw Sae, Papua, because the people build houses with individual types [8].

Fig. 5. Betang Houses.

The principles are on the poles, wood for gantry, and a straight door threshold system with wooden or bamboo walls which, without a load bearing, traditionally, instead of nails, mortis and tenon connections and wooden pegs are used. Natural materials such as wood, bamboo, ornamental roof, and fiber are traditional home ornament. Hardwood is generally used for pedestal and a combination of soft or hardwood is used for the upper wall without bearings and is often made of light wood or rumbia. Materials for woven roof is the leaves of palm leaf rumbia, alang-alang, or straw [9]. In every aspect of Dayak tribe life, there has always been based on the belief in the highest ruler who occupies two (2) nature that is the upper and lower

realms, and humans are between the two realms. This view affects the division of traditional houses of Dayak tribe in general that is divided into 3 (three) buildings including head, body, and feet. The roof is analogous to the head, the wall as the body, and the foundation or column structure as the foot. In addition, the stage house system spontaneously expresses its self-conscious mental, which feels above and overcomes the nature so that it can be found a form of self-worth that is literally and figuratively over nature, the king against the fate of nature [10]. In principle, the division of Betang building is now the same as the previous Betang where the house is divided into 3 parts. But the distinguishes is the view that affects the division of the house, where in taking the form of the building is not based on the belief in religion but tries to utilize the wisdom and physical and technical benefits such as first, in healthy hygienic environment which not directly exposed to moisture and animals that disturbing and even dangerous[11]. Second, from building physics, it greatly protects the building against the ferocious tropical humidity and the building that easily decompose [10].

3.2.2 Development of Betang House Architecture

The Border House Prototype is accentuated on the House Betang Architecture based on its flexibility in accommodating the function of occupancy for the people in border region which will be inhabited by people from various kinds, tribes, and cultures of Indonesia. Rumah betang is taken as a blueprint of the design by combining elements of private and communal space, simplicity in building mass, and the ease of construction and architectural forms that suits the nature.

3.2.3 Application Precedent on Plan

The division of space is very simple which seen from the ground plan, in which the room is divided into 3 (three) parts, namely:
1. Batang Huma which consists of space and sleeping area,
2. Kitchen, and
3. Karayan, fruit storage and hunting stuff.

In the existing ground plan, it is transferred to 3 space zones, namely:
1. space for communal living, living room, family room, study room, dining room,
2. bedrooms which are private, and
3. service room for kitchen and toilet.

Fig. 6. The precedent for the building plan.

From the above data, it produces Prototype Special House for the border state officers:
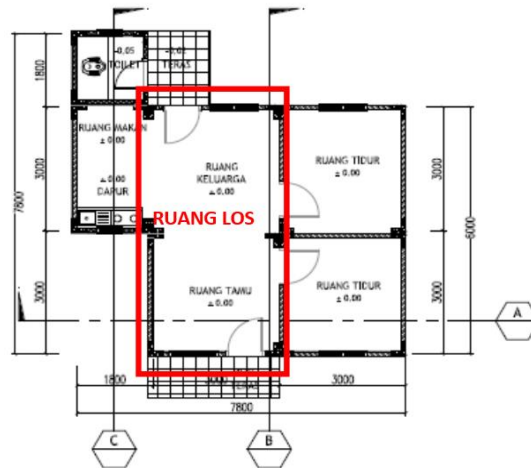
Fig. 7. Application on 45 Type plan.
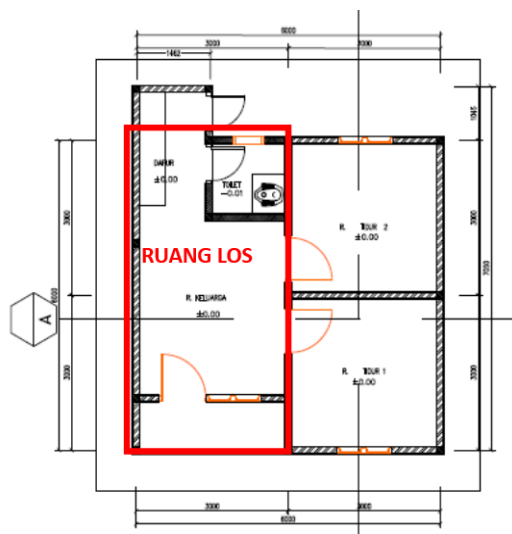
Fig. 8. Application on 45 Type plan.

Application Precedent on front view
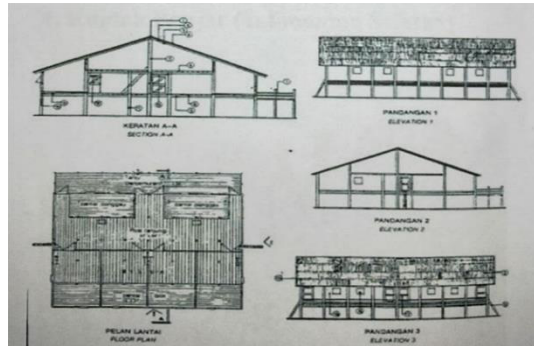
Fig. 9. View of traditional building of Rumah Bentang in West Kalimantan.

Precedents application in the form of building architecture include the use of a simple form of gable roof.

Fig. 10. Application view on the tilted house.

Fig. 11. Application view on the house.

3.3 Prototype Typology Concepts

Prototype design concept refers to the Ideal concept. Insights, ideas, concepts, and scenarios are a continuum that can be an important basis for architecture. The concept integrates elements into one related whole and enables architects to devote their resources to the most important design aspects. Therefore, from various areas that have been studied then the prototype design is formulated. The prototype consists of several types applied in accordance with the wholeness and condition of the land, and the community.

1. Floor typology:
   Type 45
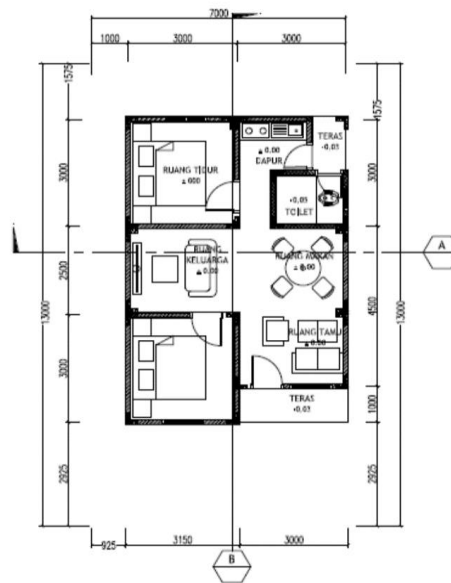
Type 36
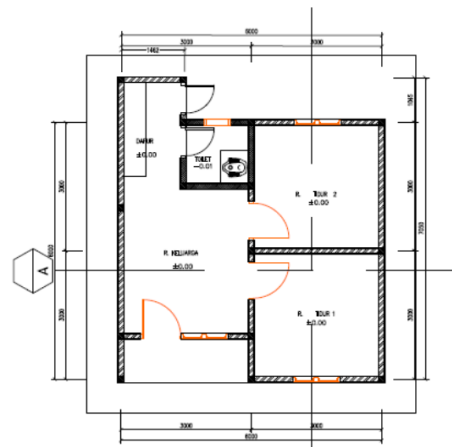
2. Structure typology [12]
    Ground Land with Reinforced Concrete Structures:
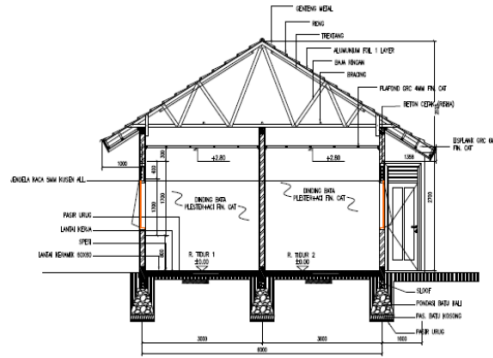
Stage with reinforced concrete structure:
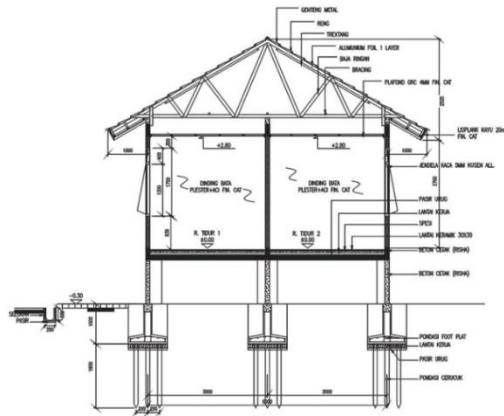
Stilt with wooden structure:
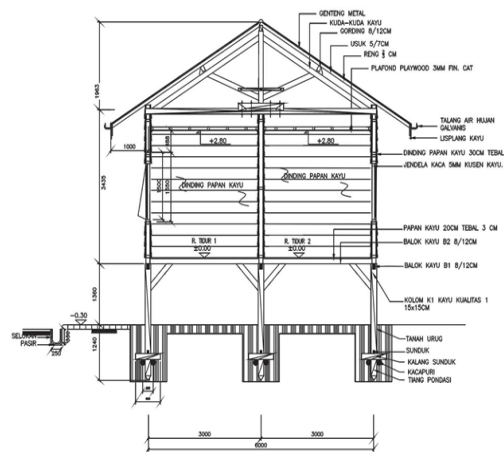
3. Typology plan:
   a. Single

   b. Row

3.3.1 Form Concepts

The concept taken from the basic concept of Rumah Betang, simple house concept that accompanied by a line and 2 colors of natural monochromatic.

3.3.2 Concept of Design Development

4 Conclusion

The conclusions of this study are as follows:
1. The design can be applied based on the precedent of local architecture.

2. The design concerns to the needs of users in the field based on the field surveys conducted by planners.
3. Prototype of the border special house, in the future, it is expected to bring special feature or characteristics of the border regions in Indonesia

Acknowledgments

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The Analysis of Determinant Factor of Company Value on Manufacture Company Listed on Indonesia Stock Exchange

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Abstract. A high increase in corporate value is a long-term goal that a company should achieve that will be reflected in its stock market price. This study is aimed to analyze the effect of profitability, leverage, firm size, liquidity, debt policy and investment decisions on the value of the company in the food and beverage sub-sector manufacturing company listed on Indonesia Stock Exchange period of 2012-2016. This research is a quantitative research using purposive sampling techniques to determinate the sample. This research obtained 9 (nine) companies from 14 companies. The analysis model used in this research is multiple linear regression models. The research result indicate that profitability and investment decisions have a significant effect, while leverage, firm size, liquidity and debt policy has no significant effect on firm value.

Keywords: Profitability, leverage, company size, liquidity, debt policy, investment decision, corporate value

1 Introduction

The business sphere plays an important role for development, either by government or by private sector. Many companies improve the quality of their companies in order to be able to compete in the market and attract consumers. The success of a company can only be achieved by good corporate management. One of those is to improve the value of the company, the prosperity of the company owner and the market price of its shares. The value of the company can describe the company situation.

The value of the firm could indicate the level of company success and it could become the investors' perception to valuate a company. In addition, it is usually often associated with stock prices. The value of a company is the amount it receives when a company is sold as a business in operation. Price to book value (PBV) is used as a projection of the value of the stock because it gives an idea of how many investors appreciate a stock.

In the stock market, the stock price of a company often reacts to the publication of the achievement of corporate value. From the source www.cnn.com, the Minister of Trade has issued a regulation since 2015 that prohibits the sale of alcoholic beverages in minimarkets and retailers, which clearly makes the stock price of food and beverage sector dropped, especially the beverage sector, Delta Djakarta (DLTA) and Multi Bintang (MLBI) and this price weakening is taking place throughout 2015. Fluctuations in the share prices of food and beverage manufacturing companies listed on the Indonesia Stock Exchange for two years are presented in the following graph.
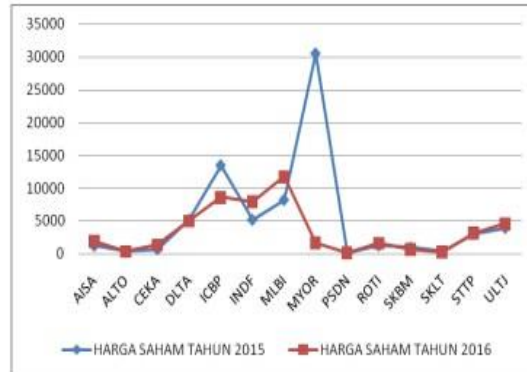
Fig. 1. Stock Price Fluctuation

There are several factors that may affect the value of the firm, such as managerial ownership, , audit committee, institutional ownership, earnings quality, dividend policy, firm size, growth, capital structure, profitability, liquidity, debt policy, interest rate, firm size, investment decisions and etc. This study is a modification of previous research, however the authors , in this study, only limit the variables that affect the value of the company consisted of profitability, leverage, company size, liquidity, debt policy and investment decisions. Subjects that are used in this study is a food and beverage sub-sector manufacturing company listed on the Indonesia Stock Exchange period 2012-2016.

1.1 Signaling Theory

Signal theory propounds how a company should give signal toward financial statement users. Signal theory discusses the company's drive to provide information to external parties. The impetus is due to the information asymmetry between management and external parties. Firms can increase company value by reducing asymmetric information. Information asymmetry occurs when management does not convey all financial information as a whole to external parties [1].

1.2 Firm Value

Corporate value conceptually can be explained as the value determined by the stock price traded in the capital market [2].According to Wahyudi, Pawestri (2006) in Meidiawati (2016), the market price of the company's shares is formed between the buyer and the seller during transaction because the stock market price is considered as a reflection of the true value of the company's assets [3].
Company value can be measured by a ratio called rating ratio. In this study, the researchers use Price to Book Value Ratio (PBV) as an indicator to measure the value of the company [4]:

$$PBV= \frac{Stock\ price\ \ per\ sheet}{Book\ value\ of\ stock\ per\ sheet}$$

1.3 Profitability

Profitability is a ratio to assess the ability of companies in the search for profit. This ratio also provides a measure of the effectiveness of a company's management level. This is shown by the profits generated from sales and investment income. In essence, the use of this ratio indicates the efficiency of a company [5]. This study measures profitability by using *Return on Asset Ratio* (ROA), this ratio measures the company's ability to generate profits based on certain asset levels. *Return on Assets* is a ratio that sees the extent to which the investment or total assets that have been invested can provide the return of profits as expected [6]. The formula of *Return on Asset Ratio* (ROA), as follows:

$$ROA = \frac{Net\,pro\,fit}{Total\,Assets}$$

1.4 Leverage

Leverage is the amount of debt used to finance the assets of the company [8]. Companies that have larger debt than equity are said to be companies with high Leverage rates. Leverage ratio aims to analyze the expenditures made in the form of debt and capital composition and the ability of companies to pay interest and other fixed expenses [7].

In this research *leverage* is proxied by using *Debt Ratio*. According Sawir (2008), *debt ratio* is a ratio that shows the proportion between the obligations owned and all owned wealth. *Debt Ratio* can be calculated by the formula [9]:

$$Debt\,Ratio = \frac{Total\,debt}{Total\,Asset}$$

1.5 Company Size

According Hermuningsih (2012), firm size (*firm size*) is an indicator that shows the financial strength of the company. The size of the company is considered capable of affecting the value of the company, because the larger the size or scale of the company, the easier the company to obtain sources of funding both internal and external [10]. According Rahmawati, Topowijono, Sulasmiyati (2015), company size can be seen from the total assets owned by the company. In this study, firm size was assessed by *Log of Natural Total Assets* to reduce significant differences between small size firms. Company size can be measured by the formula [11], [3]:

$$Firm\,size = LN\,(Total\,Asset)$$

1.6 Liquidity

According to Moeljadi (2006: 67) in Amanah, Atmanto, Azizah (2014) liquidity is an indicator of the company's ability to remunerate all financial obligations in due time. A high

level of liquidity indicates that the company has no difficulty paying its liabilities in the short term, so the creditors do not have to worry about giving loan [12]. In this research, liquidity ratio is proxied by using Current Ratio or current liabilities. According Sawir (2008) Current ratio is a comparison between current assets and current liabilities and is the most common measure used to determine the ability of a company to meet its short-term obligations. Current ratio can be calculated by the formula [9]:

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

1.7 Debt Policy

According to Munawir (2016) debt is all the company's financial policies to other parties that have not been fulfilled, where the debt is a source of funds or capital companies that come from creditors [13]. Brigham and Houston (2011: 78) in Pertiwi, Parengkuan, Tumiwa (2016), stated that debt policy is a policy regarding the decisions taken by a company to run its operations using financial leverage [14]. Debt policies are often measured by using debt ratios that reflect the company's ability to carry out all of its liabilities shown by some of its own capital used to repay debt. According to Harjadi (2013), Debt to Equity is a ratio that measures the extent to which the debt can be covered by own capital. Debt to Equity ratio (DER) can be calculated by the formula [15]:

$$\text{PER} = \frac{\text{Stock Price per sheet}}{\text{Net profit per sheet}}$$

1.8 Investment Decision

Investment is a commitment to a number of funds or other resources undertaken currently, with the purpose of obtaining future benefits Tandelilin, (2010: 2) in [14]. According to Nadhiroh (2013), investment decisions are provisions made by the company in spending the funds that it has in the form of certain assets with expectation to gain profit in the future. One of the ratios that can be used to determine investment decision is with Price to Earnings Ratio (PER). PER can be used as a proxy for investor expectations and market valuation. The formula used in calculating investment decisions are [16]:

$$\text{Current Ratio} = \frac{\text{total debt}}{\text{Total equity}}$$

1.9 The Effect of Profitability on Corporate Value

Profitability measures the company's ability to generate profits from business activities. Profitability in this study proxied with ROA is a value that reflects the return of the company from all assets given to the company, this ratio comparison between net profits after tax with total assets owned. The higher this ratio the better the asset productivity in obtaining net profit. This will increase the attractiveness of the company to shareholders or investors so that it can

affect the value of the company [1]. This supports the research that has been done by Pertiwi, Parengkuan, Tumiwa (2016) which shows that profitability has a significant influence on the value of the company [14].

Hypothesis1:Profitability has a positive effect on Corporate Value.

1.10 The Effect of Leverage on Corporate Value

According to Suffah, Riduwan (2016), sources of funding within the company can be obtained from external companies in the form of debt. Leverage shows the ability of a company to meet all the financial obligations of the company in case the company is liquidated. The debt can be used to control the free cash flow excessively by management. Therefore, it can avoid wasted investment and will increase the value of the company. Increasing the debt ratio of a company is a positive signal for investors with the assumption that future cash flow will be maintained [4]. This is in line with research conducted by Utama and Wikuana (2016) which shows that partial leverage gives positive effect significantly on company value.

Hypothesis2: *Leverage* gives positive effect significantly on company value.

1.11 The Influence of Company Size on Corporate Value

Company size is one of the variables considered in determining the value of a company. The size of a company is a total reflection of an organization's assets. Companies themselves are categorized into two types: small-scale companies and large-scale companies. According to Ta'dir, Parengkuan, Taerang (2014), large-scale companies have the convenience to enter the capital market, making it easier for companies to get additional funds. This will be considered as a good prospect for the company so that it will attract investors to invest their capital [17]. This is in line with research conducted by Nurhayati (2013) shows the size of the company has a positive and significant impact on corporate value [18].

Hypothesis 3: Company size has a positive effect on Corporate Value.

1.12 The Effect of Liquidity on Corporate Value

High liquidity can show available funds to pay dividends, finance the company's operations and investment so that it makes investors' perceptions better on the performance of the company. This is because companies with high levels of liquidity have large internal funds, so the company also uses its internal funds first to finance its investment before using external financing through debt. This can increase investor's demand for the company's stock increases, resulting in the value of the company will also increase [19]. The results of Putra and Lestari (2016) show that liquidity has a positive effect on firm value [19].

Hypothesis 4: Liquidity has a positive effect on Corporate Value.

1.13 The Effect of Debt Policy on Corporate Value.

Managers can use debt as a more trusted signal for investors. This is because companies that increase debt can be viewed as another company with the prospect of the company in the future. So the use of debt is a sign or a positive signal from the company that can make investors appreciate the value of shares greater than the value recorded on the balance sheet company, so that corporate PBV and corporate value is high or increase the value of the company [20]. The results of Pertiwi, Parengkuan, Tumiwa (2016) show debt policy proxyed

with debt to equity ratio (DER), partially have a significant positive effect on firm value [14]. This is supported by the results of research Purnama (2016) which states debt policy has a significant effect and have a positive relationship direction. Based on the theory of explanation mentioned above, it can be made as follows hypothesis [20]:

Hypothesis 5: Debt Policy has a significant positive effect on firm value.

1.14 The Influence of Investment Decision on Corporate Value

Investment decisions are provisions made by the company to spend the funds it has in the form of certain assets with expectation to gain profit in the future [16]. Suroto (2015) stated that managers who managed to create the right investment decisions, then the assets invested will produce optimal performance so as to provide a positive signal to investors who will increase the company's value and value [21]. Pertiwi, Parengkuan, Tumiwa (2016) states that the decision of investment has a positive and significant impact on the value of the company. High investment is a signal of future revenue growth companies. The signal will be considered good news that will affect the perception of investors on the company's performance that will ultimately affect the company's value [14]. Based on that opinion, the researcher proposed the hypothesis:

Hypothesis 6: Investment decisions have a positive effect on firm value.

2 Methods

2.1 Population and Sample

This study included casual research using a quantitative approach. The object of research in this research is manufacturing companies, food and beverage sub-sector companies listed in Indonesia Stock Exchange period 2012-2016. The data used in this study is secondary data and obtained from the company's financial statements published through the website of Indonesia Stock Exchange (www.idx.co.id). The population in this research are 14 food and beverage sub-sector companies listed on Indonesia Stock Exchange from 2012-2016. And there are 9 research samples companies that fulfill the criteria of the research. Sample selection criteria are as follows:,

Table 1. Sample Criteria Research Table.

Criteria	Quantity
The food and beverage sub-sector is listed on the Indonesia Stock Exchange for the period 2012-2016.	14
Food and beverage companies that do not publish their full financial statements during the period of 2012-2016.	5
Number of companies used as samples	9

3　Result and Discussion

3.1　Multiple Linear Regression Analysis

3.1.1　Goodness Fit Test

Table 2. Result of Goodness Fit Test.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135,140	6	22,523	11,252	,000[a]
	Residual	76,066	38	2,002		
	Total	211,206	44			

a. Predictors: (Constant), Investment Decision, Profitability, Company Size, Debt Policy, Liquidity, Leverage

b. Dependent Variable: Company value

Sig. output is known 0.000. Because Sig output (0.000) < Sig. α (0.05), based on these results it can be concluded that the model is fit or proper to use.

3.1.2　Determination Coefficient Analysis

From Table **5**above,it can be seen that from the calculation of the adjust valueR^2indicates a number 0.583 it means 58,3% of the company's value is determined by the variables of Profitability, Leverage, Company Size, Liquidity, Debt Policy and Investment Decision. While the rest equal to 41,7% (100% - 58,3%) influenced by other factors that are not examined in this research.

3.1.3　Statistic test T

Table 3. Multiple Linear Regression Test Results.

	Model	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2,308	4,213		-,548	,587
	Profitability	16,467	4,910	,509	3,354	,002
	Leverage	-2,304	3,127	-,164	-,737	,466
	Firm size	,081	,131	,064	,623	,537
	Liquidity	,259	,247	,173	1,051	,300
	Debt policy	,390	,937	,082	,416	,680
	Investment decision	,061	,022	,284	2,778	,008

Based on table 3, the above output results can be explained as follows:
1. Profitability variable has Sig value. 0,002 (0,002> 0,05) and Investment Decision variable has Sig value. 0,008 (0.008> 0.05) sot this matter can be stated H01 and H06 are accepted

and Ha1 and Ha6 are rejected, it means partially Profitability Investment Decision has significant effect to Company Value.

2. Leverage variable has Sig value. 0.466 (0.466> 0.05); Size Company Variable has Sig value. 0,537 (0,537 <0,05); Liquidity variable has Sig value. 0.300 (0.300> 0.05); and Debt Policy Variables have Sig value. 0.680 (0.680> 0.05), so it can be stated H02, H03, H04 , H05 are accepted and Ha2, Ha3, Ha, Ha5 are rejected, it means partially Leverage, Size Company, Liquidity and Debt Policy

3.1.4 Multiple Linear Regression Equation

Based on table 3 above can be seen the regression equation, as follows:

Company Value: a + β1 Profitability+β2 Leverage + β3 Company size + β4 Liquidity + β5 Debt Policy + β6 Investment Decision + ε

Company Value: -2,308 + 16,467 Profitability- 2,304 Leverage + 0,081 Corporate Size +0, 259 Liquidity + 0,390 Debt Policy + 0,061 Investment Decision +ε

3.2.1 The Effect of Profitability on Corporate Value

The result of the first hypothesis analysis shows that profitability partially has a positive and significant effect on Corporate Value. This happens because profitability is a company's ability to generate profits or profits that reflect the success of a company. High profitability will provide a positive signal for investors that the company is in a favorable condition or has the ability to profit, therefore, it could become one of the attractive things for investors to own shares of the company. So the higher value of profitability gained then the higher value of the company. Due to high profitability will provide an indication of good corporate prospects that can trigger investors to increase share demand. Increased stock demand will cause the company's value to increase as well, in line with previous research conducted by Pertiwi, Parengkuan, Tumiwa (2016), but the results of this study are inconsistent with other studies conducted by Moniaga (2013) which show that profitability does not affect the value of the company [22].

3.2.2 The Effect of Leverage on Corporate Value

Results of the second hypothesis analysis show that Leverage partially has no significant effect on Corporate Value. Leverage size does not affect Corporate Value because investors not only see how big companies use funding from debt in running their business to increase the value of the company but investors also pay attention to other funding such as funding derived from the company's equity. This research is consistent the result of research from Prastika (2012) which resulted in the result that Leverage has no positive effect on Corporate Value [23]. Different things are shown by research conducted Pratama, Wiksuana (2016) which states that leverage has a positive effect on the value of the company[24].

3.2.3 Effect of Company Size on Corporate Value

The result of the third hypothesis analysis shows that company size partially has no significant effect on Corporate Value. This means that firm size is no longer the concern of investors in making decisions for investment. In investing investors not only review from how much assets of the company but also from other side like financial statement, good name and also dividend policy. This research is consistent with the research of Suwarno, et al (2016) which resulted in the results of research that company size does not have a positive effect on company value. However, the result of Putra and Lestari research (2016) shows a significant positive influence between company variable and firm value [19].

3.2.4 Liquidity Influence on Corporate Value

The result of the fourth hypothesis analysis shows that Liquidity has no significant effect on Corporate Value. Liquidity position is not taken into account by investors in the liquidity ratio because only show the ability of the company to cover current liabilities with current assets of the company. In investing, investors not only review of how big the company is liquid but also from the other side such as the extent to which the company in generating profits that are reflected in the value of a company's profitability. This research is consistent with the research of Nurhayati (2013) which in her research obtained the result that Liquidity has no significant positive effect to Corporate Value [18]. However, the results of Putra and Lestari (2016) show that liquidity affects the value of the company [19].

3.2.5 The Effect of Debt Policy on Corporate Value

The results of the fifth hypothesis analysis obtained debt policy does not affect the value of the company. The results of this study indicate that debt policy cannot be a benchmark of the value of the company. This indicates that the increased use of a company's debt is not the only positive signal for investors. Debt use is used forfunding the company's operational costs in the business may not necessarily improve the performance of the company, it shows that the company has not been able to utilize the debt utilization as an optimal funding source for operational financing. The result of this research is consistent with research result of research of Pertiwi, Parengkuan, Tumiwa (2016) and Apsari, Idha (2014) stating that debt policy has no significant effect to company value [14], [25]. While the research result of Purnama (2016) shows the opposite, debt policy has a significant effect on company value [20].

3.2.6 The Influence of Investment Decision on Corporate Value

The result of the sixth hypothesis analysis shows that investment decision has positive significant effect to firm value. This is consistent with the signaling theory which states that investment spending gives a positive signal about future growth of the company, thus increasing the stock price as an indicator of corporate value. A high PER shows a good corporate investment so investors will be interested. This means the greater the investment made by a company, the higher the value of a company. With the investment, investors assume that in the future the profitability of the company will increase. Thus investors will be more interested in buying shares of companies that make investments, so this will lead to increased stock prices and will ultimately increase the market value of the company. The results of this study are consistent with the results of research from Pertiwi (2016), and

Purnama (2016) which shows that investment decisions significantly affect the value of the company and inconsistent with research Languju (2016) stating that investment decisions do not affect the value of the company [20],[26].

4 Conclusion

Based on the research conducted, the conclusions obtained are as follows:
1. Profitability and Investment Decision has a significant effect on Corporate Value.
2. Leverage, Company size, Liquidity, and Debt Policy has no significant effect on Corporate Value.

4.1 Managerial Implications

In the study of profitability variables are proxied by using return on assets, and investment decisions proxied by PER, profitability variables and investment decisions have a positive effect on the value of the company. This shows that profitability and investment decisions become benchmarks that can determine the value of the company. The higher profitability a company gets then the better productivity of assets in obtaining profit. This will further increase the investor's appeal to the company. So that profitability becomes information that is considered important by investors to invest. High corporate value can prosper the shareholders or investors. So do investment decisions, investment decisions can give a positive signal about the company's growth in the future, thus increasing the stock price as an indicator of corporate value. A high PER shows a good corporate investment so investors will be interested. This means the greater investment made by a company, the higher the value of a company. With the investment, investors assume that in the future the profitability of the company will increase. Thus investors will be more interested in buying shares of companies that make investments, so this will lead to increased stock prices and will ultimately increase the market value of the company.

In this study, leverage, debt policy, firm size and liquidity have no significant effect on firm value. This implies that how much companies use debt-induced financing, the ability of companies to pay their current liabilities in the future, the size of the assets or resources of the company is not a consideration of investors in making investment decisions.

4.2 Limitations of Research

The following limitations in this study, are as follows:
1. This research only use independent variable that is profitability, leverage, company size, liquidity, and debt policy and investment decision.
2. The object of research consists of only 9 manufacturing companies in the sector of consumer goods sub sector food and beverages listed on the Indonesia Stock Exchange (BEI) which is sampled by the selection process according to certain criteria.
3. The five-year observation period from 2012 to 2016, so it has not been able to see the long-term trend of corporate value change.

4.3 Suggestion

The suggestions that can be taken into consideration in following up on matters relating to research are as follows:
1. It is recommended to multiply the number of subjects to be analyzed by adding other sub-sectors so that the results of research more generalizable.
2. It is suggested to add another variable to the research model, which may have a greater influence on the value of the firm. Such as dividend policy, managerial ownership, profitability, capital structure, earnings per share, and others.

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PLC Based PID for Wrapping Machine Tension Control

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Abstract. The process of wrapping with plastics to better ensure the safety of the goods are mostly done, such as goods before being put into the trunk of the plane or when the industrial product to be delivered in long distances. In the wrapping process, the tension of the tension of the plastic (wrapping material) is very important to keep its value so that it will produce a wrapping that is in accordance with the desired. In this paper will be presented about the implementation of PID (Proportional Integral Differential) controller for tension control on wrapping machine. The system consists of a three phase induction motor as a drive in the unwinder and rewinders, PIDs of the PLC, inductive proximity as a plastic tension sensor, and a PC for data entry and system monitoring. The tension control of the plastic wrapping material is carried out by manipulating the unwinder velocity for the rewinder speed which is maintained at a constant speed. The speed difference between the two motors (unwinder and rewinder) will produce tension. To get good control performance, PID parameter tuning is required. From tuning using 3 methods (reaction curve method, tuning PID TIA PORTAL tool and Dotx PID tuner application), the best result resulted with 3.3% overshoot response, 1.7 second rise time, 3.2% settling time second, there is 1 oscillation and steady state error of 0.263%.

Keywords: Control system, PID, tension, PLC, wrapping.

1 Introduction

In the manufacturing industry, often the product must be delivered in great distances. To keep the product from possible damage during the delivery process, it is often done by wrapping using plastic materials. Similar process is also often we find at the airport, where passengers do the wrapping of bags or luggage before it is put into the trunk of the plane.

The processing and packing industries are growing nowadays. Various efforts are made by automating the processes that exist in the industry. Changes are made from conventional ways of being integrated and forward as a whole. The technology in packing production will be an important role in improving productivity. Findings in the field of packing automation will be very beneficial to the processing and packing industries [1].

One of the most important things in the process of thin and flexible materials, such as thin plastics for wrapping, is to obtain a result of flawless wrapping or damage to plastic as wrapping materials. Damage can occur as a result of the level of tension thin plastic material exceeds the elasticity limit, so it is important to control the level of tension thin plastic material [2].

Other research has also been done on the importance of wire tension setting on the motor coil winding process automatically.In general, the process of coil winding motor using the

device in the form of passive arm and braking hysteresis to keep the tension of the wire material.This passive arm device is unable to react quickly as the speed of winding increases.Sliding mode control is done by using an interference observer to estimate the strain of the wire [3].

In the process of rolling thin and flexible materials, problems often arise. It is as found for example in the rolling process of paper and plastic. The problem is because the inertia and radius slowly during transportation will affect the value of the spring constant of the material [4]. It is required to control precisely to the value of tension continuously in dynamics system [5].

During wrapping process, many variables must be controlled, one of them is the tension level of the plastic as wrapping material. This is done so that the quality of the wrapping process is good, not torn, evenly and tightly. Tension controller is a part that serves to tighten and relax the pull of plastic against items to be wrapped [2].

In this study will be discussed about the simulation of tension control system with PID controller on wrapping machine. The system used in the simulation consists of two three phase induction motors that functioned as a wheel drive plastic sheet. Tension control is done by manipulating unwinder roller motor at a certain speed which will cause adjustment of the speed of stretching of plastic material, so that will get the level of tension as desired. Motor speed setting is done by manipulating the frequency of the motor supply voltage generated from the inverter.

2 Mechanical System on Wrapping Machine

In figure 1 shows the path of plastic starting from the unwinder to the items to be wrapped that serves as a rewinder. First from plastic roll to roll unwinder then roll support unwinder. Roll support unwinder is useful for pressing plastic to roll unwinder so that plastic tension (tension) can be as expected (more effective in controlling tension). Then from roll support unwinder to roll dancer tension that can move forward or backward according to tension (tension) of plastic. From the tension dancer roll then past the supporting roll and directly wrap the items that are already on the rewinder board.

A. Plastic wrapping material
B. Unwinder roller
C. Unwinder support roller
D. Dancer roller
E. Support roller
F. Wrapped object
G. Where to place the wrapped object
H. Dancer roller pullers
I. Spring
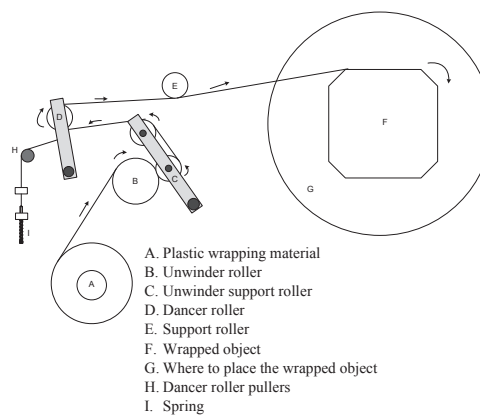
Fig. 1. Wrapping material path.

2.1 Tension on Plastic Sheet asWork piece

The work piece in the form of plastic sheet has elastic properties. The elasticity of the plastic sheet is expressed in K and D constants [6]. As the work piece shifts along the work station, the plastic elasticity causes tension on the plastic sheet [7]. For more details can be seen in Figure 2.
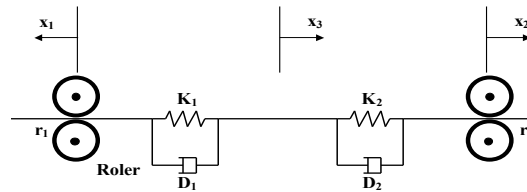
Fig. 2. Elasticity of work piece.

The equation of the tension level on the plastic sheet located between the roller 1 and the 2nd roller is:

$$f = K_1 (x_3 + x_1) + D_1 \left(\frac{dx_3}{dt} + \frac{dx_1}{dt}\right) \tag{1}$$

$$f = K_2 (x_2 - x_3) + D_2 \left(\frac{dx_2}{dt} - \frac{dx_3}{dt}\right) \tag{2}$$

f   : tension or tension (Newton)
v   : rate of shift (m / sec)
K_1, K_2 : flexibility constant (N / m)
D_1, D_2 : damping factor (N / (m / sec))
x_1, x_2, x_3 : magnitude of shift (m)

The equation for the rate of plastic sheet shifts in the middle between roler 1 and roler 2 can be expressed as follows [8]:

$$x_3 = \frac{x_2 - x_1}{2} \tag{3}$$

Substituting equation (3) to equation (2) will then be obtained:

$$f = \frac{K_2}{2} (x_1 + x_2) + \frac{D_2}{2} \left(\frac{dx_1}{dt} + \frac{dx_2}{dt}\right) \tag{4}$$

The relationship between the rotational speed of the roler and the rate of plastic sheet shift:

$$\frac{dx_1}{dt} = r_1 . \omega_1 \quad dan \quad \frac{dx_2}{dt} = r_2 . \omega_2 \tag{5}$$

For $K_1 = K_2 = K$ and $D_1 = D_2 = D$, if equation (5) is substituted to equation (4) it will be obtained:

$$f = \frac{K}{2}\int r_1.\omega_1\ dt + \frac{D}{2}r_1.\omega_1 + \frac{K}{2}\int r_2.\omega_2\ dt + \frac{D}{2}r_2.\omega_2 \qquad (6)$$

2.2 Tension Control System Block

The design of the control system to be discussed in this paper is as presented in Figure 3.
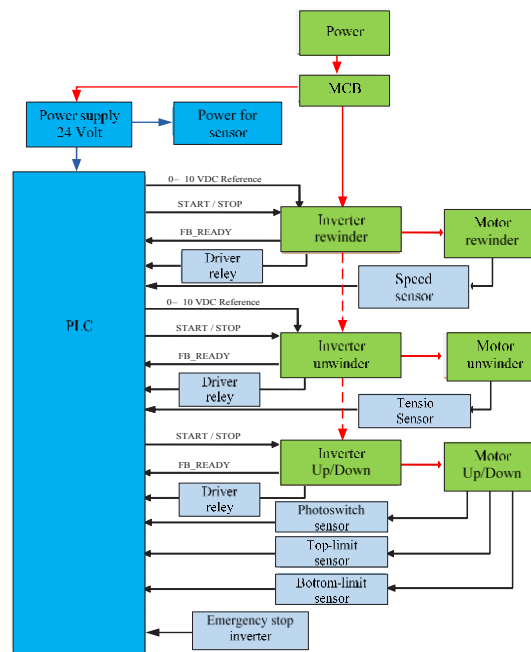
Fig. 3. Block Diagram of the System.

SIEMENS S7-1200 PLC is used as a regulator of the entire process that occurs in the system [9]. The three phase induction motors are used to drive the existing roler, by setting the speed through the working frequency of the motor working voltage that generated from the inverter. Proximity switch is used to detect the speed of motor rotation. Tension control algorithm uses PID with parallel structure.

2.3 Tension Sensor

Tension on the plastic material is detected by adding a free roller (dancer roller). Changes in the level of tension on the plastic material will result in changes in the compression force of the plastic sheeting material to the dancer roller.
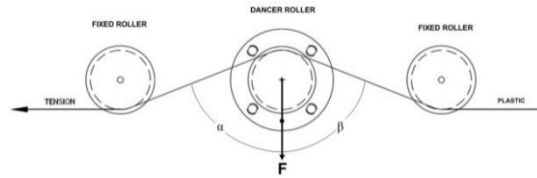
Fig. 4. Pressure force with the angle of the shaper.

$$F = f \cdot \cos a + f \cdot \cos b \tag{7}$$

F   = press force (kg or g)
f   = tension (kgf or gf)
a   = angle of forming α
b   = angle of forming β

The mechanical design of the sensor used consists of 2 main parts: 1) the plate is made oblique with a length of 8 cm in one part with a plastic tension and dancer roll and 2) inductive proximity sensor with analog output. The design of the speed sensor system is shown in figure 5.
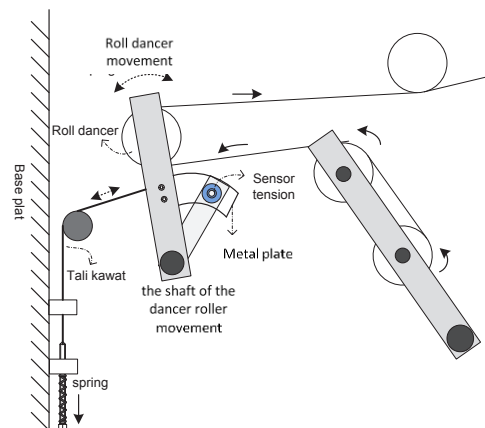
Fig. 5. The tension sensor system.

Figure 5 illustrates the design of the roll dancer which includes the position of the tension sensor, the metal plate of the roll position of the dancer and the addition of resistors to the tension sensor wiring. As the plastic sheet material undergoes a tension change, it will change the relative position of the metal plate against the proximity switch. The relative position between the metal plate and the proximity switch representing the tension of the plastic sheet material is detected by the proximity switch to produce an output voltage of 0-10 VDC.

2.4 PID controller

The PID controller is a combination of three basic proportional control (P), integral control (I) and derivative control (D). The PID diagrams of the parallel structures used are shown in Figure 6 [7]. High reliability, economical cost, and ease of control have caused the application of dc motor in industry very popular. Setting the voltage on the armature or the field is two ways in controlling the speed of the motor dc rotation. One of the most widely used controllers is PID. A lot of development against PID controllers, such as combining it with fuzy logic (Reza Akbari-Hasanjani, Shahram Javadi, 2015).
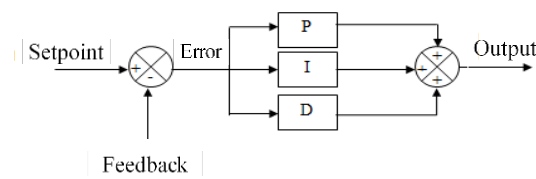
Fig. 6. Parallel PID Structure

The equation describing the PID controller action is [10] :

$$u(t) = K_P \left\{ e(t) + \frac{1}{T_I} \int e(t)\, dt + T_D \frac{de(t)}{dt} \right\} \qquad (8)$$

As description:
    $u(t)$ = PID Control Output
    $e(t)$ = error
    K_P = proportionalgain
    T_I = Integral time
    T_D = derivative time

One use of PID controls is in the form of independent modules on the PLC system. Figure 7 is a function block diagram of PID on Siemens S7-1200 PLC.

Fig. 7. PID on Siemens S7-1200 PLC [9].

The PID instruction on the PLC provides PID control with integrated tuning for both automatic and manual mode. The PID_Compact function block algorithm used in the calculation follows the following equation [9].

$$y = K_P[b(w-x) + \frac{1}{T_i \cdot s}(w-x) + \frac{T_D \cdot s}{a \cdot T_D \cdot s + 1}(c.w.x)] \qquad (9)$$

As explain as:
- y : Output value
- w : Set point value
- K_P : Proportional gain (P component)
- T_i : Integral action time (I component)
- T_D : Derivative action time (D component)
- x : Process value
- s : Laplace operator
- a : Derivative delay coefficient (D component)
- b : Proportional action weighting (P component)
- c : Derivative action weighting (D component)

3   Result and Analysis

3.1   Sensor Tension Testing

The sensor used to detect tension is inductive proximity with 4-20 mA analog output. To convert the sensor output current (4-20 mA) into a voltage (0-10 VDC) then a 500 ohm resistor is installed in parallel at the sensor output. Tension sensor testing is done by placing the object (metal) in front of the proximity sensor. In this case it is done by using a bolt that is placed permanently or locked so that the male bolts move steadily when rotated. This bolt rotation determines the distance between the sensor and the end of the bolt. So that the inductance on the sensor can change as the bolt distance with the sensor, so it will affect the current and output voltage of the sensor. The voltage output voltage (0-10 VDC) of the next tension sensor will be fed as input for the PLC to be converted into an integer (16 bits). But integer data cannot be processed in PLC program, then converted again into real data (32 bits) by using function NORM_X and set its range 0 to minimum and 27648 for maximum. From NORM_X we change the scale to from -5 to 105 according to system data requirements. Tension sensor testing is shown in Fig. 8.
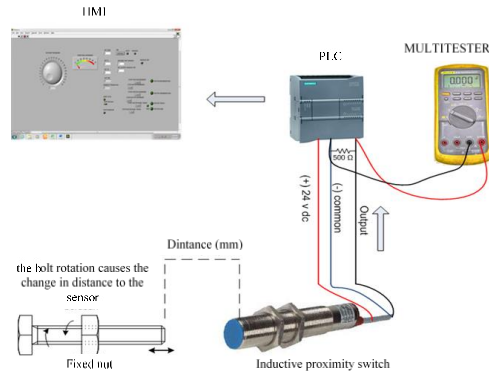
Fig. 8. Tension sensor testing.

Graph of system response as shown in figure 9 as follows:
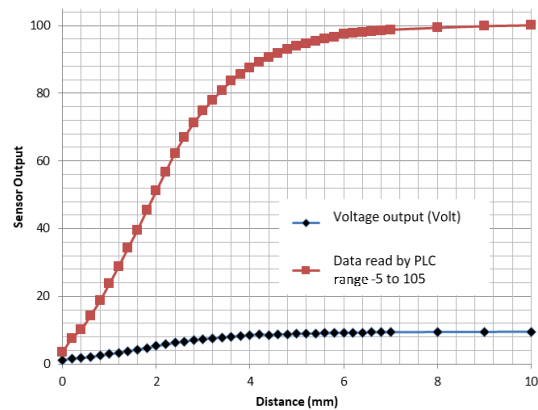
Fig. 9. Sensor response to distance change.

Figure 9 shows the nonlinearity of the sensor output response to the change in input distance. So it will have difficulty when entering the control on the PLC [11]. Then the sensor calibration required to find the results of a liner so that it will facilitate the control of system wrapping machine.

3.2 Tension Sensor Calibration

The tension sensor calibration is performed to obtain the tension value data with the actual strong pull strength using the weighed load. The purpose of this calibration is to set the pull of the dancer roll to the actual load according to the plastic strength range so that the data obtained on the plc matches the actual load and finds the linear data to facilitate the control of the system. How to perform a tension calibration on a rewinder system:

1. Use a rope that is 50 cm long.
2. Tie the strap on the roll of plastic material, then insert the rope as per the plastic path on the unwinder system.
3. At the end of the rope is made a hook for the burden (iron).
4. Put the load gradually and record the result. The range used is the maximum plastic strength of 0-2.4 kg.
5. For calibration, in the mechanical part there are bolts in the spring that can be adjusted the distance / density and change the position of the tension sensor to the dancer roll. Set so get range 0-2,4 kg.
6. In the plc program part is also added to zero-position no load and increase the range so get range 0-100% in PLC data for load 0-2,4 kg.

The calibration of the tension sensor is shown in Figures 10 and 11.
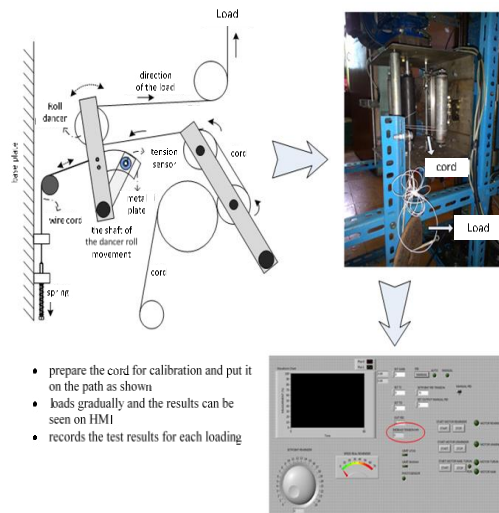
Fig. 10. Tension sensor calibration process.
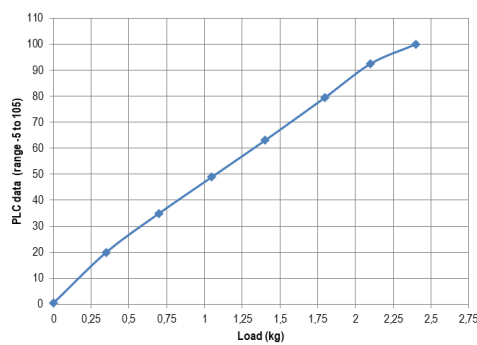
Fig. 11. Sensor response (after calibration).

Graphic Figure 11 shows a linear result that will make it easier to control the wrapping machine system [11].

3.3 PID Tuning With Reaction Curve Method

PID tuning aims to determine the exact amount of Kp, Ti and Td in order for the controller to produce the correct control signal in controlling the motor spin. The tuning by the curve reaction method is performed by giving a change in motor speed setpoint or in this case is done by changing the auto PID mode with manual PID. In the PID manual, Setpoint PID (0-100%) equals the PID output (0-100%). Analog output PLC module output voltage 0-10 VDC as reference motor speed unwinder. From this setpoint change will result in the speed of the motor is changed so that the plastic tension also changed. Process data recorded by data logger to be analyzed.

Setpoint change = 90% to 50%

Tension change that happened = 0% to 72%

Response of setpoint input system and output tension can be seen in figure 12.
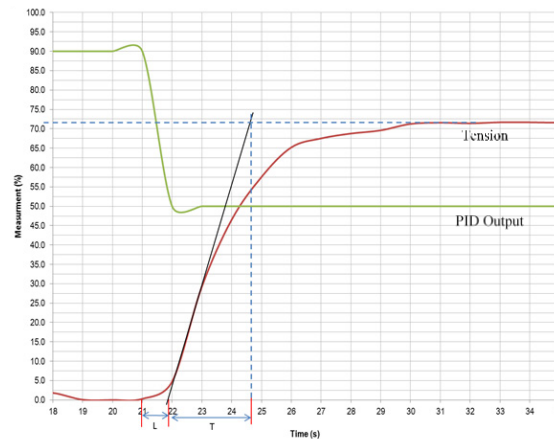
Fig. 12. Tension response to manual PID set point.

From the curve in Figure 12 we can know the parameters L and T are each of 0.9 s and 2.8 s, so the magnitude of control parameters can be determined as follows :

$$K_P = 1,2(\frac{T}{L}) = 1,2\ (\frac{2.8}{0.9}) = 3,73;$$

$$T_i = 1,2 \cdot L = 1,2\ (0,9) = 1,08\ S;$$

$$T_d = 0,5 \cdot L = 0,5(0,9) = 0,45\ S$$

The result of testing of system control with parameter of PID controller using tuning of curve reaction method is as in figure 13.
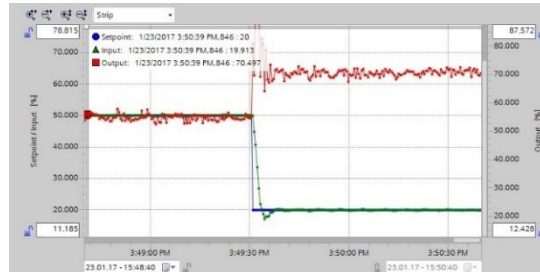
(a)
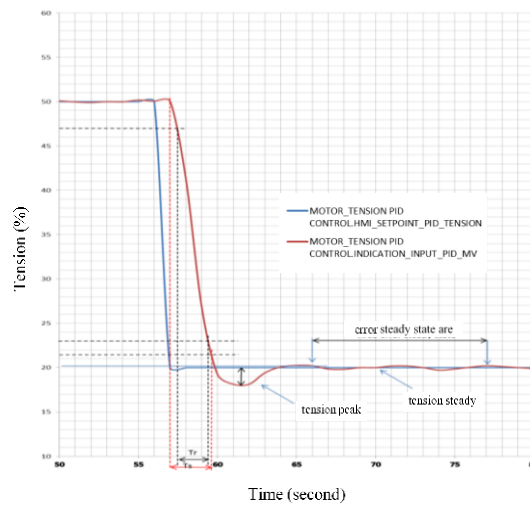
(b)

Fig. 13. system response to setpoint changes from 50% to 20%.

From the graph of figure 13 it can be known the characteristics of the system output is as follows:

$$\% \, Overshoot = \frac{|Tension_{puncak} - Tension_{steady}|}{Tension_{steady}} \, x \, 100 \, \%$$

$$= \frac{|18 - 20|}{20} \, x \, 100 \, \%$$
$$= 0.1 \, x \, 100 \, \%$$
$$= 10 \, \%$$

The rise time (t_r) is the time it takes for the output to change from 10 % to 90 % of steady state output :

$$t_r \qquad\qquad = 2 \, s$$

The setling time (ts) is the time it takes for the output to change from 0 % to 95 % of steady state output :

$$t_s \qquad = 4 \text{ s}$$

The number of oscillation = 1
Steady state error :

$$\% E_{ss} \qquad = \frac{1}{n} \sum_{i=1}^{n} \left| \frac{Output\ (i) - setpoint}{setpoint} \right| \text{x } 100 \text{ \%}$$

$$= \frac{1}{36} |0.235| \text{x } 100 \text{ \%}$$
$$= 0.00653 \text{ x } 100 \text{ \%}$$
$$= 0.653 \text{ \%}$$

From the analysis result shows that when the system is given set point change from 50% to 20%, obtained the system output response with overshoot of 10%, the rise time of 2 seconds, settling time of 4 seconds, 1 oscillation and steady state error 0.653%. The system is able to control the output according to the given set point.

4 Conclusion

Based on the analysis of the test results presented earlier it can be concluded that the tension sensor used has nonlinear characteristics, so that calibration is done. From sensory calibration results have been obtained linear sensor characteristics. PID tuning with reaction curve method has resulted PID parameter equal to Kp = 3.73; Ti = 1.08 s; and Td = 0.45 s, and indicates its ability to control system output following the given set point. When the system is given set point changes from 50% to 20%, the system output response with overshoot is 10%, the rise time is 2 seconds, and the settling time is 4 seconds, 1 oscillation and steady state error 0.653%.

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The Existence of Balinese Hindu Women in the Aspect of Political Communication
Study at Bali Women's Hindu Politician in Bali Provincial People's Legislative Council

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Abstract. Balinese culture that embraces patriarchal system is able to provide its own color in the political activities undertaken by members of the Hindu female council in the Provincial House of Representatives of Bali Province. This study uses Edmund Hussell's phenomenology theory which aims to delve deeper into the conscious experience of Balinese women politicians in the Bali Provincial Legislative Council related to their existence in political communication. As a result of this research is the experience of Balinese women politicians in the Bali Provincial House of Representatives has been able to implementation of Balinese cultural traditions and Hindu teachings in the reality of life. The strength of Patrilineal culture is deservedly to encourage every Balinese family to be able to provide understanding and education about women's rights and obligations in Vedic teachings. The political dynasty as the reality of female Balinese women politicians in the Bali Provincial Legislative Council has been able to encourage all Hindu women's institutions to be more active in empowering the quality of Hindu women related to Hindu-based political education. The construction of meaning owned by Balinese women politicians in Balinese People's Legislative Council in the reality of political communication, is expected to have been able to improve the quality of Balinese women politicians in seeing every opportunity of their own existence.

Keywords: Existence, Politician Women, Patrilineal, Political Communication.

1 Introduction

The majesty of Balinese culture that is dominated by Hindus has its own characteristics, where every region in Indonesia has its own customs and culture. Thus, every citizen has an obligation to conserve and implement all customs and culture in earnest. Likewise with the customs and culture that exist in the Island of the Gods of Bali which until now was still firmly held firmly by the people of Bali.

The customs and culture that exist in Balinese society is closely related to the religion and religious life of the Hindu community. Both have long historical roots and reflect the expressive configuration with the dominance of religious values and philosophy of Hinduism.

In the configuration is contained aspects of religious essence, lifestyle, community institutions, and art that exist in the Balinese community.

Bali province as adherents of the largest Hindus in Indonesia as in the data obtained by researchers, that the largest number of Hindus in Indonesia is on the island of Bali with details of the number of 3,419,436 people and the majority of the people also come from ethnic Balinese. If viewed in a cultural background that comes from ethnic Balinese and the majority embraced Hindu then this will be a very interesting thing to be studied. Bali as the dominance of the Hindus will have a different reality with Hindus outside the island of Bali which generally have acculturation with the local culture, such as Hindu Balinese ethnic in Lampung, Sulawesi and other regions in Indonesia [1].

The province of Bali as a region that still holds strong customs, has a patrilineal culture so strongly dominate, so the role of Balinese women becomes cornered and only limited to the domestic realm only. This can serve as one of the factors affecting the minimal involvement of women on the local and national political stage. Because talking about Hindu women's relevance in political participation cannot be separated from the interaction access and social involvement of women in every public sector. Because not only the quantity of numbers to be seen related to the involvement of women in the public sector, but also on the quality of women in interpreting every activity in the realm of political communication.

Related to the role of women in the realm of political communication, it is very important to understand how the role of women in Hinduism. As explained in the book of Manawa Dharmasastra that: According to as woman is expressed as land, man is manifested as seed; the result of the occurrence of the living bodily occurred because through the relationship between the ground and the seed in this book it is very clear that how men and women have the same duty in building a new life. Thus, it is fitting for Hindu women to take on more and more roles in their public activities [2].

The same position between men and women is also peeled in the book of Manawa Dharmasastra explaining that; In certain cases, the seeds are more prominent and other garbha women are prominent, but if both are the same, the derivatives will be greatly glorified. Where the book explains that, how men = men and women have the same opportunities and opportunities to build a quality generation. So fitting men and women have the same space to build their own existence [2].

Related with existing data, stated that Hindu women more than men, and most in Bali Island as the majority of Hindus with the number of Hindu women as many as 1.805.654 people while the number of second Hindu women in Lampung province with the number of 518,299 people and followed by other areas. Through these numbers certainly have hope there will be more Hindu women in the Province of Bali who dare to appear in the public arena as well as local and national political scene and able to give meaning in every political step. How does the construction of meaning in any political communication process done in both verbal and nonverbal communication in any social interaction, campaign, organization, publication, etc., will be able to give birth to a construction of its own political meaning for Hindu women in Bali Province [1].

1.1 Problem Statement

Based on background explanation, as for formulation of problem in this research are:
1. What is the experience of Balinese women politicians in the realm of Political Communication in the House of Representatives of Bali Province?

2. How is the existence of female politicians of Balinese Hindu in the political communication domain in House of Representatives of Bali Province?

1.2 Political Communication

This research emphasizes on political communication as the foundation of reality owned by Balinese Hindu women in Indonesia especially in Bali Province Regional House of Representatives. How the construction of reality undertaken by these Hindu women becomes the focus of the process of verbal and non-verbal formation of meaning both as well as the philosophical expositions contained in the meanings held by the Hindu women.

Culture and Religion is still a major concern as the philosophical reason of Balinese Hindu women in Indonesia to engage more in their political communication activity, so it will be very interesting if the research process is able to express subjectively how the process of meaning formation related to the Hindu women's understanding in the activity political communication.

The dominance of patrilineal culture occurring in Balinese culture as Hindu dominant dominance is able to provide an interesting color to examine the understanding of Balinese Hindu women in Indonesia related to the political communication activity it performs. Patriarchal dominance in the world of politics is also able to be a separate consideration related to the opportunities and competition system owned by Balinese Hindu women in Indonesia.

Basically political communication has an important role in the system of government of a country that can be seen from the activities of political actors that exist both from the side of masculinity and feminists involved in the process of socialization and political interaction. Adapted to Rush and Althoff statements; 1997 [3]. Which states that "political communication plays a very important role in a political system. It is a dynamic element, and a decisive part of the processes of political socialization, political participation, and political recruitment. " While in the context of political socialization Graber; 1984 [3] states that "view this political communication as a process of learning, acceptance and approval of customs or rules, structures, and environmental factors that affect political life . It occupies an important position in social - political life because it can affect the quality of interaction between society and entrepreneurs".

Existing political communication, if the democratic system requires the existence of quality relations of power between the people and the ruler, then political communication becomes the determining factor of the form of democracy. Because the political system itself can not operate well without the support of the masses whose attitudes and political behavior are driven by the power of messages that are socialized through political communication activities.

If viewed from the cultural background of Balinese Hindu women in Indonesia and Bali Province in particular, it is necessary to look at the basic concepts between communication and culture and religion because political communication is also essentially a part of, and influenced by, the political culture of a society. At the same time, political communication can also give birth, preserve and pass on political culture. So with regard to the structure of messages and patterns of political communication played, it can be analyzed political culture of a society.

1.3 Hindu Women

Discussing of Hindu women themselves, even in Hinduism, they have discussed the position of women themselves in social activities. This can be seen in the following quotation: 'strī hi brahmā babhsvitha'- a woman is actually a scholar, intelligent and able to teach in ṚgVeda VIII.33.19 [4]. In the quote ṚgVeda it is very clear that how Hindu women are asked to have a qualified capacity so as to take a role in society. Not only that, there are deep things that are also presented in the Vedas to Bhagavad Gita (Hindu religious scriptures) stating that; 'Samhotaram sma purā nārī, samanam vāva gacchati'-formerly the women went to the Agnihotra ceremony and advanced to the battlefield in Atharvaveda XX.126.1 [4]. This second quote clearly states that men and women have the same role even in battlefields.

Hinduism is basically gives great freedom to every Hindu woman to take a role in her social activities. But in reality, Hindu teachings cannot be realized well when clashing with the traditions and culture that exist in the province of Bali. The uniqueness and uniqueness of Balinese culture is inseparable from the patriarchal culture that comes from the Balinese patrilineal kinship system. Patriarchal culture in Balinese culture is based on the existence of the concept of *Purusha* and *Predana*, which symbolizes the soul (spirit) is immortal (Purusha), and human physics that have a changing nature (Prakirti). In society, the concept is better known for things related to men or *Purusha*, and things related to women or *Predana*. This concept serves as a basis for differentiating status and roles between women and men, which in certain cases cannot replace each other. This Hindu philosophy then animates the Balinese cultural ideology, which evolves into a system of values, norms and rules, called patrilineal patriarchal and customary laws, which function as social controls [5].

1.4 Existence

The existence can be interpreted by various experts. As in the great dictionary of Indonesian Existence is the existence, the presence of which contains elements of perseverance. In this case, the existence in question is certainly associated with the presence and presence of the Hindu women in the province of Bali in the realm of political communication. Not only as a passive actor, but the intended existence can be interpreted as an active activity undertaken in the realm of political communication.

In a journal written by Irfan Ardani in the journal Lakon: Journal of literary and cultural studies vol. 1 no. 2 | July 2013, describes some definitions of the word existence, as described by Hadiwijono, which states that existence is derived from the *ex* (exit) and *sistensi* derived from the verb sisto (standing, putting). The word existence means that man stands by himself by coming out of himself. Man is aware that he exists. While different definitions are expressed by Loren Bagus, which states that existence comes from the existence word derived from the Latin existere which means to appear, exist, arise, or have actual existence. Existere itself comes from the word *ex* which means out and *sistere* which means appear [6].

1.5 Phenomenology of Edmund Husserl

This research will use the theory of Phenomenology as a knife of analysis to dissect and answer research problems. Where the main essence of the theory of phenomenology is to explore the subjective consciousness of humans in this case is a Hindu female politician in Bali Province. Where in this study, all informants will be the meaning of political experience and interpret every political activity that he did.

Phenomenological tradition according to (Creswell, 1998) which states that "Whereas a biography reports the life of a single individual, a phenomenological study describes the meaning of the lived experiences for several individuals about a concept or the phenomenon" [7]. The study of phenomenology thus attempts to explain the meaning of the life experiences of some people about a concept or phenomenon, which in this case is a Hindu female politician in the province of Bali including the self-concept or view of their own life.

The same thing is also expressed by Mulyana [8] that "the approach of phenomenology includes a subjective or interpretive approach, which views human beings as active, in contrast to the objective approach or behavioristic and structural approaches assuming that humans are passive". While phenomenology according to Maurice Natanson [8] "the term phenomenology can be used as a generic term to refer to all social science views that place human consciousness and its subjective meaning as the focus for understanding social action."

Husserl emphasizes that there is no conceptual scheme beyond the actual experience which is sufficient to reveal the truth; so the conscious experience of the individual must be the route to finding reality, only through the conscious attention of the truth can be known. In other words, we can know everything in the world by investigating it in a clear way.

Husserl also tried to describe the value of one's experience in the method of phenomenology namely "Most phenomenologists today would say that experience is subjective, not objective, and that we need to value subjectivity as an important kind of knowledge in its own sake". The most important thing in phenomenology is when saying experiences are subjective rather than objective and we need the value of subjectivity which is an important thing to gain knowledge toward an interest [9].

The experience of a passive past, related to the time of the beginning of events, the temporary circumstances that occur and other experiences of this type is not very influential (in terms of giving meaning). Understanding the benefits of experience should be more than "ego action (Attitude Attitude) or some change of an action (secondary passivity, or perhaps the sudden passivity of decision making" to me ") [9].

As Husserl's statement [10] states that "We define" behavior "as an experience of consciousness that bestes meaning through spontaneous activity." As well as "In the direction of the occurrence or running-off of the behavior, the spontaneous Act is nothing more than the mode of intentionality in which the constituting objectivity is given. In other words, behavior as it occurs is "perceived" in a unique way as primordial activity. "

Husserl tries to apply a concept of the problems that exist to ourselves, in which we define "behavior" as an experience of consciousness that provides understanding through spontaneous activity. And spontaneous action is no more than a deliberate way of defining the given objectivity; in other words, such behavior is occurring "perceived" in a unique way as a primordial activist [10].

2 Research Methods

Paradigm is like a window where people observe the outside world, where people start to explore the world with the insight (world-view). But in general, the paradigm can be interpreted as a set of beliefs or basic beliefs that lead a person in acting in everyday life. This understanding is in line with the Guba conceptualized by Thomas Kuhn as a fundamental set of beliefs that guide our actions, both in daily actions and in scientific investigations [11].

In this study using an ontological Constructivist Paradigm, it states that reality exists in the form of various mental constructions, based on social experience, local and specific and dependent on the person doing so. Therefore, a reality observed by a person cannot be generalized to everyone as is usually done in positivist and post positivist positions. Because of this philosophical basis, according to this flow is a unity, subjective and is the result of a combination of interaction between the two [11].

These subjective meanings are often socially and historically negotiated. These meanings are not simply printed to be distributed to individuals, but must be made through interaction with them (hence the so-called social constructivism) and through the historical and social norms prevailing in their daily lives. These meanings should also be emphasized in the particular context in which these individuals live and work so that researchers can understand their historical and cultural background.

Therefore, the implementation of this method of phenomenological research, will actually explore the conscious experience of Balinese women politicians in the Bali Provincial Legislative Council. Where the conscious experience will be generated through in-depth interview conducted by the researcher, so that all informants will be able to interpret all the reality they have very freely in accordance with their respective subjectivity.

2.1 Data Collection Technique

Researchers will use several techniques for the process of collecting data in this study. The technique is adapted to the method used, the needs of researchers in obtaining data and phenomena in this study. Researchers see participant observation, interview and literature study able to represent data collection technique in this research.

Observation Participation, ie direct observation on the location of the study to get a clear picture - clearly about the object of research. By doing direct observation, researchers are expected to find out how Hindu female politicians in Bali Province construct the reality they have.

In order to express the reality of female politicians of Hinduism in Bali Province in the context of qualitative communication, the researcher posed various open questions to the research subjects. Interviews that researchers do is an in-depth interview, is informal and unstructured. Mengutif Lindloft, interview that researchers do aims to "develop a view of something between (inter) people" [12]. The interviews that researchers do are "conversation with a purpose" [12]. Therefore the question structure that the researcher designs is not a standard guideline, but as signposts or gratings. Sometimes researchers ask other questions or ask them to elaborate on their answers.

3 Research Result

Based on interviews that have been done by researchers to some informants namely female politicians Hindu Bali as a Member of the House of Representatives of the Province of Bali. Interviews were held with I Gusti Ayu Diah Werdhi (Member of House of Representatives of Bali Province from PDI Perjuangan Fraction), Mrs. Kadek Darmini (Member of House of Representatives of Bali Province from PDI Perjuangan Fraction), Mrs. Made Arini (Member of House of Representatives of Bali Province from Hanura Fraction)

Utami Dwi Suryadi (Member House of Representatives of Bali Province from Demokrat Faction).

In addition to research interviews, researchers also made observations in place of the informants perform activities such as, the Bali Provincial Parliament building and the workspace of the informants. Interviews were conducted at agreed locations with informants prior to the interview. Where interviews can be done in the hotel lobby, office lobby, representative offices of political parties, as well as informant workspace.

3.1 The Experience of Hindu Women Politicians in the aspect of Political Communication in Bali Province.

3.1.1 Implementation of Hindu Culture and Religion in Bali Province

Balinese culture is based on the patriarchal system by placing a very strategic male position in patrilineal family life, men have their own power and power in the family and society level. The lineage and attachment to the ancestor, very strong only seen from the male lineage. In Balinese families, women are only a complement to family activity as well as in society, because the kinship system is only determined by male lineage.

The role of men and women in Balinese culture has a huge difference. In a Balinese family order, women have multidimensional and multi gender roles as mothers, wives, workers, family members and social members, as well as organizers of religious rituals. Even the practice of Hinduism in Balinese custom is driven by the majority of Balinese Hindu women. It is precisely this that gives rise to the perception of Balinese women who are described as being persistent, tenacious, strong and independent but have high adherence value (devotion) to the husband's family.

The research informants presented in the language of Bali, which states, *"haroohhh dadi nak loh Bali to nak tuyoh bu, mekejang gaenin*. (Ough, so the Balinese woman was very tired, everything have to do) ". Even some research informants claim to have despair if already in a state of exhaustion with daily activities that have been done.

Interestingly, women politicians should be able to negotiate with their families and local *Banjar* to better understand their very crowded activities and sometimes cannot attend directly in some activities in the *Banjar*. Although initially the people are still reluctant to give them the sincerity to not attend, but efforts are still made to maximize their activities in the public aspect. As stated by Kadek Darmini stating that: "*Waahh, tyang* (I) must involve many families to be involved in the *Banjar*. Not only my husband *tyang* (me), even my father-in-law (I) must be involved. Like yesterday there is *karye* (ceremony) in *Banjar tyang* (me), *pas tyang* (me) cannot attend, and husband *tyang* (me) also again there is activity, then my in-law *tyang* (who) finally must come*".

In line with that delivered by I Gusti Ayu Diah Werdhi stating that: "I should be able to build a good coordination with my husband and children. All my family members make the team. Otherwise, it will be our time to share. "

Various ways must be done by Hindu female politicians, where patrilineal culture sometimes requires them to be tough in all aspects of life. When his devotion is complete in the house, then after that the Balinese women's politicians are just able to step out of the house for the move.

The high value of adherence (devotion) provided by Balinese women to the husband's family, resulted in high levels of domestic violence. The Legal Aid Institute (LBH) noted, during 2015, 120 cases of domestic violence up to the persecution. Of these cases, 30 cases of

women and 27 children who experienced violence (KDRT) and Legal Aid Institute (LBH) Bali also said, every day *Polresta* (Police) Denpasar received complaints of three victims of domestic violence experienced by women [13].

It was also conveyed by informants who wholly agreed that the devotion of Hindu women was extraordinary both to her family and to her husband's family. As Mrs. Made Arini puts it in a vigorous intonation, stating that: "The devotion of Balinese Hindu women is remarkable, until sometimes we do not think of ourselves. All the affairs from inside the house to the outside of the house like *upakara* (ceremonial) should we women who take care of it. Where did the man know the kitchen problem until *manyah meli banten* (pay purchase Banten / Sajen / Canang)"

The exhaustion of Hindu Women in the province of Bali in the domestic realm can be seen clearly, where their ability to negotiate with their husbands and families is an important thing to do. So there is a reluctance to be more active in the public aspect. The Hindu women politicians assume that the Balinese women's mind and energy seems to be depleted in domestic matters as well as religious ceremonies and *upakara* (ceremonial) that must be done, so that the space of socialization and space to build the quality of self in society tends to be a forgotten thing.

3.1.2 Political Dynasty as the Reality of Hindu Women Politicians in Bali Province

The interesting fact that happens in the realm of political communication in the province of Bali is the political reality that is almost the same as other areas, namely the dominance patriarchies system. Where politics is the world of men. What is interesting, however, is that the political reality in the province of Bali is now more interesting with the emergence of two female regional heads despite the patrilineal culture. So the emergence of two regional heads are able to become a motivation for the Hindu women in Bali Province.

But the condition, many are still asking how the process of Hindu female politicians to be able to exist and appear to color the stage of political communication stage in Bali Province. Many doubted the abilities of these Hindu female politicians, and were always associated with political power held by their parents and by their husbands. It is usually referred to as dynastic politics. Where the politics of self-rule can be interpreted as a political power run by a group of people who are still related in family relationships. Basically, the political dynasty is more authentic with the kingdom, because the power will be passed down from generation to generation to father or even now develop from husband to wife, so that power will remain in the family circle.

It is openly acknowledged by the women politicians, where they sometimes state that they do not really like politics. However, due to the demands of their husbands and their adherence to their husbands or fathers who make them must be willing to plunge into the political world and take part to appear in the realm of political communication.

As stated by Mrs. Kadek Darmini who said that: "I politicized it because my husband who had jumped first here. My husband is already two periods in the Regency DPRD, so when there is a chance he immediately asked me to come, though in fact I myself was not sure then ". Although the process is assisted by the husband, but Mrs. Darmini Kadek also continue to plunge into the community that is sometimes accompanied by her husband.

The development of political dynasties that now exist in the province of Bali, will tend to have an impact on the process of quality formation of the Hindu female politicians. so it can be interpreted that, the formation of female politicians of Hinduism in Bali Province still on quantity not on quality only. The activities of female Balinese Hindu politicians are still

limited to the fulfillment of women quota, not on the main essence to work and produce works for Hindu community in Bali Province.

3.2 The Existence of Hindu Women Politicians in the Aspect of Political Communication in Bali Province.

3.2.1 Opportunities of Self-Existence of Hindu Women Politicians in Bali Province

The different roles between men and women are also very clearly visible in the social fabric of Balinese society, where the structure of society in Balinese culture only provides opportunities for men to engage in public activities. This is why the Balinese family should have a son, because to be a purusa (male / leader / eternal) as the heir and a continuation of lineage or lineage in the culture of Bali. Boys should be able to replace the parent's position as a community member (banjar) when their parents are old or the boy is married. This is because, every activity of Balinese society such as meeting in banjar (society) usually only presents the head of family of male sex. But in fact in the social relations of the community, banjar acknowledged that married citizens consist of lanang (male, or head of household) and wife (female). Meanwhile, unmarried members are included in tereka teruna (clusters of youth). This shows that, the political role of men and women in Balinese culture ranging from banjar is very different.

The group of men takes a role in political decision making which is then implemented by the banjar members. While the role of women take more portion as the executor of the course. Even if the women's group meetings, itupun addressed as an extension of the command program to carry out the agenda decided by the authorities or government, such as Posyandu, gymnastics and *Arisan PKK* (regular Social Gathering), etc. So it can be seen that, political decisions in the smallest society that exist in the Province of Bali was already dominated by men.

The same thing was also conveyed by one informant who with a sad expression explains that: "That's the condition of our society today, sometimes we are still difficult to get a chance to speak in public. But this we can not be flat around the whole of Bali, because there are some *Banja*r that have been given the opportunity for women to talk, but still there are *Banjar* that only prioritize men only, "said Mrs. Made Arini in soft tones. From his expression, as there is a deep concern to be expressed in the reality.

In contrast to that delivered by Mrs. Dwi Utami Suryadi stating that; "Women's opportunity to talk is actually wide open, just how women should be able to grasp the opportunity. But most importantly, the woman dare not speak? And indeed the need for education about the rights of Hindu women who started from the family first just go to society ". So it can be said that, the family also has an important role to educate Hindu women to dare to appear in the public space, so that more and more Hindu women who appear in the political communication aspect.

3.2.2 The Existence of Hindu Women Politicians in Bali Province

Hindu women are still reluctant to appear in the public aspect, it can be seen still at least the number of female politicians who advanced in the arena of political communication in the province of Bali. Most informants say that, not all husbands allow their wives to perform, even if allowed, the wife must be able to meet some requirements that must be met.

This can be seen from the lack of involvement of Balinese Hindu women in the political arena and also as one political communicator other than academic and professional, is still very minimal, as the following data that based on the law should reach 30 percent, but from a total of 55 members of the board only five of them women and still very small numbers. The names of the five members of the House of Representatives of Bali Province are Ni Putu Yuli Artini SE (Faction of Golongan Karya Party), Ni Made Sumiati, SH (PDI Perjuangan Faction), Ni Kadek Darmini SE (PDI Perjuangan faction), Dra. Utami Dwi Suryadi (Democratic Party Faction), and Made Arini (Conscience Party Faction).

In relation to the existence of Hindu women politicians in the realm of political communication in the province of Bali, of course, becomes a very interesting thing to understand, where in its own activities, Hindu women politicians are still focused to build their own existence. So the Hindu female politicians tend to build a comfort zone in their activities. In a political activity undertaken by Hindu female politicians, there is a tendency of these Hindu women politicians to tend to build discussions with only female politicians, but when asked which one is more invited to work together, the answer is male politicians. This could be the reason that, the existence of Hindu women politicians in the province of Bali should still continue to be explored in the openness of the quality of self-owned by the Hindu female politicians.

4 Discussion

4.1 The Experience of Hindu Women Politicians in the Aspect of Political Communication in Bali Province

Related with the experience of Hindu politicians in Bali Province is strongly influenced by the implementation of patrilineal culture prevailing in Bali Province as well as the implementation of Hinduism's own teachings. Most of the female politicians of Hinduism in Bali Province tend to be burdened with exhaustion with cultural implementation which is sometimes unfavorable for women when viewed from self-actualization which will be done.

Thus, it is necessary to have a great understanding for the education of women in Hinduism especially in relation to the rights and obligations of women that are actually regulated in the Vedic scriptures that begin with the immediate environment of the family. So Hindu women, especially Hindu women politicians will be better able to understand and interpret every role that will be acted both in everyday life and in the realm of political communication.

Thus, if the understanding of Hinduism, it is hoped not only will be able to produce generation of Hindu women who really excel in quality. This will be able to build the confidence of Hindu women to always appear in their own qualities, not because of the political dynasty that happened during this time. Very important also made the empowerment of women related to Hindu-based political education. So that hope will emerge the politicians of Hindu women who are very prepared in quality to color the stages of political communication in the province of Bali.

4.2 Existence of Hindu Women Politicians in the realm of Political Communication in Bali Province.

Based on the experience generated by these Hindu female politicians, it will produce constructs of constructed meanings subjectively. Where the resulting meaning has a close relationship to the perspective that will be owned by the Balinese women's Hindu politicians. How the perspective is built, will certainly determine how the quality of Balinese Hindu women are in view of every political opportunity it has. Where every political opportunity is expected to be able to strengthen the political existence of Hindu women politicians in the realm of Political Communication in Bali Province.

So it can be said that, the quality of understanding and the political significance of Hindu female politicians is largely determined by the reality of the experience possessed by each of the Hindu female politicians. Likewise, Hindu female politicians to establish their existence in the realm of political communication. So hopefully, more and more Hindu female politicians will dare to appear to show their existence in the realm of political communication.
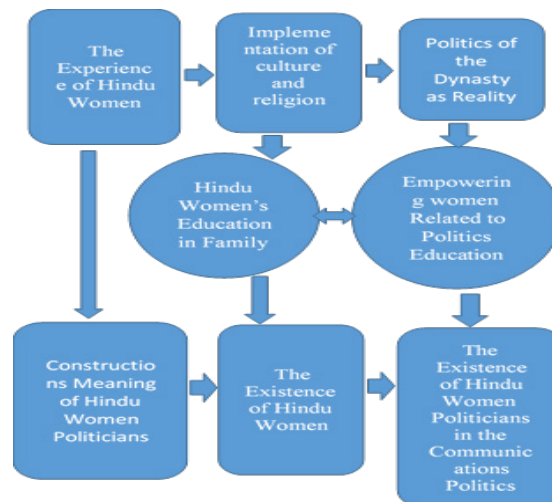
Fig. 1. The existence model of Hindu women politicians in Bali province.

5 Conclusion

As for conclusion in this research are:
1. The experience of Balinese women politicians in the Bali Provincial Legislative Council has been able to implement Balinese cultural traditions and Hindu teachings in the reality of their lives. The strength of patrilineal culture is deservedly to encourage every Balinese family to be able to provide understanding and education about women's rights and obligations in Vedic teachings.
2. The political dynasty as the reality of the female politicians of Balinese Hindu women in the Bali Provincial Legislative Council has been able to encourage all Hindu women's institutions to be more active in empowering the quality of Hindu women related to

political education based on Hinduism. As well as the construction of meaning owned by Balinese women politicians in Balinese Provincial House of Representatives in reality of political communication, is expected to have been able to improve the quality of Balinese women politicians in seeing every opportunity of their own existence.

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Entrepreneurship Training Model with Quintuple Helix Approach Study on the Batik Creative Industry Craft Sector

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Abstract. This research is motivated by research related to entrepreneurship development efforts. The government has provided various assistance programs to start-up entrepreneurs. However, the program has not been able to shape entrepreneurial behavior permanently. Researchers raise the issue of how the entrepreneurship training model that can leverage the performance of entrepreneurial craft. The research method used are descriptive explanatory, quantitative and qualitative approaches with research location in Purworejo District. The result of this research is the model of entrepreneurship training for batik creative business. The most dominant issues faced by batik entrepreneurs are excessive business expansion, environmental management, poor initial location selection, cash management. However, the problems that occur are not realized by batik entrepreneurs so that there is no hope to improve. Through this approach, business development activities for beginner entrepreneurs can be created an implementation model so that in a certain time interval can be evaluated business performance. The entrepreneurship training model for batik entrepreneurship is developed with quintuple helix approach including pre-training activities, batik training, advanced training, entrepreneurship training, mentoring, reporting and evaluation. The elements involved in the training are local government, batik entrepreneurs, academics, social community and environmental experts.

Keywords: Entrepreneurship, Entrepreneurship training model, Quintuple helix.

1 Introduction

Indonesia's economy will have strong fundamentals, if the people's economy has become the main actors of productive and competitive in the national economy. The greater the proportion of the population of a country who work as Entrepreneur, the more advanced the country. The lack of the number of entrepreneurs in Indonesia in the appeal of the total population, fueled by low interest or spirit of entrepreneurship in the country. Mental problems, lack of knowledge, the business climate is not in favor of the birth of Entrepreneurial beginner / new and certainly the most classic is the availability of adequate capital resources. Therefore, the development of entrepreneurship throughout society, particularly among young entrepreneurs should be a priority in national economic development.

Development of entrepreneurship for young people is expected to be a solution to improve the economic stability, the development of entrepreneurial potential possessed, so that in turn able to address labor issues, while encouraging the growth of the national economy [1]. The Government through the National Entrepreneurship Movement has made various efforts to develop entrepreneurship is good for prospective entrepreneurs, entrepreneurs beginners / new and entrepreneurs have long to pursue his efforts [2],[3].This assistance needs to be studied further to determine the accuracy of the target beneficiaries and to assess the policy of assistance to be able to enhance the economic empowerment of democracy in the present or in the future. Fostering entrepreneurship for entrepreneurs beginners should with a multidimensional approach that required the development of coaching model that is able to leverage business performance. This study aims to map the characteristics of beginner entrepreneurial ventures as recipients of government assistance, the problems faced and the progress of their business performance. Furthermore, based on a map of the novice entrepreneur condition coaching model developed entrepreneurship based on multidimensional lifting the root problems as a major issue. This model is expected to form a well-established entrepreneurs who will be able to better create a new field, thereby reducing unemployment.

1.1 Entrepreneurial and Issues

Entrepreneurship is a dynamic process of economic activities are planned taking into account thestrengths and weaknesses and the opportunities and obstacles in conducting a business that benefitted for welfare. Therefore important meaning contained in entrepreneurship, according [1], namely: science, art, behavior, nature, characteristics, and the character of the individual who has the ability to realize innovative ideas into real world creatively (create a new and different) , So there are three main indicators of entrepreneurship, namely: to think something new (creative), act to do something new (innovative), and the desire to create value added (value added).

Therefore, a person called the "entrepreneur" absolutely must have the ability to always think something new, do something new act, and the desire to create added value. Entrepreneurial success can be seen from the survival of businesses, providing jobs for the local population, increasing prosperity, improve the quality of life of users of the product, improving the environmental quality of the location of his business.

A common problem faced by new entrepreneurs to achieve success is the weakness of managerial like the founder of a business manager, financial reports traditionally do not have a registration, a computerized system that is weak, unclear which hamper management such as cash management that bad so do not have the funds for promotional activities and market research, lack of specialized professional staff, managers are generalists, not specialists [4]. Problems also often happens in the case of an unqualified anticipate the factors of uncertainty in the business at a later date, the initial poor site selection, initiating the expansion before it is ready, limited access to banking and financial markets, the lack of mastery of technology and information [5].

It can be concluded bring problems of entrepreneurs beginners in running business include weakness managerial, financial statements Traditionally, cash management, lack of promotion and market research, lack of specialized staff professionals, managers are generalists not specialists, unqualified anticipation of uncertainty factors in business in the future, a bad start site selection, initiating the expansion before it is ready, limited access to banking and financial markets, the lack of mastery of technology and information.

1.2 Entrepreneurial Development of Entrepreneurship for Begiiners

Fostering entrepreneurship in Indonesia at this time are derived from the government's budget is very diverse, from the training program as well as thecapital program [6] revealed that the research data shows a very diverse training program makes it possible for someone to follow more than one training activities in one fiscal year. Entrepreneurship education programs cannot be run in accordance with expectations, due to irregularities in the management of the program, the target group and mismatch irregularities training process. Most of the trainees returned to the original activity after attending a training program in the absence of improvement in economic activity. Life Skills Program activities are given post-training skills find various constraints such as poor management of financial management so that capital depleted aid used as initial assistance. This study develops entrepreneurial coaching model that includes pre-training activities, training, practice in the company, the funding process, business assistance, reporting and evaluation processes by participants.

Mulyani (2010) revealed that the novice entrepreneur development strategy must be addressed in order to realize: foster a conducive business climate; improving access to financial resources; improving market access through improved quality, design, and competitive prices; increase entrepreneurship and the ability of SMEs, especially in terms of entrepreneurial spirit; empowerment of Micro, which is the largest part of the national business actors is essential prioritized in order to encourage economic activities in the informal sector micro scale, especially who are still poor families through capacity building effort, skill, protection, and business coaching. Briefly, entrepreneurial coaching program for entrepreneurs beginners include education and training programs, mentoring (consultancy and monitoring), financing facilitation, IPR facilitation, facilitation of sale (domestic and foreign) [7].

Direction of government policy in the entrepreneurship development program in Indonesia at this time, namely the development effort aimed at the development of creative economic subsectors using the theory quadro-helix or quad-helix (Mulyani, et al, 2010). Triple-helix model of previously applied outlines synergies and partnerships in the development of creative economy took place betweenthe three main actors, i.e. government, private and intellectual [8].

While the quad-helix model of synergy and partnership lays in the development of creative economy took place between the four main actors, ie government, private, intellectual, and communities.

The concept of a quintuple helix which is quadruple helix concept development by integrating insights into the natural environment to attract businesses to the development of entrepreneurship coaching model. Although not many experts who express this concept, but the business development both now and in the future will be better if the concept of synergy quintuple helix model of entrepreneurship development, especially for novice entrepreneurs. Limited natural resources which allegedly as the difficulty factor for developing entrepreneurship needs to be maintained its nature by performing a reciprocal positive relationship between business and the natural environment [9].

1.3 Conceptual Framework

This study adopts the concept quadruple helix in building an entrepreneurial coaching model design for beginner entrepreneurs quintuple helix concept refers to the roles of academics, businessmen / entrepreneurs, government, socialand naturalenvironment in a creative economy based business management. Thus guidance to novice entrepreneurs a shared responsibility of academia, government, business and social community and natural environment feedback support. Coaching is multidimensional, involving various parties need a good

communication system. Fostering entrepreneurship should be based on the root causes of what would be the characteristics of entrepreneur's beginners business. With the right coaching will improve business performance that would eventually form an established entrepreneur. The formation of an established entrepreneur will open wider employment opportunities and improve the community economy. The framework can be described as follows:
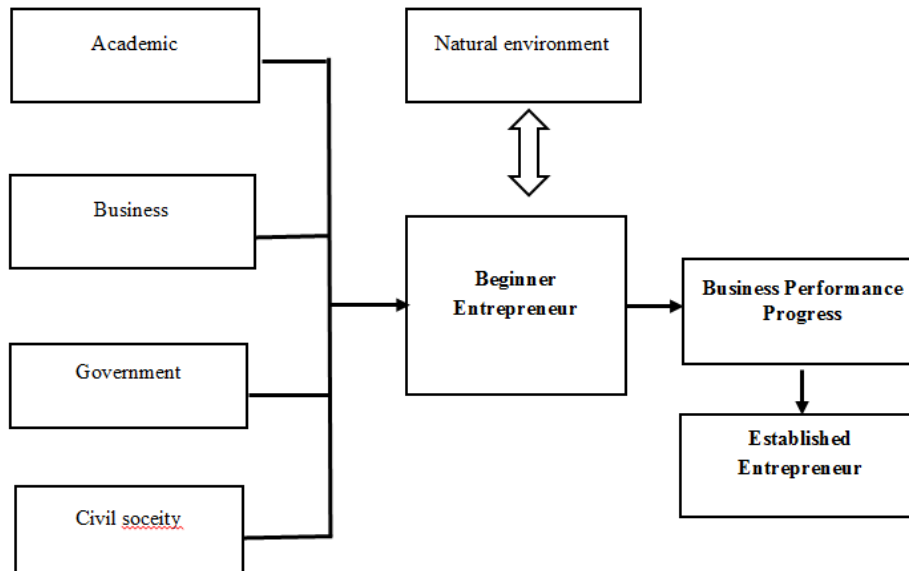
Fig. 1. Conceptual framework entrepreneurial coaching model.

2 Research Method

This study uses a variety of research approaches and descriptive exploratory survey. In this study, its scope should be limited only to the following matters: Location of the study consisted of three villages include Kedungkamal village, the village Grabag and the village. Limitations of the study included an entrepreneurial profile, challenges and opportunities for beginner's batik entrepreneurs, the need for coaching and development of entrepreneurship coaching model.

The research data conducted by using qualitative approaches. A qualitative approach to analyze data from appraisal expert (academic elements / academic, environmental experts, government / government) and practitioners (element entrepreneur / business) to be used in preparing model of entrepreneurship development and improvement of entrepreneurship coaching model.

3 Result And Discussion

The result of this research is the model of entrepreneurship training for batik creative business.The most dominant issues faced by batik entrepreneurs are excessive business expansion, environmental management, poor initial location selection, cash management. However, the problems that occur are not realized by batik entrepreneurs so that there is no hope to improve. The above obstacles in the view of researchers can be anticipated by the pattern of relationships between government, private, community, media and the environment as in the concept of quintuple helix. Through this approach, business development activities for beginner entrepreneurs can be created an implementation model so that in a certain time interval can be evaluated business performance.

The entrepreneurship training model for batik entrepreneurship is developed with quintuple helix approach including pre-training activities, batik training, advanced training, entrepreneurship training, mentoring, reporting and evaluation. The elements involved in the training are local government, batik entrepreneurs, academics, social community and environmental experts. Theentrepreneurship training model for batik entrepreneurship can be described as follows:
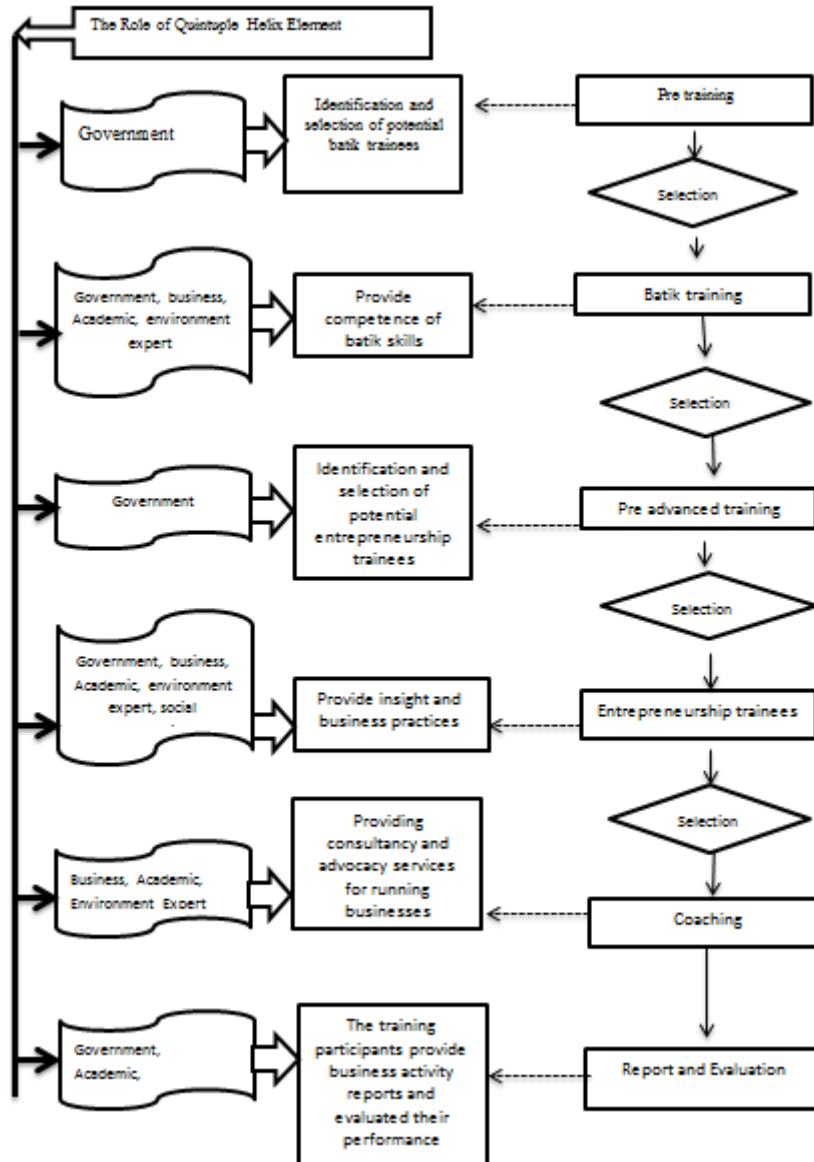
Fig. 2. The entrepreneurship training model for batik entrepreneurship.

The model of entrepreneurship training to be used young people as an effective entrepreneur beginners can improve their business performance. The entrepreneurial coaching model with a multidimensional approach will maximize stakeholder participation that can be implemented by the government in increasing the number and performance of entrepreneurs. Coaching models produced can be used as the basis for further study and provide a basis for policy making to develop entrepreneurs.

4   Conclusion

Researchers raise the issue of how the entrepreneurship training model that can leverage the performance of entrepreneurial craft. The result of this research is the model of entrepreneurship training for batik creative business. The most dominant issues faced by batik entrepreneurs are excessive business expansion, environmental management, poor initial location selection, cash management. Through this research, business development activities for beginner entrepreneurs can be created an implementation model so that in a certain time interval can be evaluated business performance. The entrepreneurship training model for batik entrepreneurship is developed with quintuple helix approach including pre-training activities, batik training, advanced training, entrepreneurship training, mentoring, reporting and evaluation. The elements involved in the training are local government, batik entrepreneurs, academics, social community and environmental experts.

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The Millennial Generation Buying Behaviour in Purchasing Houses
Case of Modest Housing Industry in Indonesia

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Abstract. The purpose of the study was to examine buying behavior of the Indonesian Millennial Generation in purchasing the lower-income or the modest housing. The variables utilized in the study were Lifestyle, Perception, Motivation, as independent variables, and the Purchase Decision as dependent variable. It applied multiple regression analysis to find determining factors for those all independent variables. The respondents were the owners of the modest houses, the price lower than IDR 250 Mio, in Indonesia. The inquiry had done by an on-line questionnaire with google form, been up loaded throughout August to September 2017. The study applied purposive sampling method by controlling the first a hundred responses for the respondent ages of 30 to 40. The study inferred that the lifestyle or economy factors and motivation or investment factors were the salient factors for the buying behavior in purchasing the modest housing. The perception or the pride factors, however, were not the issues for the millenial to buy it. Most the respondents were evidently the millinial who living in the suburb of the Jakarta Metropolitant Area.

Keywords: Consumer behavior, lifestyle, perception, motivation and purchase decision.

1 Introduction

Property refers to land, buildings, the attached facilities and the infrastructure surrounding. The building refers to houses, apartments, malls, shops or office buildings [1]. People buy property usualy for an investment, mainly for long-term investment. Investment in property is considered the most lucrative one compared to other investments such as mutual funds, shares, gold or deposits [2]. All due to increasing demand stimulated by the increasing number of people who need housing [3]. The demands affected the prices of the houses which tend to increase lately [4].

In addition on spending of food and clothing, people need investing house for assuring their future. Unfortunately, houses ownership remain obscure for various individuals, even for owning a modest house; this is even more pronounced for the buyers, who born during 1980 – 1994, commonly referred to as the millennial [3]. Millennial risk of dwindling to own a house in the next five years [5].

The prediction was supported by other analysis asserting that the ability to pay the instalment for buying a house or other spending is at the maximum of 30% out of the total income [3]. This assumption is described in the calculation as follows: with the monthly

income of millennial amounting to between IDR 5 million to IDR 7 million, their ability to pay mortgage will be around IDR 2 million. This figure is still affordable according to the mortgage for KPR (House ownership credits) of IDR250 million, with the monthly mortgage of IDR 2 million paid within the duration of 15 years; however, these figures will be impossible in five years later [6]. This fact needs to be of the consideration for developers and government alike to accommodate the millennia's purchasing power. The BPS Indonesia, (2016) recorded that in during next five year, out of the total population of 285 million population, the millennial of the ages from 15 – 39 make the most part of the demography. Indonesia currently enjoys the demographic bonus, where the productive ages outnumber the non-productive ages; it will reach its peak during 2020 – 2030 [7].

With such an advantage, it is important for Indonesia to accommodate the market for this age brackets. Failure to facilitate their house ownership will turn this demographical bonus into demographical burden and will further give adverse economic effect for the country [8]. Some of the events lately confirms the concerns. Developers and the government seem to be unresponsive to address this concern. Government regulations and property development conducted by developers are yet to demonstrate the sensitivity on this market demand [8].

As the evidences the Rumah.com, (2017) during the year 2016 the millennial age, borned during 1980 – 1994 - have only minimally been absorbed by the property market. It is recorded that, out of the whole buyers of the previous year, millennial account for 16.80% of the buyers within that period. The survey by rumah.com titled "Property Affordability Sentiment Index" [9] illustrated that 34% out of the total respondents of 1,030 declared that the property prices are exorbitant, in other words there exists only minimum property with affordable prices; whilest, 48% declared that they are not ready to buy property.

In addition to this, other empirical studies also emerged. [10] the quarterly report of the Jakarta Property Market published a number of research related to millennial and property ownership. The research recorded that 80% of the total 149 respondents being born between 1980 – 1997 actually have the plan to buy property this year. Some of the most wanted areas include Tangerang (21.21%) and West Jakarta (21.21%). Moreover, 38.38% of the total number of respondents mentioned that the most sensible price of a house is below IDR250 million. When it comes to payment method, 72% admitted that the most possible method is by paying in installment. A total of 35.9% admitted that the installment of 8 – 10 years are the most realistic.

This statement underlines the fact that although the purchasing power of millennial might be too low to own a property, they actually have significant potentials. Unfortunately, a large number of developers are unaware of the magnitude of millennial potentials. This background brought the author to conduct a study on millennial consumer behavior in buying a property. The author has observed a paucity in similar research that specifically dealt with millennial consumer behavior in buying property. Moreover, the author argues that there are some variables from the millennial consumer behavior that play significant role, and this include lifestyle, perception and motivation.

In relation with the abovementioned context, as well as the interest of millennial consumers to buy property below the price of IDR250 million, the author has the initiative conduct a research on the following topic: Analysis on Millennial' Behavior Towards Purchasing Property (Case Study of Modest House Purchase in Indonesia).

2 Scope of Research and Research Objectives

In order to focus on the object of research, as well as to minimize distraction of focus, the author limits the research to cover the following: the Lower-middle class property or property with prices below IDR250 million and jectives the research object is limited to millennial ages with buying behavior for modest house buying decision. The research was conducted between March – September 2017.

The research questions for the study were as follows: 1) Does the millennial lifestyle affect the decision to buy modest housing? 2) Does the perception factor affect the decision to buy modest housing? 3) Does the motivation factor affect the decision to buy modest housing? 4) Do the factors of lifestyle, perception and motivation simultaneously affect the decision to buy modest house for millennial? The research for the study was to recognize the effect of lifestyle on the decision to buy modest house in Indonesia, the effect of perception on the decision to buy modest house in Indonesia. Further, it was also to determine, which factor is the most influential in decision-making to buy modest house, among the three factors of lifestyle, perception and motivation. The author expects that this research will provide various benefits for many people that include, i.e: for the author, the benefits of this research for the author include knowledge generation, allowing the author to comprehend the millennial behavior in making the decision to purchase a modest house. For developers: The results will serve as input and advice to assist in the decision- making process or the selection of the marketing strategies to provide modest housing for the lower middle class, something that millennial have expressed an interest in. Lastly for readers, the results of the research will inform readers further on the consumer behavior of millennial in purchasing modest housing for lower middle class.

3 Literature Review

To support a research, there needs to be a scientific theoretical framework. This theoretical framework is closely related to the research variables used to find the response to the research questions.

3.1 Marketing

According to the American Marketing Association (AMA) — in the book written by Kotler and Keller, (2009) marketing is defined as— a series of process to create, communicate and maintain relationship – that gives additional values for the organization and consumers [11]. According to Grewal *et al.*, (2010) marketing is a managerial and social process conducted by an individual or group – to fulfill particular needs or demand – by maximizing creativity, offers, as well as exchange of valuable goods and services [12].

Marketing is further classified into several variables referred to as marketing mix for housing consisting of 4P, i.e: product, price, promotion and place and the substance certaintly all would be modified according the product and the industry in queries [13]. Grönroos, (1984) and Tjiptono, (2002) stated that marketing aims at fostering, developing and commercialize relationship between producers and consumers in order to fulfill their mutual needs; the producers need consumers as their source of income, whereas consumers need producers to fulfill their needs. In Thailand, the most respondents decision to purchase a

residence in the housing project in Muang District, NakhonRatchasima, was emphasizing every 4-P marketing mix factors including the traffic jam, location, design and well-known constructor were the top factors, while the fitness center and swimming pool were least important for the first housing owners or the milennial generation [14].

3.2 Consumer Behavior

As stated by Kotler and Keller, (2009), consumer behavior science is the study on how individuals, groups and organization – choose, purchase and use goods, services, ideas or experience – to satisfy their needs and desires [11]. This is similar to what Gibler and Nelson, (1998) states that consumers behavior is the behavior of consumers who are directly involved in the process of obtaining and using goods and services, including the preparation process to obtain this product or services [15].

The consumer behavior is further classified into several factors that include cultural factor, social factor and psychological factor. Engel, J. F., Blackwell, R. D., & Miniard, (1995) defines lifestyles as the pattern of using financial resources and time [16]. Krishnan, (2011) expresses similar idea and states lifestyle as the consumption pattern that depict people's choice in using their financial resources and time [17].

The effect of lifestyle on a variable can be simply measured using psychographic analysis. This instrument is used to measure the lifestyle quantitatively using very large dataset. This is usually conducted to view the market segments. This analysis can be the measure of the variables within lifestyle such as activity, interest, and opinion, most commonly abbreviated as AIO. Also, Krishnan, (2011) divides the AIO approach into several dimensions. This approach is commonly used by producers in promoting their products [17].

According to Pickens, (2005), perception is part of the individual process in selecting, organizing and interpreting stimulus to become something that influences the buying decision [18]. Also, Quratulain and Karachi, (2012), asserted that perception is an individual attitude towards appreciating the entire quality and competitiveness of a product; perception can be divided into two, namely quality perception and value perception. Quality perception refers to the evaluation of consumers on product and service that has been purchased or about to be purchased [19]. Value perception is the customer judgemental about being functional, self-expression and emotional values.

Mohammad and Som, (2010) described motivation as the push factor in individual that compels someone to take action [20]. (Guan, 2014) asserted that motivation is the subconscious state of an individual that propels him/her to act on something to achieve particular objectives [21]. Lee, (2007) asserted that the consumer's motivation refers to a consideration and influence that drives someone to make a purchase [22]. Svatosova, (2013) uncovered that purchase decision, in particularly on line business, refers to consumer action to buy or not to buy a product related to the buyer motivation.

Kotler and Keller, (2009) asserted that the process in which consumers decide to purchase a product is divided into several stages [11]. These stages include need recognition, information search, and evaluation of alternatives, purchase decision and post purchase behavior.

Fig. 1. Purchase Decision Process Model [23]

3.3 Millennial Generation

Each generation has their own characteristics. These characteristics are formed as the results of the changes brought by modernity. Camille Kapoor, (2011) clarified that the generation Y or *echo boomers*—now commonly referred to as the millennials—are those with the most distinct characteristics compared to other generations [24]. They are also known as the generations with the most variety in terms of characteristics.

Hawkins, D.I., dan Mothersbaugh, (2010) define the Y generation as the group of people born between years 1977 to 1994 [25]. Ordun, (2015) defined that defines the millennial generation as those who were born between 1980 and 2000 with optimistic view and they are considered as open minded, social, innovative, enthusiastic, determined, confident, motivated and smart [26].

4 Conceptual Framework and The Hypothesis

The study apply the paradigm in purchasing decision for a modest housing as figur 2 below.

The hypotheses that author formulated based on the data are as follows:

H1 = There is a positive correlation of lifestyle on purchase decision

H2 = There is a positive correlation of perception on purchase decision

H3 = There is a positive correlation of motivation on purchase decision.

H4 = There is a positive correlation of lifestyle, perception and motivation on the purchase decision.
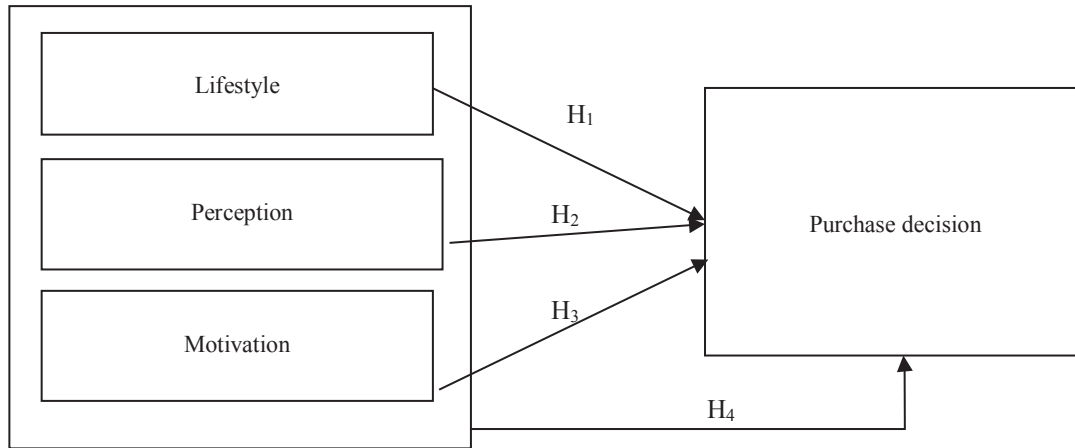
Fig. 2. Conceptual Framework

5 Research Methodology

It applied multiple regression analysis to find determining factors for those all independent variables. The respondents were the owners of the modest houses, the price lower than IDR 250 Mio, in Indonesia. The inquiry had done by an on-line questionnaire with google form, been up loaded throughout August to September 2017. The study applied purposive sampling method by controlling the first a hundred responses for the respondent ages of 30 to 40. The variables utilized in the study were Lifestyle, Perception, Motivation, as independent variables, and the Purchase Decision as dependent variable.

6 Research Findings

Statistically it revealed that The Lifestyle variable (X_1) (t_{count} = 10,972; Sig = 0,000); if T_{count} (10,972) > t_{table} (1,66) the H_0 is rejected. Value Sig. (0,000) < 0,05 the H_a is accepted (hypotesis 1). Meaning that the variable lifestyle (X1) partially related and significantly effected the Purchase Decision (Y). Further, Perception (X_2) (t_{count} = -0,647; Sig = 0,519); if t_{count} (-0,647) < t_{table} (1,66) the H_0 is accepted. If the Sig. (0,519) > 0,05 the H_a is rejected (hypothesis 2). Meaning that variable Perception or pride factor (X_2) partially related and insignificantly effected the Purchase Decision (Y).

Also, Motivation variable (X_3) (t_{count} = 3,286; Sig = 0,001); If t_{count} (3,286) > t_{table} (1,667) the H_0 is rejected; if the Value Sig. (0,001) < 0,05 the H_a is accepted (hypothesis 3). Meaning that the motivation variable (X3) partially related and significantly effected the Purchase Decision (Y)

Table 1. Collinearity Statistics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	5,519	1,357		4,066	,000		
GAYA_HIDUP	,735	,067	,717	10,972	,000	,869	1,151
PERSEPSI	-,041	,064	-,041	-,647	,519	,933	1,072
MOTIVASI	,213	,065	,214	3,286	,001	,876	1,142

The life style and Motivation have a positive correlation with $\beta = .717$ and $\beta = .214$ and significant influence (sig .000 and .001 < .005) to purchasing decision. The study inferred that the lifestyle or economy factors and motivation or investment factors were the salient factors for the buying behavior in purchasing the modest housing. The perception or the pride factors, however, were not the issues for the millenial to buy it ($\beta = -.041$), whilst it was insignificant.

Table 2. The Coefficients of Purchasing Decision Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	5,519	1,357		4,066	,000
GAYA_HIDUP	,735	,067	,717	10,972	,000
PERSEPSI	-,041	,064	-,041	-,647	,519
MOTIVASI	,213	,065	,214	3,286	,001

Table 3. Model Summary for Purchasing Decisison Regression

Model Summary[c,d]

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate
1	,999[a]	,998	,998	,64591

Table 4. Annova

ANOVA^{a,b}

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20852.950	3	6950.983	16661.024	.000ᶜ
	Residual	40.468	97	.417		
	Total	20893.418ᵈ	100			

Table 4 and tabel 3 demonstrated that the determinant coefficient results or the *Adjusted R Square* (R^2) is 0.998 or 99.8%. In other words, 99.8% Purchase Decision (Y) is determined by the variables of Lifestyle (X_1), Perception (X_2), and Motivation (X_3), all together significantly effect the purchasing decision (hipotesis 4). The remaining 0.02% is determined by other factors not being discussed in this research.

7 Conclusion and Discussion

1. Lifestyle in the millennials partially has positive effect and significantly related to the Purchase Decision for modest housing.
2. Perception or pride of the millennials partially has negative effect and insignificantly related to the Purchase Decision of modest housing.
3. Motivation in investment of the millennials partially has positive effect and significantly correlated to the Purchase Decision on buying modest housing.
4. The study inferred that the lifestyle or economy factors and motivation or investment factors were the salient factors for the buying behavior in purchasing the modest housing. The perception or the pride factors, however, were not the issues for the millennials to buy the modest housing.

The author advises developers to consider lifestyle in the development of the affordable housing or the modest housing. This lifestyle factors could be in terms of more accessible location to office building, or at least close to public transportation hubs and other public facilities such as mall, culinary centers and other amenities. In addition, the invesment motivation also the salient factor for the millennials in purchasing modest housing. Consciquently, the investment interest rate is also an important variable for them to buy or not to buy the house.

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Sustainablility Settlement Throught Recycle "Happa" In Kampung Belakang, Kamal, West Jakarta

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Abstract. Kampung Belakang is located in Kamal Village, Kalideres Sub district, West Jakarta. Kampung Belakang was reported as one of the slum areas by BPS (Biro Pusat Statistik) in DKI Jakarta.The dominant factor is the unhealthy lifestyle of people who carelessly throw garbage at any place. There are several places that turn to be garbage heap locations, such as in the river and drainage which become illegal waste disposal.Waste that is not well-managed in residential locations will have an impact on public health by causing various diseases. This problem is solved by using method of mentoring to the community to change the lifestyle of the community in order to process waste independently. The leaf of the trees is one type of organic waste. Burning it can cause pollution. So, one of the types of recycle for leaf is "Happa".In japan, Happa means is art from bone leaves. With a combination of textile dyes, Happa can be made into several art items such as bouquet or painting. Happa production can also be exported to Japan, mentoring to the community in Kampung Belakang to recycle the leaf litter into Happa, a solution to the problem of organic waste in this kampong. Community independence to process leaf waste in the environment, then the recycled Happa waste can be sold or exported to Japan. Until sales proceeds can increase economic value of society, so the impression of slums can be eliminated from Kampung Belakang.

Keywords: Happa, Sustainability Settlement, Recycle.

1 Introduction

Garbage is a common issues in all cities in the world and DKI Jakarta is one of the big cities that are facing the problem of increasing the volume of waste. Waste has become a national problem so it needs to be managed comprehensively and integrated from upstream to downstream in order to provide benefits economically, healthy for the community, and safe for the environment, and can change people's behavior [1].

Increasing the number of people on earth leads to increasing amount of waste that will be generated. The presence of waste brings many negative impacts in human life, such as causing odors, causing illness, flood, and contributing to global warming. Another problem is the limited land available to accommodate and process waste, especially in DKI Jakarta [2].

DKI Jakarta area that has problems with garbage is Kampung Belakang, Kamal village, Kalideres Sub district, West Jakarta. This can be seen from several areas of the Kampung Belakang which became the landfill. In addition, the drainage around the residential area is inadequate. A lot of waste is discharged on the drainage or river in the area of the Kampung Belakang. This affects the clogging of drainage and river channels that result in submerged water and flooding [3].

The community members also have no enough knowledge of impact of waste on health. Therefore, every household waste production is always dumped on the roadside, empty land, drainage and river. While leaf litter is collected, afterwardsit is burned. The activities of residents in processing waste affected the air pollution and disease sources [4].

To solve the waste problem in Kampung Belakang, there is counseling for Kampung Belakang , Kamal village, Kalideres sub-district, West Jakarta. In this activity, the community members will get the knowledge to recycle the leaf organic waste into a dry leaf frame or in Japan called "Happa". With a combination of textile dyes, Happa can be processed into decorative items.

After the community members have the ability to recycle their organic leaf waste into Happa, then they can produce and sell the Happa. In the end, it can improve people's economy and can solve waste problem in Kampung Belakang [5].

1.2 Problems

The problem of Kampung Belakang , Kamal village, Kalideres sub-district, West Jakarta community is lack of knowledge to recycle leaf organic waste into reusable goods.

1.3 Objectives

The purpose of assistance and counseling activities for Kampung Belakang , Kamal village, Kalideres sub-district, West Jakarta are:
- Community empowerment through recycling leaf organic waste into Happa;
- Community empowerment through the utilization of Happa to be decoration.

1.4 Output

To solve the problems of the community members of Kampung Belakang , Kamal village, Kalideres sub-district, West Jakarta, and then the output is that the community members know how to recycle the organic waste of leaves into Happa and make use of Happa into decoration.

1.5 Benefits of Method

To solve the problems of Kampung Belakang, Kamal village, Kalideres sub-district, West Jakarta, then the output is that the community will know how to recycle the organic waste of leaves into Happa and use Happa into decoration.

2 Mentoring Method

Left Waste Recycling Counseling Activity Becomes Happa for Kampung Belakang Community of Kamal Village, Kalideres sub-district West Jakarta, using approach process with TRI-POWER concept [6].

Fig. 1. Tri-Daya Concept.

Social Power Concept is to invite people through approach:
- Coordination with community leaders;
- Coordination with KSM (self-help group) Nyiur assisted by Budi Luhur University related to the development of Kampung Belakang.
  The concept of Environmental Power is to identify:
- The habit of the community in imposing organic waste leaf;
- The ability of people to recycle leaf organic waste.

The concept of Economic Power is the result of recycling production of leaf organic waste into Happacan be used by the community themselves or sold, which can improve the economy of the surrounding community [7].

By applying the concept of Tri Daya on mentoring activities, Leaf Waste Recycling Becomes Happa for Kampung Belakang , Kamal village, Kalideres sub-district, West Jakarta, the stages of implementation activities are as follows:
- Permission to the administrators of Kampung Belakang, Kamal village, Kalideres sub-district, West Jakarta to carry out the mentoring program;
- MoU Cooperation agreement with the management of KSM Nyiur assisted by Budi Luhur University as the developer of Kamal village, Kalideres sub-district, West Jakarta to carry out the mentoring program;
- Site survey for the implementation of mentoring activities;
- Make material mentoring (Leaf litter into Happa and the use of Happa becomes a decoration);
- Workshop leaf waste to become Happa;
- Workshop making decoration from happa;
- Making final report.

3   Kampung Belakang Kamal Jakarta Barat

Territory   : Kampung Belakang
RW   : RW.03 dan RW.04
Village   : Kamal
Subdistrict   : Kalideres
Municipality   :West Jakarta
Land Area   : ± 20,03 Ha (RW.03) dan ± 15,43 Ha (RW.04)
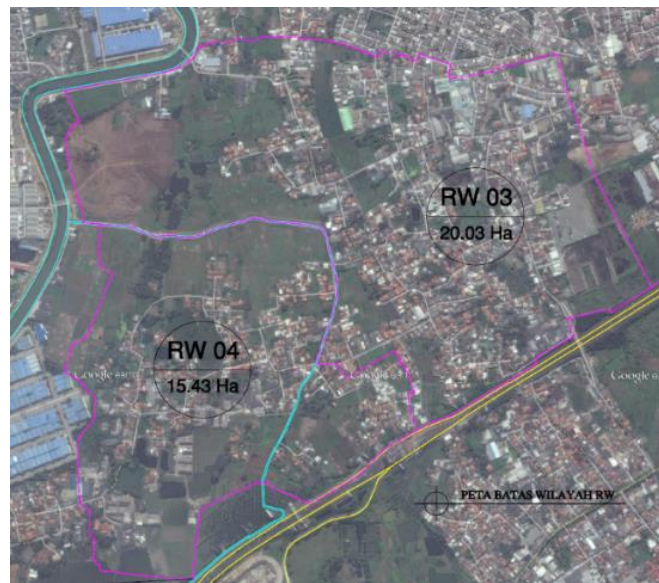
Fig. 2. Kampung Belakang Kamal West Jakarta.

Lack of public knowledge of the impact of waste in health, the cause of society does not manage the existing waste environment. This is known from the existence of several points in the area of Kampung Belakang which became the landfill.

Fig. **3.** Landfill.

Some drainages and rivers does not comply health requirements because a lot of waste piles. So that drainage and river become clogged the impact of the emergence of puddles and flood [8].

Fig. 4. Drainage.

4 Recycling Leaf Waste Becomes Happa

The problem of Kampung Belakang community is to process leaf waste by collecting and burning, so that the impact of air pollution that can interfere with health. Thus, it is necessary to conduct counseling to utilize the leaf waste into reusable goods.

To make leaf waste into goods that can be reused, then the leaf litter must be recycled first into a framework of dry leaves or called with Happa. The process of making organic waste leaves into Happa is as follows [9]:

- Collect organic garbage leaves that are still green;
- Prepare natural mud in containers. Mud is a media of fermentation of organic green leaf waste into a framework of dried leaves or Happa. Based on research conducted by the University of Budi Luhur and KSM Nyiur, mud from catfish farms have faster fermentation ability;
- Soak the green leaf organic waste in a container containing natural mud. If using ordinary sludge, the fermentation process takes 2 months. If using mud from catfish farm, fermentation process only takes 3 days;
- After the green leaf organic waste fermentation process into a framework of dried leaves or Happa, then Happa can be washed and drained water. Happa's hatching aims to remove the mud and clean up the remaining green leaves that still stick to Happa. It was only later that Happa was drained to remove the water content of Happa;
- Prepare the water in the container;
- Boil Happa in the container and give the food colouring as needed. Colouring on Happa by boiling in water that has been given food colouring;
- After Happa changes color, move Happa from the container and drain the water;
- The final stage is the process of drying Happa. Happa can be naturally dried by drying in the sun.
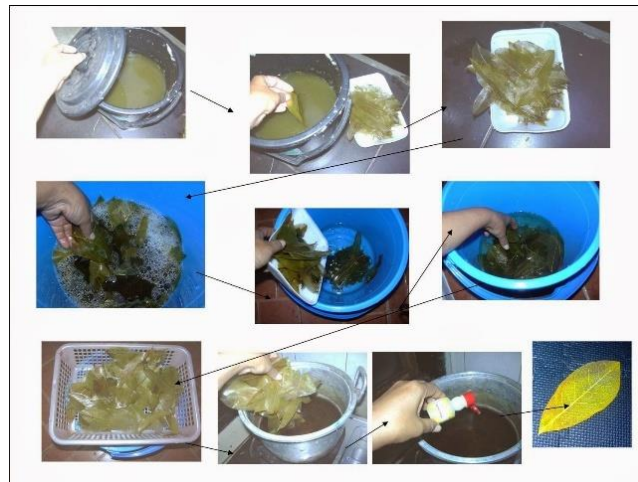
Fig. 5. The Process of Making Organic Waste Leaves into Happa.

After the green leaf organic waste undergoes a fermentation process into a dry leaf frame or Happa, then Happa can be reused into goods can be used again in the form of decoration. Some of the ornaments that can be made from Happa are as follows:

- Happa as a painting media;
- Happa as a painting of handycraft;
- Bouquet of flowers from Happa;
- Lampshade from Happa;
- Paintings from Happa.

Fig. 6. Happa as a painting media.

Fig. 7. Happa as a painting of handycraft.

Fig. 8. Bouquet of flowers from Happa.

Fig. 9. Lampshade from Happa.

Fig. 10. Paintings from Happa.

5 Conclusion

One of the waste that become problem in KampungBelakang is leaf organic waste. During this time people collect organic waste leaves to be burned. Burning results cause air pollution that interferes with respiratory health.

In order for leaf organic waste can be recycled into goods that are reused; it takes the participation of administrators and all citizens to change the cultural pattern. The consultation was carried out in collaboration with KSM Nyiur assisted by Budi Luhur University who has had experience in recycling organic waste of leaf into dry or Happa leaf frame.

The community self-help can collect leaf organic waste and process it into Happa. Society can be creative to make Happa become decoration according to their ability. The results of Happa's creations can be used by the community or sold to the wider community, which in turn can improve the economy of the community.

Happa became one of the solutions of leaf organic waste problem for Kampung Belakang, Kamal Village, Kalideres Sub-district Jakarta Barat community.

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Analysis of the Influence of Asset Structure and Sales Growth on Capital Structure and its Impact on Corporate Profitability

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Abstract. This study aimed to determine the effect of asset structure and sales growth on capital structure and its impact on corporate profitability. The population in this study was food and beverage companies listed on the Indonesia Stock Exchange. Sampling technique used purposive sampling technique, and the number of samples used as many as 9 companies. The method used was multiple linear regression analysis. The results showed that the assets structure affect the capital structure. While sales growth did not affect the capital structure. The asset structure and sales growth had no effect on profitability.

Keywords: Asset Structure, Sales Growth, Capital Structure, Profitability.

1 Introduction

The competition of building construction companies must be supported by appropriate funding decisions through the design of appropriate capital structures. In addition to anticipate the development of free market in the construction industry, the construction services industry in Indonesia needs to improve the quality of its products as a business strategy to remain exist and competitive.

Things that must be considered by the company to face the phenomenon is, one of them, the funding factor. Funding is required by the company to finance its operations and expansion. Funds can come from internal and external sources. Internal sources are funds generated by the company itself in the form of holding profit and accumulated depreciation, while external sources of funds is generated from outside the company such as funds from creditors and owners. Companies must be able to raise funds both from within and outside the company efficiently, therefore it needs an optimal balance between the two sources of funds.

One of the most important decisions facing by the company in relation to the company's operations is the decision on the capital structure, which is the description of the company's financial proportion between its own capital derived from long-term liabilities and shareholder equity, which is the source of a company's financing [1].

Capital structure is an important thing to be noted and analysed because the capital structure can describe the long-term risk borne by the company as long as the company is operating. The right funding decisions can be one of the company's efficiency factors that can impact the increase in corporate profits. The asset structure in this study is measured by

comparing fixed assets with total assets [2], companies that have large fixed assets can use large amounts of debt this is because the large scale companies will be easier to get access to resources compared to small companies. Then the amount of fixed assets can be used as collateral or collateral debt company. In a study conducted by Tangiduk et al. (2017) show that result of the research indicates that asset structures have significant effect to capital structure. While in research conducted by Solikhadi (2016) shows that the structure of the asset has no significant effect on capital structure [3],[4].

Sales growth shows changes in sales volume in the coming years based on historical sales volume growth data [5]. In the construction company, the advance paid by the consumer is the attachment of the sales transaction, so the change in sales will cause the company's debt to be higher. The research conducted by Novione et al. (2016) showed that sales growth has an effect on capital structure, however, unlike the research by Maryanti (2016)that sales growth has no effect on capital structure [6],[7].

The research of Chisti et al.(2013) reveal that capital structure (DER) has a negative effect on profitability [8]. The study of Qiliao et al. (2015)present that capital structure has a positive effect on profitability [9].

This study aims to examine the factors that can affect the capital structure, including the assets structure and sales growth and its impact on corporate profitability.

The need for funds to strengthen the capital structure of an enterprise can be sourced internally and externally, in condition that the required funding source is from places that are considered safe (safety position), and if it used, it will have a thrust value in strengthening the financial capital structure of the company. In other words, when the funds are used to strengthen the capital structure of the company, the company is able to control the capital effectively and efficiently and on target. In addition, the company should consider whether the funding decision will either use its own capital or foreign capital, both of which have each advantages and risks.

1.1 Profitability

Profitability is the net result of a series of policies and decisions. Profitability describes the level of profit earned by the company within a certain period. Profitability can be assessed in various ways, one of which is using ratio [10], profitability is the relationship between income and costs generated by using company assets, both current and fixed, in production activities. Profitability can be assessed in various ways, one of which is using ratio. Profitability ratio according to Gitman (2012) is the ratio used to measure management effectiveness based on the return of the investment sale as well as the company's ability to generate profits that will be the basis of company dividend distribution [10]. The usual ratios used to measure profitability include Return on Assets.

According to Brigham (2011), return on assets can measure the profitability of the company [11]. Weygandt et al. (2012) states that "an overall measure of profitability is return on assets [12]. We compute this ratio by dividing net income by average assets". According to Stice (2004) return on asset is the financial ratios used to assess the overall profitability of a company from the point of return on assets [13]. The lower the return on asset ratio, the less good, and vice versa, the higher the return on asset ratio, the better. The calculation of return on asset formula is as follows:

$$\text{Return on Asset} = \frac{\text{Net Profit}}{} \tag{1}$$

$$\text{Total Asset}$$

1.2 Capital Structure

According to Fahmi (2016), the need for funds to strengthen the capital structure of a company can be sourced from internal and external, external sources can be used with the provision that is considered safe (safety position) and if used, it has a value thrust in strengthening the company's financial capital structure. In other words, when the funds are used to strengthen the capital structure of the company, the company is able to control the capital effectively and efficiently and on target [1].

Determination of capital structure will involve the exchange between risk and return. The higher risks associated with larger debt are likely to lower share prices, but a higher rate of return forecasts caused by larger debt will raise the stock's price. The company will seek to find a capital structure that produces a balance between risks and return that will maximize share prices [11].

According to Sartono (2015), Capital Structure is a balance of the amount of short-term debt of a permanent nature, long-term debt, preferred stock, and common stock [2]. The capital structure can be measured using the following formula:

$$\text{Capital Structure} = \frac{\text{Total Debt}}{\text{Total Equity}} \qquad (2)$$

1.3 Sales Growth

Van Horne (2005) state that the key to most cash budgets is sales forecasts with an internal sales forecast approach done by projecting sales in the next period [14]. According to Rudianto (2012), Sales Growth is the volume of sales in the coming year based on historical sales volume growth data [5]. A good company can be identified from its sales from year to year that continues to increase, these rights impact on increasing corporate profits so that internal funding will also increase.

According to Fabozzi (2001), Sales Growth represents a change in sales on annual financial statements. The above average Sales Growth of a company is generally based on the expected rapid growth of the industry in which it operates [15].

Companies can achieve above average growth rates by increasing market share of overall industry demand. Furthermore, Maryanne (2008) state that "Several possible objectives are associated with revenue growth [16]. New products and services are developing new customers and markets, and adopting a new pricing strategy". Thus, sales growth is an indicator of demand and companies competitiveness in an industry. The growth rate of an enterprise will affect the strategy of retaining profits in funding future opportunities.

Sales growth can be measured by the following formula:

$$\text{Sales Growth} = \frac{\text{Sales}_t - \text{Sales}_{t-1}}{\text{Sales}_{t-1}} \qquad (3)$$

Note:
Sales t: Sales of a particular year
Sales t-1: Sales of the previous year

1.4 Asset Structure

Assets are resources controlled by a company for the purpose of generating profits, consisting of current assets and non-current assets (fixed assets). Current assets are resources or claims on resources that can be directly converted into cash throughout the company's operating cycle. Fixed assets are resources or claims to resources that are expected to benefit companies for several periods [17].

The asset structure represents the proportion of fixed assets of total assets owned by a company, most companies that are mostly invested in fixed assets will prioritize the capital fulfilment of the permanent capital which is its own capital, while its debt is complementary. However, the asset structure can describe part of the amount of collateral value of assets. Companies that have debt guarantees will find it easier to get debt than companies that have no collateral. Companies that have assets that can be used as debt collateral tend to use relatively large debt [18]. The calculation of asset structure formula as follows:

$$\text{Asset Structure} = \frac{\text{Fixed Assets}}{\text{Total Assets}} \qquad (4)$$

1.5 Influence of Asset Structure to Capital Structure

As stated earlier that the asset structure is one of the important variables in determining funding decisions, because the fixed assets owned by a company can be collateral for the creditor in doing loan. Asset Structure which is the ratio between fixed assets to total assets will greatly affect the company's capital structure. The capital structure is the ratio between the long-term debt and the capital itself used by the company. While the capital itself can be regarded as a company asset. The greater the assets structure owned by the company, the greater the loan that can be obtained by the company on the guarantee given to the creditor. So it will affect the value of the capital structure as well. Previous research conducted [19], Tangiduk et al. (2017) revealed the result that the assets structure significantly influence the capital structure [3].

H1: The structure of assets has a positive effect on capital structure

1.6 Influence of Sales Growth on Capital Structure

According to Van Horne (2005), the key to most cash budgets is sales forecasts with an internal sales forecast approach done by projecting sales in the next period [14]. According to Rudianto (2012), sales growth is the volume of sales in the coming year based on historical sales volume growth data [5]. A good company can be identified from its sales from year to year that continues to increase, it will impact on the increasing need for funds to finance operational activities. In accordance with balancing theories, the company will seek additional funds with loans either to banks, leasing or also by issuing bonds to finance the increase in operational activities. This is supported by Mahnaz mahdavi et al. (2013) and Alnajjar (2015) studies which show significant sales growth in capital structure [20],[21]. Based on the description, the hypothesis proposed as follows:

H2: Sales growth positively affects the capital structure.

The analysis in this research used linear regression method by using SPSS 22 program. This research examines the effect of asset structure variable and sales growth on capital structure and its impact on profitability. To test the data before being processed, classical assumption test is done with the aim that the data to be processed meets the basic criteria of data processing. The data testing step is done by step: normality test, multi collinearity test, heteroscedasticity test, and autocorrelation test. After the basic criteria test, it can be concluded that the data used is feasible to be used or researched. Next, test the hypothesis and Sobel test (Test Mediator). Sobel test is a test to determine whether the relationship through a mediation variable is significantly capable as a mediator in the relationship [24]. The test formula is as follows:

$$Z = \frac{ab}{\sqrt{(b^2 \, SEa^2) + (a^2 \, SEb^2)}} \tag{5}$$

Where:
a   = Regression coefficient of independent variable to mediation variable.
b   = regression coefficient of mediation variable to dependent variable.
SEa = standard error of estimation of the influence of independent variables on mediation variables.
SEb = standard error of estimation in from the influence of the mediation variable to the dependent variable.

Regression step is done 3 times, the first regression is done between asset structure variable and sales growth to capital structure; second, asset structure and sales growth on profitability; and last, capital structures to profitability.

3 Result And Discussion

Based on the classical assumption test, the research data has met the criteria for further processing. The pattern of distribution curves in the histogram charts tend to have a balanced slope between the left and right sides, then the residual data can be declared as in normal distribution. All variables have tolerance values>0.1 and Variance Inflation Factor (VIF) <10. Thus it can be concluded that there is no multi col linearity. Durbin-Watson values are between -2 and +2, so it can be concluded there is no autocorrelation problem in the regression model.

The Scatterplot image shows the spots did not spread randomly and not scattered above and below the number 0 on the Y axis. This indicates that there is a problem of heteroscedasticity in the regression model. One way to overcome the heteroscedasticity gel is to transform the data into the form of natural logarithm (ln). The result of heteroscedasticity test after data transformation showed that the scatterplot pattern image was not detected heteroscedasticity symptoms.

Hypothesis testing conducted in this study used multiple linear regression analysis by using SPSS version 20.0, which is presented in three stages. The first stage is to test the hypothesis that there is influence of asset structure and sales growth on capital structure.

Table 1. Analysis results on multiple regression I.

		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	-1.832	.866	.040
	LN-asset structure	1.313	.228	.000
	LN-sales growth	.078	.072	.282

From these results, it can be concluded that the asset structure variable has a positive effect on capital structure. The significance used is 5% or 0.05. The significance value of the asset structure is 0.00 <0.05, thus H1 is accepted. This means that the asset structure has a positive and significant effect on the capital structure.

Variable of sales growth have positive effect to capital structure. Value significance of 0.282> 0.05, thus H2 is rejected. This means that sales growth has a positive and insignificant effect on capital structure.

The second stage is to test the hypothesis that there is influence of asset structure and sales growth on profitability.

Table 2. Analysis results of multiple regression II.

		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	2.982	1.059	.007
	LN-asset structure	-.274	.279	.332
	LN-sales growth	.110	.088	.214

From these results, it can be concluded that the variable asset structure negatively affect profitability. The significance used is 5% or 0.05. The significance value of the asset structure is 0.332 <0.05, thus H3 is rejected. This means the asset structure has a negative and insignificant effect on profitability.

Variable of sales growth have positive effect to capital structure. Value significance of 0.214> 0.05, thus H4 is rejected. This means that sales growth has a positive and insignificant effect on profitability.

The third stage is to test the hypothesis that there is influence of capital structure to profitability.

Table 3. Analysis results of multiple regression III.

		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	-1.832	.866	.040
	LN-capital structure	-.441	.125	.001

From these results, it can be concluded that the variable of capital structure has a negative effect on profitability. The significance used is 5% or 0.05. The significance value of the asset structure is 0.001 <0.05, thus H5 is accepted. This means that the capital structure has a negative and significant effect on profitability.

Sobel test in this research is used to test the hypothesis that capital structure is able to mediate the influence of asset structure and sales growth on profitability.

Based on the value of the asset structure coefficient, z value is obtained from the test sobelat 15.638. Because the z value obtained is greater than 1.98 with a significance level of 5%,thus H6 is accepted. This proves that the capital structure is able to mediate the influence of assets structure on profitability. Based on the value of sales growth coefficientz value is obtained from the test sobelat 31.178.Becausethe value of z obtained is greater than 1.98 with a significance level of 5%,thus H7 is accepted. This proves that the capital structure is able to mediate the effect of sales growth on profitability.

4 Conclusion

Based on the results of the analysis, it can be concluded:
1. Structure of assets have a positive effect on capital structure.
2. Sales growth has no effect on capital structure.
3. The asset structure has no effect on profitability.
4. Sales growth has no effect on profitability.
5. Capital structure negatively affect profitability.
6. Capital structure able to increase the influence of asset structure to profitability.
7. Capital structure can increase the effect of sales growth on profitability.

Based on the conclusions obtained in this study, it is recommended to:
1. Company managers must be able to consider the funding decisions that will be taken, either using own capital or debt. Funding is expected to increase corporate profits.
2. Investors. This research is expected to be a consideration for investors in deciding the investment to be made, so as to get the optimum return possible.

In this research, there are some limitations of research sample which only in sub-sector of food and beverage company. Profitability as a dependent variable is proxied only with return on asset so it does not reflect overall profitability. It is advisable for further researchers who interested in similar topics to expand sub-sectors that not just food and beverage companies.

Profitability variables should be proxied with different angles such as net profit margin, return on equity and so forth.

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The Effect of Work Stress, Compensation, and Motivation to Organizational Commitment

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Abstract. The purposes of the study are to analyze the effect of work stress, compensation, and motivation to organizational commitment and determine the level of work stress, compensation, and employee motivation. The questionnaire data is obtained by 67 respondents. The descriptive statistical analysis is applied to determine the level of work stress, compensation, and motivation. The multiple linear regression analysis is applied to expose and investigate the influence of work stress, compensation, and motivation to organizational commitment whereas test the partial effect is done by t test and influence together done with test F. The research results is shown that the level of work stress, compensation, and motivation are in the moderate level. Moreover, it concluded that job stress, compensation, and motivation influence to organizational commitment together influence 79,8%, the rest equal to 20,2% is not another variable included in research model. Either managerial implications or organizational commitment is a relatively strong employee identification and involvement of employees to their organization. The conclusion for the company must either build or grow the commitment because with highly committed employee can minimize the costly of employee recruitment as consequently turnover ratio of company employees can be low.

Keywords: work stress, compensation, motivation, commitment, organizational.

1 Introduction

Tense of industrial competition and economic crisis of today's society are often the issue for the company going decline. The anticipating of decline is required the existence of reliable human resource management [1]; the reason is because the recognizing deeply the human being is one important factor in achieving company goals. Despite in fact, the company does not have competent human resources and subsequently it would be in strivings to advance the competition [2]. All exemplify that the company cannot be separated from the role of human resources by considering their needs.

The employee expectation was expressed in their greatest performances. The companies are not only required of excellent performance but also highly sense of commitment to the employee. Employees commitment is very important for the company because by having a highly committed employee the company could minimize cost in recruitment and could also increase the productivity from the existing employees [3]. Hence, the commitment must be exist and the company should create a organizational commitment [4]. Creating highly committed employee must be compensated by less job stress, compensation, and motivation [5]. Stress is an instinctively response to a situation perceiving as challenging or threatening one's health [6].

Stress is experienced by many people without exception and the causes vary such as work, tasks, job goals, and others [7].

According to Chandola (2010) stress is a dynamic condition for exposing the individual to the opportunities, demands, or resources associated with expectation and the uncertain and important result. Some stress can be either positive or some can be negative [8],[9]. Executive remuneration does not only cover the financial remuneration but also the incentive for compensating the stress, i.e: indirect financial payments like insurance and vacations [10]. Also Robbins and Mary Coutler (2007) suggested that to push and to compensate managers cost in recruitment and could also increase the productivity from the existing.

To do a high-level stress in business of achievement the remuneration should cover all the conscquences. Researches revealed that the effect of work stress, compensation, and motivation on organizational commitment were the concerns to employees productivity, particularly for manager with the large number of employees, i.e larger than 200 employees [11],[12].

1.1 Organizational Commitment

Robbins, Judge and Hasham, (2009) defines organizational commitment is reflects the feelings of likes or dislikes of employees towards the organization as an attitude [13]. O'Reilly and Chatman (1986) and Saari and Judge (2004) mentioned that employees' commitment to the organization as an individual's psychological bond to the organization including work involvement, loyalty and a sense of trust in organizational values [14],[15]. Meyer *et al.*, (2002) suggest that there are three components of organizational commitment: Affective commitment, Continuance commitment, Normative commitment [16].

1.2 Work Stress

According to Robbins, Judge and Hasham (2009) stress is a dynamic condition in which an individual is exposed to the opportunities, demands, or resources associated with what the individual desires and whose results are deemed uncertain and important. Some stress can be positive and some can be negative [13].

1.3 Compensation

Conyon, (2006) and Dessler (2013) stated that employee compensation covers all forms of payment that are given to employees and arises from their employment relationship. Employee compensation has two main components: direct financial payments (wages, salaries, incentives, commissions, and bonuses) and indirect financial payments (financial allowances such as insurance and vacation paid by employers) [17].

1.4 Motivation

In accordance to Robbins, Judge and Hasham (2009) motivation is the mechanism of willingness to do high-level business to accomplish organizational goals, conditioned by the ability of the business to appease the individuals need.

1.5 Research Hypothesis

Robbins et al., (2009) defined stress is a dynamic condition in which an individual is exposed to the opportunities, demands, or resources associated with what the individual desires and whose results are deemed uncertain and important. Research is conducted that job stress has a negative effect on organizational commitment.

H1: Job stress has a significant effect on organizational commitment

According to Dessler, (2013) an employee compensation covers all forms of payment that are given to employees and arises from their employment relationship. Research is conducted that compensation is positive for organizational commitment by Sudarwanti Retna ningsih.

H2: Compensation has a significant effect on organizational commitment

In accordance with to Robbins et al., (2009) motivation is the process of willingness to do high-level business to accomplish organizational goals, conditioned by the ability to appease the needs of some individuals. Research is conducted that motivation has a positive effect on organizational commitment by Irawan Ciptodihardjo.

H3: Motivation has significant effect on organizational commitment

Based on the completed research, it can be concluded that job stress has negative effect on organizational commitment, while compensation and motivation have positive effect on organizational commitment.

H4: Job Stress, Compensation, and Motivation have a significant effect on Organizational Commit

2 Methodology

The study population was 200 people. The applying of Slovin's formula can be used in the questionnaire is 67 people as the samples. The Primary data collecting method is obtained directly from respondents in filling questionnaire closed form. Likert Likert scale is used to give the answer score in the questionnaire with 5 points with intervals ranging from Strongly Disagree (SD) to Strongly Agree (SA).

2.1 Hypothesis Test

The Multiple linear regression analysis is used to perceive the influence of independent variable to dependent variable. The independent research variable are: work stress (X1), compensation (X2), and motivation (X3). These will influence the dependent variable with the organizational commitment (Y).

a. Simultaneous Significance Test (Test Statistic F)

The F test is an assessment of all independent variables included in the model of joint influence on the dependent variable.

b. Determination Coefficient Analysis

The determination coefficient value is between the value of zero and the value of one. The small value of R^2 means that the ability of the independent variables (work stress, compensation, and motivation) in defining the dependent variable (organizational commitment) has limitations.

c. Partial Significance Test (t test)

The T test is applied to determine the influence of each independent variable to the dependent variable with the formulation of the null hypothesis (Ho) and the alternative hypothesis (Ha).

3 Result And Discussion

The research data analysis is completed by using multiple linear regression analysis to know the influence of independent variable to dependent variable. The research has independent variable that is: work stress (X1), compensation (X2), and motivation (X3) which will influence the dependent variable that is organizational commitment (Y).

Based on the summary of regression test results, the regression equation of the results of this study can be written as follows.

Y = 1.424 - 0.167X1 + 0.346X2 + 0.262X3 + e

The regression equation above can be interpreted constant value of 1.424, this value is constant value of organizational commitment if (X1, X2, X3 = 0) or organizational commitment value before influenced by independent variable equal to 1,424. The regression coefficient of work stress variable (X1) is -0.167, it means that every 1% increase of employee work stress will decrease organizational commitment sebsar 0,167 and vice versa if job stress decrease 1% hence will increase organizational commitment equal to 0,167.

The regression coefficient of compensation variable (X2) is 0,346, it means that every 1% increase of commitment will increase organizational commitment equal to 0,346. If compensation decrease 1%, it will decrease organizational commitment equal to 0,346. The regression coefficient of motivation variable (X3) is 0,262, it means that every 1% improvement of motivation will increase organizational commitment equal to 0,262. If motivation decrease 1% it will decrease organizational commitment equal to 0,262.

The amount of influence of work stress, compensation, and motivation to organizational commitment of 0.798 or 79.8 while the rest of 20.2% is explained by other variables outside the model under study.

3.1 Hypothesis Testing 1: Job Stress Has a Significant Effect on Organizational Commitment

The working stress hypothesis test has negative effect to organizational commitment analyzed by using partial significance test (t test). Ho is rejected and Ha accepted Based on significance level $t_{account}$ (-2,443) and significance α 0,017 <0,05. The implication work stress have negative and significant influence on organizational commitment thus the first hypothesis of this study can be proven. Job stress variable has negative and significant influence to organizational commitment equal to 16,7%.

3.2 Hypothesis 2: Compensation Has a Significant Effect on Organizational Commitment

The compensation hypothesis test has positive effect to organizational commitment analyzed by using partial significance test (t test). Ho refused and Ha accepted based on can be seen that significance $t_{account}$ (4,707) and significance α 0,000 <0,05. The interpretation is compensation have positive effect and significant to organizational commitment thus the second hypothesis in

this study can be proven. The compensation variable has a positive and significant influence on organizational commitment of 34.6%.

3.3 Hypothesis 3: Motivation Has a Significant Effect on Organizational Commitment

The motivation hypothesis test has positive effect to organizational commitment and it is analyzed by using partial significance test (t test). Ho refused and Ha accepted Based on can be seen that significance $t_{account}$ (4,098) and significance α 0,000 <0,05. The interpretation is motivation have positive effect and significant to organizational commitment so the third hypothesis in this study can be proven. Motivation variable has positive and significant influence to organizational commitment equal to 26,2%.

3.4 Hypothesis 4: Job Stress, Compensation, and Motivation Have a Significant Effect on Organizational Commitment

The test of hypothesis 4 is conducted by simultaneous test (F test) to expose the independent variables (work stress, compensation and motivation) significantly influence the dependent variable of organizational commitment. Ho is rejected and Ha accepted based on the analysis results obtained $F_{account}$ 87,911 and significance α (0,000 <0.05), the interpretation means that the three independent variables work stress, compensation and motivation have a significant influence on the variable organizational commitment, thus the fourth hypothesis of this study can be proven. The amount of influence of work stress, compensation, and motivation to organizational commitment of 0.798 or as much as 79.8%.

4 Conclusions

Based on the result of arithmetic mean analysis, it can be identified that employee job stress on UD production field. Bintang Walet Klaten is in low category, it can be seen from the analysis of mean value on each indicator. The low workload shows that the employees of the production area feel the workload is not excessive with the mean workload value of 2.38 (low). The results can be seen from the description of respondents that most respondents stated that they still have enough time to complete each - his job and respondents stated that the job performance standards they are doing now are not too high. The mean work conflict value is 2.45 (low). The low value do not have conflict in the work environment and this conflict usually occurs when employees compete against demands. The mean ambiguous value is 3.44 (high). This interpretation means the respondents recognize the goals and objectives of the current job and they also know exactly what the expectation from the current job as well as knowing what has become their responsibility for their work. The comprehensible mean stress value of employee employment field is in the category of being moderate.

The exposing results of the mean value analysis on financial compensation is 2.48 (low) that means the responders consider the financial compensation they receive is currently in the low category. The employee is not contented with the current monthly salary. It received according to employees are not only in accordance with the overtime given by the company but also the bonus given by the company also has not satisfied the employee.

Non-financial compensation is a compensation in the form of financial benefits such as insurance and leisure, build upon the analysis of the mean non-financial compensation obtained

by the mean value of 3.12 (moderate), the result is to provide nonfinancial compensation to the employees fairly well.

The next hypothesis testing is positive and significant impact motivation on organizational commitment. Based on the mean value analysis on physiological needs of 2.65 (moderate), it has a meaning of the production field employees have motivation on physiological needs quite well. These results indicate that employees consider that the salary received by current employees is sufficient to meet basic needs and bonuses are also given in accordance with the agreement. The necessity of security is obtained a mean value of 2.78 (moderate). The essential security is the safety and protection of physical and emotional disturbances as well as the certainty of physical needs will continue to be met. The result is shown that the security of employees' prosperity. The security guarantees have been provided for providing the health insurance to employees, and giving more attention to the safety of work employees by the company.

The social necessity is a need of closeness with being part of the group. It is managed by co-workers and the result of the mean analysis is 3.40 (moderate). The results indicate that production's employee's field can cooperate enough with their coworkers. They also have the opportunities to participate in group / team work. Moreover, they are established a harmonious atmosphere among colleagues in the work environment.

Self-esteem needs a mean value is 3.09 (moderate), it means that internal self-esteem factors, such as self-esteem, autonomy, and achievement and external self-esteem factors such as status, recognition, attention have been obtained by employees in the field of production are shown by the award for employees in accordance with employee achievement, the employer gives an opportunity to the employee in leading the working group / work team and open / receive ideas from fellow employees The self-actualization necessity is gained by a mean value of 2.88 (moderate), it means the growth and achievement of potential employees, and self-fulfillment, the encouragement to become what employees are able to achieve enough fulfilled. The company has provided an opportunity for employees to increase their potential, provide opportunities in self-fulfillment for self-improvement and support the opportunities for employees to increase rank within the company. The comprehensive of production employees' motivation is in the category of well enough.

The result of mean value analysis on affective commitment is 2.60 (low), it means that the production department employees do not have the desire to be part of the company it can be caused the employees do not have closeness with the company. The mean value is 2.64 (moderate) on a sustainability commitment, it means that employees in the production department will continue to work, because they still need salary and other benefits for their viability and no other job as replacements, so the category sustainability commitment is enough.

The mean value is 2,88 (moderate) in normative commitment, it means that employees have their own values because of the consciousness of commitment to the company is the obligation by an employee. The comprehensive commitment variables are categorized as moderate category; it means the production officer has sufficient commitment to the company to survive as an employee of the company.

4.1 Managerial Implications

The organizational commitment is a relatively strong employee identification and involvement that employees must have for their organization. Commitment is very important for the company. High commitment in the company can reduce the costly for the recruitment of new employees to reestablish the senior and retired employees. The research result of the employee's

commitment to the company is comprehended as the moderate category, therefore it is necessary to support the management especially the HRD in managing the employees to be awareness of work stress, compensation and motivation. It is because the significant three variables to Organizational Commitment.

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Forms of Communication Practice in Social Conflict Mitigation Using Qualitative Content Analysis

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Abstract. This study aimed to identify forms of communication practice in social conflict mitigation. The research used qualitative approach with qualitative content analysis method. The study used secondary data in the form of news text about social conflict sourced from online media. Data analysis using NVivo 11Plus software. The results showed: forms of communication practice are socialization, collective action, gathering information, and dialogue. That forms of communication practice can be used as an instrument of mitigating social conflict .

Keywords: Conflict, social, mitigation, communication.

1 Introduction

Jakarta should appear as a friendly and livable city. This is because Jakarta as a barometer for other cities in Indonesia, to realize hospitality as well as a livable city is not an easy matter. Since Jakarta officially became the province and capital of the country in 1961, various problems have emerged. Unplanned and overlapping urban spatial planning, high levels of urbanization, and poor environmental carrying capacity, make Jakarta as a prone city.

The National Unity and Politics Institution Badan Kesatuan Bangsa dan Politik DKI Jakarta/BKBPJakarta (2015) mentions several objective conditions faced by Jakarta people which has the potential to become threats, challenges, obstacles, and disturbances, such as: 1) Jakarta as the capital of the state is a center of political and power interests in government [1]. This situation makes Jakarta vulnerable to all impacts arising from political life in Indonesia; 2) Jakarta people is a pluralistic society consisting of various ethnic, racial, religious, and class. This situation makes social interaction in Jakarta very complex and dynamic; 3) a prolonged multi-dimensional crisis makes people's lives tough. This situation ultimately almost eliminates public confidence in the sense of hope for a better future.

These obstacles and disorders, if not well addressed, can lead to the emergence of social conflict. Such conflicts can result in loss of security, fear, environmental damage, property loss, loss of life, and psychological trauma of the people (revenge, hatred, anti-starch, etc.), thus inhibiting overall development.

Jakarta is inhabited by 10,177 million people spread in 44 sub-districts and 267 urban villages [2]. The mapping of BKBP Jakarta (2015) shows that there are 16 sub-districts in Jakarta that are prone to conflict [1]. These sub-districts include: Kebayoran Baru Sub-district, Tebet Sub-district, Mampang Prapatan Sub-district, and Setia Budi Sub-district in South Jakarta; Kramat Jati sub-district, Jatinegara sub-district, and Matraman sub-district in East Jakarta; Grogol Petamburan Sub-district, Cengkareng Sub-district, and Tambora Sub-District

in West Jakarta; Johar Baru and Gambir sub-districts in Central Jakarta; Penjaringan Sub-district, Pademangan Sub-district, Koja Sub-district, and Cilincing Sub-District in North Jakarta. The causes of such conflicts include poverty, population density, crime, slums, and brawl [1]

Social conflicts that have become the daily menu of citizens in Jakarta put forward clearly [3]. In one of the urban villages in Jakarta, in Tanah Tinggi, Tadie (2009) clearly illustrates how violence and conflict occurred as follows: [3]

"Areas of violence in Tanah Tinggi are in plain view. This occurs because of populations located in the legality border: Inter-village fights which often get people wounded or even killed, vigilante mobs - burning police stations or burglars - and criminal acts by delinquent."

Efforts to cope with social conflicts in Jakarta have been done frequently. Whether through mediation or settlement with legal involved for the conflict doer that are indicated to commit a crime.Sumarno (2014) found that one of the efforts to mitigate social conflicts is by establishing citizens' forums, such as the Forum Kewaspadaan Dini Masyarakat, Kelompok Sadar Masyarakat, and Komunitas Kampung Aman [4].

Several studies have found the importance of communication in conflict mitigation. Nisa (2015) mentioned in the perspective of communication, the most important conflict resolution is the desire to resolve conflicts from the parties involved in the conflict [5]. Ardiyanti (2014) states that the appropriate selection of mediators and the identification of verbal and nonverbal languages used in the communication process define successful negotiations in conflict mitigation [6].

Based on the background exposure, then the formulation of the problem in this study are: what is the forms of communication practice in mitigating social conflict?

Based on the problem formulation above, the purposes of this research are to identify forms of communication practice in mitigating social conflict.

2 Research Methods

The research examines communication practices in mitigating social conflict uses a qualitative approach. According to Creswell (2016), the characteristics of qualitative research are: (a) the natural environment; (b) the researcher as a key instrument; (c) various data sources; (d) inductive and deductive data analysis; (e) meaning from the participants; (f) a developing plan; (g) reflexivity; and (h) a holistic view [7].

This research using qualitative content analysis method. Hsieh and E.Shannon (2005) explains that qualitative content analysis is one of methods used to analyze text data.Elo and Kyngäs (2008) says that content analysis have disadvantage relates to research questions that are ambiguous [8],[9].

The data used in this study is secondary data in the form of news text about social conflict sourced from online media [10]. when analysing qualitative data, it does not just identify the data, but also contextualising and making connections between those theme. Therefore, to facilitate the analysis, this study using NVivo 11 plus software. Welsh (2002) says that Nvivo could be used when dealing with qualitative data [11]. Similar to Welsh, Hilal and Alabri (2013) and Leech and Onwuegbuzie(2011) also express the same thing about Nvivo when analysing qualitative data [12],[13].

According to Praharsi (2006),the researcher is the main instrument of analysis in qualitative research. Nvivo only presents raw data that has been organized in accordance with the needs of researchers [14].

In addition, to get the relations between research subjects including communication practices and mitigation of social conflict. The news text is presented in table 1 below:

Table 1. News text of online media.

No	Title	Source	Year
1	Social Minister: Our Main Problem is Poverty and Inharmoniously Social	http://nasional.kompas.com/read/2016/04/13/08170031/Mensos.Problem.Utama.Kita.adalah.Kemiskinan.dan.Ketidakharmonisan.Sosial	2016
2	Unravelling the Fights in Johar Baru	http://megapolitan.kompas.com/read/2015/07/27/14400201/Mengurai.Tawuran.di.Johar.Baru	2015
3	Story of Central Jakarta Mayor in Confuse to Finish the Fights in Johar Baru	http://megapolitan.kompas.com/read/2015/09/09/16320881/Cerita.Wali.Kota.Jakarta.Pusat.Kebingungan.Selesaikan.Tawuran.di.Johar.Baru	2015
4	To Cope With the Fights That Become a "Culture" in Manggarai	http://megapolitan.kompas.com/read/2017/03/09/10573121/mengentaskan.tawuran.yang.menjadi.budaya.di.manggarai	2017
5	The Capital City is Vulnerable to Social Conflict	http://www.koran-jakarta.com/ibu-kota-rentan-konflik-sosial/	2017
6	Johar Baru to Become a Social Laboratory	https://m.tempo.co/read/news/2011/08/23/082353068/johar-baru-akan-jadi-laboratorium-sosial	2017
7	Citizen Forums to Prevent Manggarai's Strikes	http://www.jawapos.com/read/2017/03/14/115943/bentuk-forum-warga-untuk-cegah-tawuran-manggarai	2017
8	Important Role of FKDM to Prevent Social	http://suarajakarta.co/news/penting-peran-fkdm-dalam-mencegah-konflik-	2016

	Conflict	sosial-di-masyarakat/	
9	Frequent Fights, Johar Baru Residents to be Relocated to Rusun	http://mediaindonesia.com/news/read/42998/sering-tawuran-warga-johar-baru-akan-direlokasi-ke-rusun/2016-04-28	2016
10	Johar Baru, 'The Bronx of Jakarta'	http://metropolitan.inilah.com/read/detail/1784352/johar-baru-the-bronx-of-jakarta	2011
11	10 Sub-District in Jakarta is prone to social conflicts	https://www.merdeka.com/jakarta/10-kelurahan-di-jakarta-ini-rawan-terjadi-konflik-sosial.html	2014
12	Early Detection for the Potential of Social Conflict	http://www.harnas.co/2017/03/15/deteksi-dini-potensi-konflik-sosial	2017
13	Social Minister: social gap triggers social conflicts	http://news.liputan6.com/read/2838496/mensos-kesenjangan-sosial-picu-meningkatnya-potensi-konflik	2017
14	BIN assessed Local Government Late in Cope With Social Conflict Symptoms	https://nasional.tempo.co/read/news/2017/03/15/078856340/bin-nilai-pemda-kerap-terlambat-tangani-gejala-konflik-sosial	2017
15	Lampung, East Java, and Jakarta are Vulnerable to Social Conflict	http://nasional.news.viva.co.id/news/read/702195-lampung-jawa-timur-dan-jakarta-rentan-konflik-sosial	2015
16	Though in few number, the Potential of Social Conflict in Jakarta Need to Be Watched	https://www.gatra.com/politik/pemilu/pilkada/200010-meski-kecil-potensi-konflik-sosial-di-jakarta-perlu-diwaspadai	2016
17	West Jakarta Apparatus Cooperate	http://www.rmoljakarta.com/read/2015/07/24/10376/Aparat	2015

	with Toga Tomas to Prevent Social Conflict	-Jakarta-Barat-Gandeng-Toga-Tomas-Cegah-Konflik-Sosial-	
18	Kapolda Metro on Fights Problem: Many Social Conflict Appears in the Slum Area	https://news.detik.com/berita/2976200/kapolda-metro-soal-tawuran-konflik-sosial-banyak-muncul-di-slum-area	2015
19	Social Conflict May Be the Beginning of New Poverty	http://poskotanews.com/2014/12/13/konflik-sosial-bisa-jadi-awal-kemiskinan-baru/	2014
20	Central Jakarta Form Conflict Management Team	http://www.beritajakarta.id/read/22062/Jakpus-Bentuk-Tim-Penanganan-Konflik	2015

3 Results And Discussion

Analysis of this research data is assisted by devices NVivo 11 Plus software. According to Bandur (2016) in qualitative research analysis, NVivo software help researchers to ensure that data is sourced from the field, so it contains the high validity data [15].

After all the data collected, the researcher enter the data into NVivo so that data management can be better and orderly. Advantages of NVivo in data management is, if there is addition or modification of data, researchers will not need to fear that the data will be changed, because the data is inputted automatically, then if modified later on, NVivo will also record the data.

Qualitative research requires accuracy in reading data in order to make the categorization properly. Using the facility of nodes provided by NVivo, the process of reading and encoding data can be done easily, quickly, and accurate. According to Bandur (2016), nodes have an important role in the management and analysis of qualitative data using Nvivo [15]. The nodes presented in Fig 1 below:

Fig. 1. Nodes Research.

Nodes are then applied when the researchers coded over 20 news texts from online media.

3.1 Form of Social Conflict in Jakarta

The coding results of nodes on social conflict from online news texts resulted in frequent forms of social conflict: clashes between citizens, raids, parking lot disputes, and conflicts with security personnel. Although there are other forms of social conflict, such as torture and demonstration, the proportions of which are small. Understanding the forms of social conflict that often occur will facilitate the kind of mitigation steps to do. Therefore, every form of social conflict requires different handling. Visualization of the forms of social conflict using the concept map is presented in Figure 2 below:

Fig. 2. Concept Map of Social Conflict Forms.

Of the 20 news texts studied, brawl among the citizens is a form of social conflict that often appear, followed by gang up fights, land dispute parker, and conflicts with security officers. This shows that brawl between residents dominates the social conflict in Jakarta. This is in line with Tadie's (2009) view that brawl between people or between groups is the most common form of social conflict, especially in areas with high levels of poverty and density such as in Johar Baru, Central Jakarta or Manggarai, South Jakarta.

According to article 10 and Article 11 of Law No. 7 Year 2012 on Handling Social conflicts mention the early warning system of conflict. The early warning system is part of conflict mitigation. Other conflict mitigation activities are mapping, and prevention. Mapping the potential for social conflicts is a first step in knowing the potential vulnerability of social conflict to causal factors in a region.

Based on the conflict mitigation process, people can be aware that if a few problems arise in a vulnerable area, it will result in new conflicts and violence between citizens.

Based on the coding results, found 13 forms of mitigation of social conflict, such as education and training, community involvement, regional arrangement, and so forth. This form of social conflict mitigation is presented in Figure 3 below:
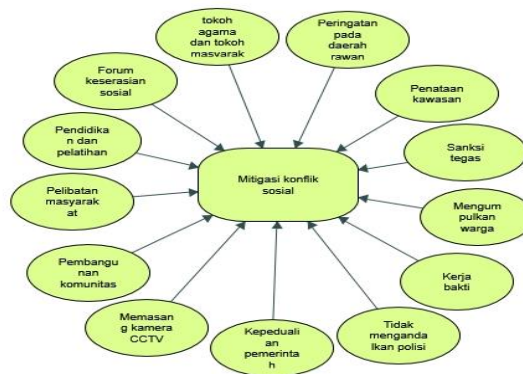
Fig. 3. Forms of Social Conflict Mitigation.

Early detection is very important to be done in mitigating the risk of conflictsocial. Early detection is done to make government officers and citizen more ready in preventing social conflict. The coding results indicate that from various forms of conflict mitigation, it turns out the theme related to community involvement, gathering citizens, religious leaders and community leaders, as well as social harmony forums. This leads to the formation of citizen forums as one of the instruments for mitigating social conflict.

Citizen forum is a form of community participation. Social conflict in Jakarta will never be completed without involving the community to resolve the conflict. Communities involved in the conflict, then the community also have to resolve so that the conflict is not protracted. So far, the space to accommodate community participation is still in minimal number. Through citizen forums, early detection, mapping, and conflict prevention can be done.

Citizen forums in carrying out the task of conflict mitigation are at a central point by doing dialogue with citizens to investigate potential conflicts, accommodate citizens' complaints, oversee the social condition of the community, and at the same time held a discussion to solve problems faced by citizens, so that the problem does not develop into social conflict.

Based on the coding of citizen forums, this study concludes that citizen forums can be meaningful as meeting places, coordinating places, and community activity centers. These places can take the form of a youth forum, early vigilance forum, or citizenship forum. As Sumarto (2009) argues, citizens forums are used to formulate common problems, seek societal disputes-often in the form of recommendations for the government to issue a policy or action,

as well as a medium of conflict resolution at the local level [16]. The full picture of citizen forums with community activities is presented in Figure 4 below:
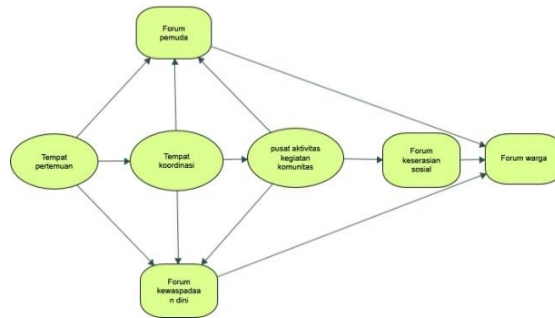
Fig. 4. The relations between the meetings place, the community center with youth forums, early vigilance forums, and social harmony forums.

3.2 Practice of Communication

The communication practices found in this study are in the form of counselling, socialization, dialogue, collective action, and information gathering. The communication practice has a final goal, awareness. Awareness is encouraged so that the community can early identify conflict potentials and at the same time to prevent the conflict from spreading. The full picture of the communication practice model is shown in Figure 5:
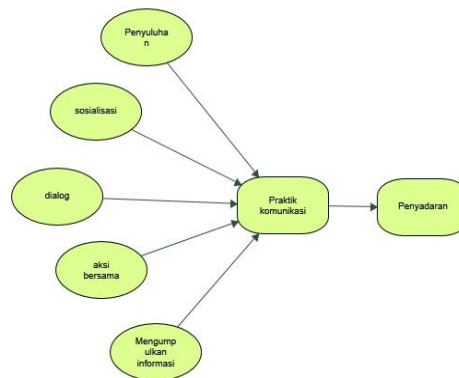
Fig. 5. Communication Practices for Social Conflict Mitigation

Based on the coding result, the practice of participative communication found is dialogue. Dialogue is a communication concerning feedback, so that communicators know whether the communication goes well and in accordance with the audience's expectations or not. Attempts to obtain such feedback are one of them through dialogue. In conflict mitigation, the importance of dialogue is in line with the views of Littlejohn and Domenici (2001), which

suggest that dialogue is another form of communication that honors relationships over individual perspectives, positions, and interests. Moreover, according to Littlejohn and Domenici (2001), the dialogue aims to help everyone understand the perspectives and experiences of others. Thus, dialogue requires attention to what the communicators make together [17].

Dialogue requires that conflicting parties as well as the authorities (e.g. government or citizen forums) place themselves in a good role in taking position as to understand the problems arises from the conflict, not to impose their own truth or opinion on others and not to simply do impression management through gratuitous appointments, appearances, and other communication tactics that have no impact on conflict resolution.

Mitigation of social conflict requires supporting factors that manifest in the form of communication practices and awareness by citizens. Both can be run through an instrument in the form of community forums. Based on the results of data analysis that researchers done, the relationship between social conflict and its related mitigation is obtained as presented in Figure 6 below:
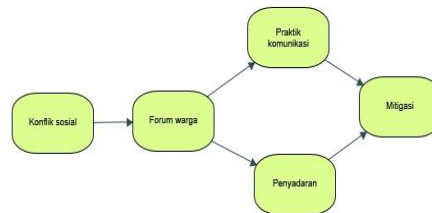
Fig. 6. The Relations of Social Conflict Relation, Citizen Forum, and Conflict Mitigation.

From the picture, the citizen forum has a central point in developing communication practices and providing awareness to the community. Awareness means that the conflicting party has a sincere desire to resolve the conflict, and it cannot be achieved instantly, but through communication practices activated by the citizen forum.

4   Conclusion

Mitigation of social conflict is an attempt to identify, map, prevent, and resolve conflict. The practice of communications to mitigate social conflict arecounselling, socialization, collective action, information gathering, and dialogue.

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Financial Management Strategy as a Mitigation Factor in the Acceptance of Going Concern Opinion

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Abstract. The research purpose is to test management strategy consisting of stock emission strategy, strategy to add new debt or debt restructuring, unproductive asset sale strategy and cost reduction in tackling acceptance of going concern opinion. The population are manufacturing companies which are listed on the Indonesia Stock Exchange, obtained a sample of 30 companies during the research period. Analytical tool used logistic regression. This research finds that; (i) shareholder strategy, strategy to add new debt or debt restructuring, and fixed asset strategy as a factor considered by the auditor in giving a going concern audit opinion (ii) reduction / cost efficiency strategy not as an auditor's consideration in giving a going concern opinion (iii) financial-based control variables into consideration of the Auditor in providing a going concern opinion.

Keywords: Financial management strategy factors, mitigation, going concern opinion.

1   Introduction

The independent auditor opinion is avoided by management is opinion with going concern. If Auditor finds material uncertainty to entity ability to maintain its business continuity, Auditor will give going concern audit opinion. During the last 5 years, companies that accept going concern opinion have decreased by 21%, but there are still companies that accept the going concern opinion as many as 13 companies from 30 manufacturing companies in Indonesia. Spathis (2003) and Gaganis (2007) state that, the ratio of profitability ratios is estimated to be proportional to the fair opinion without the exception of the auditor [1] indicates that the ratio has an important contribution to the auditor's opinion, while the receivable income ratio and the receivable/inventory ratio have little impact on the auditor's opinion decision [3]. States that one of the ranking methods related to the concept of going concern is to apply financial ratios through a combined form. These statements show that financial variables are important variables that auditors consider in providing a going concern opinion [4]. Tested the going concern opinion with information available to the public, the results of his research concluded. First, firms that in the previous year received unqualified views, are likely to receive similar opinion decisions for the current year. Second, firms with high financial leverage are less likely to accept unqualified opinion decisions. Third, firms

with higher after-tax earnings tend to receive unqualified opinion decisions. The results of this research show that published financial variables can be used to predict the survival of a company. This research will test the financial strategy in tackling going concern opinion. The financial strategy in question is; emission of new shares, debt restructuring, selling of non-productive assets, and cost reduction strategies. The use of these financial strategy variables distinguishes this research with others [1],[2],[4]. The financial variables used in this researcher as control variables. The difference of this research with other research is the use of variable financial strategy consisting of emission of new shares, debt restructuring, selling of non-productive assets, and cost reduction strategies and variable financial ratios as variable control.

1.1 Business Continuity Theory

The business continuity theory is assumed that the business entity will operate continuously to continue its commitment or activity indefinitely Ahmed Riahi (2004) and Kuruppu, Laswad, & Oyelere (2003) state that business continuity is a concept which assumes that the reporting entity will continue to operate in the future, and will be able to realize financial assets and liabilities under normal circumstances [5],[6]. With these two notions of going concern it shows that the reporting entity's financial statements provide information about the financial condition as part of the ongoing financial report. Business survival is always associated with the management capability in managing the company to survive. When companies experience financial problems (financial distress), corporate operations will be disrupted. This research is using the theory of survival as a grand theory based on the general view that established entities must be maintained its survival.

1.2 Audit Going Concern Opinion

A going concern audit opinion can be interpreted as an opinion given by the auditor to ascertain whether the company can maintain its survival IAI (2007) Information concerning going concern audit opinion for the users of financial statements as material to make decisions in investing [7]. Investors expect the auditor to provide timely and objective information about the company's financial condition. This timely and objective information is consistent with the signaling theory, which states that the company should promptly provide information to users of financial statements in good or bad circumstances. Constantinides (2002) analyzed the influence of going concern opinion toward three groups of actors each of the auditors, bankers and practitioners, the results of the analysis concluded that there are differences in behavior in response to going concern [8]. The results of this analysis reinforce the importance of going concern information for the perpetrators. Geiger, Raghunandan, & Rama (2005) documented that the increase in going concern modification rates in bankrupt companies after December 2001 was due to changes in auditor decisions. This analysis results corroborated the importance of going concern information for perpetrators [9].

1.3 Stock Emission Strategy

The management of stock's emission strategy is an effort to maintain the company's survival and can improve the management credibility that auditor can consider when making a going concern opinion decision. [10] views the stock issuance strategy would be effective in

overcoming financial difficulties if the minimum share emission amount is 5%. [11] states that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as the emission of new shares. Thus the strategy of share emissions by management can serve as a mitigation factor in the acceptance of going concern opinion. Based on the explanation, hypothesis 1 "new stock emission becomes the factor that the auditor considers when it will give a going concern audit opinion"

1.4 Debt Withdrawal Strategies

The Companies experiencing financial distress indicated by the existence of negative working capital can be overcome by attracting long-term debt [10],[11],[12]. States that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as debt restructuring / attract new debts. With the drawdown of long-term debt can be used either to finance the company's operations, the settlement of short-term liabilities as well as the operational needs of the company. Thus, the management strategy to increase lending can serve as a mitigation factor in the acceptance of going concern opinion. Thus hypothesis 2: "the withdrawal of new debt becomes a factor considered by the auditor at the time of giving a going concern audit opinion".

1.5 Reduction pf Unproductive Asset

One of the management strategies undertaken to restore the state of a company experiencing financial distress is by reducing the non-productive assets next sell it [14] proved that companies experiencing financial distress conditions can recover their condition by restructuring their assets in the form of an asset divestment. [11] states that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as selling assets that are not productive. Thus, management strategy to sell non-productive assets can serve as a mitigation factor in the acceptance of going concern opinion. Based on the above explanation hypothesis 3: "selling unproductive assets into auditor considerations in providing going concern audit opinion".

1.6 Cost Efficiency Strategy

Companies experiencing financial distress with indication of occurrence; working capital with negative cost, deficit, operating loss, and net loss. These conditions encourage managers to implement strategies to avoid receiving going-concern opinions by reducing costs, as this strategy is one of the turnaround strategies that can improve the condition of financial distress [15]. Carson et al., (2013) states that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors [11]. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as cost reduction strategies. Thus management strategies to reduce costs can serve as a mitigation factor in the acceptance of

going concern opinion. Based on the description of the proposed hypothesis H4: Cost efficiency strategy affect the acceptance of going concern opinion.

2 Research Methodology

The research population is a manufacturing company listed on the Indonesia Stock Exchange from 2010 to 2015. Sampling technique by purposive sampling method, with the following criteria (i) the company's complete financial report. (ii). the financial statements have been audited (iii) the company has financial distress problems, at least 1 criterion indicated one of the conditions of the following conditions (1) negative working capital, (2) deficit cash balance, and (3) net income. The sample of the research are 30 companies during 6 years and total data are 180 data sample.This research uses logistic regression analysis tools, because the dependent variable of the nominal or dummy variable, the model equation. as follows [16]:

$$GC = \frac{Ln\ OGC}{1 - OGC} = \beta_0 + \beta_1 S - Equity + \beta_2 S - Debt + \beta_3 S - Asset + \beta_4 S - Cost$$
$$+ \beta_5 CACL + \beta_6 LTDTA + \beta_7 NIBTS + \beta_8 DER + \beta_9 ROA + e$$

$\beta\_(0)$ = Constants
$\beta\_(1)$ - $\beta\_(9)$ = Coefficient
OGC = Going Concern Opinion (1 if opinion
GC and 0 if non GC opinion)
S-Capital = Management strategy to increase

capital (1 if there is a plan or action and 0 if not or <5%)
S-Debt = Management strategy to attract debt, (1 if there is a plan or action and 0 if not)
S-Assets = Management strategy to sell unproductive assets, (1 if there is a plan or action and 0 if not)
S-Cost = Management strategy to reduce expenditure (1 if there is a plan or action and 0 if not)
CACL = Current assets divided by current liabilities
LTDTA = Long-term debt divided by total assets
DER = Total debt divided by equity or capital
NIBTS = Net income before tax divided by total sales
ROA = Earnings before interest and tax or Earnings Before interest and tax divided by total assets
e = Error or switcher

3 Discussion

The result of Hosmer Lemeshow's fit model test is that Chi-Square is 7,991 with df 8 and significance level is 0,434. Level significance is greater than 0.05 which means that the model

is able to predict the value of observations or it can be said that this research model is a model that is fit. The result of statistic test -2 Log Likelihood indicates that there is a decrease of Log Likelihood value between block 0 and block 1, indicating that adding variable makes model better.

3.1 New Share Emissions Become Factors to Consider the Auditor At Will Give Audit Going Concern Opinion"

The test results show that the new share issuance strategy becomes the consideration of the Auditor when it will give the opinion of going concern. Wald value is 5,872 and the significance level is 0,015 <0,05. This result is consistent with the statement of Behn, B K., Kaplan, E.S., Krunwiede, K.R(2001) views the stock issuance strategy will be effective in overcoming financial difficulties if the amount of stock issuance is at least 5% [10]. Consistent with the results of research Sudarsanam, (2001)which proves that companies experiencing financial distress will recover the financial difficulties by performing an equity-based strategy. Carson et al., (2013)states that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the company's survival, such as new share emissions. Thus, a minimum share emission strategy of 5% of the total outstanding shares shall be considered by the auditor in giving a going concern opinion.

3.2 Withdrawal of New Debt Become Factor Considered by Auditor When Will Give Audit Going Concern Opinion

Wald value of 7.704 and significance level of 0.006 <0.05. The results of this research are in accordance with the classification presented by Carson et al., (2013)states that the determinants of going-concern opinion (GCO) include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company such as debt restructuring. A company experiencing financial distress is shown by the existence of negative working capital can be overcome by attracting long-term debt. Thus debt restructuring or attracting new debt, which is used in accordance with the predetermined plan will improve the performance of the company ultimately Auditors will consider to provide a going concern opinion [10],[12],[13].

3.3 Selling Unproductive Assets into Auditor's Considerations in Giving Opinion of Going Concern Audit

Strategies to reduce / sell unproductive assets into independent auditors' consideration at the time will provide a going concern opinion. Wald value of 6.840 and significance level of 009<0.05. The results of this research in accordance with the research Sudarsanam,(2001) to prove that companies experiencing financial distress conditions can recover conditions by restructuring assets in the form of assets divestment. Carson et al., (2013)states that the determinants of going concern (GCO) opinions include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as

selling assets that are not productive. These results indicate that the assets must be managed professionally in maintaining the viability of the company.

3.4 Cost Efficiency Strategy Has No Effect on Acceptance of Going Concern Opinion.

The cost efficiency strategy has no effect on the independent auditor at the time of giving a going concern opinion. Wald value is 0.012 and significance level is 0,912> 0,05. The results of this research are not in accordance with Pearce II, John A., Robinson, Richard B (2003) which states, encouraging managers to implement cost reduction strategies / cost efficiency in order to avoid acceptance of going concern opinion because this strategy is one of turn around strategies that can improve the condition of financial distress. And Carson et al., (2013) states that the determinants of going-concern opinions (GCO) include client factors, auditor factors, auditor-client relationships, and other environmental factors. Especially the client factor is related to various strategies undertaken by the client in maintaining the viability of the company, such as cost reduction strategies.

4   Conclusion

This research obtains information relating to management effort of company to overcome going concern audit opinion from independent auditor as follows; First the company's management in running the business must implement a cost efficiency strategy. Secondly in terms of tackling the acceptance of a going concern audit opinion, the first option is the stock issuance strategy, the second reduces the unproductive assets, and the third withdraws or restructures the debt. Last, although the strategy of cost efficiency has no effect on going concern opinion, where management must still manage efficiently, effectively and economically.

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Application of Environmental Friendly Architecture on Cottage in Pulau Lancang Kecil, Kepulauan Seribu

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Abstract. To meet refreshing needs, the residents of Jabodetabek area can take advantage of tourism areas nearby Jakarta that do not take a lot of time to travel. One of which is recreation to Kepulauan Seribu that has the beauty of nature. Kepulauan Seribu is a tourist destination that can be a solution for the matter above since its location is still in the area of Jakarta. The development of water tourism area in Pulau Lancang Kecil is a starting step to improve an existing one tourism facilities in Pulau Lancang Kecil. Pulau Lancang Kecil as a favourite tourist area in Kepulauan Seribu is now a tourist destination of Jakarta residents. Due to the increasing of tourists to Pulau Lancang Kecil, it is necessary to develop the suitable area around Pulau Lancang Kecil in accordance with its potential. The development of water tourism area in Pulau Lancang Kecil is a solution in order to rearrange Pulau Lancang Kecil that has a natural beauty the sea. One aspect of its development is planning the construction of cottage as one of the supporting facilities of tourism. By the availability of cottages in Pulau Lancang Kecil, it is expected to meet the needs of tourism resort for Jakarta people and increase revenue for the government of Jakarta. Eco-friendly architecture will be applied to this cottage because Kepulauan Seribu has good natural potential and can support the functions and activities in the building.

Keywords: Eco-Friendly Architecture, Cottage in Pulau Lancang Kecil, Kepulauan Seribu.

1 Introduction

In general, Jakarta is known as a city of government filled with high buildings and full of activity, whereas Jakarta is inseparable from Kepulauan Seribu which is the area of Jakarta waters. Kepulauan Seribu has 110 islands, covering from the bay area of Jakarta to Sebira Island with an area of 6,997.5 km^2 of sea and a land area of 8.6459 km^2 [1]. Kepulauan Seribu is a very attractive tourist destination and very near the urban areas. Tourism activities such as marine tourism can be one of the most important aspects in development of the Indonesian state, which is an archipelago country that is very rich in maritime potential, especially capital city of DKI Jakarta which has the potential of marine tourism that is Kepulauan Seribu. The Government of DKI Jakarta has responsibility for the development in Kepulauan Seribu.

Nowadays tourism has turned to be the needs of people in various groups, especially for the city of DKI Jakarta filled with a variety of activities. So they need spare time to break for a while from these activities and enjoy the beauty of nature by having vacation. Therefore, it required serious handling to achieve all the destinations in the field of tourism. One of the ways is by developing tourism areas, so that the potential and attractiveness of tourism resort can be more productive and able to attract potential tourists to visit and enjoy the sights. Kepulauan Seribu, which is part of DKI Jakarta area, has the potential to be developed as a marine tourism destination for domestic or foreign citizens. This can make the Kepulauan Seribu as a tourism place as tourism resort in Bali. To make it happen, it takes a great effort and requires a planned system to achieve a good result.

Kepulauan Seribu located in the Java Sea and Jakarta Bay is an area with characteristics and natural potential that is different from other DKI Jakarta areas because this region is basically a cluster of coral islands formed with coral biota and its bunch (algae, malusho, foraminifera, etc.). It is natural dynamics process. In accordance with these characteristics and development policies of DKI Jakarta, Pulau Lancang Kecil is an island geographically located in the northern part of Java Island which is geographically included in Pulau Pari territory, district of South Kepulauan Seribu, Kepulauan Seribu Regency [2]. It has white-sand beaches and aqueous greenish sculpture.

To encourage the successful development of tourism in Pulau Lancang kecil, various facilities and infrastructure is required to prepare. Those can also support the function of the area and can provide employment for local residents. In addition, it can increase government revenue in tourism field. This inspires to create a tourist area with temporary lodging or cottages. By various supporting facilities and the ideal concept with the function and condition of the area that has not been processed, it can be a productive area in the field of tourism [3].

The development of maritime tourism into an international tour requires a total effort, such as taking into account the sea transport system such as ships that must also be international standard with safety devices that meet the standards, so that local or foreign tourists do not hesitate to travel because of the guarantee of safety and comfort. Therefore, the design of ships as a means of sea transportation should be prepared. In this case, the ship is not only as a transportation system, but also become one of the tourist attractions to feel the sensation or an interesting experience with a comfortable and safe boat ride. It can be realized if the ship has a good standard and class. In addition to the transportation system, other things to note are the tourist objects that are also a major component in the development of integrated marine tourism.

The purpose of writing the Development of Water Tourism Area in Pulau Lancang Kecil is as a step action plan to develop a general tourist area of Pulau Lancang Kecil. The purpose of the activities of water development and water tourism area in the small island of Pulau Lancang Kecil as favourite tourism area in Kepulauan Seribu is to provide a water resource development planning document in the eastern region of Pulau Lancang Kecil. Thus, it can make Kepulauan Seribu as a sustainable marine tourism.

2 Research Method

In relation to the above research problems, the researcher uses a quantitative and qualitative approach, where the collected form of opinions, responses, information, concepts and explanations in the form of a description in expressing the problem. Quasi-tatif research is

a series of activities or process of filtering data or information that is reasonable about a problem in certain conditions, aspects or fields in the life of the object [4].

Quantitative method is a method that describes the existing situation in the field by involving all stakeholders in the management of marine tourism in the thousand islands, especially the island of Lancang Kecil. The data collected includes primary and secondary data. The application of quantitative methods to analyze the needs and magnitude of space in each building period. Qualitative method is an approach in conducting research oriantation on the symptoms of a natural nature because of its orientation so, it is naturalistic and fundamental or nature original and can not be done in the laboratory but must plunge in the field. Therefore, this kind of research is called field study [5]. Field study is a method of learning through the collection of data directly by observation, interview, record, or ask questions. the process of learning takes place directly in the field. understanding of qualitative approaches in research with field study method is the research stage that produces descriptive data in the form of written or oral words about humans, observable behavior so as to find the truth that can be accepted by human reason. The following qualitative approach applied in this research are as follows:

2.1 Spatial Approach

Spatial approach is intended that in developing water tourism area on the Pulau Lancang Kecil is done by observing the study area with all the potential and constraints contained there, so that the development of water tourism area on Pulau Lancang Kecil is achieved. However, this development remains paying attention and utilizes the existing potential. Spatial approach is used to observe the supply side of the tourist market that is considering Pulau Lancang Kecil as tourism area consisting of several sub-areas that have different potential. Thus, the intention of developing agro tourism needs to be done to select the most appropriate location, so the application of development efforts can be done optimally and supported by other tourist sub-region contained in the tourist area of Pulau Lancang Kecil as a form of new tourist offer to the tourists.

2.2 Result Approach

Natural resources and environment determine the type, quantity, and quality of water tourist development in Pulau Lancang Kecil. This approach emphasizes supply factors rather than demand factors. Natural factors, ecological considerations, environmental carrying capacity, and so on are more dominant in terms of social factors and the demands of human needs.

2.3 Activity Approach

This approach is based on common tastes and desires by first reviewing past activities to estimate the opportunities that need to be contained in the future. The emphasis of this approach is on the "user". In the process of planning, it is heavily influenced value of certain groups that is a well-organized group of values. This approach can work best if applied to homogeneous populations with limited scope.

If this approach is done in large cities with heterogeneous populations, it will be difficult to determine the types of activities that are mutually agreed upon because the heterogeneous population has diverse lifestyles, values, and socioeconomic levels.

2.4 Human Behavior Approach

This approach is based on an assessment of the attitudes and behaviours of residents in using leisure time (how, when, and where). The emphasize is on tourism activities as an experience, which is why people conduct travel activities, what kind of the most favourable tourist attractions, and what are the benefits derived from the trip. The desires, preferences, and satisfaction of the user of a tourism object determine the planning process.

This approach is used to understand market segmentation based on the characteristic of tourists so that the researchers can find out the market tendency from the opinion of tourists about the motivation, perception, and expectations that tourists want to develop the study area.

The results of this approach are used to further analyse in order to get the most appropriate form of development to be applied in Pulau Lancang Kecil.

2.5 Demand and Supply Approach

This approach combines elements of demand, supply, and identifies the social needs indicator to prepare the physical environment (space) that is compatible with human behaviours. This approach covers a wider range of possibilities than traditional recreational parks in general.

2.6 Development Approach

The exploring of tourism potential of Pulau Lancang Kecil has not been optimal yet. It caused the tourism activity in the area is less diverse and less well-coordinated. This development approach is used to direct the research that will be carried out to formulate the concept of agro-tourism development that is suitable to be applied in Pulau Lancang Kecil area to increase the development of the tourist area as a whole, both for Pulau Lancang Kecil itself and for the development of tourism in Kepulauan Seribu.

3 Results And Discussion

3.1 Definition of Tourism and Tourists

Tourism is a term given when a tourist travels or in other words the activities undertaken when a visitor travels [6]. Shortly, tourism can be formulated as an activity in a tourist-related society [7]. The definition of tourists by Norval (Yoeti, 1995) is anyone who comes from one country to another whose reason is not to stay or work on a regular basis, but to temporarily spend the money [8].

3.2 Development of Water Tourism

Tourism development is an effort to promote tourism activities to create tourism conditions that can generate foreign exchange. The development of tourism, especially the development of water tourism, is not only fixing the natural attractions and waters or only doing the development of accommodation and restaurants, but far more extensive than that. Tourists who come still need facilities, transportation, water attractions, service, souvenirs, safe atmosphere, and others.

The development of water tourism is influenced by several factors such as the number of visitors, the availability of transportation, supporting facilities (such as hotels, restaurants, and entertainment facilities), and the promotion and existing water attractions. Within the framework of developing water tourism, there are other forming component included in the tourism system, such as tourists, tourist attractions, service facilities, transportation, information, and promotions.

Tourist attractions and facilities are the main basis of tourism. If it is not fulfilled then the tourists will not have the motivation or desire to visit these attractions [9]. Robinson pointed out that there are six main elements for the formation of tourist attraction in tourism development, including water tourism, that is:

1. Weather, is a special feature of tourism that causes a location to be potential for tourism.
2. Landscape, attraction in the form of interesting view.
3. Facilities, consisting of two types of nature and artificial.
4. History and culture, historical relics or cultural arts of a region.
5. Accessibility, the easier to reach the tourist location the higher the possibility to visit.
6. Accommodation, regarding lodging and places to eat. An important factor in the formation of tourist attraction can also be used as a reference for the development of water tourism as has been stated by Robinson before, but added with the hospitality of surrounding residents who can create a fun atmosphere for tourists who visit the area of water tourism.

3.3 Water Tour Facilities

To support the development of water attractions, it is necessary to consider the necessary tourist attraction facilities. These facilities include the provision of recreation, cultural and social activities, entertainment and sports, shopping, administrative sections, technical services and other additions described as follows [10]:

1. Recreation, sports, and cultural and social activities.
   Collective facilities should be carefully arranged and set to increase the excitement of the tourists, to generate attraction and invite participation, and to attract a large audience, and the most important is to make tourist comfortable.
2. Stores, shop stalls, and related services.
   Trading facilities in holiday destinations are somewhat different from those in towns or villages of the same size, not only in the type of store type, but also in numbers, since tourists expect to find many shops in the tourist area, especially if they do not carry private car or in a tourist attraction that has difficult access.
3. Administrative, technical and other supporting services.
   The extent or the number of services that are accommodated in the tourist area depends on the location or location, the number of non-tourist residents, the proximity of other large cities, and the extent or extent of regional public service administration.

Water tourism facilities that are physical and must be considered its availability around the tourist area to support the existing attractions, among others, are as follow:

1. Dock, where a boat takes place and also serves as a road connecting the mainland with a boat;
2. Marina, which is a public facility on the edge of the water to lie at anchor and boat ship base for tourist purposes
3. The tourist information centre, which is the information facility for tourists who provide information and tourist guides;

4. Shelter, which is the viewing station facilities that are scattered in strategic places on the edge of the water;
5. Accommodation, for example lodging facilities such as hotels, motels, cottages, camp, or guest house;
6. Support facilities, including praying area, lavatory (bathroom), and souvenir shop;
7. Playground, which is an area in tourist area that is used as a playground for children;
8. Water sports facilities; this facility utilizes the potential of existing waters as a place to have sport which is also an attraction for tourists as a show or scenery among other attractions;
9. Open space, is a tourist orientation to go to another object that also serves as a sitting ground to enjoy the scenery.

3.4 Tour Activities in Kepulauan Seribu

Previously, the goal of Kepulauan Seribu tourism development is marine tourism, which begins with the granting of permits for 43 companies to manage the island to build resorts and manage marine tourism activities. Now only 9 islands are served as a resort with marine tourism activities that can be categorized as leisure and pleasure. This tourism activity is less successful in accommodating the demands of the community to be involved, because of the gap between the demands and the quality of tourism human resources.

Meanwhile, there are visits of the general public, whether adults or adolescents, to the settlement islands to travel. Therefore, the community provide homestays. With the establishment of Kepulauan Seribu district administration, the government facilitates the form of tourism whose management involves the locals, as shown in the development of tourism activities in Pulau Lancang Kecil. Tourist resort markets are different from Pulau Lancang Kecil Island, in socioeconomic class and in organizing activities. Similarly, there is a difference between visitors of Pulau Lancang Kecil and the settlement islands.

3.5 Program Development for Kampung Lancang Kecil

The area of water tourism in Kepulauan Seribu cannot be separated from the development of the entire archipelago in Kepulauan Seribu. The development stage in the general tourist area of Pulau Lancang Kecil will be described below. The concept of developing Pulau Lancang Kecil is eco-friendly architecture concept which is environmental arrangement by utilizing the potential or natural resources and the use of technology based on environmentally friendly ethical management [11],[12]. The patterna of planning and design of eco architecture are as follows [13],[14]:
1. Buildings can accommodate and function properly by observing the peculiarities of human activity and the potential use of the surrounding environment in shaping the image of the building.
2. Utilizing the latest natural resources located around the planning area for building systems, whether related to building materials or for building utilities (energy sources, water supply).
3. Healthy building, which means that does not give negative impact to human health in process, operation / after-hours, and when demolition. It also includes a healthy location, healthy ingredients, healthy shape, and a healthy atmosphere.
4. Architectural elements are as optimal as possible to provide protection against heat, wind and rain.

5. The energy intensity contained in the materials used during construction should be as minimal as possible, in the following ways:

    • Substitution, minimization and optimization of non-renewable energy sources.
    • The establishment of an intact cycle between the supply and disposal of building materials, energy, or waste is avoided as far as possible.
    • The use of humane appropriate technology.

3.6 Results Planning

Fig. 1. Concept of Site Planning. (Source: Field Data (processed), 2016)
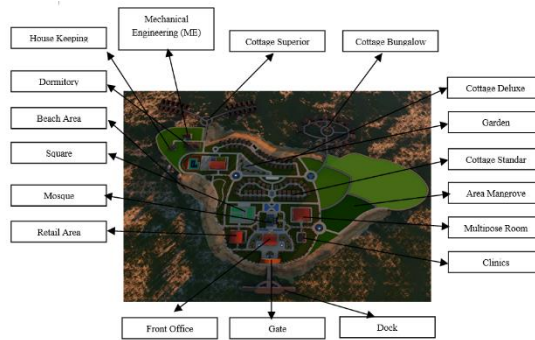
Fig. 2. Concept of Building Mass Management. (Source: Field Data (processed), 2016)

Fig. 3. 3D building mass allocation. (Source: Field Data (processed), 2016)

Fig. 4. Cottage Setup. (Source: Field Data (processed), 2016)

Fig. 5. Dock Development. (Source: Field Data (processed), 2016)

Fig. 6. Concept of Type Cottage Setup. (Source: Field Data (processed), 2016)

4   Conclusions

The development of Pulau Lancang Kecil as a water tourism area in Kepulauan Seribu, can be summarized as follows:

1. Pulau Lancang Kecil has two clusters of islands: Pulau Lancang Kecil Besar dan Pulau Lancang Kecil Kecil, where Pulau Lancang Kecil Besar as a settlement that has developed into water tourism. Meanwhile, Pulau Lancang Kecil Kecil is as nature conservation area.
2. The development of Pulau Lancang Kecil as a water tourism area in Kepulauan Seribu is focused on the development of existing condition by improving facilities such as infrastructure.
3. Development of Pulau Lancang Kecil in the eastern zone is planned as a water tourism area;
4. The concept of developing Small Lancang Island with the concept of 'Environmentally Friendly' means the arrangement of the environment by exploiting the potential or natural resources and the use of technology based on ethical management environmentally friendly, so it is expected that in addition to the new magnet will also occur even distribution of development in all environmentally friendly tourism sector for tourism sustainability.

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The Implementation of Social Media Marketing and Customer Relationship Management as a Competitive Advantage in Private Higher Education to Increase Student Loyalty

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Abstract. The purposes of the study is to determine the influence of social media marketing application to the loyalty of students and to competitive advantage, to determine the influence of the application of competitive advantage to student loyalty, to determine the influence of social media marketing application to the loyalty of students through competitive advantage , to know the influence of customer relationship management application to competitive advantage and to student loyalty, to know the influence of customer relationship management application to student loyalty through competitive advantage. This research includes explanatory research with the sample of research using purposive sampling with total 110 respondents of undergraduate students (S1) in five faculties at Budi Luhur University Jakarta which have been taking at least semester 4. Data were analyzed with Structure Equation Modeling (SEM) consisting of measurement model and structural model of AMOS program. Based on the results of research can be seen that, social media marketing does not affect the loyalty of students and the competitive advantage, competitive advantage affect the loyalty of students, competitive advantage does not mediate the influence of social media marketing to loyalty students, customer relationship management influential against competitive advantage and does not affect student loyalty, and competitive advantage mediate the influence of customer relationship management on student loyalty.

Keywords: Social Media Marketing, Customer Relationship Management, Competitive Advantages, Student Loyalty.

1   Introduction

The rapid growth and growth of private universities in Indonesia, especially in Jakarta, makes private universities implement the right business strategy in order to survive in the business world. Private universities should continually add new ways or breakthroughs in terms of interacting with their customers. In this case "private college customers" are students. Various strategies are applied to create competitive advantage. Social media marketing and customer relations management is a strategy applied to be successful in the face of competition and to create loyalty.

Research on loyalty has been widely studied, but research on the application of social media marketing and customer relationship management to loyalty through competitive advantage has not been widely studied in universities. The reason for this research is using private university object because in the previous research many use the object of manufacture. The selection of private universities is due to the increasingly dynamic development of private universities so that private universities must have new marketing strategies in marketing their products and have products that are differentiated and make their customers become loyal. The question is it true that the application of social media marketing and customer relationship management has consistently affected loyalty?

This research was conducted to develop model of social media marketing application and customer relationship management to loyalty by entering the mediation variable of competitive advantage. This research intends to fill the gap of research as follows: The inconsistency of the findings of previous research, which examines the relational relationship between social media marketing to loyalty and customer relationship management to loyalty needs to be done in service companies such as universities considering the previous research is mostly done in manufacturing; Adding the results of social media marketing research on loyalty and customer relationship management to loyalty in the field of education, especially private universities.

According to Porter (1998) by optimizing his strategy for a particular target segment, colleges that use focusing excellence seek to achieve competitive advantage in a narrow target segment despite not having overall competitive advantage. By serving a narrow and exclusive market segment, a college is expected to gain competitive advantage, enabling it to achieve institutional success and market success [20].

The most important for private universities is how to understand and meet the needs and wishes of students, so that the university can develop products, prices, distribution, promotion of service officers, service process, and the provision of physical facilities companies that can expand the market or increase market share college private. To capture new customers and retain customers, there needs to be a high commitment both in terms of funds and human resources and sophisticated technological support to ensure that the product quality is in accordance with the customers' wishes such as social media marketing on campus where they are studying and can give students satisfaction students become loyal with the implementation of customer relationship management.

2 Framework And Hypotheses Concept

Research conducted by Erdogmus and Cicek (2012); Murtiningsih and Ali Murad (2016) shows that social media marketing has an effect on brand loyalty [4],[12],[16]. In addition, the influence of social media marketing on brand loyalty can increase the attention of academic marketing and practitioners in marketing [11],[15],[24]. Based on the above opinion, it can be built as follows hypothesis:

H1: Social media marketing has an effect on loyalty.

The results of research conducted by Popescu and Alecsa (2015) states that social media marketing influence on competitive advantage. Social media is a strategy that can help companies in the face of excellence. Through social media companies can have differentiation that is not owned by competitors. Based on previous research, hypothesis can be made as follows:

H2: Social media marketing has an effect on competitive advantage.

The results of research conducted by Pudyanarti and Yuniati (2016) show evidence that competitive advantage affects loyalty [21]. The essence of competitive strategy can be described as a process of how firms build and develop their strategic resources that have the potential to produce competitive advantage, whichever advantages can be ambiguous on the one hand as instruments for performance and on the other as instruments to neutralize competing assets and competencies owned by a competitor. This process which consciously developed from time to time will in essence be a strong foundation for the achievement and development of sustainable competitive advantage [5]. Based on that opinion, the hypothesis is as follows:

H3: Competitive advantage affects loyalty.

Based on the results of research conducted by Erdogmus and Cicek (2012); Murtiningsih and Ali Murad (2016) show that social media marketing has an effect on loyalty, while research conducted by Popescu and Alecsa (2015) shows the result that social media marketing has an effect on competitive advantage, and research conducted by Pudyanarti and Yuniati (2016) evidence that competitive advantage affects loyalty. Referring to the concepts and results of previous research, this study examines the role of competing keuggulan in mediating the influence of social media marketing tehadap loyalty, based on the description above, the hypothesis presented are as follows [3],[16],[21],[22]:

H4: Social media marketing affects loyalty through competitive advantage

Several previous studies have provided evidence that there is an influence between the implementation of Customer Relationship Management (CRM) with the achievement of competitive advantage. Alipour and Mohammadi (2011) in his research concluded that CRM is very effective in order to achieve competitive advantage [1]. This relationship is reinforced by the results of research Nguyen, Sheriff, and Newby (2007) who said that the application of the right CRM can improve the company's ability in achieving the company's goal of maintaining customers and achieve competitive advantage over competitors [18]. Another study from Zikmund et al. (2003), said that if our business customers are assets, then we must think about the business customers now and in the future [25]. Verhoef and Lemon (2013) states that customer relationship management is a positive strategy in relationships with customers and can increase customer commitment and loyalty [23]. Other research conducted by Hunt, Arnett and Madhavaram (2006); Morgan and Hunt (1994); lee and kim (2014), Thomas and Sullivan (2005) argue that relationship marketing is the best way to identify customers like what customers need and can make customers loyal. Based on this opinion, the hypothesis can be constructed as follows [8],[9],[10],[13],[14]:

H5: Customer relationship management influences competitive advantage.

Another study conducted by Ndubis (2006) under the title "Relationship Marketing and Customer Loyalty" shows that there is a positive and significant relationship between relationship marketing and customer loyalty (customer loyalty) [17]. The results of this study are similar to the results of research conducted by Padmavathy, Balaji and Sivakumar (2012) where the results in the study showed that CRM has a significant positive effect on consumer loyalty [19]. Based on this opinion, it can be hypothesized as follows:

H6: Customer relationship management affects loyalty.

Based on research that has been done by Alipour and Mohammadi (2011); Nguyen, Sheriff, and Newby (2007); and Zikmun et al. (2003) states that customer relationship management affects the competitive advantage [1],[[6],[18],[25]. And the results of research conducted by Ndubis (2006); and Padmavathy, Balaji and Sivakumar (2012) have provided evidence that customer relationship management affects customer loyalty [17],[19]. Referring

to the concepts and results of previous research, this study examines the role of competing keuggulan in mediating the influence of customer relationship management tehadap loyalty, based on the description above, the hypothesis presented are as follows:

H7: Customer relationship management affects loyalty through competitive advantage.

3 Methodology

This research is included in the explanatory research category. Objects studied in this study are Social media marketing variables, Customer relationship management, Competitive Advantages, Loyalty of students, and the subject of this study are undergraduate students at least 4th semester who are in the five faculties at Budi Luhur University Jakarta. The research sample is set at 100 plus 10%, so the total sample is all (n) to 110 students. With consideration if there is a defect in collecting the remaining questionnaires still meet the minimum rules of sample size. If based on the proportion then the number of student samples of each faculty can be described in Table 1 below:

Table 1. The number of Sample in Research.

Fakultas	Jumlah	Prosentase %= (Σ@F / ΣJT) X 100%	Sampel S = % X ΣSK
FTI	606	33%	36
FIKOM	566	30%	33
FEB	484	26%	29
FISIP	125	7%	8
FT	77	4%	4
Jumlah Total	1.858	100%	110

Source: Data is processed by researcher, JT = Amount Total, ΣSK = Sample

The model of this research analysis using Structure Equation Model (SEM) with AMOS application (Analysis of Moment Structure). The research variables with their indicators are shown in detail in Table 2.

Table 2. Sources Referred for the Measurement.

No	Variable	Indicator	Source
1	*Social Media Marketing*	*Advantageous campaigns; Relevant contents; Popular contents; Various platform; Application on social media*	Erdogmus & Cicek (2012) [4]

2	*Customer Relationship Management*	*Identify; Acquire; Retain; Develop*	Kotler & Amstrong(2004) [12]
3	Competitive Advantage	*Makes Reguler repeat purchase; Purchase across product and service line; Refer other; Demostrates an immunity to the pull of the competition*	Griffin (2009) [6]
4	Student Loyalty	*Behaviour measures; Measuring swith cost; Measuring satisfaction; Measuring liking brand; Measuring commitment*	Bastian (2014) [2]

4   Analysis And Findings

Data analysis techniques using Structure Equation Modeling (SEM) using Analysis of Moment Structures (AMOS), was used to analyze the causal relationship between social media marketing, customer relationship management, competitive advantage and student loyalty.

The model has a good Discriminant Validity if the correlation value of each variable is below 0.85 [7]. The correlation value for each variable in this study is shown in Table 3 below:

Table 3. Inter-variable Correlation Value.

	Estimate

			Estimate
CRM	<-->	KB	,632
CRM	<-->	LM	,596
CRM	<-->	SMM	,825
KB	<-->	LM	,658
KB	<-->	SMM	,578
LM	<-->	SMM	,635
e16	<-->	e14	,351

Source: Output SEM AMOS 2017

Based on the data, we do not find any problems related to discriminant validity. This is because the correlation value of each variable is below 0.85. It can be concluded that all constructs in the estimated model meet the criteria of discriminant validity.

4.1 Composite Reliability

The estimation results on the value of composite reliability for social media marketing (SMM), customer relationship management (CRM), competitive advantage (KB), and student loyalty (LM) as described in Table 4 below:

Table 4. Composite Reliability Value.

Variable	CR
SMM	0,824
CRM	0,8
KB	0,789
LM	0,813

Source: Output SEM AMOS 2017

Based on the reliability analysis in Table 4 above, make sure that all constructs have good reliability. This is because each construct / variable has a value of composite reliability above 0.7. Thus it can be concluded that all variables have a good composite reliability value.

4.2 Test of Structural Model

Structural model testing performed to see the relationship between variables, Figure 1. Below shows full model structure equation analysis, is as follows:
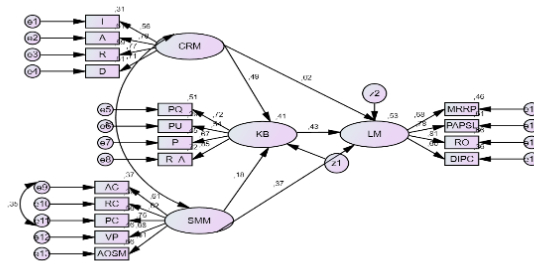
Fig. 1. Full Model Structural Equation Analysis. Source: Output SEM AMOS 2017.

The result of inner weight above shows that the strength of social media marketing (SMM) pathway affects student loyalty (LM) of 0.02; social media marketing (SMM) affects competitive advantage (KB) of 0.46; competitive advantage (KB) affect student loyalty (LM) of 0.43; customer relationship management (CRM) affects competitive advantage (KB) of 0.18; customer relationship management (CRM) affects student loyalty (KB) of 0.37.

4.3 Hypothesis Testing

The hypothesis test can be seen in Table 5, below can be seen from the value of T-statistics. The limit to reject the hypothesis value is submitted to the level of alpha significance at a value of 5% with a value of t = 1.960. Here are the results of direct impact testing. Here is the result of t-statistic estimation on result for regression weight.

Table 5. Regression Weight.

Direc Effect	Cooefecience	Prob.	Description
CRM --->KB	1,985	0,047	Significant
SMM -->KB	0,727	0,467	None Significant
KB --->LM	2,977	0,003	Significant
CRM --->LM	0,070	0,944	None Significant
SMM --->LM	1,609	0,108	None Significant

4.4 Indirect Effect Test

Indirect influence through indirect effect of influence variable of competitive advantage in influencing influence of social media marketing to student loyalty and influence of customer relationship management to student loyalty through competitive advantage, the presentation result are presented of indirect effect test:

Table 6. Indirect Effect Test Results.

Indirect Impact	Direct Impact Cooeficiency		Multiplication Outcome of Direct Effect	Description.
CRM -> KB->LM	CRM ---> KB 0,53	KB ---> LM 0,373	0,198	Partial Mediation

			0	

SMM -- > KB -- > LM	SM M -- - > KB 0,16 0	KB --- > LM KB 0,37 3	0,059	-

5 Hypothesis Discussion

5.1 Social Media Marketing Affects Against: Student Loyalty

Empirical facts show that social media marketing has no effect on student loyalty. This is not in line with research conducted [4] [16]. The value loading factor is the biggest in the possession of applications on social media, but not yet perceived well by the students. This is because students have not utilized sharing applications between lecturers and students in campus social media, and students have not optimized the use of social media on campus, as evidenced by students do not see share photos of activities published in social media such as blogs, Facebook, and twitter. By optimizing the use of social media marketing at Budi Luhur University Jakarta, it is expected to increase student loyalty.

5.2 Social Media Marketing Effects Against: Competitive Andvantage

Based on the analysis shows that social media marketing does not affect the competitive advantage. Based on the empirical results shows the reputation of the institution get the highest score. A good reputation from campus to student is an accumulation of assessment that takes no time. This study is not in line with the results of research conducted by Popescu and Alecsa (2015). Thus the University of Budi Luhur Jakarta should increase the use of social media marketing in order to improve the image of the institution and has a competitive advantage that is not owned by its competitors.

5.3 Social Media Marketing Effects Against: Student Loyalty

The results of the analysis show that competitive advantage affects the loyalty of students. This result is in line with research conducted by Pudyanarti and Yuniati (2016). Empirical facts show that a good reputation at Budi Luhur University Jakarta can make students refer to other people / friends / family to study at Budi Luhur University [21]. Recommending a positive experience of college students on campus is one of the loyalty of students.

5.4 Social Media Marketing Effects Against: Student Loyalty with Competitive Advantage

The result of analysis shows that there is no influence of mediation from competitiveness variables mediate the influence of social media marketing on student loyalty. Competitive advantage does not become a variable of mediation due to the direct influence between social media marketing to competitive advantage has a value that is not significant and on the influence of competitive advantage to the significant loyalties students. Because the value of indirect influence of social media marketing on student loyalty through competitive advantage

(0,059) is less than the value of direct influence between social media marketing to competitive advantage (0,160) and competitive advantage to student loyalty (0,373).

5.5 Cusomer Relationship Management: Influential on Competitive Advantage

The results of the analysis show that customer relationship management has an effect on competitive advantage. This research is in line with research conducted by Alipour and Mohammadi (2011), Nguyen, Sheriff, and Newby (2007), Verhoef and Lemon (2013), Hunt, Arnett and Madhavaram (2006); Lee and Kim (2014); Morgan and Hunt (1994); Thomas and Sullivan (2005). Empirical facts show that employees of Budi Luhur University who provide services to students with friendly and courteous can improve good reputation for Budi Luhur University Jakarta for its students.

5.6 Cusomer Relationship Management: Influential with Student Loyalty

The results of the analysis show that customer relationship management does not affect student loyalty. The results of this study are not in accordance with research conducted [17] [19]. Empirical facts show that the acquisition and recommendation to others is still not well perceived by the students because students assume the employees have not provided good service to the students so students are reluctant to recommend to others / family / friends.

5.7 Cusomer Relationship Management: Influential on Student Loyalty throuh Competitive Advantage

Based on the results of analysis shows that the variables of competitive advantage become the mediation variable on the influence of customer relationship management on student loyalty. The result of mediation test shows that the advantage of mediate partly on indirect influence, because the coefficient value of direct influence of customer relationship management to competitive advantage (0,530) and competitive advantage to student loyalty (0,373) is bigger than indirect influence from influence of customer relationship management to student loyalty through competitive advantage (0.198).

6   Managerial Implication

Based on the results of the research, there are several suggestions that can be given to the management to increase student loyalty are as follows:
1. Social Media Marketing, Budi Luhur University Jakarta needs to pay attention to the intensity of social media usage as a media campaign, because most of Indonesian people have made social media as part of lifestyle. If this concept is understood and applied by the managers of Budi Luhur University Jakarta in the present situation, then social media can be a force in doing promotion.
2. Customer Relationship Management, By providing services that can meet the expectations of students at Budi Luhur University Jakarta, the students will be more able to tell the ease of service at Budi Luhur University Jakarta, so this makes an emotional bond for students who already have a good relationship.
3. Competitive Advantages, Innovations created should be made sustainably, so it is not easily imitated by other universities

7   Future Research

This research is shown to know the factors that influence the loyalty of students at Budi Luhur University Jakarta, by looking at the background of research, justification theory and research methods, it can be said some limitations of this research are as follows: The results of this study cannot be generalized in the case outside the object of Budi Luhur University Jakarta; The results show that the research model is still not optimal, so there needs to be a re-development of this research.

Based on the limitations that have been submitted, the research on student loyalty can still be developed further in future research, in developing the relevant variables or constructs in improving student loyalty and not closing increase the larger sample size.

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Perspectives and Implications of Japanese Language Teachers on the Cooperative Learning Implemented in The Classrooms Conducted at Senior High Schools in Makassar

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Abstract. The purpose of this research is to figure out the perspectives of Japanese language teachers and the implementation of cooperative learning conducted in the classroom at five Private Senior High Schools in Makassar. The research found that the teachers haven't clearly understood the perspectives and implications of cooperative learning as thosearenot commonly used at their schools. The teachers, which are considered as the participants in this research, tend to usegroup discussionsin traditional perspectives which highly focuson the grammatical patterns,while the cooperative learning is consideredas one scientific approach in the 2013 curriculum. Group discussion activities with authentic and attractive topicsmay encourage the students' motivation as reflected from the 2013 curriculum to the recently implemented learning activities in their teachings. In the other words, the implementation of group discussionsin the classroom is still conventional in which the teachers still become the centers of attention in learning the grammatical patterns. The teachers have not completely understood the roles, procedures andstrategiesused in the effective group discussionsof modern perspectives to reach the goals regarding to theimplementation of cooperativelearning.

Keywords: Perspective, implication, conventional, cooperative learning.

1 Introduction

As the demands of communicative learning and teaching across the globe, including Indonesiahave rapidly increased, teaching paradigmsshould also gradually be shifted. Many language teachershave been thinking about the importance of those paradigms and trying to encourage students to learn without considering more onthe rigid grammatical rules in meeting the paradigms. Thus, students are expected to be able to use the language naturally and communicatively as the native speakers do.It means that the language should be authentic.

In order to improve the teaching methods and in respond to the shiftingparadigmsrelated to the recently global teaching trends, Indonesia has changed its curriculum several times. Indonesia has implemented the Competence Based Curriculum, with some revisions. As the government thought that it was no longer relevant, KTSP emerged to replace the previousone andeventually came to the most recent one called the 2013 curriculum which might also end by the year of 2017. Indonesiangovernment has been striving in such a way to socialize the latest

curriculum through teacher trainings that the teachers may use appropriate teaching methods and implement them in the classrooms across the nation up to the end of the program, which was, in 2017.Of course the names of curriculum have changed, but it is not necessary to change those required by anyonewho are directly involvedin this curriculum to change the previous traditional paradigm to show and implement the spirit of 2013 curriculum. The new curriculum and paradigm require many changes in term of syllabus and lesson plans, learning styles, teaching methods, classroom activities, scoring systems and students' evaluation.

Japanese is one foreign language taught at fivePrivate Senior High Schools in Makassar. Japanese language is regarded as one subject atSenior High Schoolswhich status have changed into "*lintasminat*" meaningthat students may choose one, no matterwhat majorthe students are taking. It is implied that Japanese language should be able to compete with the other foreign languages, such as Chinese, German, Arabic, and English. Due to the conditions, the government has been collaborating with The Japan Foundation in Jakarta since 2013 and simultaneously introduces and trains new teaching methods to the teachers, particularly in Makassar that the teachers become more competent in various aspects, such as in Japanese language mastery, pedagogic, and sociolinguistic competence. Those are prepared in order to enablethe Japanese Language program to be implemented based on 2013 curriculum.

Teachers play important roles to create the atmospheres for communicative teaching and learning as well as to facilitatestudents as the centers of classroom activities, expose themwith various experiencesand build their characters in the classroom [1]. Philosophy or moral values included in the curriculum are relevant with the cooperative learning discussed in this paper [2] Although cooperative learning practices in Japanese language class seem to be difficult to be implemented in Makassarcontext, it is quite interesting to investigate and figureout the teachers' teaching perspectives and implementation at Senior High Schools.

The scopes of this research coverJapanese language teachers' perspectiveson cooperative learning at five Private Senior High Schools in Makassar and how the teachers implement the cooperative learning in the classrooms. The purposes of the researchareto analyze 1) the Japanese language teachers' perspectiveson 2013 Curriculum at Senior High Schools in Makassar and 2) how the teachers implement 2013 Curriculum in the classrooms.

Richards, Plat and Platt (1992) in Byrammention that cooperative learning is not something in communicative-based teaching (Bayram, 2013) although both cooperative and communicative teaching are naturally and inherently taught in foreign language teaching [3],[4]. It is impliedthat the teaching paradigms have shifted from the traditional teaching approaches which are based on rote learning or grammatical rules to the communicative language teaching approacheswhich requirethe target languagesto be appropriately or authentically used as the native speakers do, instead of focusing on monotonous activities based on grammar rules.

Many articles and definitions on *cooperative learning* have been published, yet the authorsonly select some appropriate definitions regarding to the efficiency. cooperative learning is defined as "*An instructional arrangement in which small group or teams of students work together to achieve team success in a manner that promotes the students' responsibility for their own listening as well as the learning of others*" [5]. Kagan's definition is in accordance with that made by Mercer & Mercer's thatcooperativelearning is commonly implemented by the students to share information [6]. Azizinezhadmentions that many researchers have made various definitions on cooperative learning, yet some are more accurately described thatcooperative learning is a system in teaching and a technique in learning which urge the students to be active. Students play important roles in the classroom instead of passively listen to the teachers without involving in various activities [10]. Akdemirmentions that cooperative learning is a learning activity with a small group of students working togetherand supporting

each other in order to complete their tasks [7].Thus, the researchers conclude that based on the definitions mentioned above, cooperative learning is a small group discussion containing approximately five members who share information and work together. They are tolerant and responsible as each member plays important roles to design their learning strategies in order to achieve the goals.

Wina Sanjaya states that there are fouraspects in*cooperative learning*: 1) Members in a group. Students may form a group based on various reasons, such as interest, talent, background, ability, or mixed to achieve their learning objectives.2) Rules in a group. Each member engaged in a group should have an agreement on what they should do while making inside or outside interactions of the group. It means that as learnersthey shouldmake various contributions to their own group according to the assigned tasks, yet during activities they also need to make interactions with the othersor teachers in the classroom. 3) Effort to learn. Each member in a group has to work hard by improving their skills, such as sharing information, experiences, or ideas in such a way that all effortsare used to activate the previous background knowledge and new information. 4) Goal. They must achieve the goal through what established by the group involving planning and evaluation. It is expected that through the established goal, each member may understand the target they should achieve in their learning [8]. According to WinaSanjaya, a group discussion usually consists of 4-6 members whose academic background knowledge, genders, and ethnicityare normally different (heterogeneous). The cooperative learningcovers the followings: 1) Positive interdependentclassroomconditionsare created by the teacherswhichencouragethe students tohelp each other while doing several tasks and findingvarious resources, as well as playing different roles, yet they still require supports from others; 2) They make student-student or student-teacher face to face interactions; 3) Individual accountability shows subjectmasteryindividually learned in which the teacher showsthe assessment results to all members to make sure that each comprehends the lessons; 4) The learning process is in a group and its membersmay be identified through some activity stagesto ensure that theymay more effectively make contributions according to the goals in a group;5) Social skills-based activities may activate their knowledge to communicate and interactbetter. Leadership, decision makingandmanagementof conflicts are integrated parts within a group work thatthe teacher has to motivate the students on how to usetheir skills in learning [9]. Wina Sanjaya states that one of cooperative learning characteristics emphasizes on the processes of working together, not merely considering students' mastery onsubject materials or academic skills.

Wina Sanjaya states that cooperative learning may be explained based on some aspects, such as motivation, social, cognitive development, and cognitive elaboration perspectives [8]. WinaSanjayadescribes the cooperative learning procedures as follows: 1) the teachers has important roles to explain the subject materialguidelineswhich may be delivered through lecturing, brain storming, and question-answer session. Teachersmay use teaching media to createmore attractive learning processes; 2) the teachers askthe students to form groups regardless to their heterogeneous backgrounds. In terms of academic skills, one group might contain a member withadequately high skill level, two with average skill level, and otherswith below the average skill level. However, the formation may help the teachers to improve the one with the lowest skill level with the help of the other three through interaction in the group. 3) The assessment of cooperative learning may be conducted through tests or quizzes, both individually and in a group. The final scores of each student are obtained from individual and group scores which are divided by two. All members in a group get the same scores, while the individual score may vary since it is on the basis of each member performance. 4) A group showing the best performance mayobtain acknowledgement and be given awards to improve

the winning group members'learning motivation which may also encouragethe other groups to work better [8]. It is implied that cooperative learning is one step takento makethe students become more active and not dominatedby the teachers' instructions all the time. The teachers do not keep lecturing, but also encourage the students to share information through interactions and team works. In addition, teachersshould be able to create learning atmospheres that students are motivated and encourage each other to accomplish the tasks in a group.

Researches on cooperative learning have been conducted many times in some parts of the globe including the one conducted by Masoud Azizinehad entitled *"Application of cooperative learning in EFL classes to enhance the students' language learning"*, analyzingthe impacts of *cooperative learning* in English as Second Language (ESL) learners' performance and motivation as well as how they reach their academic achievement due to their various backgrounds in a group [10]. The other research on motivation conducted by Hui Zhou entitled *"Enhancing Non-English Major's EFL Motivation through Cooperative Learning",* shows how English lecturers at universities in China consider students' motivation as something important. This is due to the facts that there are few systematic ways implemented to increase L2 students' motivation [10]. Cooperative learning Method is also employed by engineering students in Malaysia to improve language learning motivation and it is considered significant to improve creativity and skills by working together within a small group to solve complicated tasks or exercises [11]. The implementation of cooperative learning method does not only stop at the bachelor degree but is also effective to be implemented at the early-age education and elementary school of one university in Spain. The researchers implement this method in linguistic learning (L1) and literary competence [11].

The research on cooperating learning above is based on the university's background which focuses on both English learning and non linguistic learning. Thus, the authors think that teachers have important roles in implementing this method in the class. The research on trainings of cooperative learning focusing on teachers has been conducted.This research categorizes the assessment on teachers as the research respondents joining the training of cooperative learning based on gender, education level, age, knowledge [12].

The authors argue that learning activities contained within 2013 curriculum is still new for almost all Japanese Language Teachers in Makassar because the curriculum has just been implemented in 2017.Thus, the authors consider that it is important to figure out and analyzethe perspective and implementation of cooperative learning in Japanese language learning in several private schools in Makassarwhich have already implemented 2013 curriculum.

2   Method

In this research, the authorsemploy adescriptive-qualitative method by interviewing the teachers as the research participants to obtainthe learning perspective on cooperative and its implementation in the Japanese language classrooms.

2.1   Research Background and Participants

This research uses a purposive sampling regarding tothe effectiveselecting participants. The research is conducted atfive Private Senior High Schools in Makassar. They are AthirahSenior High School, KristenSenior High School, FraterSenior High School, Katholik Senior High School, and Cenderawasih Senior High School. Meanwhile, the participants have experienced

learning processes with Japanese language teachers who have taught more than three years with differentJapanese proficiency levels. However, they have received trainings of Japanese teaching method conducted by The Japan Foundation in Jakarta.

2.2 Data Collection

The data are collected through the structured interviews. The main topic is a cooperative learning from the perspectives of Japanese language teachers by implementing the cooperative learningtogether with the teaching activities, problems,techniques, facilities, and six important elements in cooperative learning.In this research, the teachers are required to answer *open ended questions.* All conversations are recorded with OPPO F1s mobile phone, and then transcribed. The data taken from their conversation tape scripts analyzed based on problem statements.

3   Research Findings

3.1 Japanese Language Teachers' Attitudes Toward the Cooperative Learning

The data resulted from the interviews offiveJapanese language teachers indicate that basically,they have implemented teaching by conducting group discussionsalthough they have never heard the termof *cooperative learning* before. They have already knowncooperative *learning* in group discussions from traditional perspectives which normally mean working together to solvethe grammatical pattern practices.Three teachersare taken as samples coming from Private Senior High Schools: SMU Athirah(participant 1), SMU Kristen (participant 2) and SMU Muhammadiyah (participant 3)stating that they have frequently encouraged the students to implement group discussionsfor every topic ineach lesson. Meanwhile,the other two teachers come from SMUKatholikCenderawasih (participant4) statingthat theyless frequently create the atmospheres of group discussionsin the classroom, and the other one isfrom SMU Frater (participant 5) stating that group discussion is only conducted once a month.

Participant 4 strongly suggests that the implementation of group discussions does not work well as the classroom is difficult to manage, too many noises,some passive students, while those attentive studentscould not concentrate well.Since the teacherswere unable to handle the group discussions, s/he lets the students do the tasks individually, and select one student to see whether they could answer certain questions as instructed.

Participant 1, 3, and5 state that each group discussion consists of three to five students, while participant 5 states thatthe group discussion tends to be in pair-work which means that a group consisting of two students works together to accomplish the task.

In dividing the group, participant 1, 2, 3, and 5 dominate the decision makingin a group formation. The students feel that the teachersareconsidered much wiserto determinethe group formation;the teachersareconsidered more neutral and able to manage the group. The teachers tend to include one smart student to help the group. In facts, the distribution of smart students is proportionally divided.

Participant 1, 3, and 5 allocate 90 minutes for each lesson(two sessions per meeting). At the beginning of the meeting, three participants explain the grammatical rules including practicesapproximately foran hour,while the group discussion lasted only for 15 minutes. At the end of each discussion, the students are frequently assigned to prepare a small group presentation. Unfortunately, the undertaken steps are not well organized that teacher-student

gapsfrequently occur. During interviews, the participants admitted ofgiving to many grammar explanations and exercises rather than having interactive or communicative activities.

3.2 Strengthsand Weaknesses of Cooperative Learning Implementation Based on Teachers'Perspectives

Based on the data obtained from the interviews ofthose five Japanese language teachers, three participants have implemented group discussions, and mentioned the strengths ofgroup discussions: 1) Students may recognize each other better although the Japanese language class consists of students coming from different classes and majors (Natural Science and Social Science). 2) Because of working together, the studentsmay faster accomplish each task given. Two teachers state that their students prefer doing their tasks in the classroom rather than at home although they are allowed do so in groups.It seems that when students try to complete their work in group at one student' house, some students make various excuses, such as having too many assignments or they do not want to come home lateat night as their parents are worried thatthey may call the school to make sure that they really do their assignment in group together at home. 3) Students have their own roles to make various contributions to their group discussion. 4) Students with better skill levelmay provide motivation to those with below the average skill level that they may work together to accomplish their tasks to show that everybody in the group has important roles. 5) Students are trained to do their work together. 6) By working together in group they are trained to appreciate each other and avoid for being selfish. 7) When the students made presentations on Japanese Cultures, the teachersmay obtain new information from those presentations. 8) Lack of facilities or equipment, such as video tapes and LCD projectors may not support the cooperative learning activities. 9) The teachers find that the teaching aids, such ascards of pictures, copies of situations for role plays, and authentic materials such as magazines, brochures, etcmay help the students.

However, teachers still find problems inhibiting the *cooperative* learning, such as 1) Whenthe topics are on Japanese Cultures, the teachers find some difficulties on how to handle various resources the students obtain from internetas the teachers have to make sure which information is accurate or reliable. 2) Bothteachers and students areuneasily to find books on Japanese Cultures translated into Indonesian Language, 3) When the students deal with the topicson Japanese Cultures, they seem to be not focusingon what is being discussed and they rarely ask many questions, 4) To motivate the students for paying more attention, the teachers tend to threaten the students with the consequence of getting no scores if they do not participate in the group discussion. However, the teachers still cannot facilitate or control the students to actively engage in group discussion without force, 5) The teachers rely heavily on grammatical practices from books with few dialog practices, and poorly develop the authentic materials used in more natural situations, 6) The teachers are still unable to distinguish group discussion from*peer collaborative learning*, 7) The teachers dominate the classroom activities and tend to give explanatory guidance rather than to encourage the students to be more interactive, 8) The allocated time is not well managedwhenconductingthe *collaborative learning,* because sometimes there are some external interrupting factors, suchas time reduction due to the intensive programs which are not related tothe Japanese language lesson taught in the classroom*,* 9) The scoring management does not clearly reflect the *cooperative learning*scores based on processes rather than on results, 10) Teachers are still unable to optimize their efforts to motivate the students to activelyengage in completing their tasks in the classroom.

3.3 The implementation of*Cooperative Learning* in theClassroom forJapanese as Foreign Language

Based on the students'group discussion, participant 1 tends to focus on finding the meaning of vocabularies they have learnt from the Sakura book organized based on topics (the hand book recently used by SMU Athirah). The students conductthe discussion after watching the video played by the teachers taken from some parts of Sakura book. Meanwhile, the group discussion may determine their own roles; the students play their roles based on their interest or preference.For example, those who are not good or not confident at speaking may write for the group while the others engaged in group discussion. As each discussion is over, the students perform their presentations about the vocabularies and meanings they have discussed. During the presentations, the teachers scored them based on their active participation during the presentation; group discussion, as well as the presentation results.

Participant 2 implements group discussion focusing on the Japanese Cultures instead of the language itself. In this case, the students feel free to explore the topics on Japanese cultures from internet. By using mobile phones or gadgets equipped with Android operation systems, they may access information on Japanese Cultures more efficiently. After the discussion, the students performtheir presentations by showing posters related to the Japanese Culturesbased on the previously discussed topics.

Participant 3 states that the formation of group discussion is to encourage students to accomplish their grammatical pattern practices contained in the Sakura course book. If the students cannot comprehend or find difficulties to answer the questions, they may ask the teacher for help.

Meanwhile, participant 5 suggests that group discussion should be conducted in pairs as the instructions contained in the Sakura book states that the activities made in pairs are more preferable. After the discussion, the students practice the dialogscontained in the Sakura book in pairs in front of the class.

4 Conclusions

Based on the discussions above, it can be concluded that cooperative learning is still not yet popular among those five Private Senior High Schools in Makassar. Participants tend to view group discussions with traditional perspectives focusing on working together incompleting the grammatical pattern practices instead of motivating students to be actively engaged in group discussion by using the interesting and authentic topics. The teachers implement group discussion conventionally that they fail to realize their roles in the classroom. They do not teach studentsin appropriate discussion procedures or strategies. Cooperative learning which is conventionally implemented is not relevant with the modern perspective as teachingis intended to achieve the communicative competence.

The authors only conduct a research on cooperative learning to five Japanese language teachers coming from five different Private Senior High Schoolsin Makassar. The collected data are still very limited to those five teachers that the researchersmay not generalize the results. However, the research on cooperative learning may be viewed from different perspectivesand developed withthe other aspects, such asmotivation, strategy, and etc.

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On-Time Graduation Prediction System Using Data Mining Classification Method

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Abstract. The collection of data on academic information system database of Higher Education is often not utilized maximally, whereas from data with data mining technique can give knowledge which not yet known before. The purpose of this research is to know how to form the prediction model of student's graduation rate on- time at Buddhi Dharma University of Tangerang through student passing data. Prediction of student graduation on-time using comparison of algorithm C4.5 and K-NN done with data selection stage, data transformation, data mining and interpretation. This study uses 300 training data and 90 data testing. Then the process of classification technique using decision tree method using C4.5 algorithm and Euclidean distance calculation using K-NN algorithm. Evaluation of classification performance is done to know how well the accuracy of a model is formed. Based on the research that has been done, the model is formed with the help of Rapid miner software, and calculated average value of k-fold cross validation on testing up to k = 10 for algorithm C4.5 and K-NN. Testing is done with Confusion Matrix and ROC curves. Accuracy results obtained prove that Algorithm C4.5 yields 90% accuracy percentage and K-NN yield 87% accuracy percentage. Thus the C4.5 algorithm has a higher accuracy value than K-NN. This C4.5 algorithm can be used as prototype predictions of students' graduation on-time at Buddhi Dharma University Tangerang.

Keywords: C4.5, K-NN, Data Mining, K-Fold Cross Validation, Confusion Matrix.

1 Introduction

The evolution of information technology is so advanced today, causing the level of accuracy of a data is needed in life. Any information that exists becomes an important thing to determine every decision in a particular situation. This leads to the provision of information into a means to be analyzed and summarized into a knowledge of useful data when making a decision.

Higher education institution is a college which is the organizer of academic education for students. Universities are required to provide quality education for students to produce intelligent, ethical, creative and competitive human resources. In the education system, the student is an important asset for an educational institution and for that matter the student's

graduation rate is on time. The percentage rise and fall of the students' ability to complete on-time graduation is one of the elements of university accreditation assessment.

1.1 Data Mining

Data mining is an activity of extraction to obtain important information that is implicit and previously unknown, from a data. Data mining is defined as the process of finding patterns in the data. This process is automatic or (usually) semi-automatic.

1.2 C4.5 Algorithm

The C4.5 algorithm is designed by J. Ross Quinlan, named C4.5 because it is descended from the ID3 approach to construct decision trees. C4.5 is a suitable algorithm used for classification problems in machine learning and data mining. C4.5 maps the attributes of the classes so they can be used to find predictions for data that have not yet appeared. In the decision tree the central node is an attribute of the tested data (tuple), the branch is the result of the attribute test, and the leaf is the class formed. The stages in the C4.5 algorithm framework are:

a. Note the label on the data, if it is all the same, then the leaves will be formed with the value of the entire data label.
b. Calculating the total value of the information (Entropy)

$$\text{Entropy} = -\sum_{i=1}^{m} p_i \log_2(p_i) \tag{1}$$

c. Calculate the info value of each attribute (Info)

$$\text{Info}_A(D) = \sum_{j=1}^{v} \frac{|D_j|}{|D|} \times \text{Info}(D_j) \tag{2}$$

d. Calculating the gain value of each attribute (Gain)

$$\text{Gain}(A) = \text{Entropy} - \text{Info}_A(D) \tag{3}$$

e. After the decision tree branch is formed, the calculation is performed again as in steps a through d. However, if the branch has reached the maximum allowable branches, the leaf will be formed with the majority value of the data value.

1.3 K-NN Algorithm

The K-Nearest Neighbor (K-NN) algorithm is a method for classifying objects based on learning data closest to the object. The K-NN algorithm uses a supervised algorithm. The difference between supervised learning and unsupervised learning is in supervised learning aims to find new patterns in data by linking existing data patterns with new data. Whereas in unsupervised learning, data does not have any pattern, and the purpose of unsupervised learning to find patterns in a data.

Nearest Neighbor is an approach to calculate the proximity between a new case and an old case, based on matching of a number of features. To define the distance between two points ie the point on the training data (x) and the point in the data testing (y) then used the Euclidean formula, with the equation:

$$D\,(x,y) = \sqrt{\sum_{i=1}^{n}\left(x_i - y_j\right)^2} \tag{4}$$

Stages in the K-NN algorithm are:

a. Specifies the parameter k (the number of nearest neighbors).
b. Calculates the square of the Euclidean distance (query instance) of each object against the given training data.
c. Then sort those objects into groups that have the smallest Euclidean distance.
d. Gathering a new category k (classification of Nearest Neighbor)
e. By using the most Nearest Neighbor categories, the predicted value of the counted query instance can be predicted.

1.4 K-Fold Cross Validation

In this research, the method used to test the classification pattern is by k-fold cross validation method. In the k-fold cross validation data is divided into k section, $D_1, D_2 ... D_k$, and each D has the same amount of data. Testing with k = 5 or k = 10 can be used to estimate the error rate, because the training data on each fold is quite different from the original training data. Calculating the value of its accuracy can be done using equations:

$$Accuracy = \frac{Amount\ of\ right\ class}{Amount\ of\ data} \ x\ 100\ \% \tag{5}$$

2 Study Overview

Table 1. Comparison of similar studies.

No	Research	Algorithm	Result
1.	Model Algoritma K-Nearest Neighbor (K-NN) Untuk Prediksi Kelulusan [1]	K-Nearest Neighbor (K-NN)	The highest accuracy value in the data cluster k = 5 is 85.15% and the AUC value is 0.888.
2.	Implementasi Teknik Data Mining Untuk Memprediksi Tingkat Kelulusan Mahasiswa Pada Universitas Bina Darma Palembang [2]	Decision Tree J48 (C4.5)	By using 3-fold cross validation test option. The average classification of the J48 algorithm reaches 90% accuracy.
3.	Implementasi Data Mining dengan Algoritma C4.5 untuk Memprediksi Tingkat Kelulusan Mahasiswa [3]	Decision Tree J48 (C4.5)	Predicted accuracy of 87.5% of 60 training data and 40 data testing
4.	Perancangan Aplikasi Prediksi Kelulusan Tepat Waktu Bagi Mahasiswa Baru Dengan Teknik Data Mining [4]	K-Nearest Neighbor (K-NN)	Predicted accuracy of 83.36%
5.	Model Prediksi Tingkat Kelulusan Mahasiswa Dengan Teknik Data Mining Menggunakan Metode Decision Tree C4.5 [5]	Decision Tree C4.5	Testing resulted in accuracy of 61.22%.
6.	Penerapan K-Optimal Pada Algoritma K-NN untuk Prediksi Kelulusan Tepat Waktu Mahasiswa Program Studi Ilmu	K-Nearest Neighbor (K-NN) with k-fold	Results obtained from k = 5 with an accuracy of 80% applied as k-optimal

	Komputer Fmipa Unlam Berdasarkan IP Sampai Dengan Semester 4 [6]	cross validation	
7.	Identifikasi Lama Studi Berdasarkan Karakteristik Mahasiswa Menggunakan Algoritma C4.5 [7]	Decision Tree C4.5	Accuracy of classification reached 90%, test results totaling 40 test samples showed an accuracy of 67.5%
8.	Implemenasi Algoritma K-Nearest Neighbor Untuk Prediksi Waktu Kelulusan Mahasiswa [8]	K-Nearest Neighbor	Accuracy of 90%

3   On-Time Student Graduation Decision

Based on the number of students who graduated inappropriately in time at Buddhi Dharma University related to academic report of year 2016 about 28,36% increase 5,2% from previous year, hence existence of prototype prediction information system this is mandatory requirement and must be implemented for management of the university to conduct evaluation and monitoring every semester. Based on the policy of the Vice Rector I that the on-time graduation must be based on the academic guidebook where for the stratum level one is a maximum of 8 semesters or 4 years. The hypothesis of this research are:

a. Suspected algorithm C4.5 and K-NN is an algorithm that can be used to predict on-time graduation of students according to the availability of data at Buddhi Dharma University.

b. It is suspected that the most accurate classification algorithm for predicting student graduation on-time is the C4.5 algorithm.

4   Design of Predicting Information System

4.1   Research Methodology

In this research will use dataset which is used as training data and data testing as much as 390. Training data will be used for formation of algorithm pattern C4.5 and K-NN. Training data will be used for the formation of algorithm pattern C4.5 and K-NN. Then the data testing is used to test the algorithm pattern that has been formed. In algorithm C4.5, the process determines the category on-time or not a student graduated by using the steps that have been discussed in the stages of algorithm C4.5 where sought total entropy overall training data.

Next process are calculate the gain attribute calculation to determine the node of the tree and subsequent branch, the rule that has been formed will be tested into the data testing. While in the K-NN algorithm, the process of determining the category on-time or whether a student graduated by calculating proximity distance with the entire training data using euclidean distance equation, the smallest value of the overall calculation of training data is a category defined as a prediction class of data testing. In the development will be made a prototype web-based information system with PHP and MySQL. The result of this research is the implementation of C4.5 algorithm into the prediction information system on-time prediction of students' graduation at Buddhi Dharma University.

4.2 Sample Selection Method

The data used in this study is secondary data, the data used is taken based on the data of graduation of Buddhi Dharma University students 2010, 2011 and 2012 with the stratum level 1 of the entire study program.

4.3 Research Steps

The steps used in this study adopted several steps contained in CRISP-DM model (Cross Standard Industries Process for Data Mining), in this research there are 6 stages:

a. Phase of business understanding process
   The purpose of the research will be to predict whether students graduate on-time or not at Buddhi Dharma University. The data that will be used in this study is the data of students who graduated from 2010 to 2012 as many as 13 attributes and 390 records with details of 300 records for training data and 90 records for data testing.

b. Phase of data understanding
   Alumni data for training data and test data collected has 390 records and 13 attributes. All these attributes are collected and analyzed to view dominant data patterns and data types to assist in the process of selecting appropriate data mining methods and algorithms.

Table 2. Attribute and Description.

No.	Attribute	Description
1.	Waktu_kuliah	Time Session
2.	Jenis_kelamin	Gender
3.	Prodi	Study Program
4.	Ips1	Grade Point (GP 1)
5.	Ips2	Grade Point (GP 2)
6.	Ips3	Grade Point (GP 3)
7.	Ips4	Grade Point (GP 4)
8.	Ipk_4	Grade Point Average (GPA 4)
9.	Total_ SKS_ Lulus4	Amount of SKS that has passed until the 4th semester
10.	Jur_Asl_Sekolah	Major of school
11.	Status_Asal_Sklh	Graduated school status
12.	Status_Pek_Ortu	Parent's job status
13.	Cuti	Leave of absence amount

c. Phase of data processing
   This research was conducted from the previous phase results. Alumni data collected in the previous stage after selection there are 13 attributes that will be managed for the modeling stage. To enter the next stage then made observations of the data and found some data discrepancies and require preprocessing stages.

d. Phase of modeling
   The modeling process is done by testing the data mining methods to be compared ie C4.5 and K-NN against 13 existing attributes. In the process of modeling will be seen the accuracy of each method. At this stage also conducted experiments on the attributes of

alumni data in the form of modifications or delete attributes that have no significant effect. This is done to increase the value of accuracy. The testing process of each method will be carried out using the 10-folds cross validation testing technique that produces the test statistic values of accuracy, precision, recall and f-measrure. The method with the best accuracy value will be implemented on the prototype to be designed. Testing methods will be done with the help of tools rapidminer 5.3.

e. Phase of Evaluation
   The method with the best accuracy value will be implemented on the prototype to be designed. The evaluation phase will be performed by testing the prototype using data other than the training data that has been used during the modeling process, to determine the error rate in the model used. The data used amounted to 90 records will be predicted graduation students on-time or not based on reality data.

f. Deployment
   After forming the model and analyzing and measuring in the previous stage, then at this stage also applied the most accurate model for the determination of the classification of students' predictions on-time graduation.

5 Result

The resulting model will be comparative to find the best level of accuracy that will be used to determine the pattern of the ability of students who have the ability to pass on-time or not. In this research, the validation process is done to find, and convert the data to be used in data mining algorithm method and get good accuracy and performance. In the dataset to be used this, the validation of data used is to delete incomplete or empty data that has no value (null). After that, attribute selection is done to select which attributes are needed from the dataset used in the process of analyzing the student's graduation on-time at Buddhi Dharma University.

Table 3. Comparison of accuracy and AUC.

Prediction	C4.5 Algorithm	K-NN Algorithm
Success prediction on-time	171	169
Success prediction not on-time	99	93
Level of Accuracy	90.0%	87.3%
AUC	0.874	0.500

By looking at the comparison of accuracy and AUC, it can be seen that the C4.5 algorithm has the best accuracy and performance, so the rule generated by C4.5 algorithm serve as the rule for prototype making which can facilitate the prediction of the student's on-time graduation.

6 Implementation

Fig. 1. Data Training Form.

In Fig 1, it shows a form data training which is the whole training data used in this research. Data Training on this menu is read only.

Fig. 2. Data Testing Form.

In Fig 2, it shows a form data testing that's can be imported from excel file that already exist according to the format of the column used.

Fig. 3. Data testing form that has been imported.

In Fig 3, it shows a data testing form that has been imported. It's a predicted system with color, where green is indicated that the prediction is done correctly and red is indicated that the prediction is wrong, making it easier for the user to evaluate. To view the summary of testing data, click summary button and the display will be as shown in Fig 4.

Fig. 4. Summary data testing form.

The summary of the testing data in Fig. 4 consists of a confusion matrix that represents the test results of imported testing data and calculates the accuracy, precision, recall and f-measure values. In Figure 6 it can be seen that with a student count of 90, the fifty nine students are predicted accurately able to pass on-time and twenty three students are predicted to pass right not on-time. So from a total of 90 data successfully predicted as many as 82 data, so the accuracy value obtained as follows:

$$\text{Accuracy} = \frac{(\text{T on time}+\text{T not on time})}{(\text{T on time} + \text{F on time} + \text{T not on time} + \text{F not on tine})}$$

$$= \frac{(59+23)}{(59+2+23+6)}$$

$$= \frac{82}{90} = 0.9111$$

$$= 91,11\%$$

7 Summary

7.1 Conclusion

From the measurement of performance and performance that has been done on two methods of classification algorithm, the result of this research can be concluded that:
a. Data mining classification method is appropriate to be implemented into the prototype of student predictions information system on-time.
b. The C4.5 algorithm has the best accuracy between the two classification algorithms. This algorithm will be implemented into the prototype predictions of graduation students on-time. It can be seen that C4.5 algorithm has an accuracy value of 90% and AUC value of 0.874 which belongs to the category of good classification

7.2 Suggestion

a. Using other classification algorithms contained in data mining, such as Naïve Bayes, ID3, CART, Random Forest, Linear Discriminant Analysis and Support Vector Machine algorithms.

b. Adds optimization algorithms such as PSO (Particle Swarm Optimization), Backward Elimination, Forward Selection, and GA (Genetic Algorithm)

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Performance of Private Vocational Teacher: A Study on Influencing Factors in Central Java

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Abstract. This research investigates the influencing factors of performance of private vocational teacher in Central Java. The influencing factors of performance are Principal Leadership, Organizational Climate, and Job Satisfaction.This study use descriptive correlational design and multiple regression analysis. There are 60 of 234 respondents were selected from two schools using convenience sampling. The results of this study are the mean score of principal leadership is 95.25, the mean score of organizational climate is 96.43, and the mean score of job satisfaction is 77.90. The results of regression test are (1) principal leadership have significant positive on teacher performance, (2) organizational climate have positive and significant impact on the teacher performance, (3) job satisfaction have positive and significant impact on teacher performance, (4) there are no simultaneous effect between principal leadership, organizational climate, and job satisfaction on the performance of private vocational teachers.

Keywords: Principal Leadership, Organizational Climate, Job Satisfaction, Teacher's Performance.

1 Introduction

The success of a school is to apply all aspects of school planning that must be supported by the principal leadership. The principal leadership is the driving of school resources, especially teachers and school staff. The principal leadership factor is a factor that concerns to optimize school quality. A strong principal leadership will be able to optimally utilize school facilities and infrastructure efficiently and accountably. The principal leadership is the strongest key in a school to achieve the quality of professional development and educational programs [1]. The principal's job is to lead the school and be responsible for the achievement of the school's goals and to be the school's innovation leader. Principal leadership skills are a distinguishing factor in the educational process at school [2]. Innovation in schools as a differentiating factor can inspire teachers with the support of adequate resource capacity, good working environment, high teacher work motivation and teacher's desire to get good job satisfaction..

Work environment in question is the physical and psychological conditions in schools as safe and pleasant flavor that may cause the urge teachers to work [3]. This good environment

that will affect the perceived teacher behavior such as leadership, policies and management practices that support, task structure, organizational commitment is happening. An organization that is conducive climate will always be associated with a positive work attitude. (Rossow, 1990) in the study mentioned that the climate is pleasant if they can pass something that can lead to feelings of worth, given the responsibility of leadership and the opportunity to succeed [4]. (Hoy, K, & Miskel, 1991), the determining factors of the organizational climate of the school consisting of, disengagement, hindrance, esprit, intimacy, aloofness, production emphasis, thrust and consideration [5]. The first four factors related to teachers 'perceptions about their interaction fellow premises, while four other factors relating to teachers' perceptions about their interaction with the principal. Teachers try to improve the mastery of competence of learners so as to obtain a certificate of competence and increase competence.

Educational success make changes can be seen from the level of performance, and demanded to encourage creativity, empathy, motivation strong teachers, and create a conducive working environment. Ginting in (Litwin & Stringer, 1968) states that the role of this organization allows the can improve the competence of teachers work as long as the teachers got the attention of its role in achieving the objectives [6]. This is in line opinion of Litwin and Stringer in (Ali, 2005) that teachers expect school atmosphere characterized in (1) a sense of responsibility, (2) standards or expectations about the quality of work, (3) reward, (4) flavor fraternity, and (5) the spirit of the team. Criteria of a hope it will bring a positive influence to create a good performance [7].

Thomlinson (2004) mentions the teacher continues to be encouraged to learn to be able to work together to be mutual understanding between the teachers [8]. This means teachers who have a strong empathy will have a sense of togetherness and it can be used for a basic build team work in schools. Reform in education is happening in various parts of the world are 1) a change of the management model based on centralized to decentralized, 2) increasing government intervention to improve education outcomes; 3) an emphasis on performance, efficiency and accountability; 3) modification of education; and 4) the influence of society (market) and competition between schools. Such changes would affect the school leadership. The implications of these changes is the high expectations and intense performance of principals to deal with external changes, internal consolidation, resource utilization and public accountability, needed a good performance.

Various studies have shown that if the job someone has the autonomy to act, there are variations, providing an important contribution to the success of the organization and obtain feedback on the results of the work performed, the question will be satisfied [9]. With regard to job satisfaction of teachers, teachers' involvement in decision-making in schools, recognition of the perceived teacher, teacher expectations, the relationship between personnel that occurred in the work environment, and the authority received by teachers De Roche in [10]. By knowing the level of these factors, it can be seen satisfaction levels teachers. Teacher job satisfaction to note are (1) Recognition and awards are very valuable for teachers. Basically teachers expect their basic needs are met. If the profession and his achievements are recognized, then one of the teachers feel their basic needs are met.

Based on the above description, it can be seen that there is a relationship between school leadership, organizational climate, job satisfaction on the performance of teachers at private vocational school Regency in Tegal. But how they affect and how LE research needs to be done, by placing the issue is one of the factors determining the quality of education is the teacher's performance. There are quite a lot of factors that affect the performance of teachers made possible infrastructure such as education, students, curriculum, motivation, management of human resource development (teacher), school leadership, organizational climate, job

satisfaction of teachers; Teacher job satisfaction contributed to the creation of a teacher's performance; School leadership to be one of the determinants of good or poor performance of teachers. School organizational climate contribute to the creation of teacher performance and student academic achievement; School leadership, school organizational climate and job satisfaction affect the possibility of the teacher's performance.

2 Method

This research is trying to find a relationship between the variables of the study. This study includes quantitative research ex post factors search design in a correlational study (correlation design). Research by the ex post factors method is finding empirical systematic where research her scan not directly control the independent variable (X) because the event has occurred, researchers are not prosecuted provide treatment to the independent variables, but examine the facts that have occurred or been done by the study subjects, then measure the effect of these independent variables on the dependent variable specified [11].
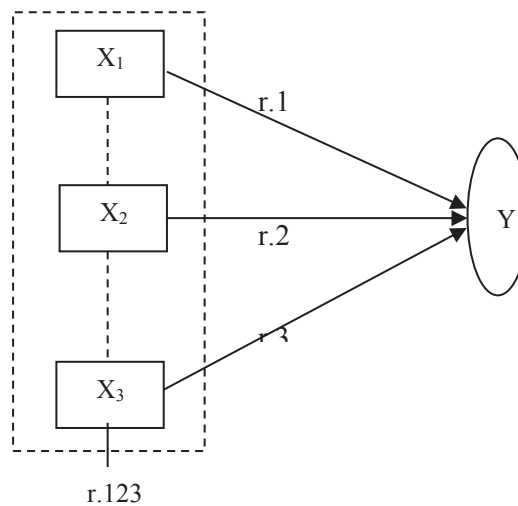
Fig. 1. Research Model.

Description:
r.1   : The contribution of principal leadership(X_1)on teacher's performance(Y)
r.2   : The contributionof organizational climate(X_2) on teacher's performance(Y)
r.3   : The contributionof job satisfaction(X_3) on teacher's performance(Y)
r.123   : The simultaneous contributionof principal leadership(X_1),
       organizationalclimate(X_2),job satisfaction(X_3) on teacher's performance(Y)

The population in this study is vocational teachers in Tegal, Central Java. Principal leadership (X1), organizational climate (X2), job satisfaction (X3), are the independent variable and the dependent variable (Y) is the teacher's performance. The development of all the instruments carried by researcher. As for the questions in the questionnaire drawn up in the

form of positive and negative statements. Each of the questions that are positive is given a score ranging from five to one, while the questions that were negative were scored from one to five. Alternative answers item can be measured with a Likert scale customized and alternative answers given by weighting.

3 Results And Discussion

The research was conducted on 60 teachers of private vocational school Regency in Tegal, is the result of field studies are taken with a questionnaire to uncover the variables of school leadership, organizational climate, job satisfaction and teacher performance as perceived by the respondents.

Table 1. Descriptive Respondents.

Principal Leadership

No.	Range Score	Freq.	%	Category
1	25 – 45	0	0	Not good
2	46 – 65	2	3.3	Not good
3	66 – 85	17	28.3	Pretty good
4	86 – 105	23	38.3	Good
5	106 – 125	18	30	Very good
	Total	60	100	

Organizational Climate

No.	Range Score	Freq.	%	Category
1	23 – 41	0	0	Not good
2	42 – 60	1	1.7	Not good
3	61 – 78	3	5	Pretty good
4	79 – 97	24	40	Good
5	98 – 115	32	53.3	Very good
	Total	60	100	

Job Satisfaction

No.	Range Score	Freq.	%	Category
1	21 – 38	0	0	Not good
2	39 – 55	2	3.3	Not good
3	56 – 71	9	15	Pretty good
4	72 – 88	40	66.7	Good
5	89 - 105	9	15	Very good
	Total	60	100	

Teacher's Performance

No.	Range Score	Freq.	%	Category
1	31 – 56	0	0	Not good
2	57 – 81	1	1.7	Not good
3	82 – 105	4	6.7	Pretty good
4	106 – 130	29	48.3	Good
5	131 - 155	26	43.3	Very good
	Total	60	100	

From the comparison table the average score of each variable can be seen that the private vocational school teachers Tegal. Good performance seen from the average performance score is 126.23, it is known also that teacher performance is good in general, good school leadership, school organizational climate is also good, so with a high work satisfaction. It can be concluded that the performance of good teachers seem to be influenced by the leadership of the principal good, which is also good organizational climate and teacher job satisfaction is high. However, it must be tested and proven in advance through good relations with the linearity test is simple and multiple regression.

The calculation result of simple regression analysis on the relationship between school leadership and teacher performance as in the table obtained value of a = 71 152 and coefficient b = 0.574, so the regression equation is $Y = 71 152 + 0.574X1$. The calculation results of regression analysis of school leadership on teacher performance can be seen in the following table.

Table 2. Regression analysis of school leadership on teacher performance.

Model	R	R. Square	Adjusted R Square	Standar Error of the Estimate	Durbin-Watson
1	0.668[a]	0.446	0.436	10.98	1.869

Informations:
a. Predictors   : (Constant), Leadership
b. Dependent Variable : Performance

The regression equation $Y = 71 152 + 0.574X1$ can to explain the predictions have indicated that an increase in one unit of the principal's leadership will be followed by improvement of teacher performance amounted to 0.574 units. In order to determine the level of significance/significance of the regression results between school leadership with teacher performance test ANOVA.

Influence of Organizational Climate on Teacher Performance
From the calculation of simple regression analysis on the relationship between organizational climate and teacher performance as shown in Table 3 obtained value of a = 27 341 and coefficient b = 1.025, so the regression equation is $Y = 27 341 + 1.025X2$.

Table 3. Table regression analysis of organizational climate on teacher performance (Model Summary).

Model	R	R. Square	Adjusted R Square	Standar Error of the Estimate	Durbin-Watson
1	0.715[a]	0.511	0.502	10.32	2.147

Informations:
    a.   Predictors   : (Constant), Climate
    b.   Dependent Variable : Performance

Table 4. Table regression analysis of organizational climate on teacher performance (Coefficients).

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	b	Std. Error	beta		
1 (constant)	27,344	12,784	0,715	2,139	0,037
CLIMATE	1,025	0,132		7,778	0,000

Effect of Job Satisfaction on Teacher Performance

From the calculation of simple regression analysis on the relationship between job satisfaction (X3) and teacher performance (Y) as shown in Table 7 obtained value of a = 60 721 and coefficient b = 0.841, so that the regression equation is Y = 65 721 + 0.841X3.

Effect of Principal Leadership, Organizational Climate and Job satisfaction to the Teacher Performance

From the calculation of multiple regression analysis on the relationship between school leadership, organizational climate, job satisfaction and teacher performance as shown in Table 7 obtained value of a = 7238 and a coefficient b1 = 0328, b2 = 0686, b3 = 0.278 so that the regression equation is Y = 7238 + 0.328X1 + 0.686X2 + 0.278X3.

Table 5. Regression analysis of school leadership, organizational climate and job satisfaction on the performance of teachers (Anova).

Model	Sun of Squares	df	Mean Square	F	Sig.
Regression	8790,365	3	2930,122	42,838	0,000[2]
Residual	3830,368	56	68,399		
Total	12620,733	59			

Based on the table above the school leadership, climate and job satisfaction will be followed by improvement of teacher performance.

Based on the table obtained F value of 42 838 and significance 0.000. These results indicate that Ho simultaneously rejected because the value of the significance level of 0.000 <0.05. With the rejection of Ho meaningful alternative hypothesis (Ha) in this study received, that there is a significant effect of school leadership, organizational climate and job satisfaction on the performance of private vocational school teachers Tegal. Besides contributing to the performance of teachers' job satisfaction by 69.7%, while the remaining 30.3% is determined by other factors.

Table 6. Table on the calculation coefficient of determination.

Model	R	R. Square	Adjusted R Square	Standar Error of the Estimate	Durbin-Watson
1	0,835ᵃ	0,697	0,680	8,27	1,996

Informations:
   a. Predictors   : (Constant), Satisfaction, Climate, Leadership
   b. Dependent Variabel   : Performance

Based on the analysis in the description of this research, it is known that private vocational school leadership Tegal generally good. Abilities oriented task structure is the ability to create tasks and emphasis on productivity, and the abilities of subordinates is oriented to the needs of subordinates, tolerance and provide the freedom and ability to unite subordinates. This variable gain total average score of 92.25. The figure includes both because it is between the range of scores 86-105.

From the results of research and testing hypotheses above, it is evident that there is a positive and significant effect of school leadership, organizational climate and job satisfaction on the performance of teachers either partially or together. The correlation coefficient of school leadership on teacher performance (r_{xy}) of 0668 so that the magnitude of the effect is 0.446 (44.6%). This shows that if principals are getting better at performing the task leadership, then the teacher's performance will be better, and vice versa if the principal in carrying out the task of leadership has little or no good, then the teacher's performance will also be reduced. The correlation coefficient organizational climate variables on teacher performance (r_{xy}) of 0715 so that the magnitude of the effect was 0511 (51.1%). This shows that there is a positive and significant effect of organizational climate on teacher performance that is equal to 0511. Thus, it means if the climate is the organization created a favorable climate/fun, it will provide positive support for teachers in work.

While the correlation coefficient of job satisfaction on teacher performance (r_{xy}) of 0552 so that the magnitude of the effect was 0305 (30.5%). This shows that if teachers feel satisfied at work, then the teacher's performance will be better, and vice versa if the low job satisfaction in, then the teacher's performance will also be reduced. When you see the results of simple regression analysis (effect of school leadership on teacher performance, the effect of organizational climate on teacher performance, the effect of job satisfaction on teacher performance), then that gives big influence teacher performance is an organizational climate that is equal to 51.1%, followed by the influence of leadership school that is equal to 44.6% and then the effect of job satisfaction on performance that is equal to 30.5%. Likewise, when seeing the results of regression analysis of the influence along the principal's leadership, organizational climate and job satisfaction on the performance of teachers, organization climate contributed the most affecting teacher performance that is equal to 0.68, followed by school leadership that is 0328, and the job satisfaction that is equal to 0276.

From the analysis, it can be stated that the organizational climate perceived pleasant, conducive environment and the importance of teachers to the organizational structure that is open, giving responsibilities, policies and management practices that support, the involvement of teachers in the organization and commitment of teachers in the task, can provide a major influence on the performance of private vocational school teachers Tegal, supported by the

behavior of a good school leadership. This is because the principal as leader figure that contributes also to the success of the school, as well as the direct supervisor of teachers. Surely the principal implementing policies in the lead-oriented tasks while keeping the relationship with the teachers (oriented subordinates). According (Campbell & Southwort, 1993) the characteristics of task-oriented leadership behaviors are as follows [12]: (1) give priority to the achievement of organizational objectives; (2) The production of high importance; (3). prioritizing the completion of a task according to a predetermined schedule; (4) do a lot of guidance; (7) an assessment of the subordinate solely based on the work. While behavioral traits leadership oriented principals subordinates are as follows: (1) pay attention to the needs of subordinates; (2) try to create an atmosphere of mutual trust; (3) sought to create an atmosphere of mutual respect; (4) sympathy for the feelings of subordinates; (5) have a friendly attitude; (6) foster the participation of subordinates in decision-making and other activities.

With the behavior that promotes a balance that is oriented and task-oriented at the same time subordinates, can provide a good influence on teacher performance.

The third factor that influence the performance of teachers is job satisfaction. Teacher job satisfaction of teachers themselves need to grow at the extent to which teachers receive and work as expected. Therefore, principals need to foster on the job satisfaction of teachers. The way, as already noted above, namely as follows: the principal should admit and reward teacher performance, putting the teachers according to their ability and willingness of teachers to work itself in accordance with the desired teacher, the school principal should to pay in attention to the promotion of teachers, the principal should consider the implementation of the supervision of a technical nature, concerned with the welfare of teachers either regular salary welfare and well-being of other support. If the job satisfaction of the teachers can be improved, it will also increase the performance of teachers.

Based on the above, it can be concluded that the better the behavior of the leadership of the principal, the climate of good organization and job satisfaction is high, then the teacher's performance will be better, and vice versa if the principal's leadership lacking/not good organizational climate is not conducive and the absence job satisfaction, the teacher's performance will also be reduced/low.

The coefficient of determination together influence school leadership, organizational of climate and the job satisfaction on the performance of the teachers by 0697, indicates that private vocational teacher performance Tegal can be affected by school leadership, organizational of climate and the job on satisfaction are 69.7%. The rest/residue amounted to 30.3% of teacher performance is influenced by other variables outside the regression model in this study. This evidence is consistent with research (Gibson, Ivancevich, & Donnelly, 1992) influenced by three variables: individual variables consisting of abilities and skills (mental and physical), background (family, social level, experience, demographic (age, origin, gender), variable organization of resources, leadership, rewards, and psychological variables that consists of perception, attitude, personality, learning motivation [13]. While according Ravianto in (Mantja & Willem, 2005) performance is influenced by education, skills, discipline, motivation, income, climate work, work experience, health and so on. This means that the performance of teachers is not only influenced by school leadership, organizational climate and job satisfaction, but there are other factors beyond the study were not examined also determine [14].

4 Conclusions

Based on the results of research and discussion about the results, the conclusion can be drawn as follows:

1. Principal leadership are categorized good (the mean score = 95.25), Organizational climate are categorized also good (the mean score = 96.43), and Job satisfaction including high category with an average score of 77.90, as well as teacher performance with an average score of 126.23, including both categories, while the effects of school leadership on teacher performance with a correlation coefficient of 0.668 so the influence is 44.6%.
2. There is the influence of organizational climate on teacher performance of Private Vocational teacher in Central Java with a correlation coefficient of 0.715 so the influence is 51.1%.
3. There is the influence of job satisfaction on the Performance of Private Vocational Teacher in Central Java with a correlation coefficient = 0.552 so the influence is 30.5%.
4. There is a mutual influence between school leadership, organizational climate, job satisfaction on the performance of private vocational school teachers with a correlation coefficient of 0.835 so the influence is 69.7%. the remaining 30.3% is influenced by other variables outside the regression model in this study.

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The Levels of Militarizationin Southeast Asia

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Abstract. In this paper we want to look at the potential threats between countries in the Southeast Asian region by looking at the militarization degree. This paper is a part of defense economics in which the militarization degree will be seen from the economic side.The research is a descriptive method by using graphics form. The index will be analyzed to see the militarization degree of countries in Southeast Asia through the Global Military Index. Indonesia has the highest national income and the largest population. However, Indonesia still has a militarization degree that below the average in Southeast Asia. For that reason, Indonesia needs to increase its military budget with heavy weaponry programs, as well as the addition of military personnel reserves.

Keywords: Defense economy, Militarizationlevel, Natural balance of power, Potential traditional threat.

1 Introduction

1.1 Background

The special characteristic of traditional or external threats is come from outside the country which state is as an actor with heavy and modern weapon. According to traditional view, the security definition is closely related to military power. In order to be secure, strong military capability must be owned or allied with other countries to face various threats. This is what distinguishes from internal threats, where the enemy is not a state, but groups or person, with the simple weapon. In more recent developments, the spectrum of "threats" is extended. The extension of this concept is from the formulation of the United Nation which requires the concept change of "security against" from "emphasis on national security" to greater emphasis on "people security".

This study focuses on traditional threats. Although Indonesia does not have traditional enemies, but the lack of awareness or guard against traditional/external threats can be very dangerous. Even weak defenses can be the entrance to internal conflicts caused by foreign influences. A weak defense will reduced state authority in the international arena. The diplomacy for the country interests does not have strong compressive power. In addition, dominance, violations, foreign infiltration and others will enter into the country easily,because of the weakness. To deal with, the state should not hope from other countries, but must based on its own strength.

There are countries that have been physically conflicted, some are aggressive, some doing arms races. But some, feeling no threat at all. Traditionally, external threats are derived from

asymmetric military forces between countries where today the concept has evolved into a natural balance of power. The modern threat is always associated with military forces that are proportional to the economy of a country. The militarization level that is too high and disproportionate to the economic capacity is perceived as a threat to the surrounding countries. We expect the economic power with healthy competition is as a national power. Who has economy power can control international relations in its strategic environment [1].

The suitable conditions for Indonesia in the strategic environment of Southeast Asia, is to treat the threat variables as potential or latent in assumption of natural balance of power. By that assumption, the novelty of this study is, the threat is not seen deals with military power only, but also from the economic forces. A country with a good economy will be able to buy good armaments, improve human resources and develop cutting-edge technology. Based on this description, the authors are interested to see the potential threats between countries in the Southeast Asian region by looking at the militarization degree of these countries. This paper is part of defense economics in which the militarization degree will be seen from the economic side, not only from its defense budget, the number of soldiers and heavy weaponry.

2.2 Literature Review

Militarization is the policy of a country in achieving its national goals by increasing the national power that is directed through the development of military force [2].

The existence of a state power relative to their neighbors strength will be considered in the calculation of threats. The magnitude of traditional/external threats is very sensitive to the existence power of each state relative to the theirneighbors strength. This magnitude assumes, the greater of the nation's relative capability will be more influence the political and military on its strategic environment. The distribution of these capabilities is asymmetric among the countries will be forming threats and pressures between them.

The differences of balance of power between countries can provide threat perceptions. Lebovic & Ishaq defines a threatening situation as an asymmetric power distribution between countries that creates a threat and tension or escalation between them [3]. Thus this threatening situation can be expressed as a concept of relative power. But this asymmetrical form of power is seen from a different angle depending on what motive underlies this condition [3].

Chatterjee explains, the classical balance of power distribution is greatly influenced by the military power of a country, the number of soldiers, the amount of weaponry and technology that is reflected in its military budget [4].

This concept actually has several weaknesses. The actual adjustment of power does not run automatically, but it depends on the ability of actors or statesmen to see and interpret it appropriately. In specific cases it is very difficult to know whether the changes in the resource are influenced by the actors or not. This model does not take into account the goals and motivations of these countries, as not all countries use their influence to continue to improve resources and power to gain influence in international politics [5].

A clear commitment between countries can provide the impossibility of war. However, asymmetric information can provide the possibility of war, even if no change in power distribution occurs. Technological developments have an important effect on the formation of a country's behavior based on the calculation of benefits and costs. If a country feels the benefits are greater than the risk, the occurrence of war will has higher proability, vice versa.

Since the World War II complete, as Virmani noted, the world changed dramatically. The concept of "balance of power" gradually transformed into a "natural balance of power" in

which the economic magnitude becomes the basis. This balance will also be called "stable balance" if it shows a natural balance. "Natural balance of power" is the ideal of peace in the world. Natural balance of power is defined as a state's responsible attitude in increasing their relative potential power in proportion with respect to internationalization and global rights. The built system is expected to create a peaceful economic competition between countries. Within his own country, there is no competition between dimensions, both economic and military [6]. Virmani explained that stable conditions in the "natural balance of power" will be realized if [6]:

a. The relative military strength is proportional to the economic power. Military posture is formed in a rational and legitimated quantity.

b. Aggressive military development can be identified and immediately isolated by the international/global system before there are victims who fall due to the aggressiveness.

c. Changes in economic power are relatively directly related to a country's position in international relations. The strongest are those with greater economic power.

d. International cooperation in the field of economic cooperation is very intensive which increases the collective strength, so as to increase the cost for a country if it wants to aggressive.

Treverton explain, national power is the total of national resources. The country's capability containers are transformed or converted through state-level processes into usable strengths. Actual processes within this framework are focused on very critical factors. These factors are what constitute a national power [7].

Green explains, a strategic balance between nations is possible only when there is system and resource stability. In order to maximize national power, it may be assumed that a nation needs a strong military as well as a robust economy. Moreover, without a strong economy, a nation will lack the resources to build a powerful military [8].

2 Methods

This research method is descriptive by using statistics that are translated in the form of graphs. The balance of power is proportionately captured by different military capabilities across countries in the region through indexes. In accordance with the concept of "natural balance of power" that developed, where the desired competition is a healthy competition in the economic field. The asymmetry of the militarization balance of a country is a potential threat faced by other countries.

The Global Military Index (GMI) is used to view this situation. An index overview through graphs will be analyzed to see the militarization degree of countries in Southeast Asia. GMI is an index that describes the capacity of armaments or the militarization level within a country. The index is published by the Institute for Strategic International Studies (IISS) funded by the German Government. This GMI is used to see the militarization degree of of ASEAN countries as Indonesia's strategic environment. The GMI is divided into three categories, namely military expenditure, personnel, and heavy weapons [8].

Figures for military spending are compiled from the database of the Stockholm Peace Research Institute (SIPRI). Data on gross domestic product (GDP) taken from the International Monetary Fund (IMF). The data on health expenditure used from the data base of the World Health Organization (WHO). All data on military personnel was compiled from

IISS. Population size figures taken from the Vital Statistics Report of the United Nations (UN). Data on the number of physicians from the World Health Organization (WHO). Data on weapons holdings was collected by Bonn International Center for Conversion (BICC) from different sources, mainly from IISS.

The indicators for GMI with their weighted can be seen in the table below:

Table 1. Indicators of Global Military Indeks [2].

Category	Indicator	Weigh-ted
Military Expenses	Military spending in relation to GDP	5
	The relation ofmilitary budget to health spending	3
	The relation of military and paramilitary personnel to total population.	4
Military Personnel	The relation of military reserves to total population	2
	The relation of military and paramilitary personnel to physicians	2
Weapons	The relation of heavy weapons in relation to total population	4

3 Result and Discussion

Each country has different situations in their strategic international environment. For example, in Southeast Asia is certainly different from the Middle East and Europe as well as Latin America. Lebovic & Ishaq share two conditions of how the state acts to face the threats in accordance with the circumstances of their strategic environment, namely [2] :

a. First, a country will seek to have high military capability aggressively regardless of the proportion of inter-state power. The country will make itself the strongest in its region.\

b. Second, threats are treated as latent rather than active threats. Threats perceived as pressure. When the perception of political pressure and tension changes, it will affect the level of military spending. The country is also more emphasis on fundamental forces that cause views against threats more implicit than explicit. The fundamental threat is seen from national security that potentially affecting economic policy and defense development.

Traditional threats in Southeast Asia environment are still so natural, that they called potential or latent threats. This threat is not only related to military power, but also economic power. Of all models described above, the most suitable situation in the strategic environment of Southeast Asia is by assuming a "natural balance of power", where the state balance of power in the region is still stable. The situation facing a country will be reflected in the military budget policy in building its defense force based on its economic strength. For Indonesia, the result of the generated economy and the population must be maintained through a strong defense.

Here are the GDP, and the number of population in Southeast Asia:
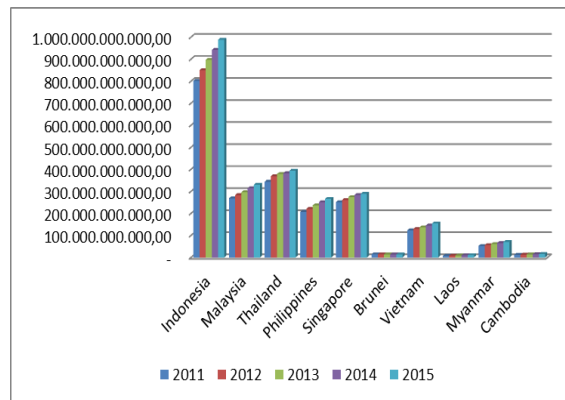
Fig. 1. The Gross Domestic Product (GDP, constant 2010 US$) in Southeast Asia(Period of 2011-2015).
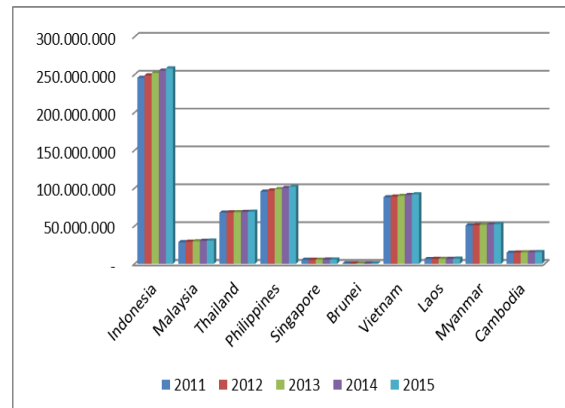
Fig. 2. Number of Population in Southeast Asia (Period of 2011-2015).

From the figures above, Indonesia has the highest national income and the largest population. Thus it is natural that Indonesia should have a large armed force. Countries in strategic environments will naturally rather than a dilemma security. Indonesia needs to safeguard its wealth and its inhabitants properly.

To see the militarization degree in Southeast Asia, indexed by looking at the economic and population power, as in the following figure:
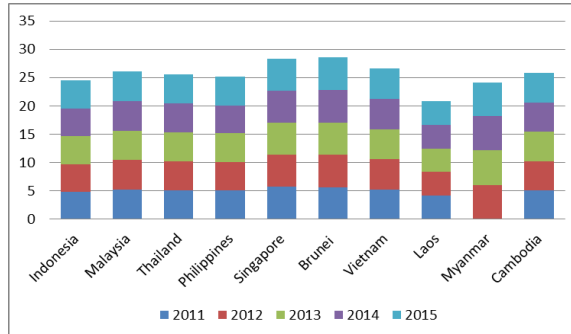
Fig. 3. Military Expenditures Indeks (Period of 2011-2015).
Source: Data Processing from Bonn International Center for Conversionhttps://www.bicc.de/
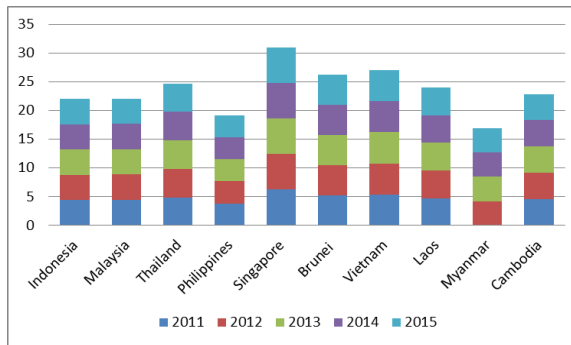
Fig. 4. Military Personal Index (Period of 2011-2015).
Source: Source: Data Processing from Bonn International Center for Conversion(https://www.bicc.de/)
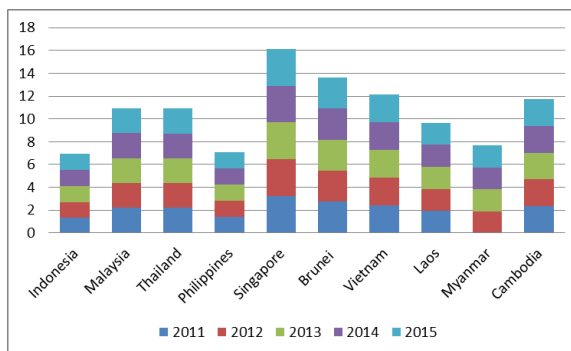
Fig. 5. Heavy Weapons Index (Period of 2011-2015).
Source: Source: Data Processing from Bonn International Center for Conversion (https://www.bicc.de/)

From the above three figures, we can see the position of Indonesia through the index of military expenditure, military personnel and heavy weaponry. Of the three indices, Indonesia have low index, despite having a high national income and population compared to countries in thestrategic environment. From the table, Singapore provides the three highest indexes though a small country. However, this has not provided a picture of instability in the region, because it is realized that Singapore must be ready with a formidable defense, because they surrounds by big countries. Brunei and Vietnam are also depicted in a high index beyond Indonesia.

The index data of military nations in Southeast Asia is still in balance condition, except the Laos is still low. While the heavy weapon index provides a more varied picture, where Indonesia, the Philippines and Myanmar are still low, while Singapore, Brunei and Vietnam show very high heavily armaments. For the number of military personnel, the countries of Singapore, Vietnam, Thailand, and Laos, have index above Indonesia.

All these data indicate the militarization degree of a country. From the Global Military Index (can be seen in the table below), Indonesia still has militarization level below the average in Southeast Asia along with Malaysia, Philippines and Myanmar. While Singapore, Vietnam and Brunei provide a high militarization degree. Thailand, Myanmar, and Cambodia have militarized levels in the average range.

Coordinating Minister for Political, Legal and Security Affairs of Indonesian Republic, Luhut Panjaitan, as also stated that during the last fifteen years untill 2015, the defense budget is still below 1% of GDP. Compared with neighboring countries, Indonesia's defense budget is relatively smaller, whereas the area of Indonesia is much larger. The amount of defense budget is still very low where Indonesia still has to improve the quality of weapons system. Therefore, the defense budget needs to be increased gradually [9].
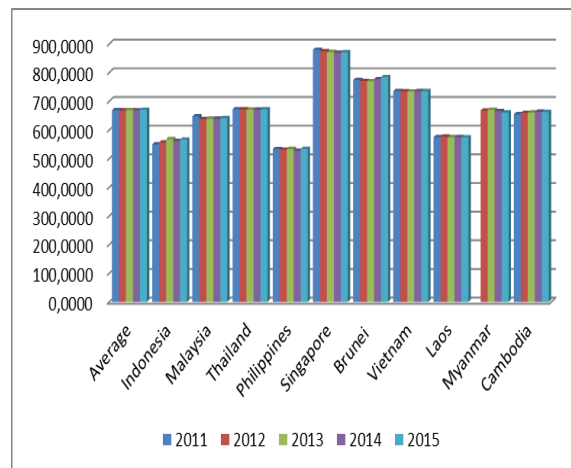
Fig. 6. Global Military Index between Countries in Southeast Asia (Period of 2011-2015). Source: Source: Data Processing from Bonn International Center for Conversion(https://www.bicc.de/)

"*In many countries, excessive militarization hinders the necessary structural change of the economic and social framework conditions and enforces development deficits in its industry and agriculture. On the other hand, a low degree of militarization can be to point*

deficits in the security sector. A weak or not functioning security sector can not prevent violence and conflicts which negatively affect the population and its development as it can not succeed enforce and uphold a monopoly of violence. One result is often fragile and weak states in which economic growth and development can not prosper. These examples illustrate the dilemma of the debate. The GMI is attempting to dispel the wide assumption that a high level of militarization is bad and a low level per se good, and to contribute to a new approach on studying militarization. An assessment of the situation concerning the development of the country and regions" [10].

In South East Asia, the tensions of the territories disputes in the South China make the rise in the militarization level of the countries concerned. The GMI values of Indonesia, Vietnam, the Philippines have remained fairly constant. But it can not be ruled out that this will change in the future. Vietnam are modernizing their navy. From 2011 to 2015, Vietnam was ranked eighth in the global importers of major conventional weapons. The majority of them came from Russia; the cooperation will intensify in the coming years. Yet another interesting feature is likely to be, what impact the complete lifting of the United States' arms embargo against Vietnam, as announced in May 2016, will have on this. The embargo has existed since the end of the war. In Myanmar, Aung San Suu Kyi certainly brought high hopes to the population. But the fighting, especially in Kachin and Shan State, and the violent unrest between the Buddhist Rakhine and the Rohingya Muslimshave recently escalated. In the past year, thousands have been newly driven out by forced resettlements and violent conflicts in Rakhine, Shan and Kachin State [11].

4 Conclusions

The assumption of "*natural balance of power*" is where there is balance of power in a region that is still stable. This situation will be reflected when the military budget policy of the country for building its defense force based on its economic strength. Indonesia has the highest national income and the largest population, so naturally it is proper for large armed force, regardless of the security dilemma. Indonesia's position through military expenditure index, military personnel and heavy weaponry is still low. Despite the fact that Indonesia's military index is still in balance condition, the index of heavy weapons and military personnel is still lagging behind. From the Global Military Index, Indonesia still has militarization levels below the average in Southeast Asia, along with Malaysia, Philippines and Myanmar. While Singapore, Vietnam and Brunei provide a high militarizationdegree. Thailand, Myanmar and Cambodia have militarized levels in the average range. As a suggestion, Indonesia needs to increase its military budget along with weaponry programs especially heavy and sophisticated equipment, as well as additional reserves of military personnel.

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Student Data Value Screen Using Steganography And Cryptography With Eof Method And Design Algorithm Case Study Campus of Universitas Budi Luhur Unit C Salemba

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Abstract. Data on the value of students at the Universitas Budi Luhur Unit C Salemba needs to be secured from irresponsible people. The value data that is in campus salemba after collected per period values will be sent to the central campus in cileduk. The result of cryptography is data that is different from the original form and usually the data seems to be messy so it can not be known what information is contained therein (but actually can be returned to its original form through the description process). Application of EOF Steganography Method System (End Of File) aims to provide data security facilities, especially in terms of hiding data intended for companies, businesses and individuals. This research is based on increasing the flow of data packet delivery via email or media others that have a direct impact on increasing threats and data theft. This research was formed by the method of experimental research technique data collection using literature and documentation. Using the incorporation of steganographic and criti- cal techniques on the transfer of confidential information by developing DES algorithms can ensure better confidentiality of threats and data theft . Based on the tests that have been done, the application generated from this research has a good ability, especially in terms of functionality , realiabilit , usability, and effieciency. In general this application has a capability level of 82% or very good.

Keywords: Data Security, Steganography, Cryptography, End Of File (EOF), Data Encryption Standard (DES).

1 Introduction

1.1 Background

The problem of communication and information technology, now is the tapping of data and information in the global Internet network. The risks are quite high. The emergence of viruses, malware, spyware, malicious software (malicious software) that is able to tap and even steal information owned by someone, coupled with bermunculanny malicious hackers (blackhacker) capable of breaking the computer network either disebuah companies or government agencies [5].

Generally information security means protecting information from unauthorized persons accessing such information, disruption (information tapping), changes to original information or illegal use. Data security techniques or digital information are also growing

well and quickly. Some of the most common techniques used in data security are cryptography, steganography, digital signatures (digital signature), use of watermarks (etc.) [1],[2]. Cryptographic techniques are created with the primary objective of securing internet communication channels and has many methods developed to perform the process of encryption and decryption of data with the aim to maintain the confidentiality of messages or information submitted. Unfortunately this is also not enough to keep the information confidential or can only be accessed by certain people only, also needed technique to maintain the confidentiality of such messages or data [11]. The technique used to hide such confidential information is called steganography.

Steganography is the art and science of communication from the delivery of invisible messages (invinsible communication) [3]. This can be done by hiding information in other information, thus hiding the existence of information communicated from the sender to the recipient.

Steganography and cryptography are two different techniques that maintain the confidentiality and integrity of the data. The purpose of steganography is to hide secret messages in digital media in a way that does not allow anyone to detect the existence of such secret messages [9]. The main purpose of steganography is to communicate securely with secret messages through pictures [6],[7]. Steganography does not change the structure of the secret message, but it hides inside the media so the change is not visible [7],[8]. While cryptography protects messages from unauthorized individuals by changing their meaning [10].

Universitas Budi Luhur Unit C Salemba located in Sentra Salemba Mas Block ST, Jl. Salemba Raya No. 34-36 is a branch of Universitas Budi Luhur located at Jl. Ciledug Raya, North Petukangan, South Jakarta. Universitas Budi Luhur Unit C Salemba has 750 students. Every semester of Universitas Budi Luhur Unit C Salemba will send student value data to campus center. Currently the process of sending student value data to the central campus is still using courier services in the form of microsoft excel files. This mechanism is very vulnerable to the manipulation of value data made by certain parties because the file can be opened easily. Thus required an application that can ensure the security of microsoft excel file that is sent. Therefore the author tries to find solutions by creating applications with steganography and cryptography to insert confidential information into certain media. Value data stored in microsoft excel will be inserted into the image media so it can not be read easily by the parties - the parties are not responsible. The method used to insert the information is EOF (End Of File). In addition, the DES (Data Encryption Strandart) algorithm will be used to encrypt the value data before it is inserted.

1.2 Identification of Problems

One of the fundamental reasons with the research background that has been described, it can be identification problems in research are as follows:
1.   Delivery of value data by courier from campus branch salemba to campus center prone to manipulation by certain parties because the file can be opened easily
2.   Delivery of value data through internet media is also prone to wiretapping and theft by third parties.

1.3 Scope of Problems

The study was conducted at Universitas Budi Luhur Unit C Salemba branch because of the

limited time of this research is limited by the things listed as follows:
1. The designed application includes value data security for delivery through courier and media services
2. Value data sent only in the form of excel file
3. The insertion media used is a digital image or image
4. The method used with the method of End Of File
5. Algorithm used is DES (Data Encryption Standard)

1.4 Formulation of Problems

In connection with the problem found by researchers at Universitas Budi Luhur Unit C Salemba Branch, it makes the basis for doing research, such as:
1. Will the use of steganography and cryptography methods secure the value data sent from the branch campus to the central campus?
2. Will the EOF (End Of File) method and DES (Data Encryption Standard) encryption be used to insert value data?

1.5 Objectives and Benefits of Research

The purpose of this research is as follows:
1. Generate applications that can insert excel value data into images using EOF and DES encryption methods
2. Evaluate the implementation of the application that has been made
   The benefits of this research are to:

The benefits of this research are to:
1. The resulting application can be used to secure the value data at the time of delivery either through courier or internet media. The results of this study can contribute to science and technology, especially in the application of EOF and DES algorithms to insert secret messages into the image media or digital images.

2 Theoretical Basis

2.1 Steganography

The word steganography comes from the Greek word Steganos, which means "hidden or veiled" and graphien, "writing" so that it means "to write hidden or veiled writing" [Sellars, 1996].

Steganography is defined as the science and art to hide the secret message (hiding message) in such a way that the existence of the message is not detected by humans. [12],[13],[14]. Steganography is a branch of science that studies how to conceal a "secret" information in other information [4].

2.2 Criteria Data Hiding Steganography

Criteria to be considered in concealment of confidential data by using digital imagery as a container file are:

1. Imperceptibility

   The existence of the secret message can not be perceived by sensory. If the cover medium in the form of images, then the image of the stego medium penyisispan make the message difficult to distinguish by eye with his covertext- image. If covertext is audio (eg mp3 audio file , wav, midi, and so on), then the ear senses can not detect changes in its stegotext- audio.

2. Fidelity

   Container media quality does not change much due to insertion. After the addition of secret data, the image of the steganography still looks good. Observers do not know that in the image there is secret data.

3. Recovery

   Hidden message must be disclosed again (reveal) .Because the purpose of steganography is data hiding, then at any time - a secret message in the stego medium should be taken back to be used further.

4. Security

   Messages or confidential data that is concealed to a media must be secure, so that unauthorized parties can not know the existence of the inserted information.

2.3 Media Steganograpy

Some examples of secret message insertion media used by steganography include:

1. Steganography on Text

   Steganography in the text is divided into two applications, namely on soft-copy text and hard-copy text. In soft-copy text, steganography encodes data by changing the number of spaces after punctuation. While on hard-copy text , there are two methods: Line Shift Coding (shifting each line up or down) and Word Shift Coding (shifting a few words left or right)

2. Steganography on Image

   Most of the research and design of steganographic applications are on digital images . This is because an image with confidential information in it is more easily disseminated through the web or forum. To note is that when the information is hidden into the image file then the image is changed to another image format , then the hidden information will be lost.

3. Steganography on Audio

   Steganography can also be applied to digital sound . However, for steganography on audio files need to be careful in designing its steganographic algorithm, because the sound is more sensitive than the image. This means that digital sound is more easily damaged when steganography is added.

4. Steganography on Video

   Steganography on a video is very similar to steganography in the image , except that information is stored on every video frame. Steganography on digital video must be designed in such a way that the transition of images from one frame to another frame

must remain good and not visible modified. Because the digital video is relatively large in size than the digital image , then the inserted information can be more.

2.4 Definition of Cryptography

In the dictionary hackers, cryptography is defined as the science of studying writing in secret [15]. In a cryptographic algorithm, there are three elements are:
1. Encryption, ie the process of converting plaintext into ciphertext.
2. Decryption, ie converting ciphertext to plaintext.
3. The key, is the key used for encryption or decryption process
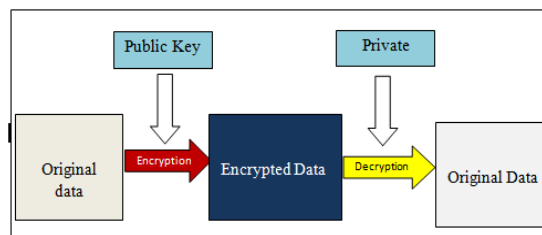
Fig. 1. Scheme processes on Cryptography method.

2.5 Format File
Digital imagery can be stored in various formats. Some digital image formats can utilize compression methods in image data storage. Compression can be lossy or lossless , depending on the type of format used.Compression that is lossy leads to a decrease in image quality, although in some cases the quality decrease can not be recognized by the eye humans.Beberapa digital image format that many met is BMP, JPEG, GIF and others.

2.6 Method End of File (EOF)

The EOF (End Of File) method is one technique that inserts data at the end of the file and development rather than the LSB (Least Significant Byte) method . This technique can be used to insert data the same size as the file size before inserted plus the size of data inserted into the file. In the EOF technique, the data inserted at the end is marked as a start recognition of the data and the final identifier of the data. In this technique, the data is inserted at the end of the file with a special mark as the start identifier of the data and the final identifier of the data.

2.7 DES Algorithm

DES (Data Encryption Standard) is a popular cipher block algorithm because it is used as a standard symmetric encryption algorithm. Actually DES is the symmetric encryption standard name, the name of the encryption algorithm itself is DEA (Data Encryption Algorithm), but the DES name is more popular than DEA . DES operates on a 64 bit block size. DES encrypts 64 bits of plaintext into ciphertext by using a 64 bit 48 bit internal key (internal key) or upa-key (subkey) internal. Key raised from external key (external key) length of 64 bits.

3 Design of Research

3.1 Method of Research

This study authors use descriptive qualitative research methods. Besides using the qualitative descriptive method, this research also uses simulation method to prove the effectiveness of the design result of the implementation that has been made. Qualitative research methods are used to examine natural sites, and research does not make treatment, because researchers in collecting data are emic, that is based on the views of data sources, not the views of researchers. In qualitative research, researchers interact with data sources. Although qualitative research does not make generalizations, it does not mean that qualitative research results can not be applied elsewhere. Generalization in qualitative research called transferability in the Indonesian language is called *ketralihan*. The point is that the results of qualitative research can be transferred or applied elsewhere, when the conditions of other places are not much different from the place of study [16],[17]. Likewise the final outcome of the design is expected to be flexible to apply anywhere as long as the infrastructure and needs are not much different. In this study, the authors use data collection techniques are:

Biblical Technique
1. Bibliography techniques
   Bibliography techniques focus on the study of various sources of literature.
2. Observation Technique
   Researchers see directly the implementation of the application of this system.

3.2 Step Research

The research steps are as follows:
1. Conduct an initial survey.
   This step aims to determine the extent to which the conditions of transactions execution of confidential information during this run.
2. Conducting literature study
   This research begins by conducting literature studies from several sources related to the discussion of data security with various techniques in application implementation
3. Create an application design
   After knowing the problems that occur in the field, the next step is to make the application design for the delivery of secret messages with cryptographic techniques and steganography.
4. Simulation and Testing
   From the process of encrypting the encryption of secret messages into excel files does not seem a significant difference when viewed in plain view.
5. Analysis of simulation results
   Compares security and time requirements for decryption of confidential messaging services before and after using steganographic and cryptographic integration techniques with the addition of EOF and DES algorithms.
6. Conclusion

This conclusion aims to explain the suitability of results designed to be applied to secret messaging applications at Universitas Budi Luhur Unit C Salemba if this application is implemented, and along with the fulfillment of the security aspects in the design of this application implementation by adding the algorithm.

3.3 Research Schedule

No.	Kegiatan	Bulan per tahun 2013-2014				
		Okt	Nov	Des	Jan	Feb
1	Pengumpulan Jurnal dan referensi	X				
2	Studi kepustakaan	X				
3	Menyusun proposal tesis	X	X	X		
4	Mengajukan proposal tesis			X		
5	Sidang proposal tesis				X	
6	Membuat rancangan	X	X	X	X	
7	Melakukan analisis terhadap rancangan				X	
8	Penarikan kesimpulan hasil analisis			X	X	
9	Membuat rekomendasi			X	X	
10	Penyusunan naskah tesis			X	X	X
11	Sidang Tesis					X
12	Perbaikan naskah tesis					X
13	Menyerahkan naskah akhir tesis					X

Fig. 2. Research Schedule.

4 Discussion Research

4.1 Cover Image used

Testing steganography method with EOF technique in this research will use digital image dataset by using JPG digital image format. Where the digital image dataset to be used amounted to 4 images. Digital image dataset which will be used as cover image in this research is bungamawar.jpg, bungamerah.jpg, bungaputih.jpg, daun.jpg Digital image dataset this can be seen in Figure 3.
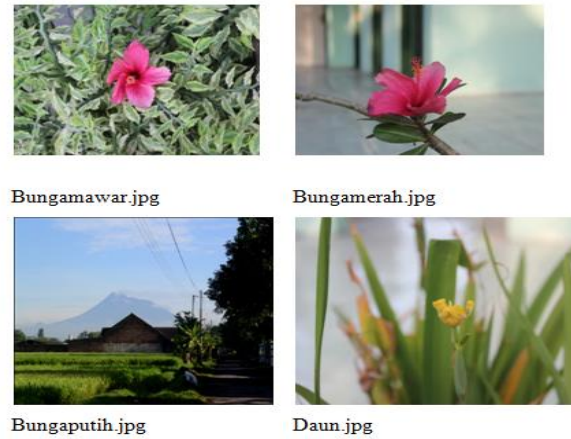
Fig. 3. Digital Image Dataset Testing Steganography Technique.

In Figure 4, shows the resolution and image size information of the digital image data used as the cover image :

No	Nama Citra	Resolusi	Ukuran Citra (Byte)
1.	Bungamawar.jpg	5184 x 3456	6529917
2.	Bungamerah.jpg	5184 x 3456	4219132
3.	Bungaputih.jpg	5184 x 3456	53367960
4.	Daun.jpg	5184 x 3456	4291714

Fig. 4. Cover Image Data Information.

4.2 Secret Message

The secret message used in this application is a Microsoft Excel file (.xlsx) with an average size of 67 KB. The excel file information can be seen in Figure 5.

No	Name file value	Size(bytes)
1.	Value 0313.xlsx	68560
2.	Value 0513.xlsx	85599
3.	Value 0713.xlsx	64061
4.	Value 0913.xlsx	69393

Fig. 5. The final exam score file.

4.3   Test Result

4.3.1   Steps Application Testing

1.   Open the apps
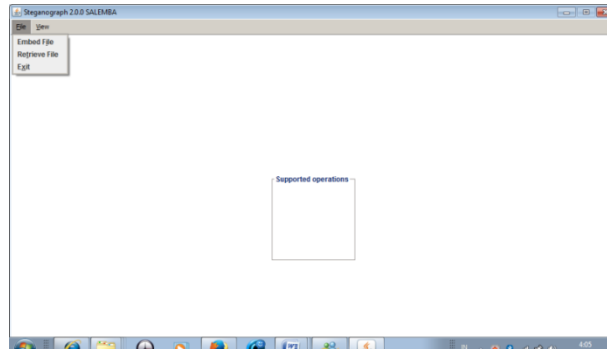
Fig. 6. Home Application page.

2.   Click Menu embed file , then select select master file
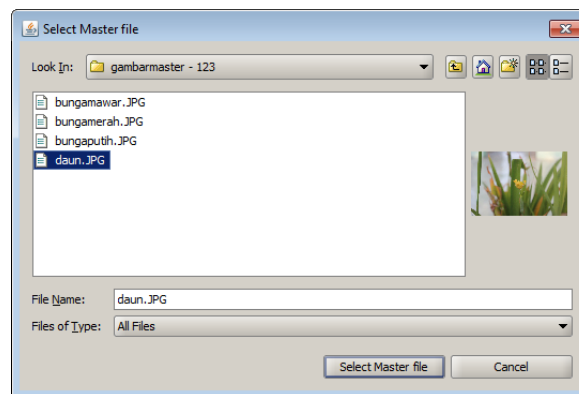
Fig. 7. Menu select master file(cover image) on embed file.

3. Select data file
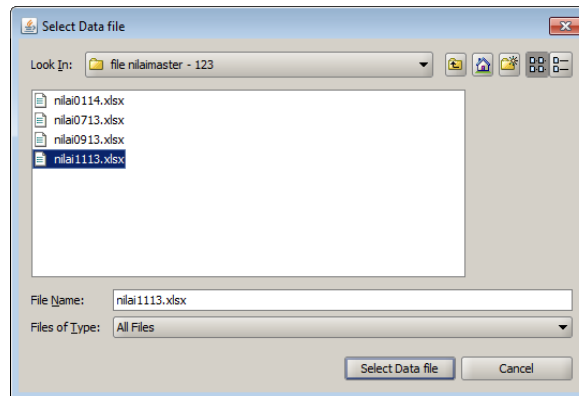
Fig. 8. Menu select output file (cover image) embed file.

4. Enter password (minimum 8 characters)
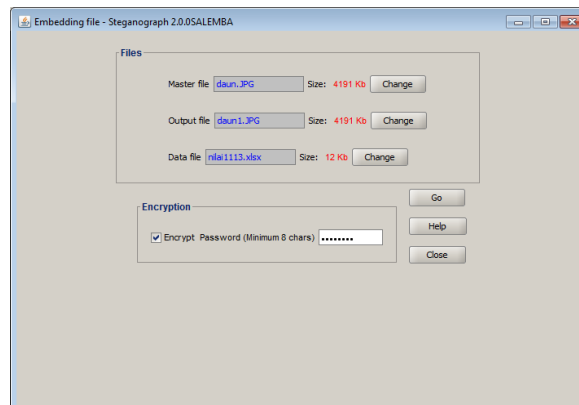
Fig. 9. Input menu password.

5. Click ok, will show the insertion process time
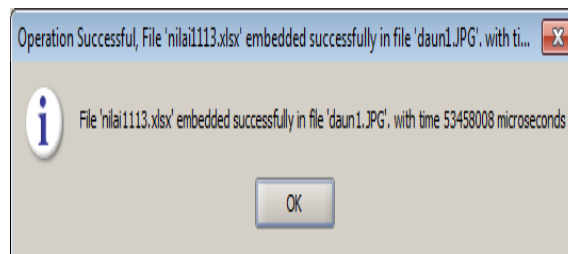
Fig. 10. The file embed menu is successful.

6. To open an inserted file, select Retrieve File
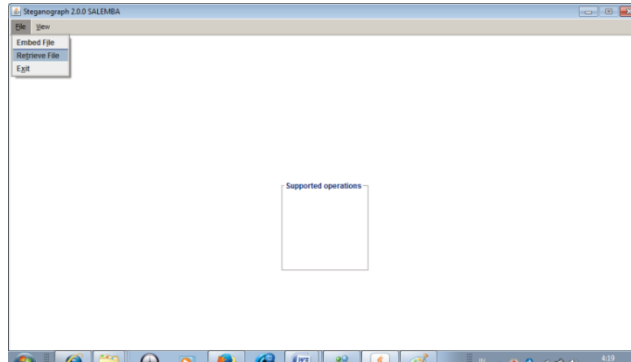
Fig. 11. Retrieve file menu.

7. Select master file
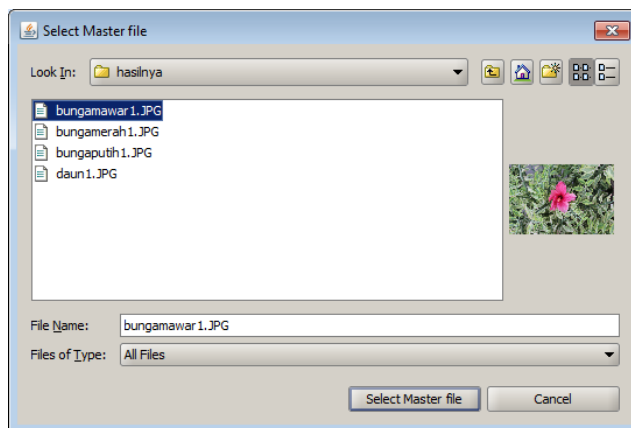
Fig. 12. Menu Select file retrieve.

8. Enter password
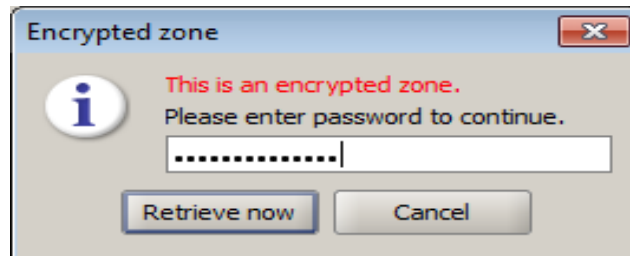
Fig. 13. Enter password.

9. The menu enters the password to open the retrieve file
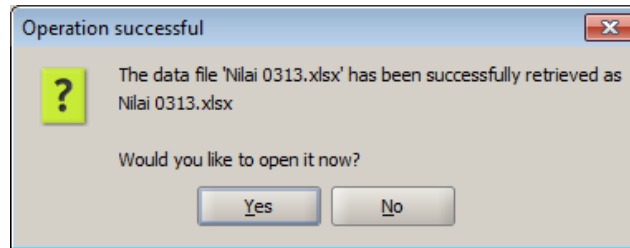
Fig. 14. Pop Up Retrieve.

10. Click Yes

Fig. 15. Delivering the results of the file in the retrieve.

4.3.2 Results of Image Testing

The following test results are inserted files:

No	Nama file citra	Ukuran citra	Nama file excel (nilai)	Ukuran file excel	Ukuran file hasil	Waktu proses (ms)
1.	Bungamawar.jpg	6529917	Nilai 0313.xlsx	68560	6583398	16574959
2.	Bungamerah.jpg	4219132	Nilai 0513.xlsx	85599	4292608	16577961
3.	Bungaputih.jpg	5878522	Nilai 0713.xlsx	64061	5932603	10387823
4.	Daun.jpg	4291714	Nilai 0913.xlsx	69393	4349952	11652749

Fig. 16. Results of Image Testing.

Based on Figure 16 above if the file size cover image 6529917 KB and then inserted with file excel 68560 KB then the result file after inserted to 6583398 KB, there is addition of 53481 KB.

4.3.3 ISO 9126 Test Results

Testing based on ISO 9126. This is to test the application in terms of functionality, reliability, usability,and efficiency .

1. Results Recapitulation questionnaire for aspects Functionality, Reliability, Usability, Efficiency.

Aspek Penilaian	Skor Responden				
	5	4	3	2	1
	SS	S	R	TS	STS
Functionality	27	11	8	6	3
Reliability	19	5	4	4	1
Usability	20	15	6	2	1
Efficiency	10	10	2	-	-
Jumlah	76	41	20	12	5

Fig. 17. Results Recapitulation questionnaire for aspects Functionality, Reliability, Usability, Efficiency.

2. Final Score aspect Functionality, Reliability, Usability, Efficiency.
   Respondents' responses to aspects of functionality, Reliability, Usability, Efficiency of data security application of student value using steganography and cryptography:

Aspek Penilaian	Skor Aktual					Total Skor Aktual	Skor Ideal	%
	5	4	3	2	1			
	SS	S	R	TS	STS			
Functionality	135	44	24	12	3	218	275	79%
Reliability	95	20	12	8	1	136	165	82%
Usability	100	60	18	4	1	183	220	83%
Efficiency	50	40	6	-	-	96	110	87%
Jumlah	380	164	60	24	5	633	770	82%

Fig. 18. Final end of aspect Functionality, Reliability, Usability, Efficiency.

5 Conclusions & Suggestion

5.1 Conclusions

Based on the analysis and test results that have been done, it can be concluded as follows:
1. With this application, the value data owned by the Salemba branch campus becomes safe from unauthorized persons.
2. The use of End Of File (EOF) method resulted in less image quality, especially if it was observed by naked eye, so it would not make people suspicious that the image file contained a secret message.

3. Based on the data analysis obtained from questionnaires covering four aspects of the quality of the application prototype device ISO 9126 obtained an application quality score of 82% (very good).

5.1 Suggestion

Suggestions for further research and refinement of research on steganography techniques are as follows:
1. Integrating steganography techniques with cryptographic compression process in this application.
2. Add another file type that is used as cover or insertion media on the steganography process.
3. This app needs to be a web-based version. This is useful for this application can be used by many people.

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Role of the Neuroticism Personality Trait and The School Climate on The Victim of School Bullying

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Abstract. Nowdays a number of program have been implemented to address bullying. However, interventions that focus on the victims of bullying is still lacking highlights. The impact of bullying can not be underestimated, either short-term (afraid to go to school, insecurity, feeling isolated), or long-term (affecting the formation of a negative self concept, depression, emotional problems and desire to suicide). This study will examine a model in which the impact of neuroticim personality trait and the school climate on the victim of school bullying. 616 students from grade 11 senior high school (SMA or Sekolah Menengah Atas) from five regions of Jakarta, Indonesia, to be sampled in this study using purposive sampling technique. NEO PI-R, School climate scale, and My life at school check are used as measuring tools. I found that the neuroticism personality trait and the school climate had significant correlations on the victim/target of bulllying. Neuroticism personality trait in this study has a positive contribution to victim of bullying. It means the stronger of neuroticism owned by students, the stronger the tendency of students to become victim of bullying. The results also indicate if the school climate has contributed to the prevention of the victim. I concluded that efforts to address bullying should involve the personality traits and the school climate improvement process.

Keywords: The neuroticism personality trait, school climate, victim of bullying.

1 Introduction

Bullying is the systematic abuse of power. There are several terms to discribe bullying. The experts said bullying as aggressive behavior doing by peers. Bullying is characterized by non-equality (or imbalance) power between the perpetratros and the targets [1],[2],[3]. The term bullying behavior often associated with aggression. Some researchers argue bullying has similarities with the aggresive behavior; several other states are part of the aggresive action [4],[5]. Bullying at school generally occurs due to peer pressure. Children can be involved in bullying as bullyers, as targets or victims, or both a bullyer and a target [1]. The researchers explain that an action can be categorized as bullying when: (a) there is an intention to injure another person; (b) the imbalance of power; (c) organized, systematic and hidden; (d) to be repeated within a periode of time; and (e) the bullying victims are physically or psychologically hurt [6].

The researcher finds out that 73% of respondents revealed that bullying occurs in school days. The bullies were seen in several roles, ranging from the perpetrator, the victim, or a person who withness the incidence of bullying (*bystander*). It was also reported some different types of bullying, such as bullying that also occurs more frequently in men than women [7]. Crick, Bigbee and Howes (in Summers, 2008) state that the boys' bullying tends to be more physical; while girls' bullying tends to be verbal/non-verbal and indirect [8]. However, the occurrences of bullying in both boy and girl students are almost similar.

Bullying gained the attention of educators, parents, and the society today. Douglass (2009) reported that the frequencies of bullying and other forms of aggressive behavior is the biggest problem were faced by the school. The researches said that in urban area, aggressive action especially in urban school is higher than elsewhere [9],[10]. Bullying is a part of aggresive behavior.

How about Indonesia? Bullying seems too pervasive in our schools. Reports from the Semai Jiwa Amini Foundation (Sejiwa), a non-profit organization that specializes attention on bullying behavior in schools [11]. The foundation reported a survey of 1,500 middle and high school level in Jakarta, Yogyakarta and Surabaya. According to the result, 67 % of students claimed that bullying happened at their school. Almost all respondents never reported the bullying they receive or they see. Komisi Perlindungan Anak Indonesia (KPAI) informed the simular data per-November 2009. KPAI claimed there were at 98 cases of physical aggresion, 108 cases sexual abuse and 176 psychological harrashment happened in the school [12].

Bullies at school age has a great opportunity to take criminal action in adulthood [13]. There are a common spotlight was adressed to the perpetrators, or to the bullyers. However, the main spotlight should be focus on the victim of byllying. I looked just a little work has been done to examine victims. Almost every student who ever be interviewed stated that they had been the bullying target (Djuwita, 2012 in Rahmawati, 2017). Olweus (2003) in Perlus, Brooks-Russell, Wang, and Iannotti (2014) a researcher who started systematic research on bullying found that 15 percent of students have been targets of peer bullying in school [14]. One of the seven students in the United States according to The Local Department of Education (2005) is reported to have experienced bullying. Bullying is an acute behavior, especially in middle and high school level. Ferráns and Selman (2014) reported that adolescents experience drastic physical and emotional changes. During the period, a person experiencing rapid development in many aspects. Teens at this age also become more aggressive. Peer violence was also reported increases (Ferráns and Selman, 2014).

In their research, Randall, Doku, Wilson, & Peltzer (2014) said, the bullying target generally perceive their school as an uncomfortable place. The victim chooses to withdraw, avoid being present at school, refused to go to places that have a school background (Randall, Doku, Wilson, and Peltzer, 2014). At the extrem cases, they try to suicide. The characteristics describe the personality characteristics of the victim. According to the experts, personality traits are influenced by temperament. Allport (in Krause, Pacey H., Dailey, 2009), said the basic components as trait [15],[16]. Trait is a core of personality. After many years, trait researchers with analytical factor methods, agreed to classify individual differences in five traits, called big five trait theory (McCrae, R.R. and Costa, P.T., 2003) One of the top five personality traits is neuroticism, characterized by anxiety, worry, easy to feel depressed and easily give up [17]. Victims of bullying are described as having certain personality traits, such as having a feeling of depression that makes them difficult to get along, low self-esteem and easily anxious when encountering a pressing situation. This description provides a description of why a certain trait in the big five perspective will represent the specific factors of the

personality of the victim However, personality traits are not the single contributing factor for bullying.

Bullying at school can be explained in the perspective of social called school setting. There are a number of interventions conducted in the school [3]. The intervention involves the social context, by attempting to interfere on the social environment Olweus Program Intervention [19]. The program try to develop close relations in school, which is characterized by adult involvement, clear rules about what can and what cannot do, the application of disciplinary procedures are clear and consistent, and the presence of people adults (the teacher, principal, or school admminstrative staff) as a role model. Committee for Children in 2002 launched an intervention program, has named The Steps to Respect program. Target of this program is in several levels. What's interesting about this program is, to laid the school environment as a first stage. It contains strategies to address bullying, increase awareness of teachers and students against bullying, increase the responsibility of the factors that cause bullying and support to develop pro social behavior (Hirschstein and Frey 2006 in Summers, 2008). There are several aspects in the school climate that should be developed to anticipate bullying: (a) teacher caring and respect; (b) school goal and norms; and (c) peer relation.

Based on the ealier studies, it can be described when researches on bullying in schools are much done. However, studies attempting to explore neuroticism personality trait and school climate in relation to victim or target of bullying are still rare. The novelty of my research is examining the neuroticism personality trait and concept of school climate on the target of bullying at Jakarta school setting**.** My hipothesis are personality trait and school climate will influence to victim or target of bullying. In my research, personality trait is seen from neuroticism personality trait, school climate is seen from the components of teacher caraing and respect, school goals and norms and peer relations; while bullying in schools is seen from the victim/target of bullying.

2   Method

2.1   Participant and Sampling Technique

The population of this study includes grade 11 senior high school students from five regions in Jakarta, Indonesia. The regions are South Jakarta, East Jakarta, Central Jakarta, West Jakarta and North Jakarta. Due to the broad population, the researcher limited the accordance with the features of the population. Accidental random sampling is used to choose the respondents from the population of the high school students. In accidental random sampling, the selection of participants is based on availability and willingness to participate in research [18].

Table 1. Research participants by region and school.

Regions	Districts	Name of School	N
South Jakarta	Cilandak	SMAN 34	156
East Jakarta	Cijantung	SMAN 39	172
Central Jakarta	Sawah Besar	SMAN 1	60
West	Tambora	SMAN 19	124

		Jakarta		
North	Kelapa	SMAN 45	104
Jakarta	Gading		
			Total	616

The students of to study is expected to reflect the condition of senior high schools in Jakarta. There are 616 students be sampled in this research.

2.2 Research Design

This research is a non-experimental study using the quantitative approach. No intervention or direct treatment was done to the variables in the study. Based on the level of explanation, this research wants to examine the correlation between independent variable to dependent variable. This research belongs to associative research, that aims to examine the correlation of two or more variables.

2.3 Measurements, Validity and Reability Test

I used NEO PI-R (McCrae, R.R. and Costa, P.T., 2003) to measure the neuroticism personality trait; school climate scale; and the victim scale was adapted from the scale of "My Life in School Chekclist" (Arora , 1994 in Rahmawati, 2016). All measuring devices are calculated using an ordinal scale of Likert. The answer choice ranges between 1 (strongly disagree) to 6 (strongly agree). Measurement tool of this research consisted of favorable (or positive) and unfavorable (or negative) statements. In processing, unfavorable statement is reversed. All of the measures had gone through the validity calculation. The scale also passed the reliability process. Face validity and content validity were used in this research. After the process was completed, I examined the reliability test and got $\alpha= 0.869$ for neuroticism trait scale, $\alpha= 0.908$ for school climate scale, for teacher caring and respect $\alpha= 0.859$, for school goal and norm $\alpha= 0.711$, for peer relation $\alpha= 0.881$, and $\alpha= 0.985$ for victim of bullying scale. Guilford (1978, in Rahmawati, 2017) states that a test is reliable if it has a reliability coefficient at least 0.700. A good score of a relibility coefficients indicate the instrument's items had a constant score to examine the same construct. It also means the instruments had a low content-sampling and heterogenity-sampling error.

Table 2. Reliability category of the instruments.

No.	Cronbach Alpha Coefficients	Interpretation
1	0.00 – 0.19	Almost unreliable
2	0.20 – 0.39	Low reliability
3	0.40 – 0.69	Medium reliability
4	0.70 – 0.89	High reliability
5	0.90 – 1.00	Very high reliability

2.4 Data Processing

The data of this study were processed using statistical analysis technique in the forms of correlation test analysis and regression. Correlation test was employed to examine the

correlation of one variable to other variables, while the regression was used to observe the effect among variables. The data were statistically processed using SPSS version 23.

2.5 Research Procedure

After getting permission from the school, 616 students from five senior high schools in Jakarta were recruited as participants. They were students from grade 11. The participants filled in the questionnaire and handed it back to the examiner for further analysis. Then data tabulation was conducted through a series of statistical techniques as have been mentioned previously.

3 Results And Discussion
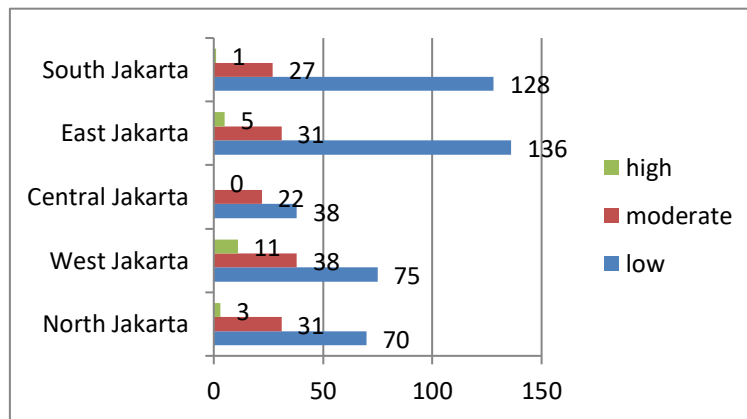
Fig. 1. Description of victim of bullying among schools in Jakarta.

Respondents in this study generally perceived the occurrence of victims in their schools in the low category. Figure 1 described in North Jakarta 70 students rated this aspect in the low category, while 31 other students rated moderate, and 3 students rated high. In West Jakarta, 75 students asess the victims low, 38 students rated moderate, and 11 students rated high. In Central Jakarta, there were 38 students who gave low appraisals, 22 students rated moderate, and none of the students gave a high rating. Similar to the pattern, in East Jakarta the majority of students also gave a low rating (n = 136), followed by a moderate (n = 31), and high (n = 5) rating. Finally, the same pattern was found in students in South Jakarta, where the majority are assessed the occurrence of school bullying low (n = 128), followed by moderate (n = 27), and high (n = 1).
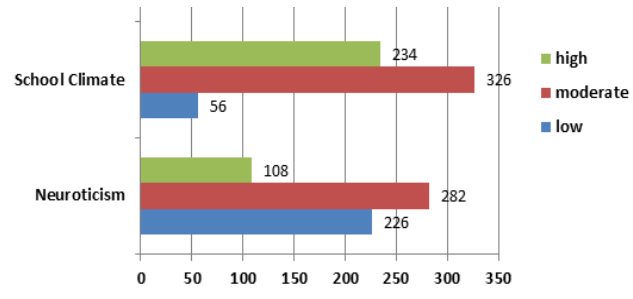
Fig. 2. Description of neuroticism trait and school climate.

How about neuroticism and school climate in perception of respondents? Figure 2 shows it. A total of 226 students perceived their neuroticism was in the low category, 228 students rated medium, and 108 students rated high category. For the school climate, 56 students rated high, 326 asess the school climate medium category, and 234 students rated low. The research described if the respondents in this study generally assess the level of neuroticism and school climate are medium category.

The next calculation was examine between neuroticism personality trait and school climate to the bullying target. The results are described below:

Table 3. N, Means, SD, Ranges, Correlations (neuroticism, school climate to bullying).

Variable	M	SD	Range	R
Neuroticsm	32.000	12.450	10-60	0.114**
School Climate	118.950	29.123	32-180	-0.241**
Teacher caring & respect	43.078	11.297	10-60	-0.160**
School goal & norms	36.636	11.912	10-60	-0.196**
Peer relation	39.235	11.195	10-60	-0.255**

The datas in table 3 appeared that correlation between neuroticism and victim of bullying was stand at r = 0.114, p <0.01. It means there was a correlation with positive relation between neuroticism and victim, indicating that neuroticism had a positive significant effect on victim. How about school climate and its dimensions to victim? Correlation between school climate and bullying was at r = -0.241, p <0.01. It means there was an opposite correlation between neuroticism towards victim, indicating that school climate had a negative significant effect on victim. Each of school climate dimensions also had negative correlation towards bullying. Teacher caring and respect as the first dimension of school climate had a negative correlation (r = -0.160, p< 0.01) to bullying. The second dimension was school goal and norms with r = -0.196 (p< 0.01), indicating that the dimension had a negative significant effect on victim. Meanwhile, peer relation as well as other dimensions of school climate, had a negative correlation at r = -0.255 (p< 0.01) on bullying.

Table 4. Model Summary.

Predictors	R	R Square	Adjusted R Square	Std. Error of the Estimate
Neuroticsm	0.114	0.013	0.011	14.876
School Climate	0.241	0.058	0.056	14.533
Teacher support & caring	0.160	0.026	0.024	14.786
School goal & norms	0.196	0.039	0.037	14.682
Peer relation	0.255	0.065	0.064	14.477

Dependent Variable: Target or victim of bullying

Table 4 displays the results of multiple regression calculation of neuroticism and school climate to the victim of bullying. The calculation shows a contribution of personality trait and school climate as independent variables to bullying as dependent variable. All variables: neuroticism, school climate, teacher caring and respect, school goal and norms, and peer realtion had contributions to the dependent variable of this research: target of bullying. Neuroticism contributed 1.1 percent to victim of bullying, school climate contributed 5.6 percent to avoid victim, teacher caring and respect contributed 2.4 percent, school goal and norms contributed 3.7 percent, and peer relation as the last variable gave 6.4 percent contribution to avoid bullying. The statistical tests above showed hypothesis verification in this study, the influence of neuroticism personality trait and school climate to target of bullying. The stronger neuroticism perceived by students, the stronger it will significantly influence on the bullying target. Meanwhile, the stronger school climate perceived by students, the stronger it will significantly a negative influence on the victim of bullying. From all aspects measured in this study, there were significant correlation between all examined variables. Neuroticism personality trait in this study has a positive contribution to victim of bullying. It means the stronger of neuroticism owned by students, the stronger the tendency of students to become victim of bullying. Tests on the neuroticism appear on several facets, like vulnerability and depression. Students who are vulnerable and easily depressed will be more easily targeted by their friends. Neuroticism trait will support individuals to become victims of bullying, as evidenced by Crapanzano's (2010) which states that bullying is dealing to the inability to regulate emotions, instability and depression. Result of this research in line with neuroticism description by Costa & Mc Crae (2003). Facets in neuroticism contribute to victims of bullying, including the depressive facet and easily give up.

The results above also indicate if the school climate has contributed to the prevention of the victim. The presence of a significant negative results indicates that the higher the school climate perceived by the students, the less likely the students will be the target in school. Testing of components in the school climate in this study also showed significant results. The importance of teachers' attention and respect, contributing significantly to the prevention of harassment. This is in line with Baker's [20]. Students who have a positive perception of school, generally assess their teachers are friendly, and able to establish effective communication [21]. Teachers also do not hesitate to give positive appreciation to students such as praise and appreciation of student achievement, and not merely focus on student mistakes [20]. In addition to teacher attention and support, the study also provides results that the dimensions of school goals and norms also have a significant effect on prevention of harassment. The adoption of clear rules with discipline is shown to have an effective impact. Nevertheless, the application of such strict rules and sanctions should not only be made when

bullying has occurred, but is socialized in the form of values and norms that the school guides. This result is consistent with Ferráns & Selman (2014) research which states that disciplinary practices in schools considered by a clear structure and supportive support have been presented to be linked with lower abortive behavior. The peer relations component in this study, as well as dimensions in other school climates, shows a significant effect on prevention of bulllying. Peer interactions are an key aspect of promotion a comfortable and safe feeling for students. Respondents in this study are categorized in adolescence, it can be understood that the contribution of peers is an vital aspect. This result is in line with the research of Douglas et. Al (2009) which states that the relationship between students is a major critical factor for teenagers, especially considering the students spend more time with peers in their daily life. The Fox and Bolton research project (2005) referred to by Douglass (2009) informs that in peer relations, the social skills aspect among peers is an important variable. Adequate social skills, will make adolescents able to adapt properly so as not to fall into bullying.

4   Conclusions And Suggestion

The implications of these findings require the school to consider the development of students personality to be encouraged to develop a positive character. Although personality experts say trait is a permanent feature in a person, yet a number of other experts say that adolescence is the age at which the personality trait is still in the developing stage. This provides the basis for the school to support the widest activities and learning systems in schools, including improving the excellence of education in progress. Furthermore, the quality of teachers must to be enriched. It will develop the the excellence of learning [22]. Teachers who simply deliver the learning materials, then do not engage in the activities of students will certainly make the programs of prevention of bullying to be less adressed. In addition, the interaction between pupils is expected to be managed in such a method that it can develop the skills of students teamwork, support each other and care about their friends, have a sense of responsibility, dare to admit mistakes, and not easily fragile, anxious or desperate when met a stressful situation. Culture in schools also needs to be strengthened so that a positive habit builds up among the students [23]. Coaching from schools, teachers and parents to these positive characters will make teenagers more resilient in developing their identity so that individuals can be ready to cope with various issues around the world of teenagers, including avoiding bullying.

The study was only done at one level school (senior high school level). I suggest for further research, it should be done at some schools with varying levels. So we can make a comparison of well being school at different levels. Using of a larger sample for further research is strongly recommended, so that the concept of school climate can be tested more depth to include other variables that have not been explored in this study.

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Learning Model of Narative Writing in Elementary School Reviewed from The Perspective of Balance of Brain Function

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Abstract. Writing is a vital skill for students to have. This research uses descriptive research methods that aim to improve the learning of narrative writing. This research was conducted at SDN 1 Pondok Kabupaten Ponorogo, SD Muhammadiyah Terpadu, and SDN 1 Jenangan. Data collection techniques are through observation, interviews, document analysis, and composition tests. Implementation of learning narrative writing in perspective of balancing of the brain function begins with a gradual learning structure with balanced brain activity through tangible objects, media images, audiovisual, music, and others. Giving stimulation based on right and left hemisphere of the brain functions provides a pleasing learning effect to students. It was proven that results of writing narrative students have improved both in content aspects, organization of content, vocabulary, grammar and spelling.

Keywords: Learning model, narrative writing, balancing brain function.

1 Introduction

Writing is the most important skills students have. This is because writing is the initial provision of a student in determining the success of learning other subjects and as a basis for students to obtain higher education later. Writing becomes a means to extend students' understanding of the lessons and is the most important language skills. This is insisted by Percy [1] which states that writing is a tool for understanding. Writing has benefits as a means to develop an understanding of something and the ability to use language (a tool for developing and understanding of and ability to use the language).

Pennebaker also mentions some of the advantages of writing activities such as clearing the mind, overcoming trauma, helping to gain and remember new information, solving problems, and free-writing can be helpful when forced to write [2]. He explains that expressive writing can change attitudes and behaviour, increase creativity, memory, motivation, and various relationships between health and behaviour.

Based on the above explanation can be assumed that writing is an ability that is important for students to have. It is also useful to write emotional expressions into books, blogs or personal journals in narrative form. There are many benefits both physically and psychologically even in behaviour that can be obtained when students write. Writing helps students get and remember new information.

A concise view of the stage of the writing course is expressed process is expressed by Tompkins a brief overview of the stages of the writing process is expressed by Tompkins presenting five stages: (1) pre writing, (2) drafting, (3) revising, (4) editing, and (5) publication / (sharing). Tompkins also stresses that these writing stages are not linear activities. The writing process is nonlinear, meaning it is a recurring round. For example, after finishing editing the author, the author may wish to review its conformity with the original writing or draft frame [3]. There are three writing processes offered by Nunan (1990: 90) namely: (1) prewriting stage, (2) writing stage, and (3) improvement phase. To apply these three stages of writing requires skill to combine between process and product writing [4] generally includes: (1) prewriting stage, (2) writing stage, and (3) improvement stage. To apply these three stages of writing requires skill to integrate between the process and the product of writing.

Based on the stages of the process of writing the above teachers should be able to apply these stages in learning to write but most teacher do not apply this. Here I portray the results of research I do about how the condition of learning to write in schools. Based on the results of interviews and observations how students learn to narrative writing of 8 elementary schools in Ponorogo district, it was obtained results about the condition of teachers and students, learning process, and evaluation in learning to write narrative. The following will give details of the results of the study.
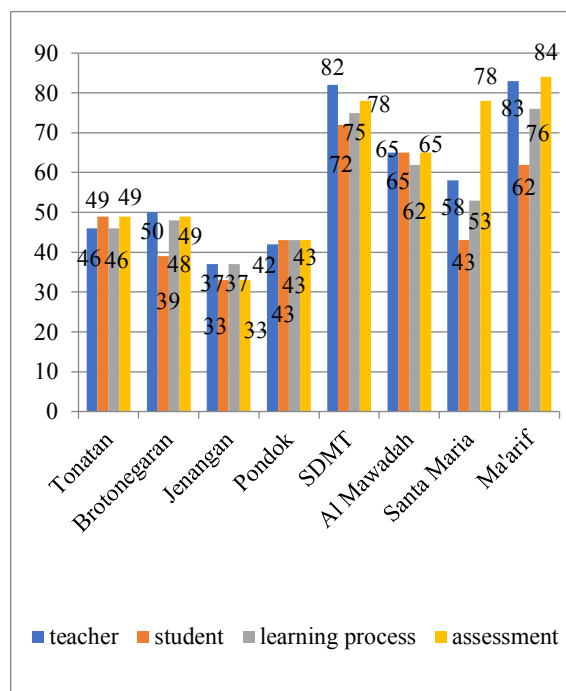
Fig. 1. Condition of Teacher, Student, Learning Process, and Assessment of Learning in Narrative Writing Lesson in Elementary School.

Teacher learning quality can be examined from preliminary activities, core activities (exploration, elaboration, confirmation) and closing activities as well as teacher guidance in learning, providing examples, new techniques being tried and reflections of written results. Based on figure 1 above there are 4 schools that have met more than 50% good criteria. The four teachers have implemented a learning that meets the criteria, with the appealing that attracts students in the core activities to implement several variations of learning techniques, i.e.: using mind mapping, series of serial images and movies. Teachers also accompany students in learning to write and also show students' weakness of writing so that students know the mistakes that have been done.

Student quality is seen from student's interest/motivation, writing idea, spirit and creativity of students, mastery of knowledge of writing stages and enthusiasm of students in learning. Based on the figure above, there are 3 schools whose students have fulfilled more than 50% good criteria. In the three schools, the interest and motivation of students in learning writing has been seen. Students have quite creative writing idea. Some of the students in the school have enough knowledge of the writing stage. Students' Enthusiasm in learning is good enough.

The quality of the learning process can be examined from the learning stages from the introduction/apperception, core activities (exploration, elaboration, confirmation) and closing activities. It includes that the teacher has conducted a mentoring program in learning, providing examples, new techniques are tried and reflection of the writing. Based on figure 1 above there are 4 schools that have met more than 50% good criteria. The four schools that have implemented the learning process in line with the criteria, i.e.: they generally start learning with apperception that can attract students to follow the next lesson. The apperception is done by telling stories, guiding questions and relating to past material. In the average core activity of 4 schools above the criteria have done several variations of learning techniques.

The quality of evaluation in learning can be examined from the 3 points: accompaniment while carrying out the learning process, the reflection of writing and performing the assessment with a simple grid. Based on figure 1 above the school that has conducted an evaluation in the learning that has met the criteria of 50% are 4 schools. The four schools that have implemented the evaluation of learning in line with the criteria set generally do mentoring while implementing the learning process. Teachers also reflect on students' writing. But in doing the assessment still use a simple grid, such as just assessing the relationship title with the content and spelling only.

Departing from the facts of the above study, a model of learning in the perspective of balancing brain function is proposed. The view that the right and left brains have different functions inspires many educational theories. It is generally known that the left hemisphere organizes the right side of the body while the right brain organizes the left side of the body. Corpus Callosum serves a vital role as a bridge between the two brain hemispheres [5] reveal that the right hemisphere of his thinking process is random, irregular, intuitive, and holistic. The thinking process is in line with ways to know nonverbal, such as feelings and emotions, awareness of feelings (sensing the presence of an object or person, spatial awareness, recognition of shapes and patterns, music, art, color sensitivity, creativity, and visualization. While the left brain thinking process is logical, sequential, linear, and rational. The left brain based on reality is capable of performing abstract and symbolic interpretations. The thinking process is appropriate for regular tasks, verbal expressions, writing, reading, auditory associations, placing details and facts, phonetics, and symbolism.

Furthermore, [6] proposed a Whole Brain Learning for educational process, namely the concept of education that combines the task of the right brain and left brain. To balance the

tendency toward the left brain, it is necessary to incorporate music and aesthetics in the learning experience and provide positive feedback. All of it poses a positive effect for you yourself. Positive emotions lead to the power of the brain that leads to success.

Brain-friendly learning according [7] should consider four main principles for applying in classroom learning. The four principles are Safety, Respect, Novelty, and Memory. Safety is a classroom should be safe, able to bring a sense of awareness and mutual trust before learning. Respect is that children will thrive when their unique amalgamation of learning styles is respected and supported. Novelty is a challenging, exciting, and new activity that raises a positive emotional state so that learning conditions can create pure bonds and learning opportunities. Memory is entering and building existing memory which affects pure learning and can keep new memory.

Based on the research of Roger Sperry [8] it reveals the difference in a constant way how both hemispheres store and process information. The results of these study support the existence of different functions between the two hemispheres. Many experts argue that the left brain is the IQ (Intelligence Quotient) controller, while the right brain serves a vital role for the development of EQ (Emotional Quotient). Both hemispheres have a very important role. Therefore, a person make a balance in every aspect of his life if he can optimize the ability of both hemispheres in a balanced way.

Humans are able to process the world in two ways. Rico [9] calls it the brain's sign and brain design. The brain of the sign (left hemisphere) thinks linearly, per section, logically, one by one, while the right brain thinks as a whole, illustrates by image, emotional net, sensory pattern, as the memory suddenly flashed in consciousness as a whole. Similarly in writing skills, Rico argues that although writing requires the work of the left brain, writing also requires a global search strategy for grouping, requiring nonlinear encouragement of emotions, memory, ideas from the right brain. The rushed emphasis on left-brain work often closes the right-brain search strategy. Once both sides of the brain have done accordingly in the writing process, the creative potential that already exists within us is all activated. The resulting writing flows quickly and easily.

There are several important roles of the brain in the process of creativity such as creativity, imagination, and intelligence. These components are very potential in the creative process. These three keywords are closely related to the function of the brain. The ability of creativity, the power of imagination is a function of the right brain. Intelligence is a function of the brain in general both the right and left brain functions.

Research related to writing learning in elementary school was conducted by Yu Shu Fan in Taiwan primary school. As performed in elementary school Taiwan, he found that the technique of thinking map in writing is very effective and facilitate students in learning writing. Other researchers analyzing writing skills in elementary schools were conducted by Fazio & Gallagher. They discuss about writing creativity techniques [11]. Their research discusses about writing skills that can be developed with Mnemonic POWER (Planning, Organizing, Writing, Editing, Rewriting) techniques that are mostly emphasized on E (Editing). Other experts who did research writing skills in elementary school are Smitherman & Girard. This study shows the success of students at the basic level because it integrates with other science. Smitherman & Girard (2011) research offers a technique by creating a bridge of learning to write with creative writing. The bridge is called craft criticism. Craft criticism is a link between creative writing and learning materials [12].

Research on how the brain works associated with the writing and learning process in school looks like this. Shah et al., (2013) describes that the research of creative writing and copying is investigated by using media fMRI (functional Magnetic Resonance Imaging) a

device that uses computer media that can see which part of the brain is active. The results show that creative writing involves the cognitive abilities, languages, and functions of the creative brain mainly represented in the parietal frontal temporal network. Based on the results of the images of the parietal frontal-temporal network of the brain when learner perform the creative writing activities, the right and left brain structures works simultaneously [13]. This is different from just writing activity in the form of copying activity. Review of various research results based on research conducted (Gülpinar, 2005, pp. 299–306) explains that research using electro psychological media, neuro psychological test affects the development of the world of education. It is also an impact of learning based on a constructivist approach. Learning based on constructivist view there are three important concepts namely individual differences, contextuality, and complexity [14]. Research conducted who examined the property of brain-based learning on student achievement with diverse learning styles. Duman's research was conducted on students of the Department of Social Science of Teacher Education at the Faculty of Education at Turkish Mugla University with a total of 68 respondents. The design used was a pre-test post-test design experiment. This study compared the academic skills performed with brain-based learning with traditional learning. The results confirm that brain-based learning is more effective. Brain-based learning is based on understanding individual differences through an understanding of learning styles. Understanding learning requires some knowledge of how the brain works and learns, and how brain function is based on the natural principle of brain work that adapts to the functioning of the brain [15].

Referring to previous research by Fazio & Gallagher (2009), Smitherman & Girard (2011), and Fan (2016), they appear to have more emphasis on writing techniques through Mnemonic POWER, writing that is associated with other disciplines, and techniques based on thingking map. In addition there are also studies that relate the performance of ota with the ability to write and learning in general [10],[11], [12]. Shah et al. shows with fMRI tools can be known when creative writing learning proved that the right hemisphere and left hemisphere work actively, while it does not work so when the activities of writing is only copying. Duman examines learning with individual learning styles. Understanding individual learning styles will be able to support success in learning when compared with traditional learning. Gulpinar provides some tenets of brain-based learning based on the effects of review of several studies utilizing neuroscience research results and the impact of constructivist approaches. The results of the review resulted in learning that respects individual differences, contextuality, and complexity.

Departing from that, it takes writing-learning techniques that are able to unravel the problem of writing skills that emphasize on how to get ideas, express ideas, develop imagination, and technically how to build the capacity to write by adhering to the system of good and right language. This can be realized by learning that optimizes the ability of both hemispheres in a balanced way. Balancing brain function makes it easy for students to express their ideas. Balancing brain function will produce complementary alloys. Feelings, emotions, imaginations which are the right-brain function of the expression are aided by the workings of the left brain. Writing is an entire brain activity that uses the right hemisphere (emotional) and the left hemisphere (logic) [5].

This research is focused on the implementation of learning narrative writing in perspective of balancing of the brain function. This narrative genre is chosen because writing narration is the most basic skill that children should master. This is in line with [16]. Martin explained that the ability to write narrative is the first step required to teach the writing process for students.

2 Method

This research uses descriptive research method that aims to describe the use of learning model of narrative writing with the perspective of balancing brain function. This research was conducted in 3 schools: SD Muhammadiyah Terpadu with 24 students, SDN I Jenangan with 22 students, and SDN I Pondok with 26 students. The total number of respondents is 72 students. Technique of collecting data through observation, interview and performance test. Interviews were carried out with teachers and students, while observations were made on the lesson. The instruments that are used are interview guides and teacher and student observation guidelines. While the performances test is a test of narrative writing skills.

Data analysis using mastery learning technique adopted by Curriculum 2013 (K-13) and Education Unit Level Curriculum (KTSP). Mastery guide uses 100 scale assessment. Personal mastery guidance states that students are declared get completely mastery in learning if students get a score of 75. Classical mastery states students are declared to have complete mastery if 85% of students have completed a score of 75. The success of research is based on the increase of the learning mastery.

3 Result and Discussion

The above problems are expected to be solved by introducing a fun and easy model to be perceived by students with different ways of learning and understanding. Teachers should know how students learn. This is in line point of view, et al. that the learning model chosen by the teacher is recommended in line with the student's learning style [17]. Joyce's exposure in introducing learning models is studied in a step-by-step activity tailored to student-based learning of brain functioning with whole brain or global learning. It also notes the phases of the writing process which consists of pre-writing, drafting, revision, editing, and publication. The following describes the syntax, social systems, principles of relations, support systems, in addition to the impact of instructional and companion impact of brain-based learning model of writing.

Based on these phases, below described how the stages of the implementation of writing based learning weighing brain function. Syntax in writing learning based on brain function weighing, the following learning steps.

Table 1. Steps of Writing Narrative Based on Balancing Brain Function.

ACTIVITY	BALANCING THE RIGHT AND LEFT BRAIN FUNCTIONS

Emotion Ignition 1) Teachers stimulate students 'emotions bringing a binding atmosphere to the students' experience using concrete objects, picture media, story texts and movies 2) The teacher arouses the students' imagination	Sparking emotions, the use of concrete objects, media images, movies, and music is the activity of the right brain. The activity is always accompanied by verbal exposure which is a left brain activity.
Clustering 1) Teacher explains how to make clustering 2) The teacher gives examples of clustering 3) clustering is made using a series of events	The working principle of clustering can be structured, hierarchy and relationships. The working principle is left brain activity. The activity is balanced by the use of colors, shapes, marks that are the activity of the right brain.
Expression 1) Teacher explains how to express writing from clustering result. 2) The teacher gives examples of how to make essays from clustering and skeleton 3) Teachers motivate and provide reinforcement for students not to feel guilty in expressing their ideas.	Expression is the expression of ideas, thoughts that are in memory through language. The use of this language is left cerebrum activity. Activities to balance is combined with imagination, intuition, creativity that is a right brain activity.
Editing 1) The teacher takes a sample of student essays to be analyzed in a classical manner with regard to the contents of	Edit activity is more dominant with left-brain activity. Because the functionality of the left-brain processes the inputs in a sequential (sequential) and analysis. This is balanced with right brain activity by signing, coloring and thinking in a holistic way.

the proposed idea, content organization, the style (choice of structure and vocabulary) of grammar and spelling. 2) After discussing one example held a discussion with the students 3) Teachers provide assistance either classical or individual 4) The teacher expects students to improve the writing that will be ready for display.	
Display Displaying student work in a classroom wall magazine or displayed in class according to their classroom condition.	Shelf activity is a visual activity that is a right-brain activity balanced with verbal exposure.
Reflection This activity begins once teacher analyzes students writing which have been edited. Teachers and students make the next draft of activity	Evaluating is a left-brain activity activity. This is balanced by the design of the next activity which is the right brain activity

Based on the above table, shortly it can be showed in the following figure 2.
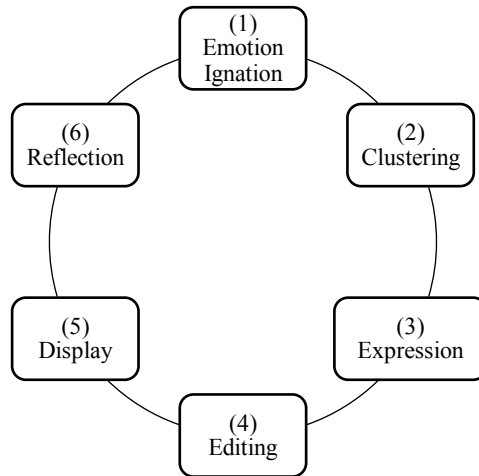
Fig. 2. Learning to Write Right-Based and Left Brain-Based Balancing Figures.

This study was conducted with two cycles. The first cycle of learning model based on balancing brain function is emphasized on giving emotional ignition with multi-sensory concrete objects. The function of giving emotional ignition is to bring students to the imagination of the object. The result of the first cycle shows students who achieve minimal criteria are 30 of 72 students or percentage of mastery achievement in the first cycle of 42%. There is an progress in cycle 2 that shows the mastery achievement 85%. It means that 61 of 72 students achieve minimal criteria.
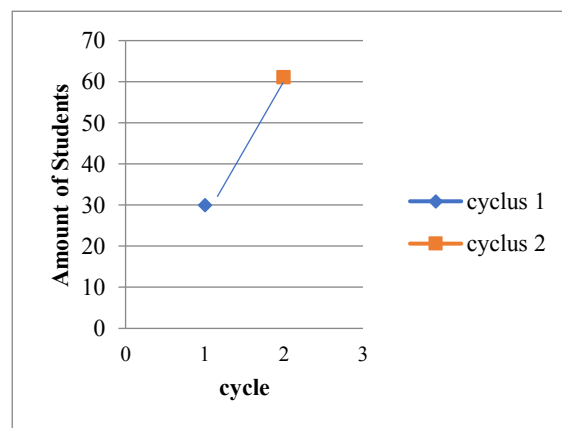
Fig. 3. Learning Result of Narrative Writing Using Clustering Technique Based on Balancing Brain Function.

Based on the assessed aspects, 4 of 72 students meet good criteria in content aspect, 64 students meet good criteria in organization content, 61 students in vocabulary, 23 students in grammar and 31 students in spelling. This is supported by the interviews that students feel that

concrete objects and clustering that are linked to the storyline help them. It is demonstrated in Figure 4.
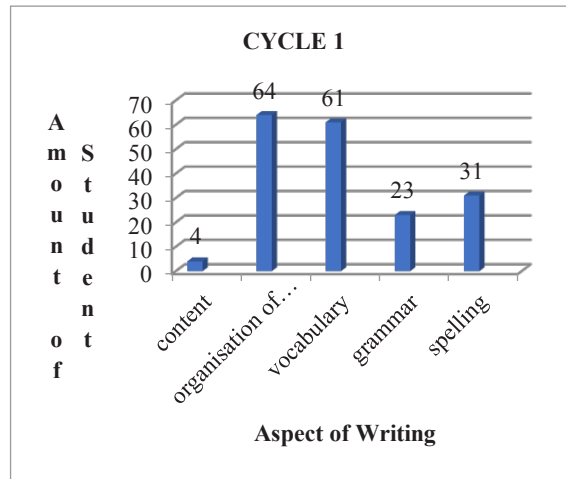
Fig. 4. Results of Narrative Writing Ability in Each Aspect of Cycle 1.

Implementation of the second cycle of learning using a learning model based on balancing brain function by lightening emotions with the film media and guided by a guide asked questions. The result of the second cycle obtained a complete student data of 61 students from 72 students. Percentage mastery in research in second cycle is 85%. Based on the assessed aspects, 29 of 72 students meet good criteria in content aspect, 70 students meet good criteria in organization content, 71 students in vocabulary, 50 students in grammar and 52 students in spelling. It is demonstrated in Figure 5.
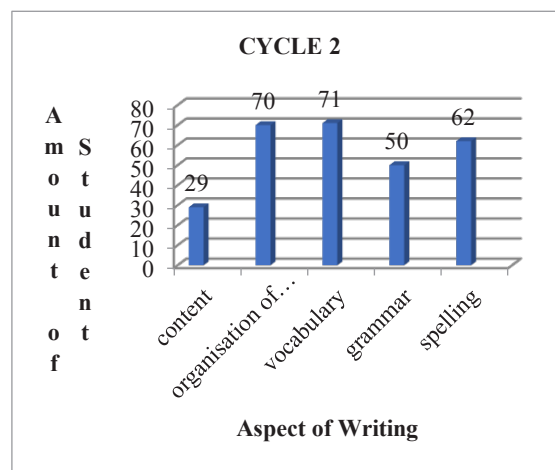
Fig. 5. Results of Narrative Writing Ability in Each Aspect of Cycle 2.

Based on the figure 5 above, we can know the development of each aspect of writing narrative essay. Good initial skills are in organizational aspects of content, vocabulary and spelling. The three aspects of development have been improved in the cycle 2 of vocabulary aspect to 99% (71 students), organizational aspect of 97% (70 students), and aspects of spelling 86% (62 students).

Inadequate initial capability in content and grammar aspects. But in its development has increased in the second cycle of content aspects reached 40% (29 students), and grammatical aspects 69% (50 students). The contents of ideas revealed by students are less creative, this is due to the ability of students to read less than the maximum. The development of sentences in the narrative is also not maximal. This is understandable because lack of adequate portion. This can be known during the research, students have difficulty in developing sentences.
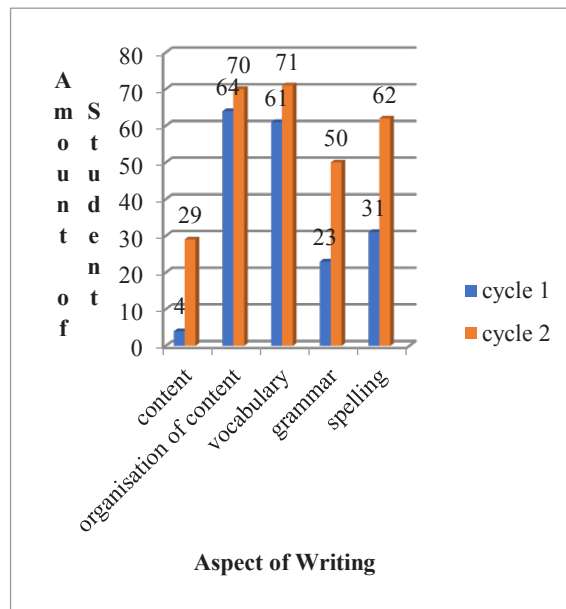
Fig. 6. Results of Narrative Writing from The Perspective of Balance of Brain Function.

This research has a novelty about a model of narrative-based writing balancing brain function in primary school. This learning model is a model that is easy and practical in its implementation. Concrete activity procedures appear in verbal activities balanced by visual and spatial activities. Discussions are not only logical but also intuitive and imaginative. Learning can use effective media or aids. In the implementation of learning, activities can be varied by combining media images, music, concrete objects, and sensory stimuli that can stimulate students to imagine. Learning activities are based on right brain activation activities and left brain in a balanced manner.

This learning model based on balancing brain function makes it easier for students to find ideas that are tailored to different types of intelligence. This is supported by a variety of media that is image, film, recording drama, illustration, concrete objects that can ignite the imagination of students.

The outcome of this study are expected to develop the theory of learning writing skills in the form of more specific studies of learning-based learning model of balancing brain function in elementary school. Practically the outcome of this study are expected to be useful for teachers. The results of this study can be used for grip and reference learning model that can be utilized in learning Indonesian especially writing narration to get optimal results. Educational policy makers can utilize the results of this study as an additional discourse in determining policies related to the variation and innovation of learning models of writing. The compilers of textbooks can make the results of this study as a reference or a foothold in the preparation of books. Curriculum developers can use the results of this research to develop, manage, and choose curriculum forms that prioritize meaningful, contextual, and respectful learning of individual differences.

4 Conclusion

The model of learning to write narrative in primary school from the perspective of balancing brain function through various variations of sensory media can stimulate students to write narrative essays. Learning model of narrative writing in elementary school from the perspective of balancing brain function can be applied as an alternative model of narrative writing lesson. It is proven, through the learning model, the ability of students writing narrative to develop.

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Competitive Advantage of Family Business and the Barriers: Evidence from Indonesia SME's

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Abstract. The growth of family business in Indonesia is higher than the global average, but some family businesses are still struggling to survive in the market. The phenomenon of this research is the sign of decline Bintang Lima as a study research and observation, a family business in Indonesia, is showing and the owner's incrimination on the country's economic slowdown. This research paper is written to analyze the factors that enabled Bintang Lima, as one of Indonesia typically family business, to survive for more than sixteen years and the barriers that diminishes these competitive advantages which caused the business to be slowing down the past few years. The data in this single case qualitative research is gathered mainly through interviews with seven respondents which includes one of the owners, four employees, and two loyal customers. As a result, it is found that product quality, post purchase service, customization, reputation, and other factors contribute to the competitive advantage of Indonesia Family Business. Furthermore, factors like receivables, technological advancement, human resource, supply chain, and other factors diminish Indonesia Family Business'competitive advantage. The outcome of this research study is a mini-theory that points attention to this case study of Indonesia SME's in category of family business.

Keywords: Family business, competitive advantage, barriers, diminish.

1 Introduction

Bintang Lima isa sample of family business in Indonesia, was established in Harco Glodok, Central Jakarta in the year 2000. It now stands as a notable shop that sells closed circuit television (CCTV) cameras, and its complements and accessories. It ships its products to buyers within and outside of Jakarta, to cities like Jogjakarta, Solo, Manado, Surabaya, Medan and Pekan Baru.

Lau Kin Sing Ricky and Lisa Megasari, husband and wife, are the two individuals who had always overseen both the operational and financial activities ofthe business. When they first moved from Hong Kong to Jakarta to start the business,the first location they rented in 2000 was 10 m² that fits no more than four people,and started with just one employee who works full time six days a week. After being established for more than a decade, it has now moved to a different location fivetimes bigger than when it started, and has seven employees in total.

Gill and Sprigs (2005) described Closed Circuit Television Cameras (CCTV) as cameras that "collect images, which are transferred to a monitor recording device of some sort, where they are available to be watched, reviewed and/or stored." They also mention that CCTV enables any location to be monitored remotely [15].

The phenomenon of this research is the sign of decline the business isshowing and the owner's attribution to the country's economic slowdown. Bintang Lima's sales has dropped as much as 60% in the past two years, and the owner areidle when it comes to investigating the core of the problem, and instead attribute thedecline to the country's economic conditions. More than 95% of businesses in Indonesia is owned by families [33],which creates millions of jobs and plays a key role in the Indonesian Economy. And even though a survey by Price Waterhouse Cooper [31] on family business in Indonesia shows that the growth of family business is higher than the globalaverage, these family businesses are still constantly faced with competitive pressure [31]. With a staggering 95% failure rate of family business by the third generation [33], and the important contribution of family businesses tothe Indonesian economy, it is important to understand factors that may better sustain the family businesses in Indonesia.

The survey also points out that family businesses, compared to non-family businesses, are more able to be entrepreneurial and are faster in decision making, although the disadvantage being they are less open to new ways of doing and thinking [31].

The aim of this single case research is to ultimately come up with atheoretical framework to show the factors that contributed to Bintang Lima's sustainability for over sixteen years and how it was able to stay ahead of itscompetitors in the Central Jakarta area. Furthermore, this research also aims toidentify the barriers that are slowing down the business for the past few years, which diminishes the existing competitive advantages business?

2 Literature Review

According to Drucker (2014), in entrepreneurship, an entrepreneur is someone who "always searches for change, responds to it, and exploits it as anopportunity". Entrepreneurs are more vigilant whenit comes to spotting opportunities around them, even though it is clear for all to spot [6].

Entrepreneurship is about taking risks [22]. A risk of an entrepreneur failing, but the returns should offset all the risks[7]. The main reason for entrepreneurial ventures being risky is because not many entrepreneurs actually know what they are doing, in other words, they lack "methodology" [13]. Entrepreneurs have what is called the serialbehavior, where they continuously try to take on more challenges and focus onconquering more opportunities and ventures [6].

Meanwhile, Entrepreneurs have to have a great deal of motivation to start their own business,knowing that there will be ups and downs along the way. There are five motivations that impel someone to start their own venture, first being the possibility of unlimited income potential, in other words, money (www.entrepreneur.com). Second is flexibility, the idea of being your own boss, and deciding your own working hours and being free from the demands of others (www.entrepreneur.com). Third is control, always being able to make all the important decisions, like who to hire and changing the direction of the business (www.entrepreneur.com). Next is teamwork.

Entrepreneurs have the privilege to pick who their team consists of, who to work with, and the attitudes, personalities, and skills sets they want to work with (www.entrepreneur.com). Finally, legacy. Some entrepreneurs, more than money and fame, simply wants to be appreciated for and remembered by something thatthey have created

(www.entrepreneur.com). As the recent trends the entrepreneurs come from home industry and most of them is family business [1],[2].

According to Harms (2014), despite having family business as more commonand accepted field of study in economics, there is still no clarity by what is meantby the term "family business" and no mutually accepted definition which existswithin this field of research; understanding of family business depends on the topic of the research, the time period in which the research is conducted, and the location of the research [17].

Family businesses are made up of the family and the business, two separate subsystems, which overlap, and the norms, rules of membership, structure of values,as well as the structure of the organization are different in these two "circles" [5]. This concept is still widely used today by scholars andresearchers to analyze "complex organizational behavior, strategy, competitiveness,and family dynamics" [14].

According to Gersick (1997), the uniqueness of the organizational form of afamily business can bring both positive and negative consequences. The "shared history, identity, and common language of families" [14] can bestrengths that other organizational forms are missing out, although factors such asauthority, vagueness of roles, business pressure influencing relationships, are some of the challenges a family enterprise must overcome to achieve success.

There is a clear distinction in strategic planning and succession planning betweena family-owned business with effective governance practices and a family-ownedbusiness with poor governance; from being able to grow quicker and last longer, afamily-owned business with effective governance practices are more likely to comeup with significant formal policies regarding issues that might occur, such as redemption, family employment, dividends, and others [25].

Using data from Sub-Saharan economy, Ghana [1], family business in that area indicated the business strategies are far from competitiveness due to the cost of leadership and social networking relationship of bureaucracy which impact to overburden the organization and benefits. Competitive advantage is "achieved by implementing a value-creatingstrategy that is unique and not easy to imitate" and "it is achievable when a firm hasstrategic resources and the ability to use them in unique ways that create value for a group of targeted customers" [4].

Meanwhile, [30] has suggested that the competitive of strategy focuses more on external factors and conditions that might affect and influence a firm. It puts great importance on a firm's effort to place itself in the market such a way that it can still stand strong despite all the competitive forces [30]. The strategies based on [30]which declared by Porter's five force includes: 1) threat of substitute products & services, 2) threat of new entrants, 3) rivalry among existing firms, 4) bargaining power of suppliers, and 5) bargaining power of buyers.

In order for a firm to cope with the five competitive forces and have an edgeover other firms in an industry, it can practice three generic strategic approaches, which includes: 1) overall cost leadership; 2) differentiation; and 3) focus. Whether overall cost leadership, also called low-cost strategy, is achieving superior profits by producing and selling goods at the lowest price possible in the industry [30].

The differentiation strategy is creating and proving products or services that are distinctive from competitors in the market [30]. Hence, firms who use the focus strategy will target markets that are narrow using either the differentiation or low-cost strategy. The firm with this strategy focuses on serving the narrow market well, rather than competitors who are focusing on serving a broader market [30].

Even that, Habbershon et.al (1999) found that value disciplines is a framework for assessing the strategic advantages of family firms. Using three 'value disciplines' (operational

excellent, product superiority, and customer intimacy), where each discipline aims to meet the different and unique needs of each customer type, and where each need different capability of resources, and can be used to help an organization make strategic decisions.

A business with operational excellence has a tactical approach to its production and delivery of its products and services. It aims to provide customers with the best price and least inconvenience. Business with this strategy aims to achieve excellence in the "core processes of order fulfillment, supply-chain management, logistics, service delivery and transaction processing." [18]. Customer intimacies means delivering what customer wants, and cultivates and develop relationships with those customers. A business needs to understand the difference between profit or loss of a single transaction and profit over a lifetime of the relationship of one single customer. Different customers require different types and levels of service, and they generate different levels of revenue [8]. Meanwhile, a business with a product leadership discipline wil lalways try to be creative and innovative and come up with new or updatedproducts and services to better serve their customers [18]. Interestingly, Treacy and Wiersema (1993) also states that businesses with this discipline should "relentlessly pursue new solutions to the problems that they own latest product or service has just solved".

This research also used the Bowman strategy clock, which is a 360 degree flexible model which presents afirm's offerings not just at a specific position (left, right, top, bottom) of a model butcan be situated anywhere on the clock; differentiation Strategies, Low Price Strategies, and Risk Strategies are some of the factors that differentiate firms fromone another [36]. Bowman's method of craftingstrategy breaks down possible strategy options into eight parts as the figure 1:
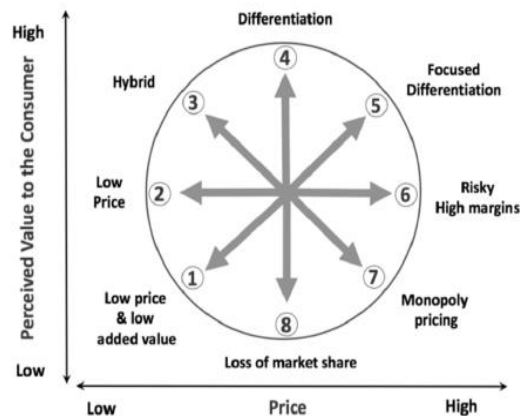
Fig. 1. Bowman Strategy Clock [36].

3 Methodology

This research study is an individual, instrumental, inductive case study usingthe qualitative method. Qualitative research focuses on the flow of research in which it starts from

"philosophical assumptions, an interpretive lens, and on to the procedures involved in studying social or human problems" [9]

The goal and aim of this research is to come up with a mini-theory, which according to Jonker & Pennink (2010), is a theory that is only suitable and relevant for a specific phenomenon and that its general validity still needs to be tested and proven. Furthermore, with repetition in future research; this mini-theory can be evolved into a theory called the 'grand theory', which can be suitable and relevant for other similar situations [16],[20],[21].

The research object of this research is Bintang Lima, a shop that sells closed circuit television (CCTV) cameras, digital recording video (DVR) systems, and its complements and accessories in the Central Jakarta area. The CCTV cameras sold are for both day night uses. Complements and accessories may include cables and BNC (Bayonet Neill—councilman) connectors.

The research subject will be the source of information for this research [26]. The research subject for this study will be those who are capable of giving useful information for the benefit of this research study. Seven respondents consisting of one founder, four employees, and two loyal customers will be the subject of this research [27],[29]. There are: 1) Lisa Megasari as the founder of Bintang Lima, 2) Elisa Puspita: The one responsible for book keeping and holding cash at Bintang Lima. She helps with assembling parts of CCTV cameras and Digital Video Recording (DVR) systems, as well as its delivery to customers.She has worked for Bintang Lima for over eight years.3) AntoRafly: Handles packing parcels for delivery to customers and sending packages to other cities via express and logistics courier services company. Also helps with assembling CCTV cameras and DVRs at the store. He has worked for Bintang Lima for over ten years.4) Arif Hidayat: Responsible for product repair and services of CCTV cameras,digital video recording (DVR) systems, and spare parts. He has worked for Bintang Lima for over eight years, 5) Heri Rusmanto: In charge of keeping track of inventory in the warehouse and storage room who also helps with assembling CCTV cameras and DVRs and occasionally repair products as well. He has worked for Bintang Lima for over eleven years, 6) Vendy The: Bintang Lima's loyal customer who has been buying CCTVcameras and DVRs from Bintang Lima for over 10 years. He has his own CCTV camera store.7) Ali: Bintang Lima's loyal customer who have used Bintang Lima's service for over 10 years. He has his own store those cell CCTV cameras, radios, and other electronic devices.The founders and four employees will be familiar with the researcher as they have known each other for a few years. The purpose of the research will be explained to the interviewees, and they will be aware of the confidentiality of this research [23],[24].

One of the key tools in qualitative research is observation [9],[10]. There are three main types of observation: unobtrusive (non-reactive), reactive, and participatory [3],[11]. For this particular research study, unobtrusive –disguised observations will be used. As stated by Angrosino (2016), unobtrusive observation is when the people being studied do not know that they are being observed and a researcher conducting disguised observations will require him or her to blend in with the group of being that is being observed, without letting them know that they are in a study research [3],[12].
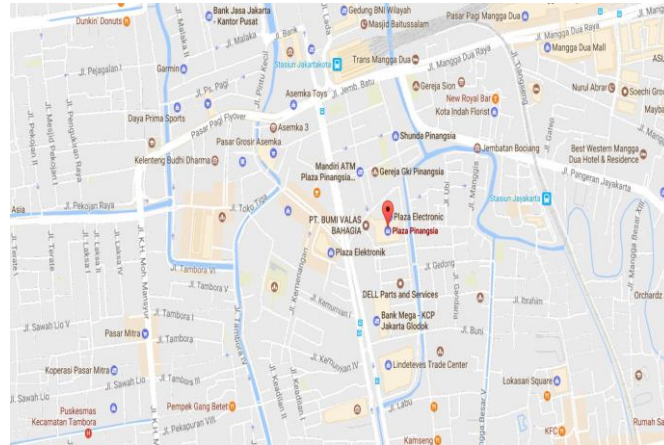
Fig. 2. Maps of Research Observation.

Creating minimal disturbance at the location is one of the top priorities of the researcher when the observation is being carried out. The researcher has asked the founder, Lisa and Ricky, for the most fitting dates for the observation to be carried out with the least obstruction and distraction to the overall operational activities of the business.The observation is carried out at the store (Bintang Lima), located at: Plaza Pinangsia 2nd Floor No.13 Jl. Pinangsia Raya, Jakarta Barat, Indonesia 11120, where the figure 2 will show the maps of observation.

4 Discussion

The research will conduct of some categories such as competitors, barriers, factors, and sustainability of the business

4.1 Explaining The Categories

Categories of the competitors, it consists [32]:
1) Product quality: The research will conduct of some categories such as competitors, barriers, factors, and sustainability of the business.
2) Customer service: The quick response and friendly service given to customers draws customers back to Bintang Lima. Customers become satisfied and loyal.
3) Customization: Customers are able to decide on the specifications they want for their CCTVcameras. For example, its resolutions, lens, systems (analog, digital). This enables Bintang Lima to cater to more customer needs and wants.
4) Integrity: Loyal customers trust that the products that they purchase of Bintang Lima are of thebest quality. The store is transparent about the products that customers order, withoutglossing over them. Bintang Lima believes that honestly is the best policy.
5) Attitude of owner: The owner's attitude make customers feel welcome and comfortable when theyconsider purchasing from Bintang Lima, whether at the end the sales is made or not.Customers always feel free to simply ask for information, without the pressure ofhaving to purchase at the end. The owner is friendly and recommend products thatthe

owner thinks is the right fit for the customer, and not what the owner wants or needs to sell.

Categories for the barriers to competitive advantage that is slowing down the business [34]:
1) Emerging online markets: The emergence of online markets has changed the way people purchase products,including CCTV cameras and DVRs. It is easier for people to sell the same productswithout having to own a physical store like Bintang Lima. Online stores are believedto be faster and more convenient for people to use.
2) Price war: The stores in the area are cutting down prices in attempt to attract customers and togain more market share. Bintang Lima is not able to compete without also cuttingdown their prices because they prioritize higher quality products rather than cheaper products.
3) Economic conditions: Recent economic downturn and prolonged unpredictable and unstable market conditions affects Bintang Lima in many ways. Prices can spike up and drop down very quickly which causes Bintang Lima to experience loss at times. Shipment fromoverseas takes time, enough time for prices to change. Economic downturn in thesuppliers' country may also affect the products and spare parts availability. Bintang Lima's store inventory depends on the inventory of that of the suppliers'.
4) Suppliers: Suppliers can carelessly deliver the wrong products from overseas, causing Bintang Lima to have to wait weeks or even months for the right products to arrive. Thisdelays and hinders sales that could have been made.
5) Receivables: Bintang Lima has a hard time collecting receivables from its customers; it has nosystem to remind itself to collect receivables when payment is around the corner.There is no fine or consequences when customers do not pay their debt, which causecustomers to postpone paying on time.
6) Human Resources: Some tasks like packing and delivering products require more than one person to complete, and Bintang Lima has only one person to do each job.
7) Shipment: Problems like port/terminal congestion, customs inspections (that took longer thanexpected) may occur at the port that causes products that should have been received by Bintang Lima at a certain point in time to be delayed and received days or weekslater.
8) Capabilities: The number of employees which remained the same over the years is handlingmore and more orders. At times, they are not able to serve customers immediately,causing the customer to wait before their wants are fulfilled.
9) Competitions: The number of stores in the area that sells similar products are increasing, causingcustomers to have higher bargaining power and Bintang Lima to have lesser marketshare.
10) Technologies: Rapid technology advancement (hardware and software) makes older versions of hardware unfitting to use. Bintang Lima has to be more careful and strategic whenordering inventory from suppliers, to avoid overstocking.

4.2 Constructing The Mini-Model

According to Ihalauw (2008), latent variables can be created and generated after thepatterns and concepts have been identified into categories. Through coding, the researcher is able to extract a total of 14 latent variables based on the exploration of the research problems [19]:
1) Product quality (V1): The quality of products meets buyer's requirements and expectations. Better quality is offered compared to competitors.

2) Post purchase service (V2): Post purchase service, in a form of a repair center, makes customers feelmore secure when buying products the first time, knowing that if anythingever happens to the products, they wouldn't have a hard time searching for arepair center. Repair centers as a post purchase service shows care andcommitment towards the long-term relationship with customers.

3) Customization (V3): Being able to have products customized will allow the business to cater tothe needs of more customers and give customers the freedom to choose thespecifications of their products.

4) Quick response time (V4): Quick response time shows commitment and availability perpetually,making customers feel cared for and secured. Quick response time means thespeed of responding to customer's orders and requests.

5) Customer relations (V5): Respecting customers as the company's most important assets by havinggood and effective communication with customers to maintain long-lasting relationships.

6) Reputation (V6): The business has a good history of past behaviors and performance. Thebusiness is honest and truthful in delivering the best products and the processes from ordering to delivery is always easy and facilitated. Positiveand strong reputation attracts customers.

7) Delivery time (V7):On time and punctual delivery shows high commitment in doing somethingand respect towards customer's time and effort.

8) Receivables (V8): Receivables are the money the business should be receiving for the goods orservices it has provided for customers. Low receivable turnover means that the number of times a business collects its receivable is infrequent. Thedifficulties in collecting receivables from customers may be due to the absence of fine or consequences for not paying receivables.

9) Delay of ship/vessel ETA (V9): The arrival of ship/vessel that brings products to the country for the business to sell is delayed, hence causing the business to delay its sales.

10) Technological advancement (V10): Technology advancement may include the existence of online markets and the rapid technological advancement in terms of hardware. Online marketshave changed the way people purchase products, and they are believed to be faster and more convenient than physical stores. The rapid pace of advancement in hardware makes it difficult for the business to keep up.

11) Human resource (V11): There is a shortage in manpower which causes work to be done less effectively and less quick than it should be. Employees are also lacking inskills like communications skills, sales and marketing skills, managementskills, and adapting to current market trends.

12) Rivalry intensity (V12): The pressure businesses put on one another to gain as much market share aspossible. Businesses seek sales and profit by presenting the best combination of quality, price, and service. Rivalry is intensified by competitors cutting down prices (price war) of products, forcing other businesses to do the samein order to survive.

13) Supply chain (V13): There is a misunderstanding or incorrect information sent by either the buyeror the seller during the process of ordering. The products sent and receivedis not according to what was ordered or expected.

14) Competitive Advantage (V14): This is when a business is at a position in which it is superior and has an edgeover its competitors, often leading to sustainability.

4.3 Model of The Sustainable The Business

1) Preposition 1 (P1)

Product quality (V1) towards competitive advantage (V14):The quality of CCTV cameras in terms of its resolution and durability is higher than what the other stores provide (Product quality – V1). This contributes to Bintang Lima's competitive advantage (V14). Customers who looked past the slightly higher price of products at Bintang Lima always return to repurchasebecause the resolutions and image quality are better. The product quality can bemaintained because the owner always keeps an eye on its employees when they buildand assemble the products. Most times, it is the owners themselves who build theproducts, from start to finish. Spare parts with defects are immediately set aside, sothat final products are made from the best components. Bintang Lima uses Product Superiority, one of the Value Disciplines by Treacy & Wiersema (1993), where it tries to always come up with different products and services to better serve theircustomers [35].
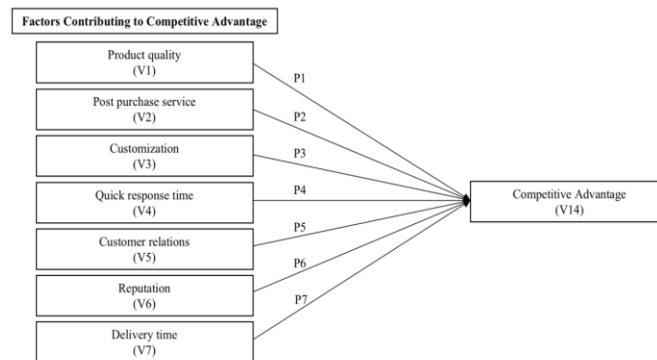
Fig. 3. Model of the sustainable the business [30].

2) Preposition 2 (P2)

Post purchase service (V2) towards competitive advantage (V14):Almost all the stores in the area do not have a repair center (Post purchase service– V2) with someone specializing in repairing damaged CCTV cameras or DVRsystems. Competitors accept damaged products, but they will need to send theproducts to another store specializing in just repairing damaged products or evenmust send it overseas to be repaired. Bintang Lima's repair center is located just afew meters away from the main store, making repairs quick and easy. Having a mainstore that sells products and a repair center to repair products makes Bintang Lima one stop solution, which contributes to its competitive advantage (V14). Bintang Lima uses differentiation, one of Porter's Generic Strategies [30], to createand provide a service that are different from what competitors offer in the area.

3) Preposition 3 (P3)

Customization (V3): towards competitive advantage (V14): Customers can ask for specific specifications for the CCTV cameras andDVR systems that they purchase (Customization – V3). Both customers who purchase products to resell them again and those who purchase for their own personal use can greatly benefit from this. This

customization service allows thebusiness to cater to more of customer's needs and wants. Customers are able to purchase and customize the products exactly how they want it and that fits theirneeds best. Bintang Lima's competitor in the area does not provide product customization, due mostly to their lack of connections to overseas suppliers that can supply them with spare parts to allow customization. Bintang Lima uses two ofPorter's Generic Strategies (2008), the focus and differentiation strategy, as it focuses on serving CCTV resellers well, rather than focusing on serving a much broader market, which includes those who are end users as well as offices.Customization is also a differentiating factor because a competitor in the area does not provide this service.

4) Preposition 4 (P4)

Quick response time (V4) towards competitive advantage (V14):Bintang Lima immediately responds to customer's orders and are always available for consultation, even outside of business hours (Quick response time –V4). For customers, especially new customers, setting up products like CCTVcameras and recording systems for the first time can be often be confusing and puzzling. Hence, having Bintang Lima employees who are always available toanswer customer's questions is a competitive advantage (V14) of Bintang Lima since many competitors do not response to customer's needs and wants quickly.

Being able to respond quickly to customer's orders and needs is an operationalexcellence strategy, one of the value disciplines by Treacy & Wiersema (1993). Bintang Lima aims to provide customers with the best price and least inconvenience, and achieve excellence in the core processes of order fulfillment and transaction processing [18].

5) Preposition 5 (P5)

Customer relations (V5) towards competitive advantage (V14):Bintang Lima always tries to maintain good and healthy relationships (customer relations – V5) with its customers through having good and effectivecommunication and doing its job well (delivering the right products, quick service).

The owner and employees of Bintang Lima always listens to customer's complaints,if there are any, and constantly tries to fix the problem and mend the relationship.This is a competitive advantage (V14) because it shows that Bintang Lima puts customers first, and it shows their willingness to listen and improve themselves. By maintaining good and long-lasting relationships with customers and making them feel comfortable and content, customers become loyal. The effort in cultivating and developing relationships with customers is a customer intimacy disciplines, one of Treacy & Wiersema (1993) "Value Disciplines".

6) Preposition 6 (P6)

Reputation (V6):towards competitive advantage (V14): Possessing a strong and positive reputation (V6) will attract old and new customers. Bintang Lima has an excellent history of past performance such as always delivering the best quality of products, always fulfilling customer's needs andwants, and facilitating customer's entire buying process, from pre-purchase service to post-purchase service. This acts as a competitive advantage for Bintang Lima (V14) because with a good reputation, new and old customers feel much moresecure and assured when purchasing from Bintang Lima because they believe thatthe business will perform well, in order to maintain its reputation. Certain customers are even willing to pay more because of the good reputation of the business.

7) Preposition 7 (P7)

Delivery time (V7):towards competitive advantage (V14) The quick delivery time (V7) that Bintang Lima can provide to its customersis a competitive advantage (V14) because

it shows that Bintang Lima is mindful ofcustomer's time. Customers order either CCTV cameras or recording systems withthe specifications they want, and expect it to be built and delivered on the same day.

Many of Bintang Lima's buyers are resellers, and they greatly depend on Bintang Lima's delivery time to be able to make their own sales for their own business.Without the quick deliver time, their sales are also delayed, which may causedissatisfaction. On time and punctual delivery shows high commitment in doingsomething and respect towards customer's time and effort. Being able to have excellent service delivery, logistics, and supply chain management is a sign of thebusiness excelling in operational excellence, a value discipline by Treacy & Wiersema (1993).

4.4 Model for Research Problem #2

Categories for the barriers to competitive advantage that is slowing down the business :
1) Preposition 8 (P8)
    Receivables (V8) towards competitive advantage (V14):Difficulty in getting collecting payments from customers (Receivables –V8), dampens the competitive advantage (V14) of Bintang Lima. Collecting receivables can be time consuming, where the time focused and concentrated oncollecting these receivables from customers could have been used to do other tasks.
    Bintang Lima lacks of receivables management and a lack of credit policies.Customers may prioritize paying other of its suppliers with stricter credit policies.
2) Preposition 9 (P9)
    Delay of ship/vessel ETA (V9) towards competitive advantage (V14):The delay of ship/vessel estimated time of arrival (ETA) (V9) causes theassembling of products to be delayed at the store, which leads to lack of inventory. Bintang Lima could have been able to sell their products to its customers if theproducts had arrived on time. Before stricter laws were in place, businesses including Bintang Lima were able to suborn individuals at the port to release their products faster, without following the queuing system. Now that stricter custom requirements (requirements for submitting documents to customs) are in place, theprocess of unloading of containers takes a much longer period of time, sometimes causing a lack of inventory. The delay of ship/vessel ETA diminishes Bintang Lima's competitive advantage (V14) as it hinders Bintang Lima to be more superiorto its competitors by always having products available for purchase.
3) Preposition 10 (P10)
    Technology advancement (V10) towards competitive advantage (V14):Rapid technology advancement (V10) has caused CCTV cameras andrecording systems to be replaced with more advanced and modern products like IP(internet protocol) cameras which are able to send and accept information with justa computer network and the internet. To avoid holding too much on hand inventory, Bintang Lima would have to order at a smaller quantity, which costs more than if itwere to order at a larger quantity. Products like IP cameras and cameras that aremore advanced than what Bintang Lima provides are substitute products that acts asan external threat to the business. As suggests, one of the five forcesthat determined the nature and degree of competition is the threat of substituteproducts [28].
    The presence of online markets (Technology advancement – V10) have alsobeen a challenge and barrier to Bintang Lima's competitive advantage (V14)because anyone with no physical store today is able to sell similar or same productwithout owning a

physical store. In addition, online markets such as Tokopedia, Lazada, and Blibli are constantly trying to make customer experience better bymaking payments safer, delivery faster, and its platform easy to use. Technological advancement dampens Bintang Lima's competitive advantage (V14) because manypotential customers then shift to online markets, causing Bintang Lima to lose someof its market share in the area. Not only is Bintang Lima is exposed to threat of substitute products, but it is also exposed to the threat of substitute services.

According to Porter (1979), firms in an industry should often offer their customeramenities, a bonus or desirable feature of product or services, to lessen the likelihoodof their customers switching to another brand. In the case of Bintang Lima, even though it offers differentiation (customization and good customer relations, etc), the decreasing number of sales in the past few years suggests that it is not enough of a feature to keep the customers loyal. In addition, the existence of online markets, is a substitute service in the market that is decreasing the market share of Bintang Lima.

4) Preposition 11 (P11)

Human resource (V11) towards competitive advantage (V14):Employees are expected by the owners to be able to do new tasks without being trained before hand. They are not trained on skills like time management and communication skills, and anything outside of their scope of work. Increasing tasksare also managed by the same number of employees than years prior, making it usualfor employees to have too much at hand, and make mistakes. The lack of trainingand manpower shortage (Human resource – V11) diminishes Bintang Lima's competitive advantage (V14), because employees are not able to work to their fullpotential and deliver the best to customers, which may cause customers to bedissatisfied.

5) Preposition 12 (P12)

Rivalry Intensity (V12) towards competitive advantage (V14):Competitors are constantly increasing, because it is easy to get hold of CCTVcameras in the market and then reselling it. With more competitors in the area,everyone is trying to gain more and more market share. This is often done by cuttingdown prices in attempt to win over customers. This diminishes competitive advantage (V14) for Bintang Lima because Bintang Lima always sticks to providing high quality products even if it means selling it at a higher price. Most customers,especially new customers, are most likely to be drawn to the price of the productrather than the quality of it. Bintang Lima cannot cut down its prices to where thecompetitors are selling the products at, because it would experience loss. According to Porter (1979), one of the forces that determine the nature and degree of competition in an industry is the rivalry among existing firms. With the intensified rivalry of CCTV stores like Bintang Lima for the last few years, profit margins become lower, and it is harder to gain market.

6) Preposition 16 (P13)

Supply chain (V13) towards competitive advantage (V14):Misunderstanding or incorrect information sent by either Bintang Lima or its supplier in the order process may cause the wrong products or spare parts to be sent, causing Bintang Lima to delay products assembly or sale. Bintang Lima lacks operational excellence, one of Treacy & Wiersema (1993) "Value Discipline". It lacks in supply-chain management, causing the business to be at a position in whichthe products are not always available for purchase, making it less superior compared to its competitors. This lack in supply chain management dampens competitive advantage (V14).

Therefore the figure 4 show the model of sustainable of Bintang Lima business, as below.
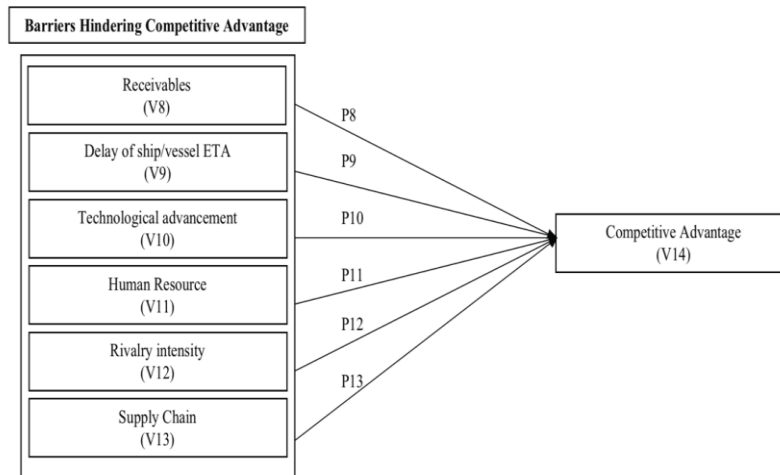
Fig. 4. Model of the barrier hindering competitive advantage [20],[30].

5 Conclusion

From the prepositions, a mini-theory for the competitive advantage of Bintang Lima and the barriers that diminishes these competitive advantages can be obtained. The mini-theory model shows the factors that enabled Bintang Lima to sustain itself for more than sixteen years, and the barriers that dampens thesecompetitive advantages which caused the business to slow down these past fewyears. The main competitive advantages include Product quality, Post purchase service, Customization, Quick response time, Customer relations, Reputation, and Delivery time.

The model shows that the country's economy slowdown is not the only reason that causes the business to decline, and there is a factor that diminishes the competitive advantage of Bintang Lima. The factors that diminish the competitive advantages are Receivables, Delay of ship/vessel ETA, Technological advancement, Human resource, Rivalry intensity, and Supply chain.

Although this research has reached its aim, there were still a few limitationsto the research study that were unavoidable. First, this study is limited to timeconstraints and the language barrier between the research and some of therespondents. Some respondents had difficulty in expressing their thoughts fluentlyand accurately. Another limitation is that the results of this study may only stand forthe current situation and may not reflect if the research study was conducted at adifferent time. In addition, the results and methodology of this research study only applies to this case since it is a single case study, and cannot be generalized to otherbusinesses because quantitatively the prepositions have not been tested.

Furthermore, the results of this research as well as the mini model can be beneficial for current business owners or the early starters who would like to understand the competitive

advantage of a decade long business and to avoid being taken back bythe barriers to competitive advantage. Beside that business practitioners in the same industry can hopefully make use of theresults of this research study to form and develop their own competitive advantage based on authentic/unique to their own business and the industry that they are in. They can also consider the barriers to competitive advantage discussed in this research study to avoid being set back during their business venture.
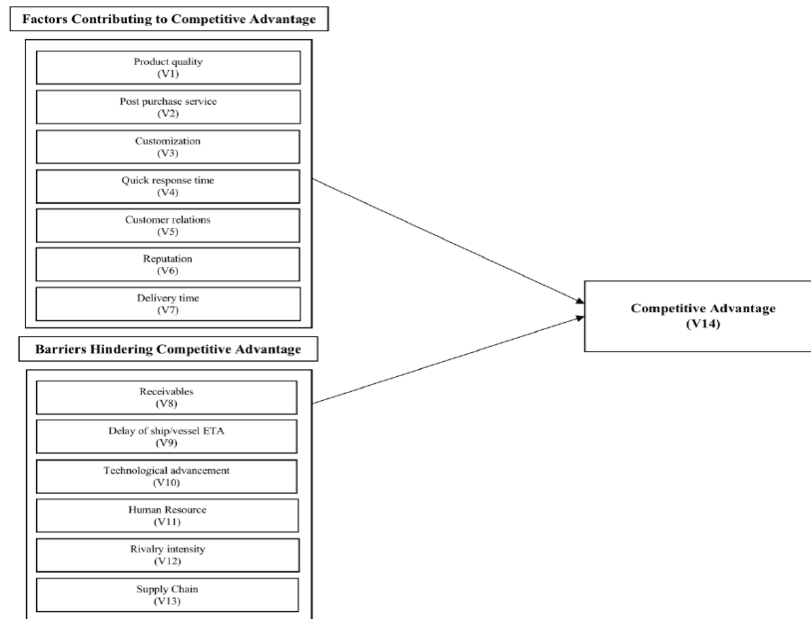
Fig. 5. Mini model of the Competitive Advantage of Bintang Lima and the Barriers that diminishes it [17],[30].

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Analysis of Accurate Learning in Radial Basis Function Neural Network Using Cosine Similarity on Leaf Recognition

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Abstract. RBF network is a method of artificial neural networks that perform hybrid learning, namely supervised learning and unsupervised learning. Basically, problem found in learning of RBF network that is a difficult to determine the centroid exactly and weight of network the less optimal. Generally, to determine the centroid is done by random and updated to use k-means clustering method. However, selection of initial centroid is less precise will have an effect on the decrease of accurate learning on leaf recognition in RBF network. A method is used to measure the level of similarity between the data proposed in this research, ie cosine similarity. By comparing the distance of similarity between each data, will be generated data the highest level of similarity from the others, so that can be used as a centroid in RBF networks. The result of research RBF network using cosine similarity will be compared a common method used in centroid determination, ie k-means clustering. The results of the test on data showed that leaf recognition with RBF network using cosine similarity method obtained an accuracy level of 79.22%, while the leaf recognition with RBF network using k-means clustering method obtained an accuracy level of 63.91%.

Keywords: RBF network, centroid, k-means clustering, leaf recognition, cosine similarity

1 Introduction

Neural network is one method of artificial intelligence that is used in pattern recognition by imitating the work of the human nervous system. Humans can recognize between one object and another by storing knowledge that is experience and reused in the time required [1]. Meanwhile, artificial neural networks that are operated on the machine to recognize an object is done by recognizing the pattern of the object and train the network to obtain the weights that are used again in the process of testing the pattern recognition of the next object. By comparing the pattern with one another, then obtained a similar pattern that can be insert into a classification.

A method is used in neural networks which has certain advantages over other types of neural networks including better approximation capabilities, simple network structure, and faster learning is radial basis function (RBF) neural network [2]. This method performs a hybrid learning, which is a supervised and unsupervised learning.

In the learning process, RBF network requires centroid. One of the common problems found in this network is the difficulty of determining the centroid exactly. The common method is used in determining centroid is k-means clustering. The determination of the begining value of the initial centroid greatly affects the results [3]. The method of initial centroid determination is commonly done by random. The next process is to update the centroid value so that the final centroid value is better. However, when determining the initial centroid is less precise will give the result of pattern recognition accuracy is not optimal. These centroid should be placed in a cunning way because of different location causes different result [2]. From the results of experiments have been conducted by taking some samples of centroid randomly, the result of accuracy of pattern recognition is different. This is proven to determine the centroid can affect the performance of RBF network.

Some previous researchers have done the research to determine the centroid inthe RBF network. One of them is the determine of centroid done with Particle Swarm Optimization (PSO). The result testing has done using centroid with PSO can obtain better results than commonly used centroid in the RBF network[3]. Other research that using fuzzy in determining centroid in the RBF network. The results are better performance of RBF network than using the usual method in determination of centroid [5].

In this research will be proposed an algorithm used to measure the level of similarity of data, ie cosine similarity in determination of centroid in RBF network. It will be used in the classification data and determined the exact centroid location. Prior to measuring the level of similarity of data, the leaf of image are introduced its pattern, so that the data in the form of numeric can be processed.

The leaves of images to be recognized pattern must be extracted features with some image processing methods. An image will be characterized by its shape, texture and color. Shape features can be identified from the value of roundness and eccentricity in an image [6]. Texture features to use GLCM method which will be recognized from the value of contrast, correlation, energy, and homogeneity [4]. Meanwhile, the color features is obtained by using HSV method which convert RGB image to HVS which will be recognized from the value of hue, saturation, and value [5].

Similar to Euclidean distance, cosine similarity is also used to calculate the distance between each data. Higher values will show a higher level of similarity. The use of cosine similarity in this study did not require the initial centroid. It because the data used is already classified, the next find the exact data to be used as a centroid. Centroid will be generated by comparing the similarity between each data in one classification. Data that has a higher similarity than the other data that will be selected to be centroid. This process is done as many as the data classification used in RBF network training. The collection centroid from each classification has function as a centroid in the learning of RBF network to know the accuracy of leaf recognition. Each centroid will has the collection data that has a similarity to it to be grouped in the classification. The use of cosine similarity method is chosen as the method of measuring the similarity of data due to better accuracy in each testing than the Euclidean distance method in the measurement of similarity level [6].

2   Radial basis Function

The RBF network is a kind of three-layer forward neural network, the hidden layer activation function of which is a set of radial transmitted to the hidden cell space. This set of kernel function forms a base of the input sample (Pan, et al., 2011). Architecture of RBF can be seen in Figure 1 as follows(Li, et al., 2013):
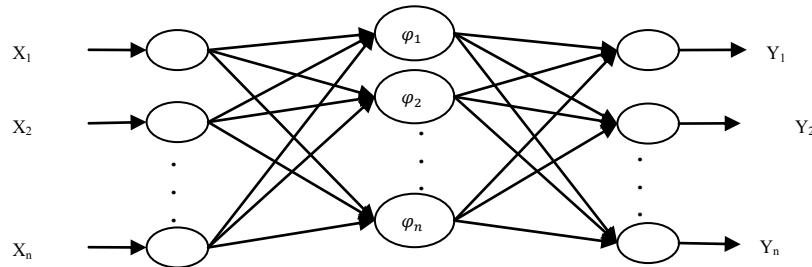
Figure1. Architecture of RBF Network

2.1 Input layer

Input layer is part in RBF network input in the first layer. The other side, input in RBF networkis used as input data that is function to determine centroid and the standard deviation from data that generate activation function of hidden layer. There are two ways that is used in determining centroid, ie random and k-means clustering methods.

The random method is performed by selecting data in the vector input randomly. This method is easy to implement but less precise in the selection of centroid in input data. The second, using k-means clustering method, that is grouping the data according into its cluster and determining the data itself which will be made its centroid. This method is difficult to implement but will result the exact centroid. Looking at the first step of the RBF network learning, it can be concluded that at the step of the training is unsupervised. The acquired centroid will be used for the activation function in hidden layer. The selection of the exact centroid will result the good calculation and the appropriate weight gain so that the pattern can be well recognized in the RBF network.

After searching the centroid value of data input using k-means clustering algorithm, the next step is calculated Gaussian value by using Gaussian equation. The centroid value of the search results from the input data is used in hidden layer. Before calculating the Gaussian value, the standard deviation value is determined first.

2.2 Hidden layer

The centroid value is obtained from the input layer will be processed on hidden layer in RBF network. In this layer the activation function is used to obtain the network weights used in the output layer and formulation activity in the formation of the algorithmic system used in the RBF network. Commonly, implementation is used functions in solving the case using RBF network is by using Gaussian basis function which is formulated as follows:

$$\varphi(r) = exp\left(-\frac{\|x_i - c_i\|^2}{2\sigma_i^2}\right)$$

where,
x = Input data
c = Centroid
σ = Spread
with,

$$\sigma = \frac{Maximum\ distances\ of\ 2\ center}{\sqrt{n\ center}}$$

$$= \frac{d_{max}}{\sqrt{n}}$$

After the Gaussian value is known, the next process, calculate the new weight (w) by multiplying the pseudoinverse of the G (Gaussian) matrix by the target vector (d) by the following equation:

$$w = (G^T G)^{-1} G^T d$$

After the weight value is known then the next step is to store the value of centroid calculation results and weights value to be reused during the testing process in RBF network.

2.3   Output Layer

The last step, after obtain the result calculation of Gaussian's basis function by weights updating. The sum of the multiplication of weights with the basis function will produce an output called the output layer. The output layer responds from the network according to the pattern previously entered on the input layer. The transformation from the input layer into the hidden layer is non-linear, while the transformation from the hidden layer into the output layer is linear. This step, it is done to calculate the network output value of y (n) is summed the bias weights (b) as follow as:

$$y(n) = \sum_{i=1} wG(\|x - c\| + b)$$

3 Cosine Similarity

Each object of one another can be grouped in the same type based on the similarity of the pattern formed. The object is translated by image processing method. The image is processed using the technique can be identified with each other based on shape, texture, and colorthat contained in an image. While techniques to determine the similarity or image similarity so that can be grouped in one type can use a method of similarity, one of which is cosine similarity.Cosine similarityis a method that used to measure a level of similarity between two data [9]. The purpose of this method compares two objects to be calculated the level of similarity, so that can be seen how the level of similarity. In some cases, it is also often applied to calculate the level of similarity of documents or images. It is similar to the Euclidean distance method is used to measure the distance between two pieces of data.The difference is that the process of measuring the distance in the Euclidean distance method is used the minimum distance to measure the level of similarity level, while the cosine similarity method is used the maximum distance. Mathematically to calculate the level of similarity is as follows:

$$Similarity\ (X, Y) = \frac{\sum x_i y_i}{\sqrt{\sum x_i^2} \cdot \sqrt{\sum y_i^2}}$$

Equation of cosine is called have a data similar, if the angle is 0 degrees and the similarity is 1 and when two data are not similar at all, the angle is 90 degrees and the similarity is 0.

4 Pattern Recognition

Artificial neural network has been used widely in pattern recognitionandcommonly shows advantages compared with other learning methods, general nature, and adaptabilityin mapping non-linearly [1]. Pattern recognition is a subject researching object description and classification method, it is also a collection of mathematical, statistical, heuristic, and inductive techniques of fundamental role in executing the tasks like human being on computers [3].

Before insert into the artificial neural network, the first it must introduce the image pattern. In this paper is used to features an image based on the shape, texture, and color in the image. Figure 2 shows the block diagram used for image processing.
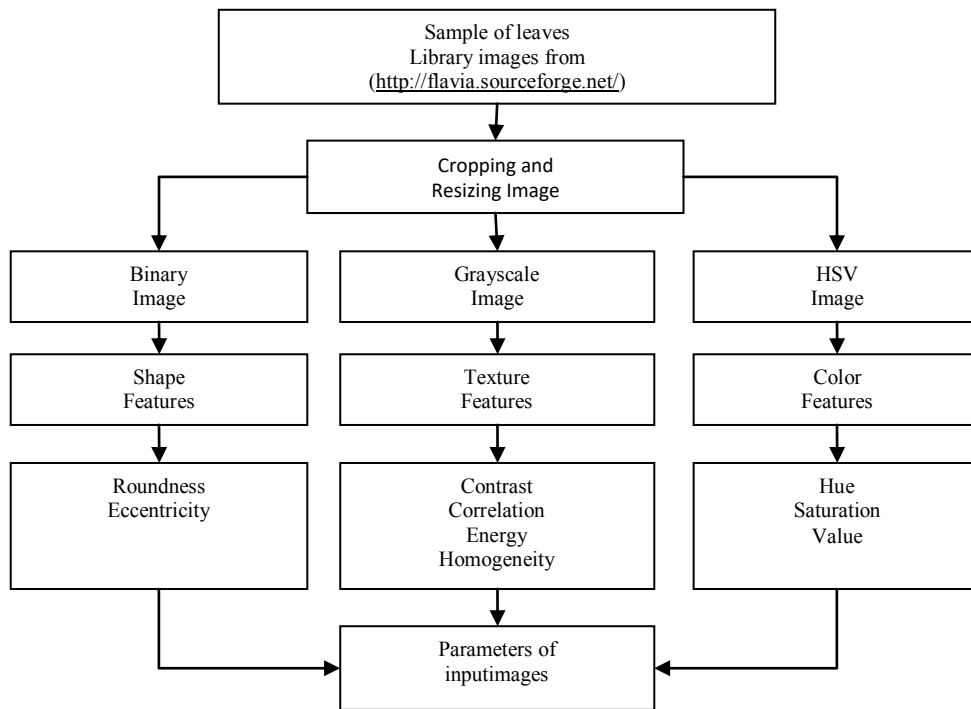
Figure 2. Digital image processing block diagram

The leaves of images obtained on Flavia dataset [10]. All leaves of images are in 512 x 512 resolution. An RGB image is firstly converted into grayscale, binary, and HSV image to obtained features value. Figure 3 shows the result of convertion on the RGB image.

Figure 3. RGB image

(a) Binary   (b) Grayscale   (c) HSV
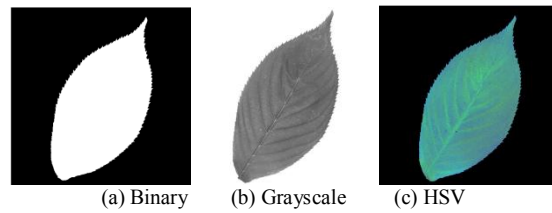
Figure 4:Image conversionondigital image processing

4.1 Shape Features

Shape features extraction is one way used to extract the image features associated with the geometric of the image (Kadir, et al., 2011). Type of leaf feature extraction is used consists of several features, as follows(Kumar, et al., 2015):

$$Roundness\ (\gamma) = \frac{A}{P} = \frac{4\pi\ x\ A}{P^2}$$

$$Eccentricity\ (e) = \sqrt{1 - \frac{Major\ Axis\ Length^2}{Minor\ Axis\ Length^2}}$$

From the both of it will produce two input images (x_1 and x_2) which will be processed into the RBF network. Every image will be processed into the RBF network will be generated the both of it.

4.2 Texture Features

The next step is to extract the image to obtain texture featuresof the image. Generally, the method is used the Gray Level Cooccurrence Matrix (GLCM). GLCM is presented by Haralick [5], is one of the statistical methods for textural feature extraction and includes the most widely method is used. The GLCM method in this researchusing various features of texture which is representation of digital image which want to be analyzed. The features of these textures, as follows[4]:

$$Contrast = \sum_i \sum_j (i-j)^2 P(i,j)$$

$$Correlation = \frac{\sum_i \sum_j i,j \ P[i,j] - \mu_i \mu_j}{\sigma_i \sigma_j}$$

$$Energy = \sum_i \sum_j P[i,j]^2$$

$$Homogeneity = \sum_i \sum_j \frac{P[i,j]}{1+[i-j]}$$

The GLCM method is used in data input will produce 4 texture extraction. Each image will be processed has a value based on contrast, correlation, energy, and homogeneity is contained in the images. The feature is used as input in RBF network with x_3, x_4, x_5, and x_6 symbols respectively.

4.3   Color Features

The color features extraction in images is done in this research by looking for way of extraction of the color characteristicswith the HSVmethod. Where this method is used to define the RGB color that becomes the value of Hue, Saturation, and Value. The RGB value contained in an images has a range between 0 - 255 to be converted to HSV with a value of 0-1. The formulas used are[5]:

$$R' = \frac{R}{255}; \ G' = \frac{G}{255}; \ B' = \frac{B}{255}$$

$$Cmax = \max(R', G', B')$$
$$Cmin = \min(R', G', B')$$

$$\Delta = Cmax - Cmin$$

$$H \ (Hue) = \begin{cases} 60^0 \ x \left(\frac{G'-B'}{\Delta} mod6\right), Cmax = R' \\ 60^0 \ x \left(\frac{B'-R'}{\Delta} + 2\right), Cmax = G' \\ 60^0 \ x \left(\frac{R'-G'}{\Delta} + 4\right), Cmax = B' \end{cases}$$

$$S \ (Saturation) = \begin{cases} 0 & , \Delta = 0 \\ \frac{\Delta}{Cmax} & , \Delta <> 0 \end{cases}$$

$$V \ (Value) = Cmax$$

From the calculation of this HVS method, will produce color features are written with the symbols x_7, x_8, and x_9. Each input images will produce color features before being processed in the RBF network.

5 Proposed Approach

To analyze the accuracy learning in RBF network using cosine similarity method in centroid determination on leaf recognition, the data is used in the form leaves of images is obtained from internet page with address: http://flavia.source-forge.net/, with the selection and cutting of images size of 512 pixels x 512 pixels, which will be formed into shape, texture, and color extraction matrix.

The amount of data is used as many as 32 types leaves of images and each species will be taken as many as 50 leaves of images, so the total data are 1600 images. The image processing data is done by taking the extraction value of the shape, texture, and color leaves of images which will be divided into two parts, are data training and testing. The division of data is 60 : 40, where data training is used as many as 960 leaves of images and data testing is used as many as 640 leaves of images. The proposed approch can be seen in Figure 5 as follows:
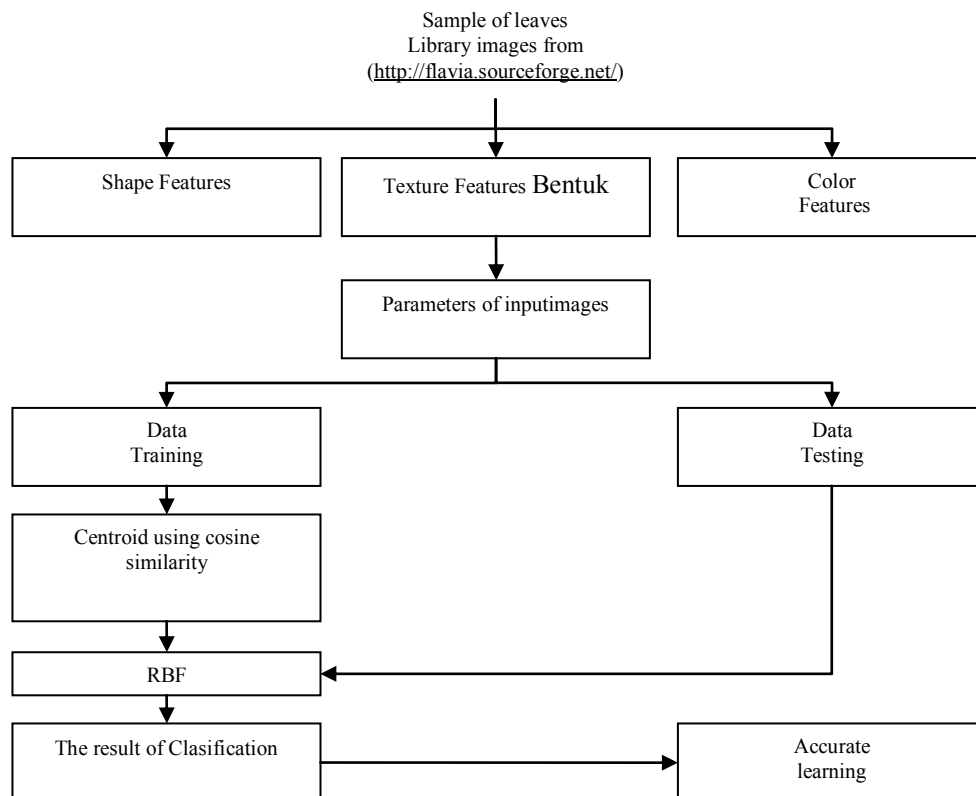
Figure 5. The proposed metodology

Figure 5 illustrates the process of input images matrix recognition is done by taking the features extraction value of each image.The features extraction is used of the shape, texture, and color of the 9 pieces of value or parameters in each image. The next process is the centroid determination that will be done by using the general method, is k-means clustering

and cosine similarity method to obtain the good centroid is based on data similarity. All of the calculation process will produce weights vector that will be inserted into RBF recognition for the classification step. This step will process the pattern recognition of input and output, to compare with the target so that it can be calculated the accuracy of learning. Mathematically equation is used to calculate the results of leaf recognition can be formulated as follows:

$$Accuracy\ (\%) = \frac{The\ numbers\ of\ true\ data}{All\ numbers\ of\ data}$$

6 Experiment Result

In the process of leaf recognition using RBF network in this research, the centroid determination is done by using cosine simalrity method and comparing it with k-means clustering method. The results of leaf recognition using RBF network with cosine similarity and k-means clustering can be seen in table 1.

Table 1. RBF network testing

No.	Method	Recognition	Accuracy of network testing
1.	RBF-KMeans	409	63.91%
2.	RBF-Cosine	507	79.22%

The based of analysis results of accuracy learning using usual of RBF network and RBF network using cosine similarity have different results. Using k-means clustering in the RBF network has an accuracy of 63.91%. It is caused centroid calculation results have not achieved optimal results. The based of several experiments are conducted, to obtain the initial centroid with different data on k-means clustering calculation results will result in a different amount of accuracy. It needs to be thoroughly tested on all input data and determine which data is appropriate to be the initial centroid. This process will result in a long time due to the calculation and comparison process in centroid determination.

While the results of cosine similarity in RBF network obtained an accuracy of 79.22%. This is because the centroid selection is only done on similar data that has been visually classified. The use of this method only compares the input data in a class to compare the level of similarity with other data. So the selected centroid is just a data in the same class.
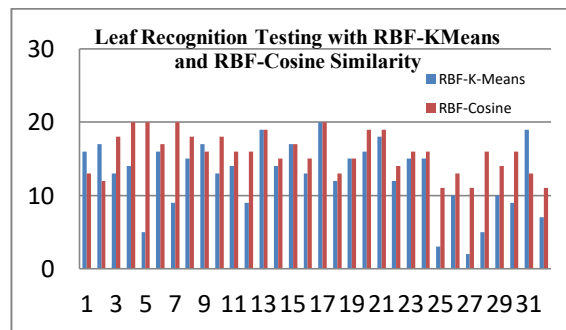
Figure 6. Leaf recognition testing

7 Conclusion

The based of the results are obtained by comparing k-means clustering and cosine similarity method in centroid determination in RBF network, the increase using cosine similarity method is higher by 15.31% if it is compared to the usual RBF network. It proves that the leaf recognition requires the good centroid to improve the performance in RBF network.

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Improving Student's Learning Outcomes on Natural Science Material Through Multimedia Learning Approach in Elementary School

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Abstract. This research paper aims to describe the improvement of students' learning outcomes on the subject of natural science through the approach of multimedia learning in elementary school. The research method used is Classroom Action Research Design. Data were collected through multiple choice test to find out the students' learning outcomes from each cycle, result of observation activities of teacher and student, and the result of a questionnaire of student response. The results of research obtained data that student learning outcomes in cycle 1 of 72% and increased by 24% to 96% in cycle II. Teacher activities in cycle I was 81% while in cycle II was 94%, thus the increase of teacher activity by 13%. Student activities in cycle 1 are 80% and in cycle II is 91%. Increased student activities by 11%. Student response to learning is very happy, where the expressed pleasure to statement component learning activities that researchers apply in the learning of 97.2%. Thus it can be concluded that through the use of multimedia learning approaches on the subject of Natural Sciences can improving students learning outcomes, teacher activities and students as well as ongoing enjoyable learning as planned and get high responses from students.

Keywords: Students Learning Outcomes, Natural Sciences, Multimedia Learning Approach, Elementary School

1 Introduction

Learning is a complex process that occurs in every person throughout his life. The learning process occurs because of the interaction between a person and his environment. Therefore, learning can happen anytime and anywhere. One of the characteristics a person has learned is a change in behavior caused by a change in the level of knowledge, skills, or attitudes [1].

Robbins [2], defines learning as the process of creating a relationship between something (knowledge) that has been understood with something (knowledge) new. While Brunner [2], said that learning is an active process in which students build new knowledge based on experience/knowledge they already have. In the view of constructivism learning is not simply transferring knowledge beyond itself, but learning more about how the brain processes and interprets the new experience with the experience it already has in a new format.

Burton [3], argued that learning is a process of behavioral change in the individual because of the interaction between individuals and individuals, individuals with their environment so that they are more able to interact with their environment. While Gagne [4], suggests that learning is a relatively sedentary behavior change resulting from past experiences or from planned/intended learning. Experience gained by individuals in their interactions with the environment, both unplanned and planned so as to produce relative sedentary changes.

The interactions that occur during the learning process are influenced by the environment, which includes students, teachers, librarians, principals, materials or materials (books, modules, leaflets, magazines, video or audio recordings, and the like), and various learning resources and facilities (overhead projectors, video and audio tape recorders, radio, television, computers, libraries, laboratories, learning resource centers, and so on).

The development of science and technology increasingly encourage renewal efforts in the utilization of technology results in the learning process [5]. In teachers are required to be able to use the tools that can be provided by the school, and it is possible that these tools in accordance with the development and demands of the times. Teachers can at least use cheap and efficient tools which, though simple and understated, are imperative in achieving the expected teaching objectives. Besides being able to use the tools available teachers are also required to be able to develop skills to create teaching media that will be used when the media is not available. For that teacher should have sufficient knowledge and understanding of teaching media. Seels & Richey [6] explains that multimedia or integrated technology is a way to produce learning materials by combining several types of computer-controlled media. While Rosch defines multimedia is a combination of computers and videos or as suggested by McCormick that multimedia, in general, is a combination of three elements, namely voice, image and text [7].

Based on observations and interviews with teachers of State Elementary School 7 Paya Bakong, Aceh Utara, Aceh Province, Indonesia is the teacher in teaching always use the conventional motode and do not use any learning media. Both teachers and students tend to be passive and the learning process boring. Conditions like these are not motivated students to learn, so it affects the results of student learning. Students need a variety of learning media to create an active, creative and enjoyable teaching-learning environment in the classroom. So that seen from the students of State Elementary School 7 Paya Bakong they are not enthusiastic in following the lesson.

This, of course, affects the student's own learning outcomes. It is necessary to apply the multimedia learning approach that can encourage students to be more active, open to giving and receiving opinions, independent and responsible. So research formulate the problem; 1) How to improve student learning outcomes through learning multimedia approach? 2) How are the activities of teachers and students through the multimedia learning approach? 3) How are the student's response to the material form and its nature in class IV State Elementary School 7 Paya Bakong through multimedia learning approach?.

The purpose of this research is to know; 1) improvement of student learning outcomes 2) teacher activity and students 3) student response on material form and its nature in class IV State Elementary School 7 Paya Bakong through multimedia learning approach.

One effort that can be done is to use the multimedia learning approach. This learning multimedia can be used by teachers because it can bring students to the real world. Students are better able to absorb the information with the help of multimedia messenger tools so that in the learning process achievement can be achieved better. The multimedia functions of learning according to Suyanto [13] are as follows: 1) Able to attract the senses and attract students because, is a combination of views, sounds, and movement. 2) Being able to generate a sense of fun during the learning takes place, so it will increase student learning motivation.

3) Be able to combine text, images, audio, music, animated images or video in a unity that support each other so as to achieve learning objectives. 4) Be able to visualize the real material. 5) The storage media is relatively easy and easy. 6) Bringing hard-to-reach or dangerous objects into the learning environment. 7) Displays objects that are too large for the class, and 8) Displays objects that can not be seen directly.

Endah Arnitasari [5] a study entitled "Interactive Multimedia Application of Science Learning". Explained that the application of interactive multimedia learning science for elementary school class VI. Along with the rapid development of information technology today, the multimedia computer has a very important role in the field of education. This is evidenced by the production of multimedia applications in the form of learning CDs that have been widely circulated in the market today. CD learning itself there are many kinds, both of which are interactive and non-interactive. For learning CDs created for sd kids, they will tend to be more fond of interactive applications because for them the app will be more interesting and effective to learn. This is what encourages the production of multimedia learning applications that are interactive.

The advantages of multimedia learning, in general, is the learning process more interesting, more interactive, the amount of teaching time can be reduced, the quality of student learning can be improved and the learning process can be done anywhere and anytime, and student learning attitudes can be improved. Warsita [16] suggests that learning with multimedia or integrated technology has the following characteristics: 1) Can be used randomly, in addition to linearly. 2) Can be used according to the learner's wishes in addition to the way as designed by the developer. 3) Ideas are often presented realistically in the context of learners' experiences. Relevant to the condition of learners, and under the control of learners (user). 4) Principles of cognitive learning theory and constructivism applied in developing and utilizing learning materials. 5) Learning is centered and organized according to cognitive knowledge so that knowledge is formed upon use. 6) Learning materials show high interactivity of learners. 7) Properties of materials that integrate words and examples from many media sources. Characteristics of multimedia learning are one of the computer-based learning media, which combines and synergize all media presented to learners with the aim to form knowledge after the implementation of learning takes place.

Learning media that have been selected to be used effectively and efficiently need to take steps systematically. This study uses pictures and videos as Warsita [16] says. There are three main steps that can be done: *preparation, implementation of the presentation,* and *follow-up.*

1) *Preparation* is the activity of a lecturer who will teach by using instructional media. Activities that can be done by teachers in preparatory steps include: making the implementation plan of learning as if to teach as usual. In the learning, implementation plan includes the media that will be used, study the user manual or accompanying materials that have been provided, prepare and organize the equipment that will be used so that the implementation will not rush and look for again and learners can see and hear with good.

2) *Implementation/Presentation,* Teachers while doing the learning process using learning media need to consider such as: make sure that all media and equipment are complete and ready to use, explain the objectives to be achieved, explain in advance what should be done by learners during the learning process, avoid events that may interfere with attention /concentration, and calm learners.

3) *The follow-up*, this activity needs to be done to strengthen learners' understanding of the material covered by the media. Besides, this activity is intended to measure the effectiveness of learning that has been done. Activities that can be done include discussion, observation, practice, and test

Agustina [1] in a study entitled "Multimedia Utilization to Improve the Results of Science Classroom II students Theme of the Environment In SDN Ngembeh 1 Dlanggu" shows that the completeness of student learning outcomes in class I cycle for the subjects of Natural Sciences obtained a percentage of 60% or as many as 15 students who have completed learning, while 10 students do not complete learning with percentage 40%. And the completeness of learning outcomes classically in the first cycle (first) Indonesian subjects get a percentage of 60% or as many as 15 students who have completed learning, while 10 students do not complete learning percentage 40%. This result shows that cycle I have not reached the standard of completeness which is set 80% with average 70 not yet successful from the result of learning test on learning done, because student not yet accustomed to learning with the application of multimedia in the subject of Natural Science. the completeness of student learning outcomes classically in cycle II in cycle II subjects of Natural Sciences obtained percentage of 92% or as many as 23 students who have completed learning, while 2 students do not complete learning with percentage of 8%, This result indicates that cycle II is good once, this is seen with the increase of the average of student learning outcomes from cycle II on subjects of Natural Sciences that is 68.4 to 90. Learning completeness achieved in the second cycle of 92%. This shows that the completeness of student learning outcomes classical in cycle II has reached the percentage set on the success indicator.

Multimedia learning is used by teachers will bring students to the real world, students are better able to absorb information with the aid of multimedia messenger tools, so that in the learning process achievement can be achieved better. One effort that can be done is to use the multimedia learning approach. This learning multimedia can be used by teachers because it can bring students to the real world. Students are better able to absorb the information with the help of multimedia messenger tools, so that in the learning process achievement can be achieved better. Based on the above description, the researcher is interested to choose the title "Improving Student's Learning Outcomes on Natural Science Material Through Multimedia Learning Approach in Elementary School".

2   Methods

This research was conducted at the State Elementary School 7 Paya Bakong, Blang Pante Village, Paya Bakong Sub-district, Aceh Utara District, Province of Aceh, Indonesia. This research was conducted on the students of class IV in the odd semester of the academic year 2016/2017 consisting of 23 students consist of 9 men and 14 women.

This research was conducted by the qualitative method by following the Classroom Action Research design. Therefore, this research is carried out by following the following stages: planning, implementation, action, observation, and reflection. This research takes two cycles with four actions. Sources of data obtained through questionnaires of teacher and student activities, test items as well as questionnaire responses of students. The test items that are prepared in the form of multiple choice items are given at the end of each cycle.

Further data obtained have been analyzed by using some equations, that is:
1. Calculating the improvement of student learning outcomes was analyzed by calculating the absorption for each cycle using the equation as follows:

$$\text{Absorption} = \frac{Number\ of\ Students\ Completed}{Number\ of\ Students} \text{ X } 100\%$$

[8]

The results of calculation of absorptive power, then in use the criteria mastery in classical and invidual set by State Elementary School 7 Paya Bakong namely: individual mastery if students get the value of ≥ 75, while the mastery of the classical if the absorption reaches 85%.

2. Calculate teacher and student activity and calculate student response analyzed by using percentage, that is:

$$P = \frac{f}{N} x100\%$$ [8]

3. Students Response

To find out student response by presenting answer from questionnaire given to student with descriptive statistic as follows:

$$P = \frac{f}{N} x100\%$$ [8]

Symbol Description:

P : Percentage calculated
f : Correct answer frequency
N : Number of questions

Table 1. Criteria for student response

No.	Achievement Score Total	Category
1.	86-100	Very good
2.	70-85	Good
3.	60-69	Enough
4.	< 60	Less

3 Result

3.1 Description of Research Location

Implementation of this research on the Class IV students of State Elementary School 7 Paya Bakong, Blang Pante Village, Paya Bakong Sub-district, Aceh Utara District, Province of Aceh, Indonesia, with conducted on the students of class IV in the odd semester of the academic year 2016/2017 consisting of 23 students consist of 9 men and 14 women. The study began on Thursday, October 26, 2017, to Friday, November 4, 2017.

In the course of this study, it was observed by two observers. Implementation of learning acts by using multimedia learning approaches on material object and its nature is done with two cycles.Cycle I consists of two meetings with the material being studied is the form and nature of the object. Cycle II consists of two meetings with material changes in the form of objects.

3.2 Description of Research Actions

Implementation of this research action conducted in 2 cycles, that is the cycle I and cycle II. Each cycle consists of 2 actions (teaching meeting). In action 1 of cycle 1 (first teaching meeting) the researcher teaches matter material form. While action 2 of cycle 1 (second teaching meeting) the researcher teaches the solute and the insoluble in water.

Cycle II consists of 2 actions (meeting 2 times) with material changes of matter (Solid → Liquid → Gas) in action 1 and the shape of the object (Solid → Gas → Solid) in action 2.

After preparing the completeness of the study, the researcher acting as a teacher, carry out the action on the Class IV students of State Elementary School 7 Paya Bakong observed by 2 observers to observe the implementation of the research.

3.3 Description of Student'sLearning Outcomes

The use of multimedia learning approach on material form and its nature in research conducted in class IV State Elementary School 7 Paya Bakong proved to improve student learning outcomes obtained from the analysis of the results of student learning outcomes in the cycle I and cycle II. Data on the improvement of student learning outcomes in cycle I and cycle II are presented in the table below:

Table 1. Percentage of Student's Learning Outcomes in Cycle I and Cycle II through the Use of Multimedia Approach to Learning on Material and Its Nature

No.	Cycle	Student's Learning Outcomes		Percentage Enhancement
		Mastery	Not Mastery	
1.	Cycle I	72%	28%	24%
2.	Cycle II	96%	4%	

Based on table 1 above, it can be seen that in the first cycle there are 18 students complete the learning result with the acquisition value > 65 so that the percentage of classical completeness of 72% and 7 students get the value of ≤ 65 with the percentage of unfinished students by 28%. While in cycle II there are 24 students complete the learning result with the acquisition value> 65 so that the percentage of classical completeness of 96% and 1 student get the value of ≤ 65 with the percentage of unfinished students of 4%.

Based on this, after implementing the action cycle I and cycle II there is an increase in student learning outcomes as expected. Increased student learning outcomes from cycle I to cycle II by 24%. Increasing the percentage of student learning outcomes from cycle I to cycle II which is the influence of the use of multimedia learning approaches on material form and its nature in learning, the improvement can be seen in figure 1 below.
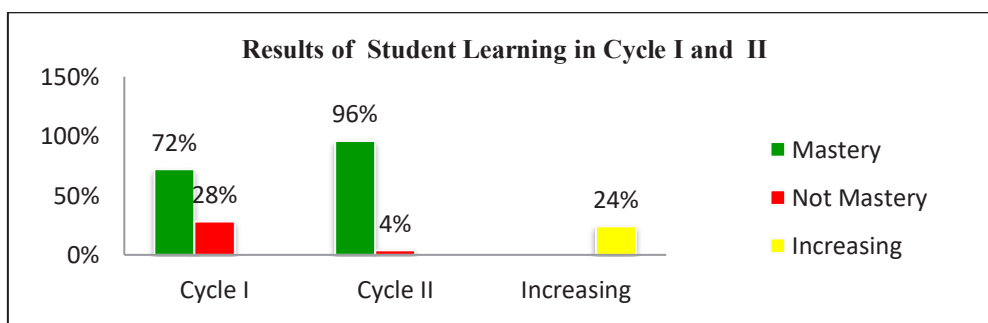
Figure 1. Percentage of Student's Learning Outcomes in Cycle I and Cycle II

3.4 Description of Teacher's Activities

Based on the observation of teacher activity during the learning activity, analyzed by using percentage. The analysis results for cycle I and cycle II can be seen in the table 2 below.

Table 2.Percentage of Teacher's Activities in Cycle I and II

No	Cycle	Percentage	Percentage Enhancement
1.	Cycle I	81%	
2.	Cycle II	94%	13%

Based on table 2 above, it can be seen that the percentage of teacher activity in cycle I was obtained by 81% and teacher activity in cycle II was 94%. Thus the increase in activities undertaken by teachers during the learning process lasted by 13%. To know the percentage of teacher activity in cycle I and cycle II can be seen from figure 2 below.
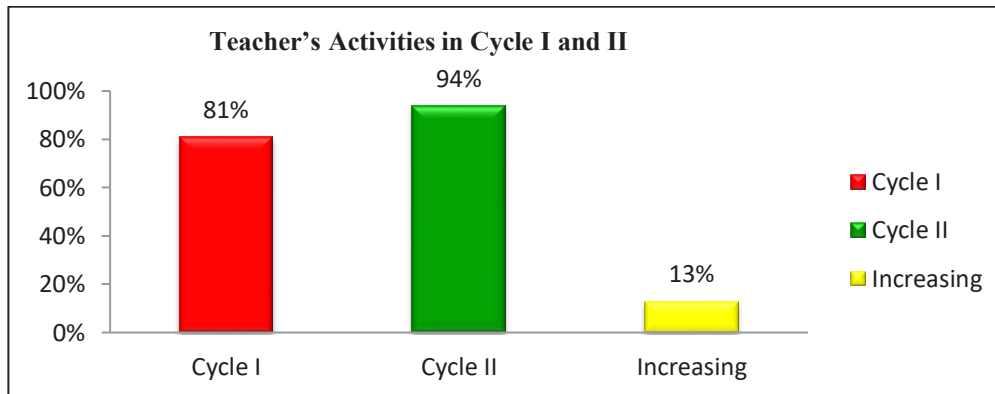
Figure 2. Percentage of Teacher's Activities in Cycle I and Cycle II

3.5   Description of Student's Activities

Based on the observation of student's activities during the learning activities is analyzed by using the percentage. The analysis results for cycle I and cycle II can be seen in the table below.

Table 3. Percentage of Student's Activities in Cycle I and II

No	Cycle	Percentage	Percentage Enhancement
1.	Cycle I	80%	
2.	Cycle II	91%	11%

Based on table 3 above can be seen that the percentage of student's activities on the first cycle obtained by 80% and student's activities on the second cycle obtained by 91%. Thus, the

increase in activities conducted by students during the learning process lasted by 11%. To know the percentage of student activity in cycle I and cycle II can be seen from figure 3 below.
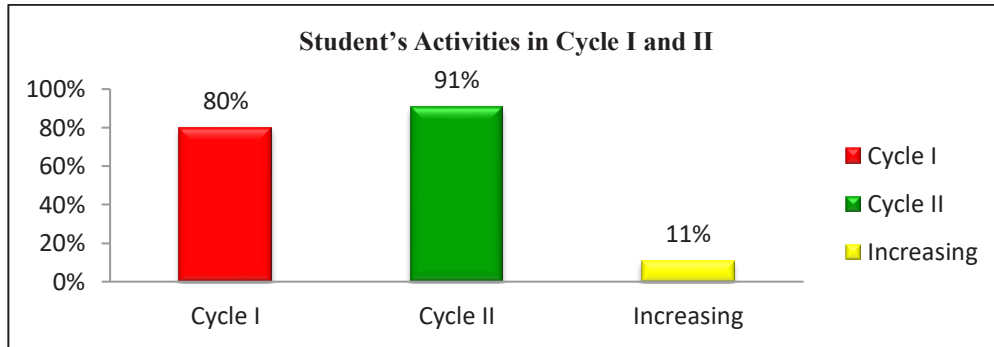
Figure 3. Percentage of Student's Activities in Cycle I and Cycle II.

3.6   Description of Student's Responses

To know the student responses to the implementation of learning through the use of multimedia learning approach on the material object and its properties obtained by using a questionnaire of student responses. The results obtained can be seen in the following table 4 below.

Table 4. Result of Student's Responses

No	Statements	Happy	Not Happy
1.	When starting the lesson the teacher shows a video related to the material being studied.	25	0
2.	Teachers ask questions to students based on video impressions.	24	1
3.	The teacher writes the learning objectives on the board and ns the learning objectives to be learned to make it easier to tand the learning materials.	24	1
4.	Teachers form study groups consisting of 4-5 students each group.	24	1
5.	Each group is given a Student Worksheet relating to the subject matter.	25	0
6.	The teacher provides guidance to each group in working on the Student Worksheet.	24	1
7.	Teachers provide reinforcement at the end of learning.	23	2
8.	What do you feel when learning by using a multimedia learning approach.	25	0
9.	What if the teacher uses a multimedia learning approach on other materials.	25	0
10.	Teachers share the test questions for students to do the cycles to determine the final ability of students after all learning process finish.	24	1
	Total	243	7

Graph to show percentage analysis of student response to statement of learning component can be seen as follows:
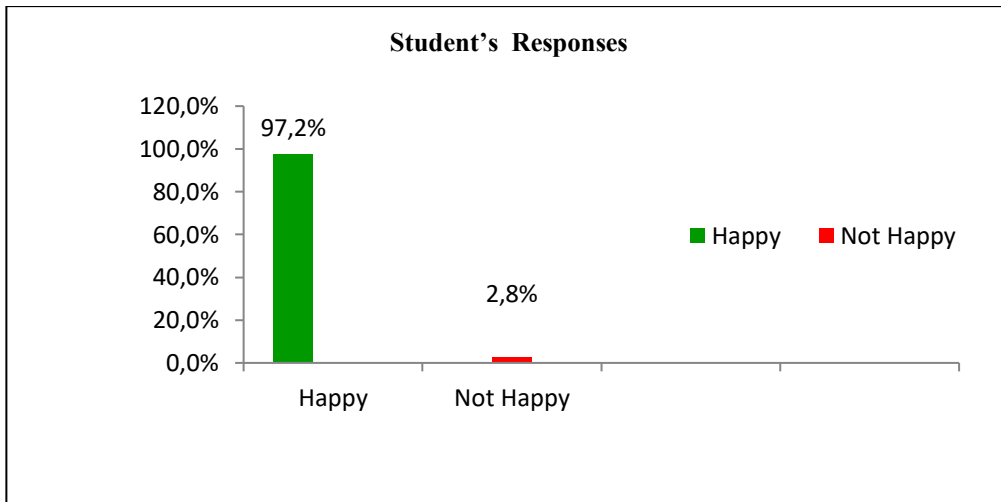
Figure 4. Student's Responses

Based on the questionnaire analysis of student responses during the implementation of teaching and learning process, it can be concluded that 97.2% of students answered happy with the statement that researchers apply in the implementation of learning by using multimedia learning approaches on material object and its properties, while 2.8% happy with the statement that the researchers apply in the implementation of learning by using the multimedia approach of learning on the material form and its nature thus the learning activities using the multimedia learning approach on the material form of the object and its fun for every student in the class and increase student interest in following the learning in the classroom and able to motivate in learning.

4   Discussion

The use of multimedia in learning is an attempt to create an atmosphere of creative and innovative learning without reducing the true learning objectives of a change in student behavior that can be measured and observed. Creating an interesting learning environment for students is certainly something to be achieved by teachers anywhere and anytime. By attracting the students' attention to the teaching and learning activities that teachers create, surely the students' learning motivation will increase as well as the understanding of the concept of the subject matter which of course has an impact on the students' learning outcomes which also increases.

The multimedia learning approach allows teachers to change teaching rules, where learning is no longer centered on the teacher but centered on the students. In the implementation of learning in the classroom, getting an interesting impression to follow the learning activities by students is an important and decisive first step for the achievement of

expected learning objectives. In addition to the above, the use of multimedia learning also provides an important role in terms of being able to cause pleasure to students during the process of teaching and learning activities take place. This will increase students' motivation during the process of teaching and learning activities so that learning objectives can be achieved with the maximum.

The use of multimedia learning approach in material form and its nature has increased the activity undertaken by teachers during teaching and learning activities in which the percentage of activities undertaken by teachers in the first cycle of 81% and included in both categories, while in cycle II activities are undertaken by teachers increased to 94% and were included in the excellent category, thereby increasing teacher activity increased by 13%.

Multimedia learning applied in the classroom is able to promote cooperative and interactive learning among students through discussion. Thus the use of multimedia learning on material form and its nature has increased the activities undertaken by students so that the implementation of learning has been going both ways between teachers and students and between students and students.

The use of multimedia learning on the material form and its nature can generate students' learning motivation because the multimedia learning makes the presentation of learning becomes more interesting. Thus, the use of multimedia learning approaches on material form and nature have been used effectively and efficiently teachers so that the purpose of the implementation has been achieved well. This can be seen from improving students' understanding of the material they have learned. The improvement of the students' understanding is obtained from the learning result that has increased, where the percentage of student learning outcomes classically in cycle I is 72% and increased by 24% in cycle II to 96%.

In using the multimedia approach of learning on material form and nature, the teacher is able to generate a sense of fun during the learning process takes place so that will increase the motivation and interest of students in following the learning. This can be seen from the increase of activities conducted by students during the research activities conducted, in cycle I the percentage of activities undertaken by students during the learning took place by 80% and categorized well, then in cycle II there was an increase in student activity by 11% from the previous cycle to percentage of 91%. Based on the data analysis of the percentage of activities undertaken by these students, the use of multimedia learning approach on target and successfully done with satisfactory results and as expected earlier.

Student response in learning by using multimedia learning approach also looks very happy, where 97,2% answer given by student stated that the learning that done by using learning multimedia approach is fun for the student, this is proven from student answer based on student response questionnaire. The use of a learning multimedia approach can replace most of the teacher's role as an informer or subject matter giver. It also affects the student's response to the learning implementation.

Positive responses and student interest in the material presented by the teacher can also generate students' learning motivation. The use of multimedia learning also allows students to absorb and remember the materials presented in the learning process. This will improve learning outcomes and achievement of the objectives of the learning activities themselves. Based on the above discussion, it can be concluded that the learning activities with multimedia learning approaches on material form and its properties can increase the activities undertaken by teachers and students during the learning process takes place.

5   Conclusions

Based on the above discussion, the researcher can conclude that the results of the research conducted on the Class IV students of State Elementary School 7 Paya Bakong on material object and its nature by using multimedia learning approach are as follows:

1. Students' learning outcomes in the first cycle are 72% and included in the category enough, while the learning outcomes in the second cycle are 96% included in the category very well. Therefore, the increase that occurs after the implementation of the action cycle I to cycle II of 24%.
2. Teacher activity in cycle I is 81% and in cycle II 94%, from each cycle has increased as much as 13%. Student activity in cycle I is 80% and in cycle II 91%, from each cycle has increased as much as 11%.
3. Student response looks very happy, where 97,2% student answer stated that the implementation of learning is fun and able to improve student understanding. Presentation of learning becomes more interesting because the teaching material is easily understood by students through the multimedia learning approach used by teachers

Recommendation

Based on the results of research, the researchers can provide suggestions to stakeholders are as follows.

1. The use of multimedia learning approach used in teaching and learning process provides opportunities for teachers to develop learning techniques, so as to obtain maximum results. Likewise for students, with the use of multimedia learning approaches it is expected they will be easier to determine with what and how students obtain information quickly and efficiently.
2. The use of multimedia learning approach by teachers can generate students' learning motivation, thus the use of multimedia learning approach can be used in all subjects.

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The Modeling and Simulation of Heat Transfer in Flat Platesolar Collector Using Software Engineering Equation Solver

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Abstract. Solar collector is a device that serves to collect the incoming solar energy and convert it into energy which in turn forwarded to the working fluid. A great systemof solar collector is a solar collector which has high efficiency, this means, most of heat energy that absorbed the collector can be used to water heater that flows inside and a small portion of heat energy is lost to the environment. In this study, the model of solar collectors has been modeled and heat transfer process to the solar collector solved by using software Engineering Equation Solver (EES). Iteration method is used to determine surface temperature in order to get useful heat energy on the collector. The solar collector simulated is measuring 1m x 2m x 0,06m, assumed absorber plate is aluminum and zinc plate size 0.4 mm and 0,6mm. The simulation results obtained fluid out temperature by using aluminum as the absorber is much higher than using zinc plate as the absorber plate. The fluid out temperature using aluminum plates as an absorber measuring 0.4 mm is higher than the plate size of 0.6 mm. The temperature of out fluid by using a copper pipe is larger than using a metal pipe for flat plate collectors for copper pipe that has higher thermal conductivity than the steel pipe. The simulation results are compared with the results of testing and the fluid out temperature of the test results is obtained less than the simulation results using the collector pipes and absorber plate of the same.

Keywords: Flat Plate Solarcollectors, Solar Energy, Modelingand Simulation, Heattransfer.

1 Introduction

A good solar collector is a highly efficient solar collector, in other words, most of the heat that affects the solar collector can be used to heat the fluid that flows in it and reduce significant of heat lost to the environment [1]. Heat lost that released to the environment as it is reflected in returned by the cover and absorbent plate and partly lost to the environment through the bottom and side portions of the solar collector. Since the side portion is relatively small compared to the bottom and top part, the heat loss through the side is negligible. A good solar collector is determined by the geometry of the model and the type of materials [2].

The main components of solar collectors are consists of the cover section, air gap, and absorber, working fluid, and insulation layers. One of the most important parts of solar collectors is the absorber part [3].

Solar water heating systems have reached technical maturity and are used in many countries. After the first oil crisis in1973, the strategies used by industrialised and developing countries to reduce their oil dependence have been numerous. A diversification of energy import, a structural change of the large domestic product (industrial development of activities using a low energy expenditure) or an icrease of the national supply have been the essential measures taken by the countries with various degree of importance [4].

Nowadays, as the development of computer utilization in analyzing a wide range of problems, including in thermal science–modeling and simulation are commonly used among others methods.

Modeling is a method of mathematical equations that aim to explain the physical phenomena of the model of the study. In solar water heater collectors, modeling can be interpreted as the implementation of mathematical equations that aims to get the phenomenon of heat transfer that occurs in the collector [5].

In this research, modeling and simulation of heat transfer will be performed as numerical analyses by using a numerous of equations. The equations will be simulated by using software Engineering Equation Solver (EES). Also, the physical properties are available completely provided by the software.

In this research, the model will be developed by compiling a number of equations in order to perform the simulation. Many of the models have been proposed but were highly dependent on the location where modeling and testing were performed.

The purpose of this research is to develop numerical equations of heat transfer phenomenon and simulate it as mathematically on flat plate of solar collector. Furthermore the results will becompared with the experiment results. The results are expected to provide an overview of the calculation of heat transfer for water heaters in flat plate solar collectors and can develop science and technology in accordance with the development of the era.

2 Literature Review

2.1 Modelling and simulation

Modeling is the implementation of numerous numbers of mathematical equations that aim to explain the physical phenomena of the model. In solar water heater collectors, modeling can be interpreted as the use of mathematical equations that aims to get the phenomenon of heat transfer that occurs in the collector [6].

Making a model of solar water heater for the process of making food and comparing with measurements on the real conditions of the object. The development of a mathematical model is based on a numerical method called the Elementary Balance Method on each collector element represented by the node and the relevant energy balance equation for each collector element [7].

2.2 Heat energy utilization from the collector

The useful heat energy of the solar collector can be determined in three different ways. Based on the outer balance of the absorber, the useful heat energy of the collector using the following equation:

$$\dot{Q}_u = A_a\big[(\tau\alpha)_{ef}G - U(t_{abs} - t_a)\big] \qquad (1)$$

The heat energy that comes out based on absorber tabs temperature is not easy to know because with experimental measurement it is difficult to identify tabs.

The heat energy that comes out based on the average tm of fluid temperature is more easily known, as it corresponds to the experimental test results on the solar collector [8]. The average fluid temperature can be obtained easily from the measurement of inlet temperature and exit temperature.

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The heat energy coming out based on the average tm of fluid temperature is more easily known, as it corresponds to the experimental test results on the solar collector. The average fluid temperature can be obtained easily from the measurement of inlet temperature and exit temperature [9].

$$t_m = \frac{t_{in} + t_{out}}{2} \qquad (2)$$

The heat energy coming out of the collector based on the average fluid temperature is determined by the efficiency factor F'.

$$\dot{Q}_u = A_a F'\big[(\tau\alpha)_{ef}G - U(t_m - t_a)\big] \qquad (3)$$

In the mathematical model of the solar energy system, to calculate the heat energy and the exit temperature of the collector is calculated according to the inlet temperature. The useful heat according to the inlet temperature can be given as in equation 3.

In the mathematical model of the solar energy system, to calculate the heat energy and the exit temperature of the collector is calculated according to the inlet temperature [10]. The useful heat according to the inlet temperature can be given as in equation 4.

$$\dot{Q}_u = A_a F_R\big[(\tau\alpha)_{ef}G - U(t_{in} - t_a)\big] \qquad (4)$$

To obtain the exit fluid temperature at the flat plate solar collector by means of equilibrium of the inner and outer energy as shown in equation 5.

$$Q = m \cdot cp \cdot \Delta T = \dot{m} \cdot cp \cdot \Delta T \qquad (5)$$

Then the fluid temperature out of the equation will be:

$$T_{out} = t_{in} + \frac{Q_u}{\dot{m}\,cp} \qquad (6)$$

3   Materials And Methods

The process for solving the heat transfer equation modeling of a flat plate solar collector, by using thermal resistance as shown in Fig. 1, therefore computer programming is required in order to solve several variables and unknown equations [11].
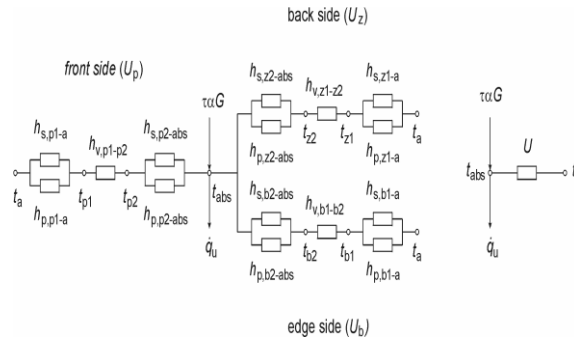
Figure 1. Thermal resistance of energy equilibrium in solar collector

3.1 Collector dimension

The geometry of plate solar collector as shown in Figure 2. The height of the La isassumed/considered to be the same as the length of the pipe. The width of Ha is divided by the number of pipe nr width of absorber fins given as W (the distance between two axes). The thickness of the dfr frame, the thickness of the front side air layer dp, the thickness of rear air layerdz and the thickness of the glassdgl with the total depth of the collector is given as B.
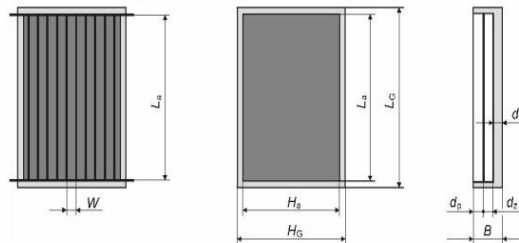
Figure 2. Dimension of solar collector

The specifications of each of the simulated components are:
1. The frame of the collector: made of aluminum material with thickness of 0.03 meters;
2. The length of the collector: 1 m, collector width 2 m and the volume of collector area 2 m^2;
3. There are two variations of flat absorber:
    *   The absorber plate used is aluminum material with thickness 0.4 mm and 0.6 mm
    *   Zinc absorber plate with thickness 0.4 mm and 0.6 mm.
4. Glass cover: clear glass with a thickness of 4 mm
5. Collector absorber pipe: copper pipe with outside diameter 10 mm, 8 mm inner diameter.

4   Results And Discussion

4.1   Simulation results

The following will show some results from simulations that have been executed based on the program that has been created with different input data and the flow rate used is 200 cc/min, then the simulation result will be compared with the test result.

Case 1

Data input:

- Solar intensity is assumed under bright sky conditions, ambient temperatures, incoming fluid temperatures;
- Material absorber used is Aluminum with thickness 0.4 mm and 0.6 mm;
- The pipe material used is copper;
- Data retrieval time from 08.00 am until 18.00 pm.

Case 2

Data input:

- Solar intensity is assumed under bright sky conditions, ambient temperatures, incoming fluid temperatures;
- Material absorbers used are zinc with thickness of 0.4 mm and 0.6 mm;
- Pipe material used is iron;
- Data retrieval time from 8:00 am to 18:00 pm.

The data obtained from the simulation and test results of flat plate solar water heaters, test results and simulations are discussed in graphical form. The graph of the intensity of solar radiation over time can be seen in Figure 3.
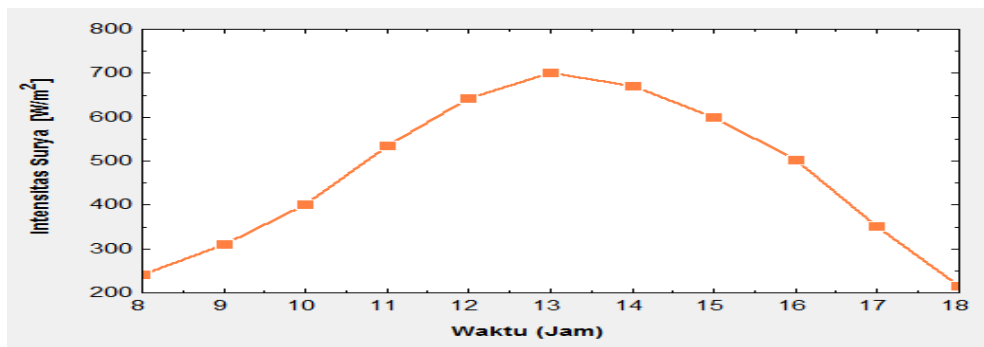
Figure 3. Graphsolar radiation intensity against time

At the beginning of the simulation of the absorber plate used was aluminum then replaced with zinc with the same thickness (0.4 mm), where the temperature of the inlet fluid (Tin), ambient temperature (Ta), the outlet fluid temperature of the simulated results by using the aluminum plate as Absorber (Tout: Abs of Aluminum) and the fluid temperature comes out from the simulation result using zinc as absorber plate (Tout; Abs of Zinc).

The simulation results of media influence on temperature are shown in Fig 4 below.
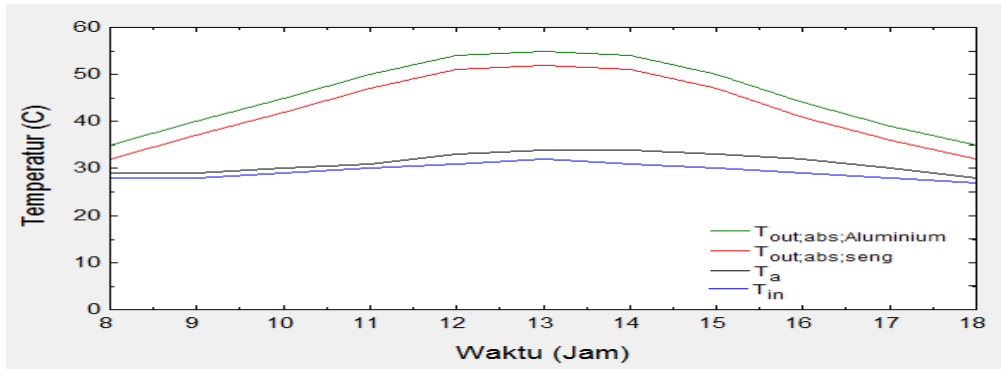
Figure 4. Graph temperature of out fluid based on the absorber plate

The next simulation is by varying the thickness of the absorber plate using aluminum with a thickness of 0.4 and 0.6 mm. The collector pipe used is a copper pipe. The effect of thickness on the fluid out temperature can be explained in Figure 5.
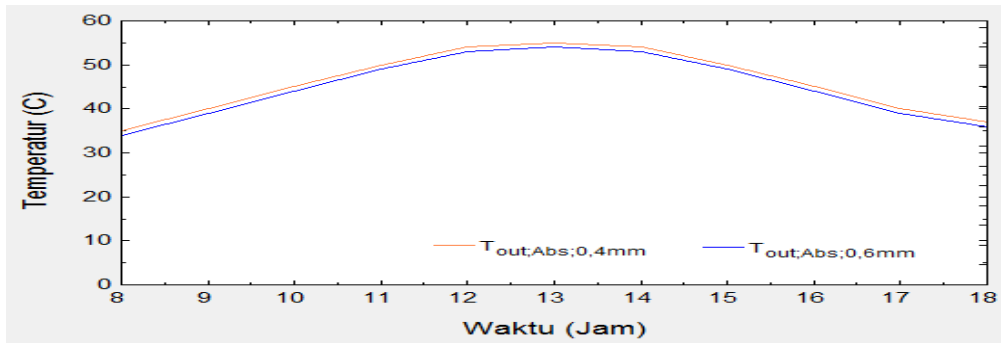
Figure 5. Graph temperature of out fluid based on the thickness of absorber plate

The next simulation varied the thickness of the absorber plate using the zinc with a thickness of 0.4 mm (Tout;Abs; 0,4) and 0.6 mm (Tout; Abs; 0,6) thickness . The effect of thickness on the fluid out temperature can be explained in Fig. 6.
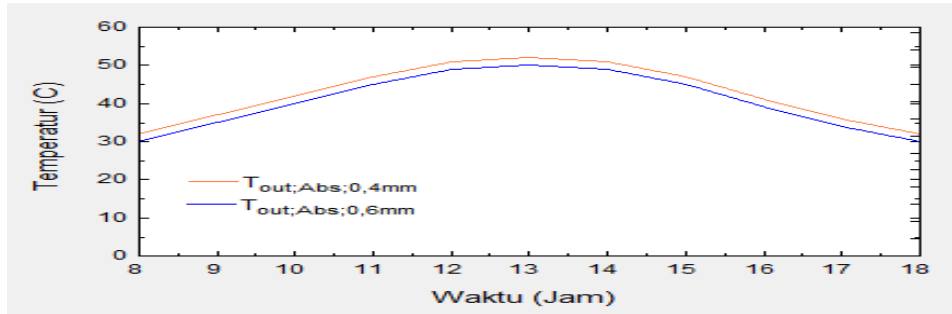
Figure 6. Graph temperature of out fluid based on the thickness of the absorber plate

The next simulation is done by varying the collector pipe using copper pipe and iron pipe with solar intensity, ambient temperature and ambient temperature equal. The effect of the collector pipe material on the fluid out temperature can be explained in Fig 7.
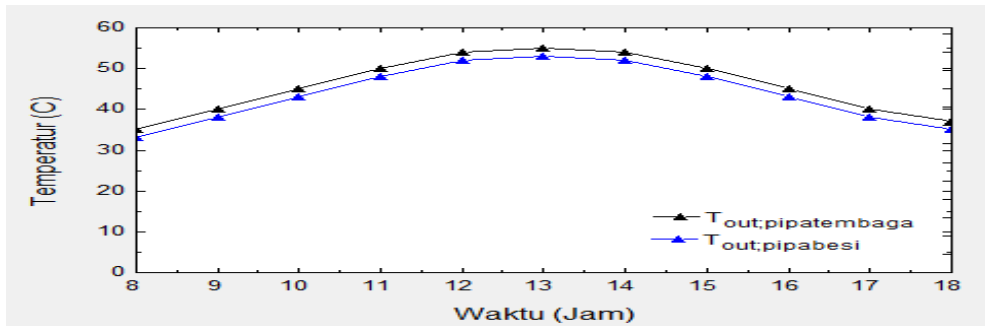
Figure 7. Graph temperatureof out fluid by collector pipe material

The next simulation using aluminum and zinc with a thickness of 0.4 mm as an absorber, then compared with the test results on 17 July 2012 by using aluminum as an absorber. Comparison of exit temperature of simulation result and test result as in Fig 8.
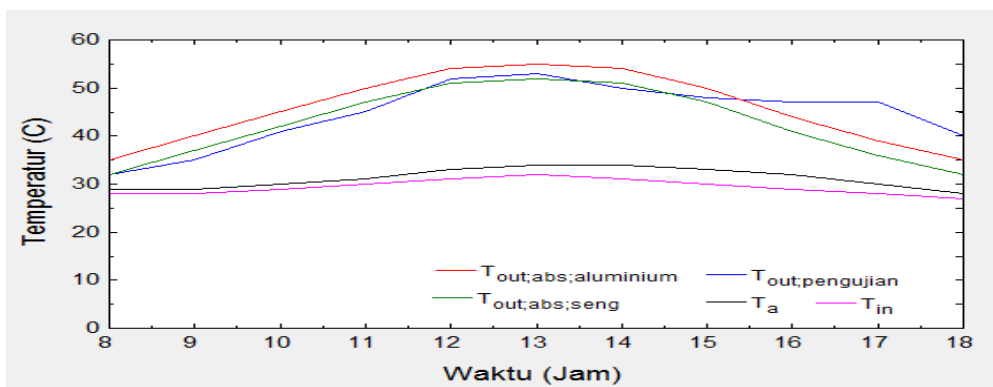
Figure 8. Graph fluid temperature from simulated and test

5 Conclusions

These modeling and simulation are carried out with the main objective of obtaining a reference for the calculation of heat transfer and the absorber material used in flat plate solar collectors. The simulation results were then compared with the results of tests conducted among the Department of Mechanical Engineering Department, Malikussaleh Univerisity. To achieve the goal is modeling by entering the equations and then simulating with the software. From the results of this simulation can be concluded.

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Determining Route of Distribution to Minimize Transportation Costs Using Saving Matrix Method in PT. X

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Abstract. This study aims to determine the distribution route of goods that can minimize transportation costs in PT.X. Methodology of problem solving approach in this research is saving cost matrix method. This study provides alternative route of distribution that must be passed by as many as 12 routes with 505.08 km distance, and total transportation cost IDR 15.434.394, while the previous transportation cost is IDR 18.138.897, - per distribution cycle, resulting in cost savings transportation of IDR 2,704,503, or 14.9% cost savings per distribution cycle.Distribution areas under study include the area of North Sumatra with several sub distributors to Medan, Kabanjahe, Tebing Tinggi, Pematang Siantar, Indrapura, Rantau Prapat, Kisaran, Padang Sidempuan, Balige and Sibolga which are then distributed to foodstore (super market and mini market) and traditional outlets (wholesale).

Keywords: Distribution, Transportation, Minimum Cost, Saving Cost Matrix.

1 Introduction

Good distribution and transportation is essential for a company so that a product can be delivered to customers on time, in exact quantity, to the place and goods specified in good condition. In general, distribution can be integreted as a marketing activity that aims to facilitate or facilitate the process of delivering goods and services from producers to the hands of consumers, as needed [1]. Every company wants a minimum cost for this transportation process that can provide an optimal solution.

These issues require companies to define an appropriate distribution strategy. One strategy that can be used by customers in the right amount, good condition, in accordance with the promised time, and low transportation costs so as to optimize the use of capacity and number of vehicles. PT. X is one of the companies that produce beverages in Medan, packaging more responsive to retailers' demand that causes transportation routes to change and less consider the suitability of transportation capacity. With such distribution, the condition of transportation cost requirement is not small. In this study, this study aims to determine the optimal distribution route by considering the transportation capacity by Saving Matrix Method.

2 Literature Review

2.1 Distribution

Distribution is an activity to move products from suppliers to consumers in the form of a product. Distribution is a key benefit to the company because the distribution will directly affect the cost of the product and consumer needs, the appropriate distribution network can be used to achieve a variety of product needs ranging from low cost and high response to consumer demand. Distribution term is the same as place (placement) that is activity of channeling or placing of product (goods) from producer to consumer. Material movement occurs in all cycles of the product manufacturing process, either before or after the production process [2].

2.2 Transportation

According to Nasution (2004) in [3], transportation is defined as the movement of goods and people from the place of origin to the destination. The transport process is a movement from the place of origin, from where the initial transit activity begins and the destination is an activity where the transport is terminated.

2.3 Distribution and Transportation Functions

Traditionally we recognize distribution and transport management with various designations. Some companies use the term logistics management, some companies use the term physical distribution. Whatever the term, in general the function of distribution and transportation is basically delivering the product from the location where the product is produced until the service to the consumer as well as the satisfactory seller's service [3].

2.4 Transportation Model

Taha (1996) in [4] suggests that in a simple sense, the transport model seeks to determine a plan of transporting an item from a number of sources to a number of destinations. The data in this model includes: 1. Offer level in each source and number of requests in each destination. 2. Transportation costs per unit of goods from each source to each destination. Noer (2010) argues that the method of transportation is intended to find the best solution of the problem of transportation (transport) goods or products from warehouses or factories to the destination market with the cheapest cost. Once transport costs have been identified from factory to market, as well as factory capacity and market demand are known then the question of how the best allocation can be done [5].

2.5 Transportation Issues

Agustini and Rahmadi (2004) in [6] suggested that transportation cases arise when trying to determine how to transport (distributing) a kind of item from multiple sources (location of offer) to multiple destinations (request locations) that can minimize costs. Usually the amount of goods that can be distributed from each bidding location is fixed or limited, but the number of requests at each request location is varied.

2.6 Transhipment Model

Trasnshipment model is a model that allows indirect delivery of goods, in which the goods transported must undergo two or more means of transport, either from a source to another source or other before reaching its final destination. Thus, in this Transhipment Model, a source can simultaneously serve as a goal and vice versa, a goal may also serve as a source. For example, for example, a farmer can not obtain fertilizer from the factory directly, but must go through a regional agent, even the regional agent must go through a new center agent from the factory [7]. The standard transport model assumes that the direct route between a source and a destination is a minimum cost route, by providing the closest route between source and destination. This means that a preparatory calculation involving the determination of the nearest route must be made before the unit cost of the standard transport model can be determined. This calculation can be done by applying the closest route algorithm to the desired node pair. The transhipment model has an additional feature that allows units to be sent from all sources to pass between intermediate and temporary nodes before arriving at destination. As a result, this transhipment model combines both the usual transport algorithm model with the closest route algorithm into a single procedure [8]. Diagrammatically the transhipment model can be seen in Figure 1 below:
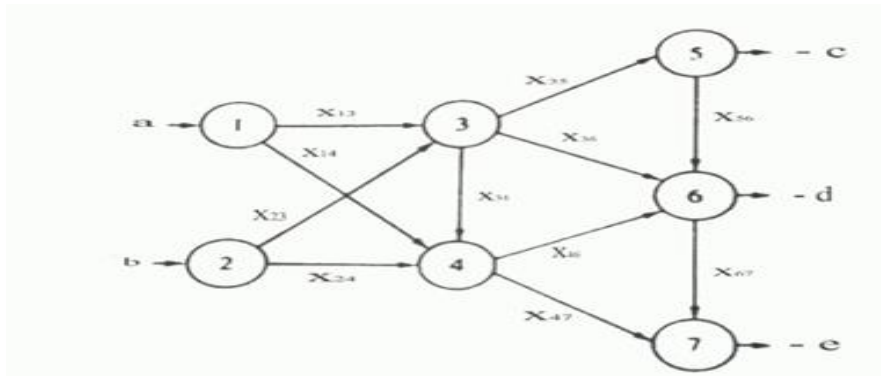
Figure 1. Transhipment models

2.7 Saving Matrix

Saving matrix is a method to minimize distance, time or cost by considering the constraints that exist. In the Saving Matrix method there are steps to be taken, the step is to identify the Distance Matrix, identify the Saving Matrix, allocate the retailer to the vehicle or route, sort the retailer (destination) in a predefined route. In steps one through three are used for the determination of vehicles used for retailers, while the fourth step is used to determine the route of each vehicle to obtain optimal mileage [9]. The purpose of the "savings" method is the method used to determine the route of product distribution to the marketing area based on the capacity of the conveyance used. The goal is to obtain a proposed distribution route that is used to minimize total mileage and distribution costs. The saving matrix method is also one of the techniques used to schedule a limited number of vehicles so as to minimize distance, time, and cost by considering the existing [4].

3 Methods

3.1 Initial Route Data and Transportation Cost

Table 1. Initial Route Data

No.	Route	Distance Total	Request Total
1	G-D27-D57-D43-D34-D45-G	69,8	375
2	G-D22-D23-D28-D33-G	38,2	422
3	G-D48-D19-D14-D54-G	30,3	423
4	G-D21-D26-D44-G	54,1	308
5	G-D35-D47-D55-G	42,5	243
6	G-D11-D12-D25-D3-G	44,7	357
7	G-D2-D46-D5-D41-D53-D56-G	38,76	399
8	G-D32-D42-D39-G	73,9	288
9	G-D9-D24-D31-G	60,3	417
10	G-D1-D4-D20-D17-D13-D18-G	52,7	448
11	G-D29-D40-D36-D30-G	60	382
12	G-D7-D8-D37-D6-D25-G	62,2	427
13	G-D10-D49-D50-D16-G	61,6	318
14	G-D51-D52-D38-D15-G	53,8	376

Source: PT. X

In this study, the object of research is the initial distribution route 390 ml bottle products and the data used is secondary data in the form of data distribution companies such as information distribution area, the number of requests, type. and the amount of transportation used and transportation costs such as labor costs, fuel costs and retribution costs. From the research results 390 ml bottle products distributed to 58 consumers by using Toyota Dyna 130 PS HT / Truck Box with 450 dozen capacity, obtained the initial route data, total demand and total distance from warehouse (G) to consumer (D) and back to warehouse (G) can be seen in table 1.

Transportation costs incurred using the initial route are derived from total fuel costs, labor costs and user fees, for recapitulation and details of goods costs can be seen in Table 2.

Table 2. Prices for transportation costs

No	Type of Amount	Amount (IDR)
1	Bio Solar Fuel Cost	IDR 5,150,- /liters
2	Levy Fees	IDR250,000,-/ trip
3	Salary	IDR 500,000,- /trip

Source: PT. X

Transportation cost prior to application of saving matrix method on the initial route is calculated for 1 shipment of each route based on demand in May 2017.

It can be calculated the initial route transportation cost ie:

1. Fuel Costs Toyota dyna used as a means of transportation using 1 liter of bio-diesel fuel for 6 km distance. for fuel costs can be calculated using the following formula:
   1) Fuel costs = distance x 1/6 x the price of diesel fuel
   2) Route 1 = 69.8 km x 1/6 x IDR 5.150 = IDR 60.031
   3) Route 2 = 38.2 km x 1/6 x IDR 5.150 = IDR 32.854

4) Route 14 = 53.8 km x 1/6 x IDR 5.150 = IDR 46.271.

Thus, the total fuel cost of the initial route, is: Total cost of fuel = route 1 + route 2 + route 3 + route 4 + route 5 + route 6 + route 7 + route 8 + route 9 + route 10 + route 11 + route 12 + route 13 + route 14 Total fuel cost = IDR 638,897,-/ trip

2. Labor Cost
   1) Labor Cost = Number of routes x Number of labor x Salary
   2) Labor costs = 14 x 2 x IDR 500,000 3) Labor cost = IDR 14,000,000, - / month
   3) Retribution Cost

   Retribution cost = route number x retribution cost Retribution fee = 14 x IDR 250,000 Retribution fee = IDR 3,500,000, - / trip

3. Total Transportation Cost
   Total transportation cost = fuel cost + labor cost + retribution fee Total transportation cost = IDR637,813 + IDR 14,000,000 + IDR 3,500,000 Total Transportation cost = IDR 18,137,813., - / trip.

3.2 Identifying Distance Matrix

This distance measurement is obtained using Google Maps app, then put it into the distance matrix table, see table 3.

Table 3. Distance Matrix (Km)

3.2 Identifying Saving Matrix

Identifying the savings matrix of each route can be calculated using the following formula:

$$S(x,y)=J(G,x)+J(G,y)-J(x,y)$$

With the above formula can be saving matrix between consumers by using the distance in the attachment and here are some calculations in determining saving matrix:

S (D1,D2)   = J(G,D1) + J(G,D2) – J(D1,D2)
             = 10,3 + 4,1 – 6,6 = 7,8

S (57,58)   = J(G,57) + J(G,D58) – J(D57,D58)
             = 19,5 + 17,1 – 16 = 20,6

After obtaining the calculated value of the overall savings matrix of some consumers, the distance or value obtained is entered into the Saving Matrix table contained in table 4.

Table 4. Saving Matrix

(Table 4 is a large 58×58 saving matrix of numeric values; individual cell values are not legibly reproducible.)

3.3 Determining Distribution Route

By using Saving Matrix, it can do the allocation of consumers into the route. The allocation of each different consumer can be combined with the existing truck capacity limits. Route determination starts from the largest savings value, the first largest saving value of the savings matrix table is:

- The largest savings figure is 42.96 km in Table 4.6 which is found in line 27 of column 8 by combining D7 and D26, with the sum of requests D7 = 98 dozen and D26 = 100 dozen then combined 98 + 100 = 198 dozen (<450 dozen / capacity truck). Because D26 is closer to the warehouse than the D7 then route 1: G-D26-D7.

From the search and consumer allocation above then got the proposed route by using saving matrix method that is 12 routes and can be seen in table 5.

Table 5. Proposed Route

No.	Proposed route	Distance (km)	Truck capacity (dozen)
1	G-D26-D7-D39-D47-D42-G	35,67	450
2	G-D44-D43-D36-D45-D57-G	56,9	450
3	G-D30-D31-D34-D32-G	60,1	445
4	G-D23-D24-D28-G	37,4	450
5	G-D50-D58-D16-D6-D29-G	51	448
6	G-D27-D52-D37-D12-D15-G	48	450
7	G-D25-D35-D22-D40-D8-G	48,9	450
8	G-D14-D13-D18-D38-G	41,4	440
9	G-D46-D56-D48-D19-D51-D21-D3-G	56,3	381

10	G-D1-D33-D10-D55-D49-D41-D20-G	29,74	439
11	G-D2-D5-D54-D53-G	27,87	437
12	G-D4-D9-D11-D17-G	11,8	388

3.4 TransportationCost Estimation

1. Fuel Costs
   Fuel cost = distance x 1/6 x the price of diesel fuel Route 1 = 35.67 km x 1/6 x IDR 5.150 = IDR 30.678 Route 12 = 11.8 km x1 / 6 x IDR 5.150 = IDR 10.148 So, the total fuel cost of the proposed route, is: Total cost of fuel = route 1 + route 2 + route 3 + route 4 + route 5 + route 6 + route 7 + route 8 + route 9 + route 10 + route 11 + route 12) Total fuel cost = IDR 434.394,-/ trip

2. Labor costs
   Labor cost = Number of routes x Number of labor x payroll Labor cost = 12 x 2 x IDR 500,000 Labor cost = IDR 12.000.000,-/ trip

3. Retribution Fees
   Retribution fees = route number x retribution cost Retribution fee = 12 x IDR 250,000 Retribution fee = IDR 3.000.000, - / month

4. Transportation Total Cost Total transportation cost = fuel cost + labor cost + retribution cost Total transportation cost = IDR 434,394 + IDR 12,000,000+ IDR 3,000,000.

5. Total transportation cost = IDR 15.434.394,-/ trip.

4 Results and Discussion

4.1 Efficiency of Distance

Comparison of the initial distribution route run by the company with the proposed route done by using saving matrix method can be seen in Table 6 below.

Table 6. Comparison of Initial Routes and ProposedRoutes

Initial Route				Proposed Route		
No	Route	Distance Total	Request Total	Proposed route	Distance (km)	Truck capasity (dozen)
1	-D57-D43-D34-	69,8	375	5-D7-D39-D47-D	35,67	450
2	22-D23-D28-D3	38,2	422	-D43-D36-D45-I	56,9	450
3	48-D19-D14-D5	30,3	423	30-D31-D34-D3	60,1	445
4	-D21-D26-D44-	54,1	308	-D23-D24-D28-(	37,4	450
5	-D35-D47-D55-	42,5	243	0-D58-D16-D6-D	51	448
6	)11-D12-D25-D	44,7	357	-D52-D37-D12-I	48	450
7	46-D5-D41-D53	38,76	399	5-D35-D22-D40-	48,9	450
8	-D32-D42-D39-	73,9	288	14-D13-D18-D3	41,4	440
9	-D9-D24-D31-(	60,3	417	5-D48-D19-D51-	56,3	381
10	4-D20-D17-D13	52,7	448	-D10-D55-D49-D	29,74	439
11	29-D40-D36-D3	60	382	D2-D5-D54-D53	27,87	437
12	7-D8-D37-D6-D	62,2	427	D4-D9-D11-D17	11,8	388
13	10-D49-D50-D1	61,6	318			
14	51-D52-D38-D1	53,8	376			

From table 6 it can be seen that the proposed route has a total shorter distance compared to the route used by the company, that is on the total proposed route traveled by 505.08 km and on the initial route the total distance traveled by 742.86 km with the difference between the proposed route and the initial route of 237.78 km can be calculated the efficiency of distance by:

$$Distance\ fisiensi\ = \frac{initial\ route - proposed\ route}{initial\ route}\ x\ 100\%$$

Then the efficiency of distance obtained using saving matrix method is as follows:

$$Distance\ Efisiensi = \frac{742,86 - 505,08}{742,86}\ x\ 100\% = 0,32\ x\ 100\% = 32\ \%$$

From the above calculation efficiency of distance of 32% of the distance used by the company.

4.2 Transportation cost Efficiency

The comparison of the initial transportation cost incurred by the company with the cost of transporting the proposals obtained using the saving matrix method can be seen in Table 7 below:

Table 7. Comparision Transportation Cost

Initial Route			Proposed Route		
No	Cost Type	Ammount (IDR)	No	Cost Type	Ammount (IDR)
1	Fuel cost	IDR 63,897	1	Fuell cost	IDR 434,394
2	Labour coat	IDR 14,000,000	2	Labour cost	IDR 12,000,000
3	Retribution fee	IDR 3,500,000	3	Retribution fee	IDR 3,000,000
Total		IDR 18,138,897	Total		IDR 15,434,394

From table 7 it can be seen that the transportation cost before the implementation of the saving matrix method of the company incur a transportation cost of IDR 18,138,897, - / trip while using the saving matrix method of transportation cost generated is IDR 15.434.394 / trip to obtain transportation cost savings for IDR 2,704,503 / - trip. By using transportation cost of proposal then can efficiency of transportation cost can be calculated by:

$$Cost\ Efficiency$$
$$= \frac{initial\ cost - proposed\ cost}{initial\ cost}\ x\ 100\%$$

$$= \frac{18138897 - 15434394}{18138897}\ x\ 100\%$$

$$= 0,149\ x\ 100\% = 14,9\ \%$$

From the above calculation cost efficiency of 14.9% of transportation costs incurred by the company.

5 Conclusions

Based on the Processing, analysis and discussion conducted in this study, it can be drawn some conclusions, namely:

1. The formation of the proposed route using saving matrix method resulted in lower total mileage compared to the total mileage applied by the company, where the number of routes applied by the company there are 14 routes with a total distance of 742.86 km, while the proposed route produces 12 routes with a total distance of 505.08 km and efficiency of 32% of the total initial route used by the company, with the distribution of products to 58 consumers in Medan company still use the truck where each truck changes the route taken, the distance is different from the previous route and the capacity corresponding.

2. Using the proposed route obtained from data processing using saving matrix method can save total transportation cost, where total transportation cost on the initial route is IDR 18.138.897, - / trip and total transportation cost after application of saving matrix method on the proposed route of IDR 15,434,394. - / journey so as to obtain transportation cost savings of IDR 2,704,503. - / travel and efficiency of 14.9% of transportation costs used in the company.

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Profile of Moodle Based Evaluation Media on Mathematics Learning at SMA Muhammadiyah Al-Amin Kota Sorong

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Abstract. This research was a research development which produced the product of evaluation media used LMS Moodle. This research was conducted at SMA Muhammadiyah Al-Amin of Sorong city with the subject of the research were students of grade XII IPA.The model of development chosen was the model which developed by Alessi and Trollip. The result showed that (i) result of media evaluation on learning has valid because validation result was on interval $2,5 \leq M < 3,5$. Based on all average score 3,3it means that, the component which validated including on category "Valid". (ii) learning device has practiced because of the average of questionnaire percentage was 90% which means the teacher responds "High Positive" towards evaluation media which developed. (iii) evaluation media on learning has effective because the result of all students' respondsincluding expected criteria.

Keywords: Evaluation Media, Moodle, Mathematics Learning

1 Introduction

The development of globalization rapidly was impacts towards changes in all aspects of human, The change also felt by the aspect of the economy, social, culture, education and so on. The demands of the globalization of development as indirect demands so that all the aspects adjust with the demands of development and the progress of time, especially in education sector should be updated in line with the development of time in globalization era.

This change supports the world of education has to have innovations which suitable for the development of time. The innovations could be applied in all national education system. In curriculum, teacher, learning process and also assessment. The government generally, and especially to educational actors should be self-adjusted with some progress who able to increase quality andeducationaloutput. Some positive things could be felt based on the development of globalization especially in educational sector is easier in finding learning sources, more choiceto use ICT in learning, it was used in order to increase a part of media and multimedia on learning, these devices of learning were cover some media such as learning

opportunity is flexible, learning based computer (CBI), mobile learning, e-learning, learning management system and etc.

Innovations which developed should not focus on innovation in the learning process, but it is involved all aspects to determine learning outcomes which need the innovation in learning phase. This in line with [1] who proposed that evaluation activity become more crucial to determine whether the activity which succeeds to be done or not.The Evaluation also covers decision about how to know students' learning outcomes, when do it, and anything which is known.

Based on the observation at SMA Muhammadiyah Al Amin of Sorong city, teacher evaluated students' learning outcomes who still used conventional way, like the question made in form of paper, and the assessment was still done manually.This way, of course, needsa long time from making of evolution sheets till evaluation of assessment sheets. Based on that problem, it was needed to be developed a media which can help the teacher to do the evaluation of students' learning outcomes, the media was Moodle (Modular Object-Oriented Dynamic Learning Environment) is designed by using the principles of pedagogy to help educators in making the system of e-learning which effective[2].

Moodle is a name for an application program which can change the process of learning and evaluation of learning outcomes in web form.This application allows the students enter to "classroom" digital for accessing learningmaterials, exercises question.Moodle can be used as learning materials, quiz, and others could be gained through internet.(Taylor *et al.*, 2011) proposed that learning based moodle sometimes has many benefits to the students. If it was designed good and proper, so the learning based moodle can be fun learning, have high activity element, caused the students remembering more learning materials.

2. Methods

The Development of Model which is used in developing an evaluation media based Moodle.This moodle is model which developed by Alessi and Trollip. The development step which done in this research wasa design of planning stage and development. Population and sample in this research were the students of class XII IPA SMA Muhammadiyah Al-Amin SorongCity. The criteria validation and product feasibility were, (1) Determine the category of validation in every aspect or all aspects by matching the average criteria ($\overline{K}_t$) or average aspect ($\overline{A}_t$)or total average$\overline{x}$ with validation category which was set. (2) Validation category in every criteria,every aspect, or all aspects was set as follows:

$3,5 \leq M \leq 4$: strong valid
$2,5 \leq M < 3,5$: valid
$1,5 \leq M < 2,5$: enough valid
$M < 1,5$: not valid

Keterangan :

GM = $\overline{K}_t$ **,** for finding of validation every criteria,
M = $\overline{A}_t$,, for finding of validation every aspect,
M = $\overline{X}$, for finding of validation all aspects,

Determining the category of positive respond based on a percentage which is obtained by respond category that is used as follows:

$85\% \leq RT$: Strong Positive
$70\% \leq RT < 85\%$: Positive

50% ≤ RT < 70%   : Enough Positive
 RT < 50%   : Not Positive

3. Results and Discussion

The data of this study was described as in the following figures.
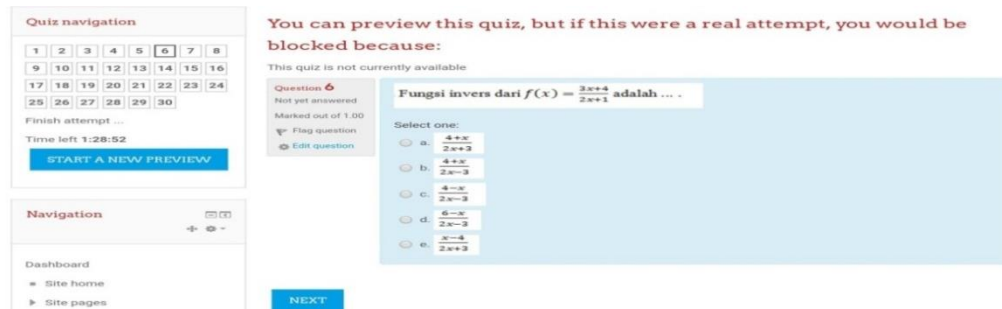
Figures 1: Evaluation Media based website moodle

This media was developed used LMS Moodle which has features, which can help the teacher to make the exam question of computer based test (CBT) in order to students' learning outcomes can be carried with effectively and efficiently. [4], [5] explain that the use of assessment system of learning outcomes using Moodle can help in assessing and able to give repairing to result that students got. Based on the questionnaire result which has given to 3 experts were obtained score analysis as follows:
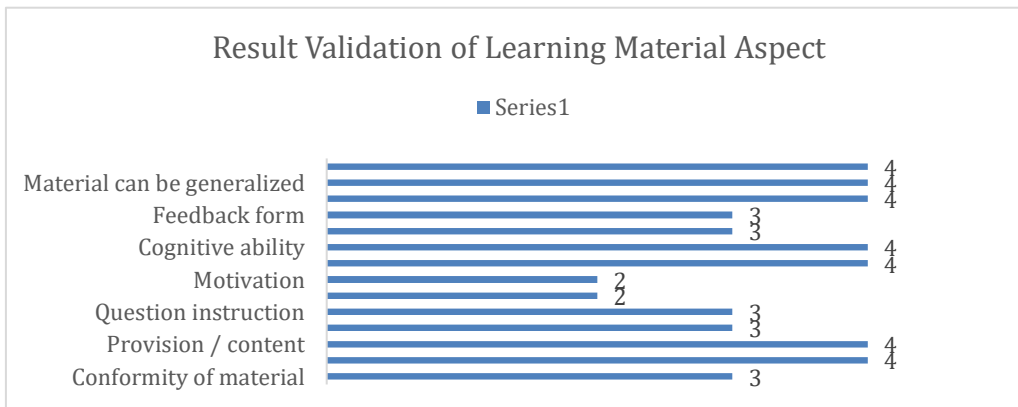
Figures 2. Evaluation Media based website moodle

Validation score by the expert of material was 47 with average 3.4. Based on the criteria of validation that the average score of this assessment was in category "Valid" (2,5≤ M < 3,5). Then, it can be stated as validation criteria. So that evaluation media that the researcher developed and proper to use in implementing on exam implementation at school.

The result of feasibility was strengthened by [4] stated that the use of Moodle can help a teacher in giving the learning evaluation.
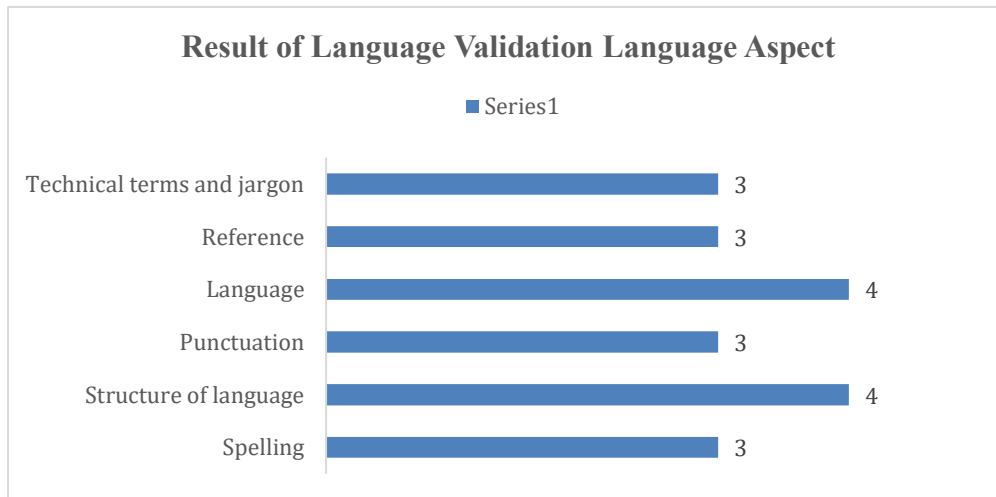
Figures 3. Validation Result Language aspect

The assessment from the language expert towards evaluation media which developedhas number h of score 20 with the average 3.3. Based on validation criteria that the average of assessment was in category "Valid" (2.5≤ M <3.5). Then it can be stated as meeting criteria of validation.
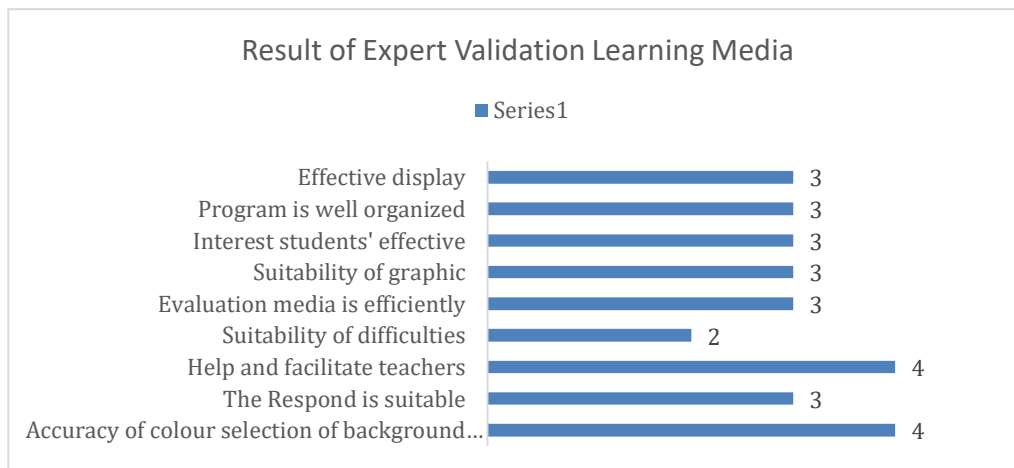
Figures 4. Result Validation of Learning Aspect Media

The assessment from the expert of evaluation towards evaluation media which is developed had the score 28 with the average 3.1.This phase is supported by the research [6]stated that the description of ability and the students in the class can be improved through

evaluation process used Moodle.Based on the criteria of validation, The average of assessment category was "Valid" (2.5≤ M <3.5). So that it can be stated as meeting the validation criteria.

Table 1. Questionnaire Score of Teacher

No	Indicator	Percentage	Category
1	Do the use of evaluation media based website memorable to the teachers towards evaluation process on learning?	100%	Strongly Agree
2	Do the use of evaluation media on learning outcomes based website Moodle ease to be operated?	75%	Agree
3	Is there any advantage from evaluation media based website Moodle if it is compared with evaluation media used paper?	75%	Agree
4	Is the process accurate on assessment and easiest compare with assessment manually?	100%	Strongly Agree
5	Do the teachers interested in using evaluation media base Moodleon further examination?	100%	Strongly Agree
Average		90%	High Positive

Evaluation of questionnaire on teachers' respond was done after examination process used evaluation media basedMoodle which developed by the researcher. Based on the data of the result from teachers' respond in questionnaire It can be concluded the average score on the percentage of the result on teachers' respond was 90%. Based on the practical criteria, the percentage of this assessment was in the category "High Positive" (85% ≤ RT). Then it can be said that evaluation media base website moodle fill the practical criteria and can be used in exam implementation at school.This in line with [7], (Pe, Farin, and Bolay, 2014)proposed the use ofmoodle in evaluation learning process and it can be seen the differences on students' ability and the activities were done during the learning process.

Table 2. The Score of Students' questionnaire

No	Indicator	Percentage	Category
1	This evaluation media used the easiest language to understand	70%	Agree
2	Evaluation media used the sentences which showed the double meaning	78%	Strongly Agree
3	Instruction of activity in clear evaluation media, So that makes me ease to make all these activities.	68%	Agree
4	Type letter selection, size, and space which is used to make me ease in reading the questions.	95%	Strongly Agree
5	An affordable internet network	68%	Agree
6	When using this evaluation media, there is something interest for me	75%	Agree
7	Presenting style of this evaluation media not bored	78%	Strongly

			Agree
8	In every word question or sentences and easy to understand	75%	Agree
9	The question which presented was benefited for me	78%	Strongly Agree
10	Material in evaluation media can make me understand	78%	Strongly Agree
	Average	76%	Positive

The evaluation of students' respond was done after the process of final examination by using evaluation media based moodle. Based on the data of the result on students' questionnaire respond which given to 10 students, it can be concluded that the average of score percentage on the questionnaire was 76%. Respond category was $70\% \leq RT \leq 85\%$, which mean the average of students' positive respond towards evaluation media base website used in this research. This means that the media was developed fill the effective criteria.[9]propose that students gave good respond towards the use of moodle in learning evaluation, besides that the quality of an evaluationlearning process well obtained in improving students' motivation.

The result of an experiment on evaluation media in the mathematics learning basedmoodle, it is very interesting for teachers and students because this is a new thing, where the students can do the exam only using headphone, tablet or laptop that they had, besides that the ability to access in everywhere make moodle easiest to use. [10]explained that the use of moodle is very helpful students in collaborating to establish the concept and solve the problem in learning.

4. Conclusions

The development of evaluation media base website moodlesfor mathematics learning at students of grade XII SMA Muhammadiyah Al-Amin SorongCity already develop on development criteria. This media was developed by involving 3 validators which consist of expert media, language expert and the material expert had stated that the media was developed could be carried to evaluation criteria on category "valid". As for the result of respond teachers and students said that the media which developed could be used in the implementation of learning outcomes.

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Comparative Analysis of Ergonomic Risk With QEC and REBA Method on The Souvenir Aceh Treater in UD. Ikhsan Aceh

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Abstract. UD. Ikhsan is one of Acehnese special embroidery souvenirs. The production process is tailoring done with long term work posture statistically this activity caused complaints from the workers. This study aims to identify the level of ergonomic risk by comparison of Quick Exposure Check and Rapid Entire Body Assessment methods. Data collection was done by distributing Nordic Body Map questionnaire and QEC questionnaire and taking posture when conducting sewing activity based on capture video camera. The results of NBM questionnaires show that workers are experiencing multiple complaints of musculoskeletal disorders. The body part of the complaint is 93% waistline, 87% buttocks, 87% lower neck, 80% left shoulder, 80% back and 80% right wrist. For QEC score calculations ranging from 50% - 70%, included in the next action category which means it needs further research and changes. The results of the calculation of the REBA method on the assessment of tailor work posture are obtained by operator operator = 5 with high risk and level 2 with a medium category which means that action is needed. The cause of work risk based on the research is the factor of the operator's posture, work equipment and method.

Keywords: Ergonomics, Nordic Body Map, REBA, QEC

1 Introduction

Culture is a custom and characteristic of an area [1]. The Indonesian state is made up of various cultures, such diverse Indonesian cultures as beliefs, languages, dances, objects etc. Cultural heritage continues to be preserved and increasingly want to be developed and introduced to the world wide [2]. Aceh Province is one of the western regions of Indonesia which has a very unique culture both from language, social life, dance, food, objects such as; houses, clothing, carvings, and so on, as well as natural expanses that encourage and invite tourists to visit the region of Aceh. These perspectives also have an impact on the people of Aceh which are able to stimulate the economy and insight.

The development of tourism objects can create ideas to create products that can be sold to tourists without removing the culture of Aceh [3]. The products are produced in various forms that can be made souvenirs typical of Aceh, one of which is in the form of bags with embroidery typical of Aceh. Increased activity to run a souvenir business Aceh is very promising and provide great benefits. However, there are things that need to be considered in the production of souvenirs of Aceh conducted by tailors that is on postr work and work poster relationship on

the workplace that can cause negative impacts that is, against muscle disorders and health complaints and at risk of work accidents.

Ergonomics can also be interpreted as a science that regulates posture, work, proper planning and prevention of occupational diseases such as low back pain and disorders of Musculoskeletal Disorders (MSDs) because basically work affects health in various ways [4].As for some tools that can be used in ergonomic risk to improve work system, Nordic Body Map questionnaire is a questionnaire that is used to know the discomfort at worker at work and method used for this research among others.

QEC (The Quick Exposure Check) is an assessment of occupational occupational risk (Musculoskeletal Disorders-MSDs), and REBA (Rapid Entire Body Assesment) is a regulation of body posture at work and an assessment of factors that affects Musculoskeletar Dissorders complaints. UD. Ikhsan located in Bungkah, is one of the artand producer of souvenir embroidery typical of Aceh with the product that is produced in the form of bags and wallets of various sizes . During this process of production of souvenirs of Aceh by using machines that are operated automatically and manually if there is power outages.

Generally use a new type of sewing machine and a rather large size with the help of engine dynamo to facilitate them in sewing and accelerate the completion of their stitching tasks. Bad work station condition will reduce the performance of the tailor and also can cause work risk within a certain period of time. In general, tailors who work with static movements for an excessive period of time in their work activities will be at risk for injuries such as muscle disorders or Musculoskeletal Disorders (MSDs) associated with ergonomic problems.

The results of preliminary observation note that in the process of Aceh souvenir design conducted by workers ranging from operating machines using legs to embroidery and sewing. From various phenomenon experienced by tailor by doing work condition of work posture in not ergonomic position with repetitive and static movement, long working hours from Monday to Saturday even week starting at 08.00 until 17.00 and continued by curfew at 09.00 until 22.00 and time break the less regular workers so that workers work longer. Complaints are usually painful on the back, at the waist, on the arms and buttocks due to static muscle loading.

2   Literature Review

The term ergonomics began in 1949, when it was formed by the Ergonomic Research Society in England. This resulted in the first journal in the field of ergonomics in November 1957. The International Ergonomics Association was formed in 1957 and The Human Factors Society in America in the same year [1].

Ergonomics is derived from the Greek ergon meaning work and 'nomos' which means law or rule so that ergonomics is a rule or law in doing work activity [2]. Simply stated, ergonomics is defined as the study of the interaction between humans and the objects it uses and with the environment in which such interactions occur [3].

According to Humantech [4] Musculoskeletal Disorders (MSDs) is a disorder caused by accumulation of injury or minor damage to the musculoskeletal system due to recurrent trauma that each time does not recover completely, thus forming considerable damage to cause pain. According to OSHA [5], MSDs are a set of symptoms associated with muscle tissue, tendons, ligaments, cartilages, nervous system, bone structure, and blood vessels. MSDs initially cause pain, pain, numbness, tingling, swelling, stiffness, shaking, sleep disturbances, and burning sensations.

According to the National Safety Council [6], MSDs can also be interpreted as a disorder of normal functioning of muscles, tendons, nerves, blood vessels, bones and ligaments due to changes in structure and changes in the musculoskeletal system.

MSDs are injuries or diseases of the nervous system or tissues such as muscles, tendons, ligaments, joints, cartilage or blood vessels. The pain of MSDs can be described as rigid, inflexible, hot / burning, tingling, numbness, cold and discomfort. Musculoskeletal complaints are complaints on the skeletal muscle that is felt by someone ranging from mild complaints to painful complaints [7].

According to Humantech [8], symptoms of MSDs are often accompanied by complaints that are subjective, making it difficult to determine the severity of the disease. MSDs are characterized by symptoms such as pain, pain, discomfort, numbness, weakness or loss of power and hand coordination, burning sensation, mild movements, stiffness and cracks in joints, redness, swelling, heat, and pain keeping awake in the middle of the night and feeling to massage hands, wrists, and arms.

Musculoskeletal is the science of the muscular system and the skeleton or bone that is covered by the muscle. The term musculoskeletal consists of two words namely muscular and skeleton. Muscular means muscle and skeleton means bone or skeleton. Simply it can be concluded that musculoskeletal is a combination of muscle system and framework that adhesive with connective tissue that serves to facilitate the occurrence of movement in humans.

3 Methods

UD. Ikhsan is an Acehnese embroidery souvenir industry established by an individual by a civil servant (PNS) in 1980. History of UD. Ikhsan became the beginning of developing and the establishment of buildings to produce typical embroidery souvenirs of Aceh in Bungkah. Where the people of North Aceh, especially in Bungkah realize that this field of business has a bright prospect. In 2000 the father retired as a civil servant, resulting in UD ownership. Ikhsan was given to his son, Mr. Ikhsan. The production of bordir Aceh souvenirs has been marketed throughout Aceh and several cities in Indonesia to get to foreign countries like America. Sales each month increase with an average sales of 150-500 units.

The work that became the object of the writer's observation was the tailor of Aceh embroidered souvenirs who worked in informal venues that belonged to similar industrial areas. Generally workers come and live close to UD. Ikhsan in Bungkah area. When working workers using a vehicle or on foot only takes a maximum of 15 minutes to get to work. Work activities undertaken are analyzed as follows:

1. Sewin.

In doing the job of sewing clothes, each worker usually works in accordance with the capabilities and production targets that have been determined by the business actor. Long working hours from Monday to Saturday and even Sunday from 08.00 to 17.00, and continued by curfew at 20:00 to 23:00. There is no standard provision for length of working time and many minimal clothing to be completed by workers. There are only rest periods that are almost valid for all employees such as lunch breaks and prayers at 12:00 to 13:00 and afternoon breaks from 5:00 pm to 8:00 pm. Outside of these breaks, each worker is given the freedom to continue or complete production targets if not resolved at night. This happens because most of the workers or employees who work as a tailor is domiciled around or even in the home business that has been provided. From the observation, the aspects that can be considered to get a picture of activities and work locations, namely:

a. Seats

From the results of observations in the field, all the tailors use the same seat form of wooden or plastic chairs that do not have a backrest. Seats are only given pads to avoid the pads on the buttocks. Seats are commonly used by tailors as in Figure 4.1 below.

Figure 1. Seats commonly used by tailors

b. Sewing Machine

For the type of sewing machine that is generally used by workers, there is no difference in the machine used by this tailor. They generally use a new type of sewing machine and a rather large size with the help of engine dynamo to facilitate them in sewing and accelerate the completion of their stitching tasks.

4 Results and Discussion

In general, workers who work in this sector of informal sewing sector background of lower education with education levels ranging from not graduating elementary school until high school.Tidak workers who finish education or continue education to college level. However, there are 2 seamsters are still a student status that is sitting in high school. For their knowledge of sickness complaints many of them are still confused to explain because they reasoned that at the time of filling the questionnaire they are not in a state of pain or muscle pain as described in the questionnaire Nordic body map and Quicks Expossure Check.

Table 1. Characteristic of Male and Female Tailors

Operator Name	Age (Year)	Sex (M/F)	Working Time	Length of Work	Height (cm)	Weight (kg)	Smoking
1. Masnur	28	M	2,4 Year	10	166	56	Yes
2. Ikhsan	24	M	9 Year	10	175	60	No
3. Risky	23	M	1,2 Year	10	160	60	Yes
4. Muhammad	35	M	8 Month	10	169	67	Yes
5. Risky M.	45	M	2 Year	10	160	65	Yes
6. Rahmadi	18	M	1 Year	5	155	58	Yes
7. Wahyu	28	M	2,4 Year	10	168	63	Yes
8. Zakir	33	M	1,8 Year	10	165	64	No
9. Rahmat	22	M	3 Year	10	160	50	Yes
10. Sukri	20	M	8 Month	10	158	54	Yes
11. Rahmady	23	M	8 Month	10	158	62	Yes
12. Fakhr1 R.	25	M	7 Year	10	170	65	Yes
13. Abdul H.	40	M	5 Year	10	165	55	Yes
14. Ibnu Jari1	28	M	1 Year	10	160	68	Yes
15. Putri Jesa	16	F	2 Year	5	140	35	No

Source: Result Observation at UD.Ikhsan

Complaints of musculoskeletal disorders in all workers can be seen in table 2.

Table 2. Complaints Musculoskeletal Disorder In All Workers Tailor.

No	Part of Body	Musculoskeletal disorder complaints			
		Sick		No Sick	
		Amount	%	Amount	%
0	Upper neck	11	73%	4	27%
1	Lower neck	13	87%	2	13%
2	Left shoulder	12	80%	3	20%
3	Right shoulder	11	73%	4	27%
4	Left upper arm	6	40%	9	60%
5	Back	12	80%	3	20%
6	Upper right arm	6	40%	9	60%
7	Waist	14	93%	1	7%
8	Buttocks	10	67%	5	33%
9	Butt	13	87%	2	13%
10	Left elbow	5	33%	10	67%
11	Right elbow	5	33%	10	67%
12	The left arm is left	1	7%	14	93%
13	Right arm down	3	20%	12	80%
14	Left wrist	4	27%	11	73%
15	Right wrist	12	80%	3	20%
16	Left hand	6	40%	9	60%
17	Right hand	5	33%	10	67%
18	Left thigh	6	40%	9	60%
19	Right thigh	7	47%	8	53%
20	Left knee	2	13%	13	87%
21	Right knee	1	7%	14	93%
22	Left calf	7	47%	8	53%
23	Right calf	10	67%	5	33%
24	Left ankle	3	20%	13	87%
25	Right ankle	5	33%	11	73%
26	Left foot	3	20%	12	80%
27	Right foot	7	47%	8	53%

From the results of observation and assessment in the table above found that most complaints on workers are on the upper neck, waist, and right wrist. This is caused by an awkward posture when doing the work of making patterns and cut the pattern and also because the layout and the height of the table commonly used to perform his work is still not in accordance with the physical form and posture of the worker.

Based on the results of the distribution of questionnaires and recapitulation Nordic Body Map (NBM) to all respondents conducted to 15 workers. The intended complaint is the symptoms of pain felt by the worker after or while performing his work on a particular body part. The pain can be only one part of the body or a combination of aches, pains, tingling, heat, seizures, cramps, swelling, stiffness and numbness.

From the results of the assessment, respondents who stated musculoskeletal disorders complaints in certain sections are classified into 4 categories with the following classification:

a. 0 - 24% of respondents claimed to have a complaint on the part described by white color

b. 25 - 49% of respondents claimed to have a complaint on the part described by white color

c. 50 - 74% of respondents claimed to have a complaint on the part described with orange color

d. 75 - 100% of respondents claimed to have a complaint on the part described with the color.

The Nordic body map illustrates the parts of the body that are complained of illness and body parts that have few complaints of pain as in Figure 2 below.
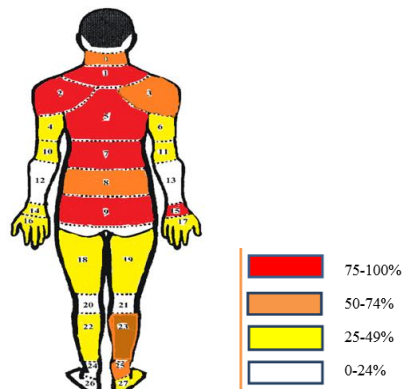
Figure 2. Pictures of pain complaints on the tailor's body

From the picture Nordic body map (NBM) above note that the red body part of the body is part of the body who complained most of the same more than 75%. On the NBM cross section, it is known that the body parts that most experienced pain complaints are in the lower part of the neck, left shoulder, back, waist, and right wrist.

From the characteristics of work done by the workers on this tailor, it can be seen that the work of sewing is mostly done in a state of posture that is static or fixed that is in the sitting and body that often experience the movement is on the right hand, left hand and right foot .

The position of the body sitting on a plastic or wooden chair without a backrest causes most of these tailors always bent over to lead sewing machines. The right wrist performs the activity of rotating the material, cutting the material when it is excessive.

The right foot always performs repetitive movements such as stepping on the dynamo of the sewing machine which emits vibration from the engine direction to the worker's leg part from the right ankle, calf, knee, thigh up to the body, so that the right calf and right ankle have complaints on tailor experienced as many as 67% and 33%.

Where in parts of the body given orange color indicates that about 50 - 74% of workers have complaints on the upper part, buttocks and right shoulder. The yellow part of the body indicates that the worker has a 25-49% complaints on the upper left arm, right upper arm, left elbow, right elbow, right wrist, left hand, right hand, left thigh, right thigh, left calf and right foot. These complaints can be caused by the work posture and layout of the table used are still not in accordance with the physical condition and the body posture work as well as poor lighting conditions coupled with striped or dark colored material motifs also impose their body and eyes to be able to see the path of the seams on the pattern which will be sewn.

So that the conditions of this kind of work that causes the workers when sewing and install a supplement bagbekerja with awkward posture.In accordance with the characteristics of work and work location experienced by tailors in UD. This Ikhsan causes complaints on the above body parts sufficiently experienced by many workers. White color on the body shows that about 0-24% of the body is very rarely complained is on the left forearm, right forearm, left and right knee and left wrist. This is indeed on the body has a pedestal or backrest is quite comfortable This can be due to work posture and layout of the table used is still not in accordance with the physical condition and worker posture so that it can minimize the risk of complaints and muscle pain or skeletal known as musculoskeletal disorders (MSDs).

5   Conclusions

Based on the results of research conducted by researchers, it can be concluded as follows:
1. Based on Nordic Body Map calculations of 15 tailors subjected to subjective complaints of Musculoseletal Disorders (MSDs) and showed mixed results. Body parts that have complaints 93% waist, 87% ass, 87% lower neck, 80% left shoulder, 80% back, right wrist 80%.
2. Based on the calculation using QEC Exposure score level method has a value of 50% - 70% it shows a high enough value which means the next action needs further research and changes are made.
3. Based on the result of calculation using REBA method to assessment of work posture on tailor known from result of calculation of REBA worksheet value of operator score is 6 with medium level and action level 2 which means action needed. The results of calculations with QEC and REBA methods show high results. Where QEC calculation results are measured based on muscle disturbance experienced by workers in the workplace while REBA is measured based on worker posture while doing the work.Calculations by QEC method were measured based on muscle disturbance experienced by workers at work with high ergonomic risk values whereas and REBA was measured based on worker posture when sewing with ergonomic risk values were moderate. This shows a higher QEC score and both indicate the need for improved facilities and posture position of the worker in order to be more effective, comfortable and no injury while doing the work.

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The Effectiveness of The Method of Opening The Reed's Land Against Nutrient Removal

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Abstract. The purpose of this research would like to see the effectiveness of how the opening of the reed land against the loss of nutrient elements are carried away by soil erosion, on critical land dam DTA Singkarak, studying the influence of various types of plants against the magnitude of the nutrient elements due to soil erosion in critical land DTA Singkarak and see the impact of the interaction between the way the opening of the land with the kind of crops against the magnitude of nutrient elements due to soil erosion in critical land DTA Singkarak. This research was carried out from March to July 2010 in critical land Nagari Aripan and analysis of soil in Soil Chemistry Laboratory Faculty of Agriculture Andalas University. This research in the form of Split Plot Design (RPT) with the primary plot treatments (4-way opening land reeds) and child compartments (3 types of plants) which consists of 3 replicates. The data were analyzed statistically (F test), F > count table (a real different) then proceed with advanced Duncan's New Multiple Range Test (DNMRT) on a practical level of 5%. The results showed that the way the opening of the land more efficiently reduce nutrient elements are carried away by soil erosion is by opening the land with the granting of mulch (R1) because with the grant of this mulch can withstand a grain-grain rain instantly fell to the ground so that the erosion is smaller and the magnitude of nutrient elements are carried away by erosion is also small.

Keywords: critical land, erosion, land clearing, nutrient.

1. Introduction

West Sumatera has an area of 4,229,739 Ha which mostly (± 80%) consist of hills and mountainous land topography, the 20% composed of flat and wavy topography, 849,950 Ha for farmland, and 131,155 Ha of that farmland area stay in critical condition, where 110,219 Ha is an area outside the forest region while the remaining, 20,396 Ha, exist within the forest region.

The area for farmland is limited due to topography factor which forces the farmers to utilize hill and mountainous land topography as a farmland. Besides that, the knowledge of farmers is limited as well, especially for planting and cultivation which is not based on soil conservation principle, and it already makes the critical land is being expanded. Moreover, the need of infrastructure construction also becomes a cause of competition in land utilization, since the fertile farmland has been used for non-agriculture sector which at the end makes farmers using the dry land in hills and mountainous topography as farmland. Furthermore, the sloping land condition affects the value of high erodibility that leads the dry land becomes vulnerable to erosion [1].

Erosion causes land damage with the result that critical land is expanding, where the critical land is an area that loses the fertile top layer due to erosion. That land cannot be productive for agriculture sector. Losing the top surface, the nutrient element as a nutrition for plants on that ground will be lose as well. One of them is the reed land that often experiences the drought which make it flammable and also become a source of larger forest fires.

The reed's land is a marginalized area due to its low productivity. The problem of reed land's utilization for agriculture is the bad physics characteristics and soil chemistry. The wretched feature of soil physics will affect the ground water's availability since it depends on the capability of soil for with standing water. Besides that, the clayey soil accumulation on the bottom layer causes the increasing of soil content. Meanwhile, some soil chemistry problems of reed land are low cation exchange capacity, reaction of aid soil, high aluminium saturation, low nutrient element specifically phosphate and cations that could be exchanged, such as Ca, Mg, K.

To increase the productivity of reed land as a productive and long-lasting farmland, there are things that need to be done like repairing the soil features, especially managing the soil organic element with some mechanisms of land clearing and arranging the planting pattern that suit with local condition.

One of locations that has reed field is Singkarak Catchment Area. Lake Catchment Area is an earth crust around lake that limited by ridge which retains rainfall and channels it through rivers or surface flow and underground streams heading to lake. The Singkarak Catchment Area has a region of 75,586 Ha, and 28,742 Ha (37,53%) is critical land. Increasing the critical land at that region happens because of population growth and society's need. Besides that, this critical land is mostly dominated by reed vegetation that formed by land burning activity in the summer and shifting cultivation which reducing the forest area and increasing soil erosion at rainy season [2].

The reed in critical land at Singkarak catchment area, particularly in *Nagari* Aripan, Solok regency, has been widely spread as mentioned in Ekspos Wali Nagari Aripan Kecamatan X Koto Singkarak (2009). It is about 35% of *Kanagarian* Aripan's region which has an area of 4,460 Ha. The land utilization includes ricefield about 12% at the bottom slope, annual plant about 18% at the middle slope, forest about 0.56% at the top and middle slope, animal husbandry about 19.7%, small and medium enterprise about 9.26% and the rest is offices, residential and tourist sites. Aripan is located in the rain shadow area with the rainfall is unpredictable. Location of the research has a 35% slope.

The research of conservation farming indicates that repairing soil condition is able to improve the land productivity. For soybean plant, repairing the marginalized land condition can increase the crop yield up to 800 kg/Ha. For corn, it can be improved from 2.5 ton/Ha to 5-6 ton/Ha. Then, for watermelon in reed land can achieve 25 ton/Ha. This result indicates that there is an opportunity for utilization of marginalized land to be productive farmland [3].

Soybean (*Glycine max (L) Merr*) is a multifunction plant because it can be used for food, woof, and material for manufacture industry. Since there is a foreign exchange economization by State, soybean becomes an important commodity. The import value for fulfilling the country's need is getting bigger year by year. There are 92.000 industrial units are using soybean in Indonesia. 39% of them stay in Central Java, 22% in East Java, 13% in West Java, 8.5% in Jogjakarta and the rest exist in Sumatera and Borneo. The producer of fermented soybean is about 56 thousand units, soybean curd 28 thousand units, soy sauce 1,500 units and *tauco* 2,100 units [4].

Watermelon (*Citrullus vulgaris*, Schard) is included as an annual fruit plant which has significant position for social, economic development of society and country. The

empowerment of watermelon cultivation has a good prospect since it is able to support the increase of farmers' income. Interest of watermelon cultivation for farmers is coming from its high economic value. The watermelon farmers at the north coast of Java who practice an ordinary cultivation receiving 1-2 times income from *usahatani*'s cost allocation which range from 1.5 – 3.0 million rupiah/Ha [5].

Objective of the research is to study the effect of Reed's land clearing method toward amount of nutrient element due to soil erosion on critical land at Singkarak catchment area, to learn the effect of various kinds of plant toward amount of nutrient element because of soil erosion on critical land at Singkarak Catchment Area and to seek for influence of interaction between land clearing mechanism and type of plant upon amount nutrient element on critical land at Singkarak catchment area.

2. Material And Method

2. 1 Time and Place

The research has been conducted from March to July 2010 in *Nagari* Aripan's critical land, X Koto Subdistrict. Then it was continued by soil analysis in Soil Chemistry Laboratory at Agriculture Faculty, Andalas University.

2.2 Experimental Design

Design that being used is Split Plot Design (RPT) in which the mechanism of reed's land clearing (R) as main plot and planting (T) as sub-plot. The analysis of variance separate plot design is conducted in order to see the effect of soil variety treatment. Meanwhile, the Duncan new multiple range test *(DNMRT)* is used to see the difference between those treatments.

Main plot (R): four methods of reed land clearing
R0   : Burning reed and cultivating land
R1   : Slashing reed, cutting it approximately 20cm. It becomes 1.1 ton/ha of mulch (based on reed biomass) and soil is cultivated. Mulch is given by spreading evenly on the seedbed with ± 1 cm thickness.
R2   : Slashing reed then its leave is composed and soil is cultivated, adding 1 ton/ha CaCO3 lime (3,75 Kg/main plot) and 10 ton/ha manure (37,5 kg/main plot)
R3   : Reed is sprayed with Round Up systemic herbicide, then reed is put down while the land is cultivated based on plant row.
Sub-plot (T) : three seasonal plants i.e.:
T1   : corn
T2   : soybean
T3   : watermelon

Therefore, there are 12 treatment combinations as showed through the table above. The main plot with a size 2.5 m x 16.5 m and the distance between those main plots is 0.5 m. While the sub-plot with a size 2 m x 5 m and the distance between sub-plots is 0.5 m. Each combination is repeated 3 times until number of sample to be taken is 4 x 3 x 3 = 36 sample. The difference due to treatment will be analyzed with variance analysis in accordance to plot

experimental design which is separated 4x3. It will be utilized and for those which have significant effect will receive further test with DNMRT.

2.3 Research Implementation

2.3.1 Land preparation and the making of plot experimentation

Reed land that has been choosen is confined (plotted) with plastic rope based on size and number of plot experimentation. The plot of land clearing method (R) is done randomly. After making the plot, land is cleared in accordance to land clearing treatment that has been appointed, and it is made to be the main plot (each main plot has a size of 2.5 m x 16.5 m); the distance between main plots is 0.5 m. Finishing land clearing, then planting according to the type of plant (T) that has been designed and made as sub-plot with a size 2 m x 5 m. Distance between each sub-plot is 0.5 m. Putting each sub-plot within main plot has been done randomly. Each sub-plot is made erosion plot with size of 1 m x 2.5 m, the edge of erosion plot is confined with plastic carpet which has 40 cm width (20 cm is planted in the ground and 20 cm appear on the ground surface). On the bottom, there is a tank of water flow in form of guttering with a size of 150 x 20 x 25 cm, at the lowest part, there is a hole to channel the surface's water flow to plastic tank.

2.3.2 Compost production

Reed which has been trimmed, then being chopped into pieces using machine. After that, reed will be mixed with manure according to the need. It is inserted into black plastic bag and then closed. Compost is located in roofed room in order to avoid rain and sunshine; then the compost material is incubated for one month.

2.3.3 Soil sampling

Initial Soil sample was being taken before experiment started. It was taken from some sites in experimentation location, then it is composited for the need of characteristic of soil chemistry analysis. The analysis of soil sample has been done in Soil Science Department Laboratory, Andalas University.

The soil sample for final analysis was taken from soil eroded which accommodated in plastic bag at each rainfall event within every single experimental plot. These soil eroded, then, is composited for the need of nutrient element's (N, P, K, Ca, Mg) amount analysis and soil organic matter.

2.3.4 Planting corn

Corn planting is done with drill system; plant row is made to be parallel with the direction of contour line. The planting distance within a row is 40 cm and for the distance between rows is 40 cm. Planting hole is made using a wood with ± 4 cm diameter which is sharpened at its point. This hole is created with 3-5 cm depth. Before planting process, corn seed is submerged for one hour and then these seed is inserted into the hole (each hole contains 3 corn seed) and covered with the soil. The variety that is used is Supermanis variety.

a. Stitching

Stitching is only be done if there is a plant which does not grow or die after two weeks of age. The aim of stitching is to avoid decreasing population due to the died plant which affect the data obtained. If there are three corn plants grow in one hole, one plant has to be cut carefully and let the others grow.

b. Fertilization

Fertilizer that applied is Phoska NPK fertilizer (15 % N, 15% P_2O_5, 15 % K_2O dan 10 % S) as the basic one at planting process, with drill system. Then, urea is given twice, the amount of urea for first fertilization is 300 kg/ha (300 g/sub-plot) when the plant is 15 days of age and 150 kg/ha (150 g/sub-plot) for second fertilization when the plant is 35 days of age. Urea is given by the array between plants.

c. Cultivation

Cultivation is done by watering, piling up, weeding and pest and disease control. Watering is done by using a hose that aims to keep soil water availability for plant. Watering is done once a day if there is no rain. Piling is done by piling up the stem base with soil once it is fertilized, this aim to facilitate the nutrient absorption by plant root. Piling up is done when the plant is 15-21 days of age. Weeding is conducted by pulling up the weeds, so the soil aggregate will not be damaged. The purpose of weeding is to keep the healthy condition of plant so it is able to grow and become productive significantly, fungicides that used is Rhidomil 35 SP. Fungisida is given when the plant damage such as leaves begin to rot and to have brown spot. The fungicide is given by spraying it to all parts of that plant.

d. Harvest

Harvesting can be done after the plant is 72 HST of age (80% of population have fulfilled the harvest criteria) which means it --- has become yellow, the seed is quite hard and shiny, if that seed is pressed with the thumb it will not leave any mark.

2.3.5 Soybean

a. Planting

Soybean planting is done with drill system, the seed is planted within 3 cm depth and backfilled with fine soil and reed as mulch. The distance between soybean plants is 40 x 20 cm. The number of seed within each hole is about 2 – 3 seeds. Similar to the corn plant, before planting the seed is submerged for one hour. The variety of this soybean is Otau variety.

b. Stitching

The plant for stitching is planted simultaneously with the time of planting; it has purpose to replace the plant that does not grow. If more than 3 plants growing in one hole, so the three plants will be left to grow while the others being cut. It aims to give the better result of soybean plant.

c. Fertilization

Fertilizer that applied is Phoska NPK fertilizer (15 % N, 15% P_2O_5, 15 % K_2O dan 10 % S) as the basic one at planting process, it is given through drill system. The first fertilization is by giving Urea fertilizer (45-0-0) with 150 kg/ha (150 g/sub-plot) as recommendation for the plant with 15 days of age. Fertilization is done by inserting fertilizer into 3 cm depth of array, and its distance from the plant is about 5 cm. After inserting the fertilizer, array is backfilled with soil. The second fertilization will be done when the plant is 35 days of age and owns 100 kg/ha (100 g/sub-plot).

d. Cultivation

Cultivation is done by watering, weeding, tilling and pest and disease control. Watering is done once a day, at the morning or afternoon if there is no rain in one week. Watering aims to maintain soil moisture. Weeding is done when the growth of weed is relatively small. The first weeding is done when the plant is 2-4 weeks of age. Weeding is done simultaneously with tilling. Tilling aims to achieve the maximal quality and quantity of production. Pest and disease control have a purpose to keep the healthy condition of plant in order it can grow and have a good production, insecticide that applied is Decis. Insecticide will be sprayed when the plant had a pest like the brown spot on soybean leaves. Insecticide is given by spraying it to all parts of plant.

e. Harvest

Soybean harvesting will be done after reaching its ripeness which is 90 days of age. It is indicated by leaves that turn to be yellow and then fall, the color changing of fruit from green to brownish-yellow with some cracks; the stem becomes yellow with slightly brown and also turns to be bare. Harvesting is done by cutting 1 cm of the soybean stem above soil surface; then the stem is separated with pods.

2.3.6 Watermelon plant

a. Planting

Watermelon seed is sown in the seedbed before the planting process. Process of raising seedling has some purposes: saving the number of seed, facilitating seed's maintenance, choosing the good seed and helping it in order not to be withered. After 3-5 days, the seed will germinate, and watermelon seed can be moved to the land that has been provided. There are one or two watermelon seed in a planting hole. One day before the watermelon is planted in the land, the planting hole has been given a basic fertilizer of NPK Phoska. The fertilization mechanism is by mixing the fertilizer with soil in the planting hole. The variety for watermelon that is utilized is New dragon.

b. Fertilization

The watermelon plant is fertilized with NPK Phoska (15% N, 15% P_2O_5, 15% K_2O, 10% S) as a basic fertilizer. It is given by mixing the land which has been prepared as a planting hole. The first fertilization will be done when the plant has grown about 1 meter length. The

fertilizer that is used is urea (45-0-0) with recommendation of 200 kg/ha (200 g/sub-plot or 10 g/plant). It is given through circular way. The second fertilization is done when the plant produces fruit as big as chicken egg. The fertilizer that is used is urea (45-0-0) with recommendation 150 kg/ha (150 g/sub-plot). It is given in similar way with the first fertilization.

c. Cultivation

Cultivation is done by watering, weeding and piling up. Watering is done at the early stage of growth for 10-15 days. Weeding and piling up has to be done carefully since the root is quite shallow. Weeding is done in 3-4 times during the growing season.

d. Harvest

Watermelon can be harvested after ± 75 of planting. The characteristics of watermelon that can be harvested are: by hitting the watermelon with finger/hand and listening to the sound of fruit. The "heavy" sound indicate that the fruit is ripe while the "light" sound show that it is unripe. The other way to see whether the watermelon can be harvested or not is by looking at fruit stalk which has dried or changed into brown color, besides the rind within the soil changed its color from white to yellowish.

Observation
Soil Analysis in the Laboratory

The soil analysis that being conducted covered the initial soil analysis and final soil analysis: 1) N-total analysis with Kjeldahl method, 2) P-available is determined by Bray II method, 3) The amount of K, Ca and Mg that can be exchanged with ammonium acetate pH7 through a washing method, and 4) The measurement of C-organic with Walkley and Black method.

Observation in the field

a. Observation of Rainfall

The data of rainfall observation that is used is the data from Climatology Station of Aripan Tropical Fruit Research Institute in Solok Regency.

b. The amount of soil erosion for each rainfall event

The amount of soil erosion is measured based on the amount of soil being stored in plastic bag during rainfall event. The mechanism of eroded soil's measurement is by collecting the soil in plastic bag for each rainfall event then weighing it. The nutrient element which is brought is being analyzed.

c. Observation of crop production
➢ Corn
At the harvest time, the wet cobs are counted and weighed , then converted into Ha in order to get the weight of cob per Ha.
➢ Soybean
After soybean harvesting, pod is separated with soybean seed. Each seed within a plot is weighed in dry condition; then it is converted into Ha in order to get the weight of seed per Ha.
➢ Watermelon plant
After watermelon harvesting, the weight of fruit is calculated in wet condition; then it is converted into Ha for getting the fruit weight per Ha.

3. Result and Discussion

3.1 Soil Analysis in the Laboratory

Initial soil analysis

After the initial soil analysis has been done in laboratory, the result of analysis is obtained and presented in Table 1.

Table 1 The result of chemistry characteristic analysis before treatment

Parameter	Value	Criteria *
pH H_2O (1 : 1)	5,95	A bit sour
N-total (%)	0,32	Average
P-available (ppm)	7,81	Low
K-dd (me/100 g)	1,49	Middle
Ca-dd (me/100g)	2,00	Low
Mg-dd (me/100 g)	4,11	High
Organic matter (%)	2,56	Low

* Source: Staff of Soil Research Center (1983, cit Hardjowigeno, 2003)

From the result of initial soil analysis and some soil chemistry characteristics based on Table 2, it can be seen that the research location's soil has low fertility rate which is indicated by a slightly acid of soil pH, i.e. 5.95, low level of P and ca element that is 7.81 ppm and 2.00 me/100 g and also the low organic matter i.e. 2.56%. The land where reed has grown usually has low fertility rate that indicated with the acid of soil reaction, low nutrient element especially P and Ca and low organic matter.

Organic material has important role toward the soil fertility rate, because organic matter is able to repair the physical, chemistry, and biology characteristics of soil. The amount of organic matter is influenced by depth, climate, drainage and land cultivation. Looking at its role, the organic matter of soil needs to be maintained through a good management [6]

[7] stated that the organic material generally found in the land surface. The amount is not big, it is only about 3-5%, but the effects of organic matter toward soil characteristics and plant growth are: 1) as granularity that is repairing soil structure, 2) the source of nutrient element N, P, K and other micro elements, 3) adding the soil capability to retain water, 4) adding the soil capability to retain nutrient element, and 5) as a source of energy for microorganism.

The result of soil analysis carried by erosion

a. Element N and P of soil carried by erosion

The result of N and P element of soil carried by erosion in various ways of land clearing is presented in Table 2.

Table 2. The effect of land clearing toward the amount of N and P element carried by soil erosion of the three types of plant

Land clearing	N	P
	….%....	…ppm....
R0	0,34a	13,51a
R1	0,27b	11,44a
R2	0,33a	11,88a
R3	0,28b	11,77a

The numbers in the right column followed by the similar small letters is not significant based on the further examination of DNMRT at 5% level

Based on the statistical analysis of land clearing mechanism's influence toward the amount of N element in soil, at the burning treatment (R0) it is significantly different with the treatment given mulch (R1) and the treatment in round-up (R3), and also not significantly different with the treatment given compost, lime and manure (R2). Meanwhile, the influence of land clearing mechanism toward the amount of P soil element is not significantly different on each treatment; it can be seen in Table II. From Table II, it can be seen the highest value of N and P exist in the burning treatment (R0), i.e. 0.34 % and 13.51 ppm. It happened because of burning, and then the land is conventionally cultivated without the soil cover which is able to reduce erosion. On the other hand, the lowest value of N and P exist in the treatment given mulch, i.e. 0.27 % and 11.44 ppm. The low volume of N and P element in soil carried by soil erosion on mulch treatment allegedly because the mulch is able to withstand the rain that fell to the ground. Besides that, mulch on the land surface can protect the soil and reduce water evaporation from that surface.

[7] stated that the loss of N from soil happens because it is utilized by plants or microorganism, and N element which in form of NO_3^- (nitrate) is easily leached by rain. In addition, N element is soluble and easy to be lose due to drainage water or evaporation. [8] also added that the loss of N happens through 1) denitrification process, 2) carried by harvesting, 3) washed by harvesting and 4) fixated by mineral. Due to its position in the soil solution, nitrate ion is easier to be leached by water flow. The direction of leaching is heading to the layer below the root zone. Therefore it cannot be utilized by the plant.

According to [9] some of the P element are absorbed by the plant through diffusion mechanism which is about 93%. Meanwhile, 3% happens through root interception and 5% through mass flow. The loss of P from a particular place or land also has a close relationship with the process of surface flow and erosion that can be found in high rainfall zones. Meanwhile, [6] stated that the loss of P due to erosion is relatively larger than the other factors, it happens because the fine particles which own high fertility as a whole will be carried from the soil by erosion.

b. K, Ca and Mg element in soil carried by erosion

The result of nutrient element analysis K, Ca and Mg of soil carried by erosion in various mechanisms of land clearing is presented in Table 3.

Table 3. The effect of land clearing mechanism toward K, Ca and Mg element carried by soil erosion from three types of plant

Land clearing	K	Ca	Mg
	me/100g..		
R0	1,02a	1,02a	3,63a
R1	0,65b	0,91a	3,45a
R2	0,73b	0,97a	3,62a
R3	0,67b	0,95a	3,47a

The numbers in the right column followed by the similar small letters are not significantly different based on the further examination of DNMRT at 5% level

Based on statistically analysis of the land clearing mechanism's influence toward the amount of K soil element, at burning treatment (R0) is significantly different with the treatment is given mulch (R1), treatment is given compost (R2) and also treatment in round-up (R3). Meanwhile, the effect of land clearing toward the value of Ca and Mg is not significantly happened for each treatment; it can be seen in Table III.

Table III. Shows that the highest amount of K, Ca and Mg element exist at the burning treatment (R0), i.e. 1,02 me/100g, 1,02 me/100 g, and 3,63 me/100 g. It happens because this treatment does not have the soil cover which protects soil from rainfall. Therefore the soil is easy to be crushed into fine grains which close its pore. Then, it leads to inhibition of infiltration water and increasing of runoff with the result that K, Ca and Mg element of soil brought by erosion will be bigger. Meanwhile, the lowest amount of K, Ca and Mg element brought by soil erosion exist at the treatment given mulch (R1), i.e. 0,65 me/100 g, 0,91 me/100 g and 3,45 me/100 g. The reed that is utilized as mulch on the soil surface is able to protect the soil and reduce the water evaporation from its surface. According to [10], the more soil is drifted, the more nutrient elements carried by runoff or drifted along with soil erosion.

[11] added that the effect of erosion would make soil particle and nutrient elements are being drifted. [12] also stated that the excessive loss of nutrient element causes the degradation of soil fertility. Therefore soil cannot utilize the sufficient and balance nutrient element to support the normal growth of the plant. As a result, the soil fertility will be low. The damage in this form occurs as the effect of organic matter's reorganization and mineral weathering, nutrient element leaching in a quick way at the hot and wet tropical climate and also the loss of nutrient element through harvesting without any effort to recover it.

c. The content of soil organic carbon

The determination result of the content of soil organic carbon carried by erosion in various ways of land clearing is presented in Table 4.

Table 4. The effect of land clearing mechanism toward the content of soil organic carbon carried by soil erosion from three types of plant

Treatment	Soil Organic Carbon
	….%....
R0	2.30c
R1	2.60bc
R2	3.44a
R3	3.16ab

The numbers in the right column followed by the similar small letters are not significantly different based on further test of DNMRT at the level of 5%

Based on statistically analysis, the influence of Reed's land clearing mechanism toward amount of soil organic carbon is significantly different for each land clearing mechanism. It can be seen in Table IV. The highest value of carbon organic exist in the compost treatment i.e. 3.44 %. The high value of soil organic carbon in compost treatment exist allegedly because of big contribution of soil organic carbon from reed compost and manure. The soil organic carbon in reed compost can repair the forming process of soil aggregation so that aggregation becomes better. Meanwhile, soil organic carbon of manure is able to interact with soil particle, microorganism and to form a good microecology environment. Therefore the soil pore can be created within soil aggregation. The burning treatment has low content of soil organic carbon i.e. 2.30 % because this soil does not receive soil organic carbon support. The soil organic carbon carried by soil erosion that exists in burning soil become low due to burning process. Burning causes the increasing of soil temperature, as the result, the soil organic matter is burned as well.

[13] stated that in the cultivation of soil organic matter, the sources are coming from the application of organic fertilizer such as manure and green fertilizer or compost. The soil organic matter play a role in physical, chemical and biological which determine the soil fertilization. The chemical role takes a position in determining the cation and anion exchange capacity that has an important influence on nutrient availability.

The soil organic carbon is one of construction material for soil density. Organic matter is the residue of organic living, either plant or animal starts with the fresh one, the one in decaying process and already decayed. While the organic matter in decaying process is an action that needs the high power of energy [14].

[15] explained that the source of organic matter is plant tissues like root, shrub, grasses and low-level plant which provide organic matter in a big amount for every single year. Most of the organic matter will be carried during the harvesting. Nevertheless, there are some parts that can be the source of organic matter after decaying process, such as root, leach, and straw.

Rainfall observation

The amount of rainfall, rain intensity, and rain distribution determine the dispersion power of rain upon the soil, the amount and velocity of runoff. The amount of rainfall is the height of water on a particular area that presented in meters per unit or generally stated in

water height millimeters (mm). Rainfall is recorded at the site of the research is 181 mm. [12]. While [1] stated that in the wet climate area like Indonesia, the rainfall becomes the main cause of runoff and erosion.

[16] proposed that some climate factor can affect erosion, such as rain, temperature, wind, humidity and solar radiation. Among those factors, rain becomes the most significant one. The result of Utomo's research indicates that the important characteristics of rain are rainfall, intensity, and distribution. Those three characteristics work together for determining the rain capability to dissolve soil grains and also the amount and velocity of runoff. The capability of rain causing erosion is called erosivity, while erodibility stands for the power of soil to be eroded.

According to [1], the influence of rain's amount and intensity on erosion is different from each other. A large amount of rain does not necessarily create erosion if the intensity is low. Similarly, the high intensity of rain does not necessarily make erosion if the amount of rain is little because there is not enough water to drift the soil. In reverse, if the amount of water is large and intensity is high, it can produce severe erosion. [12] added that the high rainfall for a long period of time would cause a large amount of eroded soil and little amount of rain in short time will create a small erosion.

4. Conclusion and Suggestion

1. The land clearing mechanism that can reduce the amount of nutrient element carried by erosion is
   through mulch application (R1), because it can withstand the rain which fall to the land, as the result, the erosion will be smaller, and nutrient element carried by erosion become small as well.
2. There is no interaction between land clearing mechanism and type of plant toward the amount of nutrient element carried by soil erosion on critical land at Singkarak Catchment Area.

Acknowledgment

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Evaluation of Establishment of Oleochemical Industry in Special Economic Zone in Aceh Using SWOT Analysis

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Abstract. The purpose of this research is to see the opportunities of oleochemical industry establishment in the midst of the plan to establish a special economic area in Lhokseumawe Aceh. This research was conducted in Lhokseumawe and Aceh Utara district. Design / methodology is done by regulation of review, interview, and observation / supervision. Results from structured interviews and collected data were analyzed using qualitative analysis. Researchers analyzed the oleochemical industry market opportunities in a special economic region in Lhokseumawe Aceh using SWOT analysis. The results show that the area of oil palm plantations, human resources, geography, former industrial infrastructure in Lhokseumawe, and openness of the government is very possible established oleochemical industry in the special economic region (KEK) Arun Aceh. This plan will be threatened to be cancelled or transferred to another province when the central government, regional government, and consortium companies do not seriously realize the established development. This study was conducted only to see the SWOT analysis and recording actions taken by the government. Do not see from the side of financial feasibility. Despite these limitations, the findings of this study allow governments, consortium companies, and investors to assist in obtaining a true picture for subsequent decision making.

Keywords: Industries, Oleochemicals, Special, Economic, Area

1   INTRODUCTION

Today human dependence on fossil fuels is very high. This dependence on fossil fuels is not only used in the transportation sector but also in other primary needs such as clothing, food, and boards. Increased usage raises fears of an energy crisis. These needs continue to increase along with the increase in population, quality and living standards of society, and technology. Although it is also realized that the development of technology can only suppress the energy needs through energy efficiency. If you only rely on the source of fossil raw materials, then there will be obstacles in the fulfilment of energy needs. Therefore another alternative is needed to reduce dependence on petroleum energy sources. One of them is by

presenting an alternative industry that is oleo chemical industry. Oleo chemistry is a chemical derived from fats and oils. Its products can be used for industrial and household needs.

The oleochemical material can replace petrochemical products. The basic thing that makes oleochemicals can replace petrochemical products is renewable and sustainable oleochemical products. The use of fats and edible oils enables the development of competitive, robust products, and both consumer-friendly and environment-friendly. Oleochemical products have several advantages over mining products such as petroleum, eg oleochemicals derived from renewable resources. It is easier to decompose naturally and socially economically more involving many communities.

If viewed from geographical location, Indonesia has a natural wealth. One of the favorable geographical location is because Indonesia has wide and long coastal areas. Lhokseumawe is on the west coast of the island of Sumatra. The location of this area is very strategic because it is located in the Malacca Strait Marine Lane as an international sea transportation route. This area is also very potential developed profitable agriculture plantations. Sources of plantation products are valuable and easily marketable considering the location of Lhokseumawe demographic and supporting infrastructure is adequate.

With consideration to develop economic activities and utilization of natural resources potential, the Indonesian government through regulation number 5 of 2017 stipulates the area of Lhokseumawe City and the region of North Aceh Regency as a special economic area (KEK). This [1] area has an area of 2,622.48 hectares (ha) located within Arun Lhokseumawe refinery area of 1,840.8 ha. in the Dewantara area of 582.08 ha, and the Jamuan area of 199.6 ha. The location of KEK Arun is temporarily unnecessary for land acquisition because the area and location of KEK are located in the former PT Arun and several other vital projects.

Broadly speaking KEK Arun Lhokseumawe is divided into several zones namely Export Processing Zone, Logistics Zone, Industrial Zone, Energy Zone, and Tourism Zone. The direction of KEK Arun Lhokseumawe activities focuses on several sectors: energy, petrochemical, agro industry supporting food security, logistics and kraft paper producing industries. From the energy sector (oil and gas) will be developed LNG regasification, LNG Hub / Trading, LPG Hub / Trading, Mini LNG Plant PLTG with development of environmentally friendly power plant or clean energy solution provider.

From the results of a temporary review of the addition of new industries is very possible established within the special economic area. The prospect of the oleochemical industry is considered to be very feasible if it is juxtaposed with other chemical factories that have already been present in the region. Both types of oleochemical raw materials are already available in many coastal areas and the highlands of Lhokseumawe and Aceh Utara. Basic infrastructure such as roads, ports, buildings and locations are available. Large-scale national and international companies existed once to form a famous industrial estate. It's just that now many companies no longer operate due to shortage of raw materials of natural gas, internal security disturbances with the state, natural disaster Tsunami, and government policies for the region. These conditions have led to the development of Aceh province lagging behind other regions. Under these conditions of recovery, the government is now planning to establish a special economic zone. Establish a previously lagging region.

According to [2] have been researching the potential of remote areas in Indonesia to be developed into a developed region through strategic regional economic development programs. Important variables that affect these success factors lie in resources, social capital, and local support, entrepreneurial strategies and performance. That is, the contribution of the region itself is the biggest influence in the effort to help the special economic area. This model can give an idea how to form a developing economic area.

Basically, building a special economic zone in Aceh needs to adopt technological progress. Studying information technology and marketing economics is a must. In addition to the creativity of the business entities themselves, the state also needs to study aspects of global marketing and technology in a continuous improvement effort. The economic and technological management system is a combination of the national strategic planning system. The state can apply the model to build the region.

Learning from China by [1] explains to pursue future prospects, China's Technology Management system always depends on continuous improvement and adjustment. This way can adapt to ever-changing global environment changes. To develop an industry in an area requires a global marketing perspective. Therefore, there must be economic linkage with the establishment of a wide business network. Marketing is closely linked to economic development as it opens up the world marketing system [3]

The presence of a special economic zone in Lhokseumawe, Aceh gives new hope to all parties. Considering the infrastructure of the former factory that is still feasible and the availability of natural resources materials are cheap and easy to obtain, it is suspected the plan to establish an oleochemical industry is very possible. However, to see the existence of the oleochemical industry in the Lhokseumawe KEK region certainly needs to be discussed more deeply. One such form of study can be done by conducting marketing research to assess the benefits, constraints, and opportunities through SWOT analysis. Just as in China to develop new business at the right factory location SWOT analysis is required. According to [4] when determining the exact location required SWOT analysis strategy tool. With SWOT analysis can be explored based on regional infrastructure, local skill level, and cost factor.

This study has not been studied by other researchers because this specific research is in areas of severe natural disasters and former conflict areas of prolonged conflict. This research becomes interesting when the government is also more serious about the development of Aceh because the province has been granted the status as a special autonomous region almost entirely not owned by other provinces. Attract interests between the central government, local government, and the inclusion of a management company appointed as a consortium for the construction of a special economic zone in Aceh is an interesting issue to discuss.

2 LITERATURE REVIEW

2.1 The Need and Selling of Oleochemical Products

According to [5] describes Oleo chemistry is a derivative of a substantial component of vegetable oil, marine and animal oils and fats, glycerines, glycerol and fatty acids, and includes useful fatty acids. The derivative products of oleo chemicals include fatty alcohols, fatty ester, amides, amines and other nitrogen derivatives as well as heavy metal soaps and water-soluble alkali metal soaps, polyoxyethylene materials, polyoxypropylene products, sulphonated and sulphonated derivatives and quaternary ammonium compounds. Although commonly used in small quantities, but chemical oleo ingredients are important raw materials, additives, to help paint production.

Fatty acids: Fatty acids are the most needed oleochemicals. In general, the production of fatty acids in the world is greater than its consumption. Fatty acids originating and America and Europe are generally synthesized dali tallow, coconut oil, soybean oil, rapeseed oil and others. Fatty acids can be made by splitting CPO or PKO at high temperature and pressure. Further, the fatty acid is distilled or fractionated to obtain high purity fatty acids. Meanwhile, a

by-product of glycerine after purification will produce glycerine in accordance with the pharmaceutical standard. Derivative products and fatty acids such as fatty ester, fatty alcohol, and other fatty amines are used to replace petrochemical products.

Fatty ester is used as a substitute fuel for diesel oil. The by-product produced in the distillation process and fractionation of high purity metal ester is glycerin which can be used as raw material for pharmaceutical and cosmetic industry. Fatty alcohols: Fatty alcohols are the most widely used basic oleochemicals as surfactant raw materials such as fatty alcohol sulphate (FAS), fatty alcohol ethoxylate (FAE) and fatty alcohol ethoxy sulfate (FAES). Fatty alcohols can be prepared and fatty acids and metal ester by means of hydrogenation at high temperature and pressure using chemical catalyst. Further distillation is performed to produce high purity fatty alcohols.

2.2 SWOT Analysis and Marketing ProSpects

SWOT Analysis is a strategic planning method used to evaluate strengths, weaknesses, opportunities (opportunities), and threats in a project or a business speculation. The four factors that form the SWOT acronym (strengths, weaknesses, opportunities, and threats). In it, including personal, financial, manufacturing, and of course 4P (Price, Product, Promote, and Place). While opportunities and threats are external factors that can affect business (macroeconomics, technology, law, culture, and location). SWOT is a simple analytical framework by examining how internal and external factors come together and analyzing the current state.

Before a new business starts first there should be research on whether the business to be pioneered or developed profitable or not. If profitable, is the benefit adequate and can be obtained continuously for a long time? Technically it may be feasible to do so, but economically and socially less benefit. For that, there are two studies or analyzes that can be used to determine whether or not a business is started or developed, namely: a feasibility study of business and SWOT analysis.

SWOT analysis is certainly not absolute because it is necessary also consideration of other factors. There is no easy solution if the analysis is based only on parameters of strengths and weaknesses or threats and opportunities only. At the same time depends also on future developments and specific ideological perspectives [3]. Actually the concept of implicit in society also greatly influences the business concept (Marilyn M. Helms, 1999). Decision-makers often overlook socio-political aspects such as public acceptance As a result the decision is often incorrect. Therefore, strong relationship mediation is required to avoid gaps in determining market orientation, innovation, and business performance in palm oil processing companies [6].

3 METHODOLOGY

This research was conducted in Lhokseumawe and Kabupaten Aceh Utara as the area designated as Economic Zone. Design / methodology / approach is done by regulation of review, interview, and observation / supervision:
- Conducting consultation / interview with government apparatuses such as Head of Sub-district, Department of Industry, Office of Financial Management and Regional Asset

(DPKAD), regional secretary of Lhokseumawe City Goverment and Sekda District of North Aceh, and academics, especially State Polytechnic of Lhokseumawe.

- Study of government literature and regulation, and analysis of secondary data from Central Bureau of Statistics (BPS) of Aceh Utara District, BPS of Aceh Province, and mass media.

The results of structured interviews or data that have been collected are analyzed using qualitative analysis. Qualitative assessment uses the data sources as described above. The researchers analyzed and explained the oleo chemical industry market opportunities using SWOT analysis. Several points to be considered are the potential for oil palm in Aceh, the need for oleochemical processed products, the central and regional government policies related to the plan to build a special economic zone in Aceh.

4 RESULT AND DISCUSS

4.1 Potential of Palm Oil Production in Aceh

The palm oil industry in Aceh is currently in a recovery phase after a period of conflict and natural disasters. This is evident from the small harvest and the limited extent of the garden. It takes a joint effort between interested parties involving government, private sector and society to re-move the palm oil industry. This cooperation seeks to produce and promote the development of sustainable palm oil in Aceh within the framework of the Roundtable on Sustainable Palm Oil (RSPO).
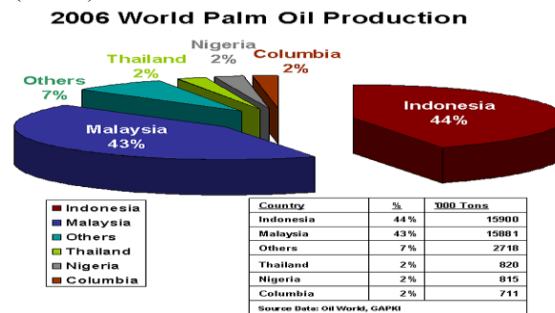
Fig. 1 World Palm Oil Production

In Indonesia the island of Sumatra has long been the largest producer of palm oil in Indonesia. Aceh province participated. Although the producers of palm oil are relatively small and contribute less than 3 percent of national production, Aceh has never been a pioneer of oil in Indonesia. The palm oil industry in Aceh is centered on five districts along the western and eastern coasts, namely Aceh Utara, East Aceh, Aceh Tamiang, Nagan Raya, and Aceh Singkil (including the Subullusalam municipality). These six districts and municipalities have more than 84% of the total hectares of cultivated land and their production [7].

During the conflict period, an estimated 85,000 hectares or 33% of the total land (52,712 hectares of smallholders and 32,316 hectares of large estates) were abandoned or abandoned. Many small farmers, especially transmigrate from outside Aceh, can not live on plantations. Much of the palm oil production area is sufficiently affected by the conflict, while

approximately 21,000 hectares are less or less affected by the Tsunami. Even when the price of fresh fruit bunches from oil palm is bought down for palm oil processing, people are willing to sell cheaply. The community does not know that there is no alternative to palm oil processing, namely palm oil derivatives, ie, oleochemicals that can be traded.

Although the potential of the palm oil industry is huge, in Aceh there is currently no secondary processing plant for palm kernel oil or refineries. The feeder port or tank warehouse for practical storage does not exist. It includes the palm oil-based food industry, biodiesel, oleochemical plant and surfactant, and complete port facilities. Therefore, Aceh is still more a producer of raw materials, with local prices relatively depressed due to logistical barriers and quality barriers previously mentioned. As a result, practically all production is currently sold as a domestic product and is exported indirectly through the Belawan port in North Sumatra.

4.2 Prospect of Oleochemicals Industry

International commodities research data showed during the period 2010-2020, the oleochemical market is expected to grow 3.6 percent for fatty alcohol and four percent for fatty acids. The growth record is the largest in Asia. Indonesia and Malaysia will become the largest oleochemical producers in the world. To support the prospect, the Indonesian government needs to limit the export of crude palm oil (CPO) gradually to support the downstream industry in the country. Therefore, it is necessary to build CPO-based industrial clusters. The market opportunity for CPO derivative products, especially oleochemicals for the national industry, is enormous. This is because world demand continues to increase.

Although the condition of Indonesia's infrastructure is not sufficient, the prospect of the oleochemical industry is very promising as demand in the world market continues to improve. With such world demand conditions, there should be a government policy that ensures the availability of raw materials in the form of crude palm oil and palm kernel oil (PKO) in the country. That is, the current export of crude palm oil is restricted so that the refinery runs well and (industrial) oleochemicals can thrive. Without the government's policy of limiting CPO exports, it is feared that Indonesia as the largest producer of CPO will become the largest importer of oleochemicals. The added value of oleochemical products is very high compared to CPO. The added value of the product reaches US $ 400-1,200. Unfortunately not many companies in Indonesia go into the oleochemical industry.

On the other hand, the government's attention to infrastructure for the development of the oleochemical industry is still limited. The problem is the oleochemical industry requires adequate infrastructure. For example the port used for export abroad. To be more directed, good communication between departments (government), consortium business entities, local governments, and communities to support the development infrastructure of the oleochemical industry. One of them is by establishing special economic area as planned in Lhokseumawe, Aceh.

Researchers such as [8] have conducted surveys conducted in the palm oil processing sector in Malaysia, consisting of grinding, refining and oleochemical companies. Organizational resources have a direct impact on the presence of the chemical oleo industry. It is necessary to promote business performance in the palm oil processing sector characterized by the ability to access organizational resources for better business performance.

4.3 Perspectives of KEK Aceh and its Problems

Although the government has issued regulations, special economic zones (KEK) in Aceh have not been running. In fact now many parties complain about the available infrastructure. For example in the harbor the number of cranes and warehouses is very limited. The existing warehouse is also considered not feasible. These obstacles need to be addressed immediately if you want to talk export and import business because KEK actually depends on the availability of infrastructure. With the existence of adequate infrastructure will give birth to various industries. Both small and large scale industries.

Not yet fully run normally, the presence of KEK Arun Lhokseumawe also raises internal problems from Aceh. The acceleration team for the development of Arun Lhokseumawe Special Economic Zone requested to be revised again Government Regulation No. 5 of 2017 due to inconsistency of share participation. The Government of Aceh is considered to have only the authority to establish a consortium of development and management of the Lhokseumawe KEK only. While those who run the development and manage it is a consortium company. This means that the central desire to involve the Aceh Government is still limited. The plan is that the Aceh Government wants to make the assets of the Arun LNG plant as the initial capital for the Government of Aceh, the Government of North Aceh, and the Lhokseumawe Government in the Management Agency of KEK Arun Lhokseumawe. Provided that the assets of former LNG refinery remain state-owned under the State Asset Management Agency, the management is handed over to the Aceh Government, North Aceh Regency Government and Lhokseumawe Municipal Government.

In article 6 of Government Regulation No. 5 of 2017 only regulates the Business Development Agency of KEK Arun Lhokseumawe, while the Management Board as mentioned in Article 5 is not regulated. The appointment of the consortium company itself is not based on a share holder agreement governing in detail the governance, duties and obligations of the parties, but only based on the Memorandum on Understanding (MoU) signed by the respective directors of each consortium company and the Company Regional Government of Aceh (PDPA). In the MoU the Aceh Government shares represented by PDPA as the party that has been approved to be given the right to manage only 25 percent. Its share ownership is in the form of capital payments sourced from the Aceh government budget or other sources. In essence, the Government of Aceh wants the existence of goodwill as the party given the right to manage is calculated as the participation of capital. The share of each share is 25 percent for Aceh, considered to be a fair share of the numbers but does not meet the sense of justice for the people of Aceh. Therefore, the government is asked to revise the government regulation it has issued.

From the hard work of the Aceh government, it was later learned that Aceh Province through the Aceh Oil and Gas Management Agency (BPMA) has obtained 46% share approval in the management of Special Economic Zone (KEK) Arun. This means that the share of Aceh has increased 21% from the previous amount only 25% [9]. The Aceh government claimed to have asked members of the KEK Arun consortium to reduce their shares. Members of the consortium finally agreed to reduce their share of the stake in the management of KEK Arun 7% each to be given to the Aceh government so that the share of Aceh now has 46%. The above recognition will be reliable if it has been accompanied by a revision of government regulations. The 46% share of new shares is convincing if it is actually written in the latest regulations issued by the government.

4.4 SWOT and Potential Marketing Analysis

Building an integrated industrial area should analyze the market and the environment thoroughly in order to be able to apply further strategies to conduct further marketing activities and achieve the highest level of customer satisfaction.

Table 1. SWOT Analysis

Strenght	Opportunities
1. Community interest for oil palm plantation is very high	1. The market of oleo chemical products both nationally and internationally is very open
2. Available skilled manpower produced by nearby campus	2. Land for coconut and oil palm is still very wide
3. Experience and introduction of oil palm plantations have been long	3. The government has set up Aceh province as a special economic zone (KEK) which will build various infrastructure supporting the oleo chemical industry
4. Palm oil is easy to grow in many different conditions compared to other plants	4. New oleo chemical industries / plants 6 new companies.
5. Close to air, sea and land transportation routes	5. Foreign trade routes (exports) to the most oleo chemical user countries are very close
6. Being in the former industrial area of international standard	
7. Sufficient power supply available from Perta Gas Arun (PGA) Aceh refinery	
8. The special autonomy authority of Aceh Province may determine the regional economic policies.	
Weakness	**Treat**
1. Need big investment to build oleochemical industry	1. Canceled the decision of KEK Arun Aceh
2. Support from the government and national head of palm oil organization is still limited in formulating the policy of oleo chemical industry development	2. Assistance from local governments to build KEK has not been optimal
3. Regulation and job synchronization between central government, local government, and consortium companies are still slow.	3. The oleo chemical industry is likely to be established in other provinces because the infrastructure is more adequate compared to Aceh
4. Until now there has been no infrastructure development in connection with the plan of KEK Arun Aceh	4. It is difficult to determine world market prices due to unavailability of market information
	5. People are not familiar with the prospect of the oleo chemical industry

The land area and the production of coconut and oil palm in Aceh Utara district and Lhokseumawe City Government are relatively stable from year to year. While the land that has not been utilized for plantations is still quite extensive. Raw materials in the form of coconut and oil palm can also be obtained from other districts in Aceh. Cheap and easy to get the material. Stakeholders involved in the development of oil palm commodities are optimistic that coconuts in Aceh can still flourish. Because of that sufficiency, the oleochemical industry in Aceh is very possible to be established.

The oleochemical industry and the presence of special economic zones (KEK) in Lhokseumawe are believed to have a positive impact on regional development. In addition to growing the investment climate, SEZ development can also reduce unemployment. This Special Economic Zone will require tens of thousands of skilled workers from various disciplines. These needs are believed not to be a problem because Lhokseumawe already has a college institution that produces skilled and qualified graduates. One of them is a graduate of Lhokseumawe State Polytechnic. The educational model in the institution of higher education is prioritizing the vocational education system that prioritizes operational skills rather than

conceptual mastery. Polytechnic Alumnus is skilled and ready to be employed in various fields.

The SEZ location is located around the national road. From the distance side of the transportation range this location can be visited easily. Some basic infrastructure such as Malikussaleh Airport and Kruenggukueh port are already available. The infrastructure certainly needs improvement and addition. Roads need to be widened, railways need to be built, airports have not been expanded, the number and feasibility of storage warehouses is also worth noting. All stakeholders should work hard to realize the SEZ. If this is not handled seriously and quickly, it may be that the determination of the Aceh Arun Regions was canceled and transferred to other provinces.

From the analysis of marketing study using SWOT analysis, the plan to build oleochemical industry in Lhokseumawe Special Economic Zone (KEK) is very potential to be implemented. Not because of this area as a former natural disaster area, a former area of security conflict, or because this area has special autonomous region status, but from resource factor, social capital, government support, and preparedness of available infrastructure, special. Requirement to wake up first the special economic area. Aceh province may contribute to market participants in the oleochemical industry. This area also enables very well established industrial zones and export processing zones to reach the marketing area to worldwide.

5 Conclusions

The feasibility of building an oleochemical industry depends very much on the plan to build a special economic zone. The key to the success of the Special Economic Zone program (KEK) of Arun Lhokseumawe lies with the Builder and Management Enterprise (BUPP). It is in accordance with Article 5 paragraph (2) PP No. 5 of 2017 stating that BUPP is responsible for financing the construction and management of the KEK Arun Lhokseumawe. It is desirable that the commitment of the consortium of State-Owned Enterprises and Aceh-Owned Enterprises to immediately complete the development of Special Economic Zone (KEK) Arun Lhokseumawe.

This study was conducted only to see the SWOT analysis and recording actions taken by the government. This research should also look at the financial feasibility side. Despite these limitations, the findings of this study allow governments, consortium companies, and investors to assist in obtaining a true picture for subsequent decision making.

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The Effect Of Compensation, Work Environment And Leadership On Employee Job Satisfaction Regional Development Planning Board Musi Banyuasin Regency

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Abstract. This study aims to determine the effect of partial and simultaneous compensation factors, work environment factors and leadership factors on employee job satisfaction of The Regional Development Planning Board of Musi Banyuasin Regency. This research is a causality research. The population of this research is the employees of Bappeda of Musi Banyuasin Regency, totaling 107 people. The number of samples of 85 people is determined by using the Slovin formula. Samples were selected using the accidental sampling technique. The data were collected by using questionnaire method and analyzed by using multiple linear regression analysis. The result of the research showed that (1) the compensation factor had an effect on employee job satisfaction with tcount (4,026)> ttabel (1,666), (2) work environment factor influenced on job satisfaction employee with tcount (3,722)> ttabel (1,666), (3) leadership factor influencing employee job satisfaction with tcount (2,341)> ttable (1,666). While the influence of simultaneous compensation factor, work environment factor and leadership factor to employee job satisfaction with value Fcount (3,861)> Ftabel (2,72), (4) magnitude of influence of compensation factor, work environment factor and leadership factor to job satisfaction of employee is 71.6%, which is indicated by the value of determination coefficient (R Square) of 0.716.

Keywords: Compensation factor, Work environment factor, Leadership factor, Job satisfaction

1 INTRODUCTION

Employee job satisfaction is very important in improving employee performance and performance of an organization. Therefore, it is important for an organization to pay attention to what efforts can be done in increasing employee enthusiasm so they feel happy in working in the company. Job satisfaction is basically something that is individual. Each individual has a different level of satisfaction in accordance with the value system that applies to him. The

higher the assessment of the perceived activity in accordance with the wishes of the individual, the higher the satisfaction of the activity.

Job satisfaction is a pleasant emotional attitude and loves her job. Robbins said job satisfaction is a general attitude toward one's work, which shows the difference between the number of rewards earned by workers and the amount they believe they should receive [1]. This attitude is reflected by work morale, discipline, and work performance. According to As'ad said the factors that affect job satisfaction consist of compensation, work environment and leadership [2]. This is evidenced also by some research results such as the results of research conducted by Confessa [3]. This research indicates that there is a significant influence between compensation, leadership, and working environment condition on employee job satisfaction at PT Anugrah Merta Sari Sedana Denpasar either simultaneously or partially.

While to show a significant influence between compensation and job satisfaction is also evidenced by the results of research conducted by Nawab and Bhatti on the education sector in pakistan [4]. From some of these studies it can be said that giving compensation can provide job satisfaction for employees because it can prove as a form of reward organization for the performance they have done.

The influence of work environment on employee job satisfaction is also evidenced from the results of research [5]. Research conducted on employees of PT. sumber Alfaria TrijayaTbk known there is a significant influence between compensation on employee job satisfaction. A comfortable working environment, and the availability of the necessary work tools can affect employees in performing their duties.

While research that proves the influence of an leadership style on employee job satisfaction can be proved by the results of research conducted by Khan et.al. on employees from banks in Islamabad, Pakistan [6]. The results of this study indicate that the transformational leadership style is more satisfying employees than the style of transactional leadership. Leadership is a process by a company manager to direct (directing) and influence (influencing) his subordinates in activities related to the task, so that subordinates are willing to direct all his abilities both as a person and as a member of a team, to achieve goals has been established company.

The Regional Development Planning Board Musi Banyuasin Regency is one of the regional apparatus units in Musi Banyuasin Regency that is tasked with assisting the Bupati in formulating regional development planning policy and assessment and control over its implementation. The severity of the task carried by The Regional Development Planning Board Musi Banyuasin Regency requires every employee to have a good performance and one of the ways used is to increase employee job satisfaction on the service, but based on employee absenteeism data during the year 2012 until the year 2016 known that there is a decrease in the number of employees who come to work at The Regional Development Planning Board Musi Banyuasin Regency.

Table 1. Employee Attendance Data The Regional Development Planning Board Musi Banyuasin Regency 2012-2016

Year	Sign in	Permid	Sick	Without explain	Total	%
2012	89	10	4	4	107	17%
2013	88	10	4	5	107	18%
2014	82	15	6	4	107	24%
2015	78	17	5	7	107	27%

| **2016** | 73 | 20 | 8 | 6 | 107 | 32% |

Source: BAPPEDA of Musi Banyuasin Regency, 2017

In addition, based on interviews with the author of the Head of Sub Division General and Personnel The Regional Development Planning Board of Musi Banyuasin Regency known that every employee get salary and incentives in accordance with their group but for compensation in the form of overtime and incentives in the agency is given almost the same to every employee without look at the workload and every employee will be given work facilities used to support their work such as computers / laptops.

The results of observations that the authors do also indicate the work space is less well organized employees can dilhat of the many documents that pile up both on the table and that is next to the desk employees. In addition there are still employees who come and go home from work not according to the rules and the employee who just sitting outside the office just to chat and so forth. Facts in the field researchers find that the increased action because of job satisfaction felt by employees decreased. This is because employees feel that the policy taken by the leadership is too tight to make employees feel depressed and uncomfortable in working, especially the policy in completing the job. Looking at the phenomenon, this research was conducted under the title "The Influence of Compensation, Work Environment and Leadership on Employee Satisfaction at The Regional Development Planning Board Musi Banyuasin Regency.

2 METHODS

The methods in this study use conclusive research in which this study is designed to assist decision makers in determining, evaluating and selecting the best alternative in solving a problem. The type of causality research selected in this study is the research of the cause-effect form of some of the variables or strategies developed in management (Ferdinand, 2006: 5). The variables used in this study consisted of three independent variables and one dependent variable, where the independent variable consists of compensation factor (X1), environmental factor (X2), and leadership factor (X3) while the dependent variable namely employee satisfaction (Y).

Table 2. Operationalization of Research Variables

Variabel dan Definition	Sub Variabel / Dimensions	Indicator	Measurement Scale
Job Satisfaction (Y) According to Robbins (2007: 148), job satisfaction is a general attitude towards one's work, which shows the difference between the number of rewards earned by workers and the amount	1. Challenges in work 2. A decent wage 3. Supportive conditions 4. Coworkers 5. Trust Source: Robbins (2007: 149)	1. Satisfaction because of challenges in work 2. Satisfaction because it has a reasonable reward for the job 3. A conducive	Likert Scale

Variabel dan Definition	Sub Variabel / Dimensions	Indicator	Measurement Scale
Compensation (X1) According to Simamora (2007: 443), Compensation is something that employees receive as a substitute for the contribution of their services to the company. Compensation is one of the execution of human resouces manajemen functions that relate to all kinds of individual award awards	1. Giving Wages / Overtime salary 2. Incentives 3. Benefits 4. Provision of facilities. Source: Simamora (2007: 445)	1. Salary appropriate 2. Overtime is awarded for additional work 3. Incentives that fit the workload 4. Allowances that are appropriate to the workload 5. 10. Facilities to support the work	Likert Scale
Work Environment (X2) According to Isyandi (2004: 130), the work environment is everything that exists within the worker's environment that can influence him in performing tasks, such as temperature, humidity, ventilation, lighting, noise, cleanliness of the workplace and the adequacy of work equipment.	1. Build workplace 2. Ventilation for the exchange 3. Sufficient work equipment 4. Working relationship with the border 5. 10. Working relationship with fellow employees. Source: Isyandi (2004: 134)	1. Clean and orderly working space 2. Good air circulation 3. Availability of adequate equipment 4. Good relationship with superiors 5. 10. Good relationship with colleagues	Likert Scale
Leadership (X3) According to Ridwan (2009: 206), leadership is the ability to convince and move others to work together under his leadership as a team to achieve certain goals	1. Take opportunities 2. Being able to take risks 3. Engaging others 4. Being a model 5. Strengthen subordinates Source: Ridwan (2009: 208)	1. Employers who can take advantage of job opportunities 2. Bosses who dare to take risks 3. Boss who always willing to cooperate with subordinates	Likert Scale

The population in this study is all employees of The Regional Development Planning Board Musi Banyuasin Regency amounting to 107 people. Sampling is done by using the accidental sampling technique of determining sample by chance, where anyone who happens to meet the researcher can be used as a sample when viewed by the person who happened to meet it is suitable as a data source [7]. The basis of determining the number of samples using the Slovin formula, with a confidence level of 95% and the error rate that can still be tolerated by 5%. Thus, the number of samples in this study were as many as 85 samples.

Data analysis to be used in this research is by using SPSS program aid version 21, there are some instrument test that must be done to see data obtained through questionnaire can be used to see the effect of variable X to variable Y. Questionnaire is measured using Likert scale with category strongly agree (SS), agree (S), neutral (N), disagree (TS), strongly disagree (STS). Prior to collecting data, firstly testing the instrument. Instrument testing is conducted to determine whether or not the instrument is feasible. Instrument testing is done by giving a questionnaire to the employees of The Regional Development Planning Board Musi Banyuasin Regency to be filled. Then the data obtained from the results of questionnaires tested by using the validity test and reliability test. Data analysis techniques used in this study are multiple regression analysis, correlation analysis, t test (partial hypothesis) and F test (simultaneous hypothesis).

3 RESULTS

The result of analysis shows the influence of compensation factor and work environment factor and leadership factor on job satisfaction partially as seen in Table 3.

Table 3. Value t Compensate Count, Work Environment, Leadership on Job Satisfaction

	Coefficients[a]				
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	19,439	2,448		9,988	,000
Compensation	,802	,070	,003	4,026	,000
Work environment	,683	,114	,075	3,722	,000
	,124	,203	,085	2,341	,000

Source: Primary Data Processed

Based on data from the output of SPSS and t table results can be seen from testing the variable of compensation to job satisfaction of staff The Regional Development Planning Board of Musi Banyuasin Regency seen in Coefficients column there is value of sig 0.000. Sig value is smaller than probability value 0,05, or value 0.000 <0,05, hence Ha accepted and Ho rejected. Variable factor of personal (X1) have t count that is 4,026 with t table = 1,66365. So t arithmetic> t table and it can be concluded that the compensation variable has a contribution to the consumer's decision. A positive t value indicates that the compensation variable has an

unidirectional relationship with job satisfaction. So it can be concluded that compensation has a significant influence on job satisfaction of staff The Regional Development Planning Board of Musi Banyuasin Regency.

Testing of work environment variable to job satisfaction seen in Coefficients column there is value sig 0,000 Sig value greater than probability value 0,05, or value 0,00 <0,05, hence Ha accepted and Ho rejected. Work environment variable has t arithmetic that is 3,722 with t table = 1,66365. So t arithmetic <t table and it can be concluded that the work environment variable has contribution to job satisfaction of staff The Regional Development Planning Board Musi Banyuasin Regency. The positive t value indicates that the work environment variable has a direct relationship with job satisfaction. So it can be concluded that the work environment has a significant influence signifikan to the job satisfaction of employees of The Regional Development Planning Board of Musi Banyuasin Regency.

Testing of leadership variable to job satisfaction seen in Coefficients column there is value sig 0,000 Sig value greater than probability value 0,05, or value 0,00 <0,05, hence Ha accepted and Ho rejected. Leadership variable has t count that is 2,341 with t table = 1,66365. So t arithmetic < t table and it can be concluded that leadership variables have contribution to job satisfaction of staff The Regional Development Planning Board of Musi Banyuasin Regency. A positive t value indicates that the leadership variable has a direct relationship with job satisfaction. So it can be concluded that leadership has a significant influence on job satisfaction of staff .

The simultaneous influence of compensation factors, work environment factors and leadership factors on employee job satisfaction **Bappeda** Musi Banyuasin Regency was analyzed by using F test with SPSS 21.0 for windows program. The result of F test shows the influence of compensation factor, work environment factor and leadership factor to job satisfaction of staff of The Regional Development Planning Board Musi Banyuasin Regency simultaneously as shown in Table 4.

Table 4. Value F Compensate Calculate, Work Environment, Leadership on Job Satisfaction

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	,400		,200	3,861	,000[b]
Residual	70,589	92	,767		
Total	70,989	94			

Source:Primary Data Processed

Based on data from SPSS output and F table result can be seen from simultaneous test of X1, X2 and X3 to Y obtained value of F count equal to 3,861 with probability value (sig) = 0,000. F value arithmetic (3.861) > F table (2.72), and sig value. smaller than probability value 0,05 or value 0,000 <0,05, hence Ha accepted which means compensation, work environment, leadership together have a significant effect on job satisfaction of staff of The Regional Development Planning Board Musi Banyuasin Regency To know the influence of

compensation factor, work environment factor and leadership factor to job satisfaction of employee, hence can be used analysis of coefficient of determination (Adjusted R Square). The magnitude of the coefficient of determination can be seen in Table 5.

Table 5. Results of Calculation Coefficient of Determination (Adjusted R Square)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,724ᵃ	,776	,716	4,87594

a. Predictors: (Constant), Compensation, Work Environment, Leadership

Based on the analysis result in table 4 above shows that the influence of compensation factor, work environment factor and leadership factor to employee job satisfaction is 0.716, so the contribution of compensation factor (X1), work environment (X2) and leadership (X3) Job satisfaction (Y) is 71.6%. This means that the job satisfaction of employees of The Regional Development Planning Board Musi Banyuasin Regency is 71.6% determined by personal factors and psychological factors, while the remaining 60.8% is influenced by other factors not included in this study.

4 DISCUSSION

Based on the results of filling questionnaires from 85 respondents who are employees The Regional Development Planning Board Musi Banyuasin Regency is known that the gender of 59 people or about 69% of employees male sex while the remaining 26 people or about 31% female sex. Viewed from the age, 36% or about 30 people are under 30 years old while the remaining 33% or 28 people are between 30 to 35 years old and 32% or 27 people are over 35 years old. Judging from the education, 30 employees of The Regional Development Planning Board Musi Banyuasin Regency or about 59% of the employees are graduates of S1 while the remaining 29% or about 25 people are graduates of S2 and 12% or as many as 10 people are high school graduates.

Based on the result of validity test stated all questions get Sig value. (2-Tailed) is smaller than $\alpha = 5\%$ (95% confidence level), so it is concluded that the 20 questions consist of 5 questions related to compensation, 5 questions related to the work environment, 5 questions related to leadership and 5 questions related to job satisfaction. passed the validity test.

The results of the reliability test on the compensation instrument, work environment, leadership and job satisfaction are declared reliable because the value of Cronbanch Alpha> 0.60. With the following explanation for the question related to the compensation value obtained Cronbanch Alpha is 0.683, the questions related to the work environment obtained Cronbanch Alpha value is 0745, while the questions related to leadership values obtained Cronbanch Alpha is 0.803 it can be concluded that the instrument of leadership reliabel / passed the reliability test meaning for leadership instrument has a high level of trust because the value of Cronbanch Alpha> 0.60. Based on the results of reliability tests for questions related to job satisfaction, the value of Cronbanch Alpha is 0.710.

While the correlation coefficient (R) variable of compensation, work environment, leadership toward the job satisfaction resulted in the number 0,724, it means the compensation relationship, work environment, leadership towards the job satisfaction of The Regional Development Planning Board Musi Banyuasin Regency showed strong correlation.

Based on the above analysis, this research shows that the influence of compensation factor, work environment factor and leadership factor to job satisfaction of staff of The Regional Development Planning Board Musi Banyuasin Regency can be known through the result of coefficient of determination analysis (Adjusted R Square). From the result of determination coefficient analysis obtained that the magnitude of influence between compensation factors, work environment factors and leadership factors on employee job satisfaction simultaneously that is equal to 0.716. Thus, it can be seen that the contribution of compensation factor (X1), work environment factor (X2), and leadership (X3) on employee job satisfaction (Y) simultaneously is 71,6%. This assumes that the job satisfaction of the employees of The Regional Development Planning Board of Musi Banyuasin Regency is 71.6% influenced by compensation, work environment and leadership factors, while the remaining 28.4% is influenced by other factors.

For the most dominant factors affecting employee job satisfaction on employee job satisfaction at The Regional Development Planning Board Musi Banyuasin Regency is compensation. So if the Regional Planning and Development Board of Musi Banyuasin regency wants to increase the satisfaction more quickly, so that must be considered is the compensation of employees.

5 CONCLUSIONS

Based on the results of this research, so the conclusions among others: Compensation, work environment, leadership together significantly affect the job satisfaction of employees of The Regional Development Planning Board Musi Banyuasin Regency is seen from the test results simultaneously X1, X2 and X3 to Y obtained value of F arithmetic of 3.861 with probability value (sig) = 0,000. F value arithmetic (3.861)> F table (2.72), and sig value. smaller than probability value 0,05 or value 0,000 <0,05.

Relation / correlation (R) variable of compensation, work environment, leadership to work satisfaction is 0,716, meaning compensation, work environment, leadership towards job satisfaction of employee of The Regional Development Planning Board of Musi Banyuasin Regency indicate a strong correlation.

In improving job satisfaction of the employee, there are several things that need to be done by The Regional Development Planning Board of Musi Banyuasin Regency that is the first can continue to improve employee job satisfaction by continuing to provide compensation in accordance with the performance and workload of employees.

The second is The Regional Development Planning Board of Musi Banyuasin Regency continue to create good working environment and so forth so that employees feel eager to work. And then Should the leadership of The Regional Development Planning Board of Musi Banyuasin Regency can establish good communication with employees so that the assignment to employees can be implemented in accordance with the directives given.

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Implementation of Learning Courses And Cultural Customs of Aceh In The Historical Education of Study Program of Samudra University

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Abstract. In this study focused on knowing the implementation of traditional and cultural lectures in Aceh, to illustrate the results achieved in the implementation of this learning, and to know the obstacles faced in the implementation of learning. The research method is qualitative descriptive method. The strategy in this study used a single case study, by first determining the focus of the study. Source of data taken from informants, activities and documents. Data collection using observation techniques, in-depth interviews and document recording. Next, to check and verify the data, use the triangulation technique. Implementation of learning looks not optimal because there are some things that are not relevant between lesson plans with implementation. The results of the implementation of learning, seen from the results of learning to get good results, but that need to be considered aspects of the assessment is still not complete because it is only seen from the aspects of cognitive and psychomotor. Obstacles encountered in the implementation of learning is the method and teaching materials and learning strategies used. Then this learning activity turned out to produce some positive aspects for students such as aspects of education, inspirational aspects, and aspects of recreation.

Keywords: Learning, Customs and Cultural of Aceh.

1 INTRODUCTION

Aceh is a region where there are a wide variety of ethnic groups that has the diversity of customs, ordinances, languages, arts, crafts, skills etc. Therefore the diversity should always be preserved and developed with retaining the excelency values through education. The introduction of environment, social and Acehnese culture to students that allows them to get involve in their surroundings, better understand the cultural heritage from the ancestor.

Through education in this respect is the college, this education is better known as history of customs and culture. The history of customs and culture in college in Aceh should be viewed as one of the possible alternative that can be selected and applied by bringing students in what is called a Living History, history from the environment around them. The question is, why? This is because in learning the history of the customs and culture of Aceh will likely lead to development of insights in teaching history. This is supported by the opinion of Klein

that "Learning can be defined as experiencing process that results in relative states, maturation, or innate response tendencies [1]. This definition of learning has three important components. First, learning reflects a change in the potential for a behavior. Learning does not automatically lead to a change in behavior. We must be sufficiently motivated to translate learning into behavior". By this, the student is expected to be more passionate in following lectures and gain the benefit greater than the process of analytical study.

Through teaching of the Acehnese customs and culture history the Acehnese students are invited to get closer on the real situation of the closest environment. Next, bringing students directly to know and live the community environment, where they are part of it. Exactly when it says that the teaching of Acehnese customs and culture history was able to break through the boundaries between "World College" with the "real world" outside of the college. This is in the opinion of Hilgard and Bower cited by Snelbecker [2], "learning is the processby which an activity originates or is changed through reacting to an encountered situation, provided that the characteristic of the change in activity cannot be explained on the basis of native response tendencies, maturation, or temporary states of the organism". By teaching Acehnese customs and culture history student will get plenty of examples and experiences from the different levels of society development, including the current situation. They will also be more inclined to develop special skills as a matter of observation, asking or doing interviews, selecting sources, looking for facts, etc.

Yet again, the success of a learning not regardless of how motivation and high discipline of lecturers and the support of their students. Some of action which can be done includes, Firstly, the professor simply tooks examples from the customs phenomenon and culture of Acehnese to give explanations of historical material that is being taught. Secondly, by guiding students out of classes to do research by observing directly the historical sources and collect historical data (go to museums, historic sites, or even interview). Lastly, case studies are needed to be prepared for longer and gradual (students involved in choosing the topic, making the activities plan, carrying out such a plan from heuristics to historiography stage).

From the three forms of teaching Acehnese customs and culture history in the college, the second way is relatively approached the target i.e. less spending the time, but invites/involves the students to do research outside the classroom though in simple way. As the choice, process take precedence over results, certainly in motivating students to develop particular skills are needed when doing fieldwork, so the students can skip the dullness in learning history.

In conclusion, in the system of learning the role of professors and students is equally dominant, especially for learning in College, in addition to other components such as the material and the environment is not as important in the learning process. Therefore. the researchers examine how implementation of learning courses and cultural customs of aceh in the history study program of Samudra university.

2 METHODS

The research approach used in this research was the qualitative approach with a descriptive form. According to Bogdan and Taylor in the Moleong [3] qualitative methods are procedures that produce descriptive data in the form of words written or spoken of people and behavior that can be observed. In addition, because of the problems and the focus of the research is already determined before plunging into the field, then the strategy research specifically may be referred to as case studies were established (embedded case study

research). According to Soetopo [4] says that "the source of the data in qualitative research can be a resource (the informant), event or activity, place or location, objects, images and recordings." While according to Lofland cited in Moleong [3] states that: "the primary source of data in qualitative research is the words and actions of the rest is additional data such as documents and others".

The technique of sampling is a special form or process for centralizing or election in the research that points on a selection (Goetz and Le Comte in Soetopo [5]). In this study researchers using the technique of sampling with aims (purposive sampling technique) to determine the informant. the selection of informants based on analysis i.e. informant deemed to know and can be trusted to be a steady source of data and figure out the problem in depth [5] , i.e. the coordinator of history education study program in Samudra University, lecturer and students as participants of the courses, to keep the confidentiality of our informants identify each result of the interview with the letter "S" followed by the serial number (S1, S2 ...), the location of research is history education study program and documents, which include: the syllabus and SAP as well as used textbook.

3 RESULT AND DISCUSSION

3.1 Lecturers Understanding Toward School-Based Curriculum (KTSP)

History education study program in Samudra University, KTSP is still the applied curriculum in it. In short, things that need to be understood in relation to KTSP for lecturer is that KTSP was developed in accordance with condition KTSP units of education, potential and characteristics of the region, as well as social culture of local people and learners. Things that is needed to be prepared in KTSP are, (1) Syllabus which includes: SK and KD. The learning material and the indicators of achievement, (2) Learning implementation plans/RPP which includes: learning objectives, Instructional Material, method/ Strategies of learning, Media, learning resources and evaluation or assessment. From the results of observation and interviews, it can be obtained from portrayal that lecturers of history education study program can already understand KTSP.

In KTSP, syllabus is basic elaboration of competencies and competency standards into learning materials, learning activities and indicators of achievement of the competencies for assessment of learning results. Development of these components is the absolute authority of lecturers, including development of syllabus format and the addition of other components. The more detailed syllabus can help lecturers in outlining the lesson plan.

The successful of learning depends heavily on the success of the learning materials that lecturer have designed. Learning material in fact is part of the syllabus, namely planning, projections and predictions about what will be done at the time of learning activities. An overview og lecturers understanding toward KTSP looks at the material being taught, the achievement of basic competencies and competency standards by considering the potential of learners and the allocation of time, the example of the standard of competence "learners can strengthen the mastery and broadening the competence of scientific knowledge and expertise in the field of the history of the customs and culture of aceh "with basic competence" Explain the meaning, urgency, and the object of the study of the history of Acehnese customs and culture " outlined in the syllabus and learning material that is explained in the meaning of history of Acehnese customs and culture, urgency of history of Acehnese customs and culture aceh and the object of the study of the history of Acehnese customs and culture.

Learning activity starts with opening, the core activities and closing, and then assign the method i.e. lecture and question and answer. This type of assessment written test with essay form. This standard task that most major professors associated with the lesson plan (RPP) KTSP syllabus outlines are based into the RPP that are more detailed and operational, as well as ready to be taken as guidelines or scenarios in learning [6]. Then, from the results of the data analysis through observation, it can be obtained from portrayal that history of customs and culture lecturer has been ready to apply KTSP, it has been proved in the preparations that is done by lecturer maximaly.

3.2 Learning Implementation

The core of the Organization of education is the implementation of learning that is done by lecturer in the classroom. The implementation is learning activities between lecturer and students. In this activity the lecturer should be able to use all its capacity to carry out the learning stage by stage as in the lesson plan that has been prepared or compiled before. In addition, in realizing the lesson plan, lecturer must be able to manage the class both in the ability of the opening lecture, the lecturer's attitude in the learning process, the ability of presenting learning materials/material, ability in implementing learning strategies, the use of media and learning resources, detail in time setting, motivate learners, enabling learners so that learning takes place in a living, active, creative and fun. Learning that really excite learners so as to obtain a meaningful learning experience and obtain results in accordance with learning objectives, this means learning implementation phase includes the preparation of tools and learning activities that consists of the initial activities, the activities of the core and the cover.

In the preparation phase, the lecturer has made the syllabus and lesson plan (RPP) independently, but not out of the example that has been given by the government. In the RPP, the lecturer do three activities, namely early activities, core activities and cover activities.

In the initial activities in class, the lecturer opens with precencing and giving the general explanation related material being taught.

"*Children, yesterday I have said about the examples of cases of traditional history and culture of Aceh with the approach of social history such as the case studies on the process of customary marriage in the community of Aceh Tamiang and Peusejuk Adat, the differences and similarities. Furthermore, for today's meeting, I will continue the lecture material about the life cycle material of the people of Aceh*". (S1)

The core activities in the form of exposure to the explanation is made during 20 minutes. When the lecturer explain with lectures method, learners are seen noticed, many learners who noted, during the learning process does not appear some students who fell asleep, there are only a few that look speak to their friends and play their handphone. After the question and answer session is finished, the lecturer does not do follow-up activities. The lecturer continued at closing activities by giving greetings to learners.

Preparation of the RPP by history of Acehnese customs and culture lecturer is still very simple, the RPP was designed for one basic competence, basic competence in which one covers the entirety of each meeting. Aspects such as the achievement side of cognitive, affective and psychomotor not shown.

Based on the results of observation can be inferred that the lecturers have yet to implement learning programs that have been created. These conditions resulted in the mismatch between the RPP with learning implementation, otherwise it will not produce a good quality of learning according to Winkel [7] that the quality of learning depends on how

teachers provide information, how the teacher presents the material, how teachers provide reinforcement, teaching how to awaken and enable the learners involved in the learning process. All that range in didactic skill owned by teachers.

"If this course is not there, write it on the blackboard for the media is not there yet". (S2)

The researcher analizes that the use of media should be optimized so that everything that is delivered can stimulate the mind, get attention and interest of learners to learn. So, if all those things are implemented, certainly the purpose of education generaly and specifically can be achieved.

"The media is not used, just telling stories and lectures, so writing on the board, have never used the media". (S3)

The researcher analysis on the use of media found that there are three main functions, which one of the function is the purpose of instruction that should involve learners in the form of real activities so that learning can occur optimally and is not monotony. In mastering material, a history lecturer have already mastered the teaching material, this is due to the history of Acehnese customs and culture lecturer has educational background in history.

Analysis the researcher found that lecturers' understanding of material is very important as their duty to transfer the knowledge, where lecturers are required to be able to become a reference for learners in providing material.

Learning process in history of Acehnese customs and culture education courses is applied through learning in the classroom. Classroom learning is done through several methods, including using lectures and faqs, case studies and assignments. Some of these methods are also applied in the course of history of Acehnese customs and culture including lecturing methods and question and answer. lecturing methods and faqs found that are less attractive so that learners get bored easily because tose are monotony.

The researchers analizes that lecturers are supposed to use various methods to make learning procss more interesting and fun. In the end, the use of various learning methods will provide more value namely, for the lecturer, the variation of learning methods will be able to facilitate the delivery of the subject matter to students. In addition, it can also create a condition of learning that is not monotonous, so that learning is not boring and preferred by learners. This opinion is corresponding with Davies [8], in the selection of methods, a lecturer should be based on the criteria, namely the nature of the learning objectives are achieved, the need to enrich the learning experience and the ability of the learners are covered in the task. It means that the suggestions in teaching changed the behaviour of learners into appropriate behavior. For the learners, the various methods in learning process can increase their learning interest.

The researcher reflection analysis result, lesson plan of history of Acehnese customs and culture that is compiled by lecturer in accordance with KTSP reference, both in terms of systematics as well as components that are outlined, but its essence is less appropriate. Implementation of the learning that was carried out was not appropriate with the lesson plan made that use projectors as a media. The readiness of a lecturer in performing learning in general is ready and a device of learning such as syllabus and RPP also already exists. Implementation of learning still not following KTSP, this is shown from the use of method in teaching is dominated by the method of lecture and without using the learning media.

3.3 The Result of Learning Inside Classroom

Assessment of learning results from students that is conducted by the lecturers is not only to monitor the process, progress and development of the learning results of students in

accordance with their potential, but also feedback to lecturers in order to refine the planning and learning process.

On the aspect of assessment, lecturers do written assessment, tasks assessment and attitude assessment, the form of a written test consisting of a midterm (UTS) and a final exams (UAS) plus three times of the tasks value. Whereas, the task form of midterm or final exams are essay or elaboration. From this assessment the result is processed into the value in end of the semester.

Based on the observation of UTS values and UAS values, it shows that the learners in the form of a materials mastery which include knowledge and understanding, are good on average. Learners' learning aspect, attitude and skills, in general it can be said better. It can be shown that learners have a positive attitude in the following course, like pay attention when lecturer explains, actively record to what was explained by the lecturer and do well the task given.

The successful implementation of history of Acehnese customs and culture, it is reinforced by the existence of the supporting factors of success. Some of the supporting factors can be further elaborated, for example, it can be seen from the ability of a lecturer in mastering the material and lesson plan. Any material that was taugh previously has been consulted by experts team who drafting the material. The selection of the material to be taught must be adapted to the area of expertise in teaching. Thus, the ability of material mastery and the lesson plan can be the lecturer ability. The factor of learning methods selection, observation methods and classroom are considered suitable as a learning method in to be delivered in the history of Acehnese customs and culture course, since the substance of the subject matter can be applied at the time of the field observation is in progress. From the learners curiosity factor, it can be seen that before they implement their active observation, asking questions and seeking information of historical objects which may be allowed as a matter of observation or research.

3.4 The Result of Learning Outside Classroom

As expressed earlier that in the history of education, the learning process has always emphasized on the achievement of learning objectives that is formulated into several competencies which one of them are pedagogic competencies, personality, professional and social. In the process of learning, the fourth such competence was made as referral for the achievement of learning objectives are being carried out. If such criteria of lecturers professionalism are met, those things will change the role of the lecturer from passive into creative and dynamic. Lecturer professional development becomes the global concern, because lecturers' duty and role is not only to provide science and technology information, but also to create the attitudes and the spirit that is able to survive in hipercompetency era.

Assessment in terms of the result quantity values at the time the evaluation was carried out by giving written exam either UTS or UAS to learners after learning activities in the classroom are completed. In this way, the lecturers will be able to see how far the level of knowledge and understanding of learners towards the material presented. While the assessment process conducted by the lecturer by observing the pattern of behavior of the learner while carrying out field observations. In addition, the process assessment is also useful to know how far the students have the attitude of empathy towards the learning environment.

"To improve the learning achievement, so to improve the achievement we provide the training of students to write, so that later learners will be accustomed to writing, and will become a habit, which in turn they are able to make a scientific paper research, and the

impact can make mapping that can be included in the creativity program of learners. Once he got used to writing observations, he could propose in October to follow PKM (Student Creativity Program). For the results of the exam semester, the value is relative, just by learning to write history there is an interest to better understand the local cultures. That's our main goal like that. For the achievement in class yes as it is-that, every end of the learning process that is the end of the semester we assign learners to do field observations related to local history, eg philosophical values in traditional Song-Song dance in Aceh Tamiang or many others, each region has its own uniqueness, well that we assign them to them carefully and kaji, and we also do not let go. We also will accompany them by always evaluating the way they research. So that we also do not need to go directly to the field, they are enough we terjunkan with the provision of knowledge and understanding of the correct research techniques. They will then know that their environment is part of a large piece of history and has such broad insights. From there we can see the process of workmanship when it is appropriate we give the value in accordance with the final results achieved. That's from the field assignment, while to obtain academic results, we always hold the midterm exam and final exam of the semester. Well from there we will know how far the understanding of learners about the material delivered by the lecturer ". (S4)

After conducted the analysis, the researcher believes that the evaluation of learning that is conducted aims to know the achievement of basic competencies that have been determined. With this basic competence can be known the level of mastery of both the standard of the material by students in terms of aspects of intellectual or creativity or to assess the effectiveness of the program implemented.

According to the recognition of the learners, the assessment system is done after the class activities take place, ie learners are required to make an observation report about the customs contained in their respective areas. This is done to see understanding of the customs and cultures that exist in their respective regions. The assessment system can be seen from the results of observation and writing reports conducted. For that, learners are expected to prepare themselves related to the lecture material of traditional history and culture Aceh maximally, when will carry out research. Preparation of the learners are done by making the observation report maximally, that is by searching the source of information as much as possible and study carefully, before written in the report. For the assessment process, achievement indicator becomes the authority of the lecturer, namely the implementation of process evaluation can be done by lookinh at how the behaviour and the interaction of learners in the implementation of observation activities write report. To evaluate the results can be done by giving some lecture material that has been set before then held a test or exam to know the mastery of the material. Both evaluations should be continous, so they are an important set of evaluations in learning.

According to observations made by examining the document of the work of the student observation report, the result is as follows, this report was prepared by some students, including discussing "The philosophical values in traditional Song-Song dance in Aceh Tamiang". Based on the observations, the authors conclude that the observation tasks performed are still simple, the learners have not worked optimally. This is evident from the results of research that looks not deep and is only fundamental. This means that the lecturer in assigning the task, still can not be understood by the learner, so it is suggested for later on when the lecturer give the task of observation report, the learner must be given good knowledge and researching procedure, so that the report will be sequential and accompanied with data or complete evidence.

Analysis of researchers, that the assignment to learners in the form of making observation reports research a particular object, this is very good because this is a contextual learning.

Learners not only understand the material but in the end will also understand the methodology in the study. But before they are released to carry out research activities, should be given enough stock so that at the time of the final report writing process, they are able to write the research well and complete.

Other results achieved from field observation activities can be seen and known from two points of view, namely from the lecturers and learners. From the lecturers, the achievement of this field observation activity is the lecturer can be easier to deliver the subject matter to the students, because it is done by looking directly at the historical objects in their respective area. Such activities are also useful in the context of transferring knowledge contextually, applying constructivist thinking, and providing an understanding of field research. Then, according to the recognition of the learners, the achievements of field observation activities such as learners can add knowledge insight to the historical objects in their own areas. In addition, it can train students to conduct critical analysis of the historical objects they examine in their observation activities.

Based on the results of field observations that researchers do, it can be analyzed that, the method of learning applied by lecturers very appropriately applied in the lectures of traditional history and culture aceh this, because it is done by direct fielding learners of the objects of study of customs and culture in the region they are each. With these activities will equip learners to understand their own philosophical values and can be a source of support in learning the history of adat and aceh culture in the classroom.

"The measure of success, is they managed to compose the origin of an area both customs and culture. So this is in addition to the final exam of the semester that became the benchmark of learning outcomes of learners, I will also assess them from the results of the task from the beginning of the semester I have given that is composing a regional origin in each area of learners. I will give them a stimulus with an understanding of concepts and appropriate steps in the research, and I will also always accompany them, when they are confused what to do, yes I help with consultation like sharing. They will arrange the task of research is the form of observation report, and that later I will value, both in terms of results and research procedures, for learners who process and the results well yes will be good value". (S5)

Reflection on the results of the analysis of the researchers, that the results achieved learning Indigenous History and culture aceh, can be seen from two aspects, namely the evaluation of the quantity of the results of written test scores and evaluation of the quality of the process when learning through field observation activities take place. The results achieved in the learning in terms of quantity of values can be seen from the test results after the course materials are completed, while the assessment in terms of process, can be seen by observing and assessing the work of learners at the time of writing the observation report. Both of these achievements can be used as a criterion of the success of learners in taking the subject of Traditional History and aceh culture.

"I from the beginning of this local history lecture told my students to make an observation report, which will be collected at the end of the semester. From the beginning I gave them knowledge about the methods and techniques of research, so they were able to research in the field. And this task I do not limit this must be so, I release them to explore the potential of historical objects in their respective regions. Besides they will have experience they will also get knowledge about the correct research process. Well from there indirectly I have implemented a contextual learning process is not just a matter of lectures in class ". (S5)

"If I think, perhaps with the activity of the assignment of the observation report we will be able to understand the material described in the class, so we can practice directly in the

field not just imagine. In addition, with the assignment we will practice writing scientific papers, which later we can use in the future as in making a thesis or another Mr. " (S6)

"With us studying it, we will be able to understand more about course material because we not only hear during college but we can also directly practice what we get in class". (S7)

The results achieved in teaching Indigenous history and aceh culture through classroom learning and observation can also be seen and known from two perspectives, namely from the lecturers and learners. In addition, the achievement of learning through classroom activities in the classroom and at the time of observation took place also contains three important aspects, namely educational aspects, inspirational aspects and aspects rekreatif. These three aspects become important factors of successful learning through the classroom and field observation.

3.5 Obstacles Faced

Implementation of the learning of traditional and cultural subjects of Aceh is closely related to the lesson plan (RPP), the selection of topics and strategies and instructional media used by the lecturers, so it can be known obstacles or difficulties faced by lecturers. In the selection of topics or customs and culture material of Aceh lecturers have been referring to the existing SK or KD. For learning strategy depends on existing facilities and infrastructure. However, for the case of the traditional and cultural subjects of Aceh, the lecturer has not used the appropriate media with the competence to be achieved as the learning strategy, and this is felt less impressive and monotonous. The selection of media should be tailored to the material and competencies that the learners must achieve. This is in accordance with Mulyasa (2004: 56), facilities and learning resources selected and used in the learning process if appropriate and support the achievement of basic competencies.

Another obstacle analysis is the difficulty of elaborating the standard of competence into syllabus in planning the learners' learning experiences, identifying the competencies according to the needs and problems faced by the learners, as well as describing the subject matter of learning, because the learning experience to be provided is tailored to the ability / creativity of lecturers is also different.

Another inhibiting factor, derived from the lecturers themselves, ie in terms of learning strategies. Among them in the selection and application of methods, and approaches in learning. According to Mulyasa [6], teachers must master the principles of learning, selection and use of teaching methods, and selecting and using learning strategies and approaches. In terms of learning methods, the obstacles experienced are the difficulty of choosing the appropriate method with the competencies to be achieved during the learning activities take place. To overcome obstacles in the selection and use of methods, lecturers should try to see and recognize the characteristics of learners in order to choose the right method, that is by looking at the condition of students and existing facilities, trying to be a facilitator in the learning process, and improving the relationship between the study program with parents of learners. To overcome barriers about the learning approach used, lecturers should seek more information about methods and approaches in learning and try to apply them. In addition, lecturers also need to discuss with many other lecturers about the approach in learning and its application.

In addition, obstacles for lecturers in the implementation of learning that is about evaluation. The lecturer has conducted an assessment that includes the cognitive, affective, and psychomotor aspects. Of the three domains of this most difficulty is the assessment of the affective domain. This is because there is no clear scoring standard for the assessment of the affective domain, so that the lecturer has difficulty to provide an assessment. Consequently,

affective domain assessment still tends to be subjective. Lecturers are also difficult to monitor learners continuously, this observation is needed to really know the attitude and circumstances of learners in following the learning process. To overcome these problems, lecturers should be in every teaching and learning activity, need to make notes about the students who are good and not good, or can also use the observation sheet.

4 Conclusions

It can be said that the lecturers of Aceh's traditional and cultural subjects have had a fairly good understanding of KTSP. This is demonstrated through his understanding of the concept of KTSP, Syllabus and RPP. In the preparation stage in the implementation of learning, lecturers have developed learning tools independently and well. Only, entering the stage of learning activities, lecturers do not conduct learning activities according to the RPP he compiled. Based on the results of UTS and UAS values that have been implemented by learners, shows that they are able to master the material presented by the lecturer.

With the method of giving the task of field observation, lecturers try to invite learners to study the objects of cultural studies in Aceh society, in order to obtain the information needed in the lecture and later as an archive or as their final project.

In learning through this method of observation turned out to produce some positive aspects, including educational aspects, namely aspects related to the improvement and understanding of the lecture materials, inspirational aspects, namely aspects related to motivation to continue to develop themselves, and aspects of the recreative aspects that are related with pleasure. All three aspects are intertwined into a single unit, so that achievements in field observation activities should also be able to accommodate these three aspects.

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The Level of Water Supply and its Effect on the Growth of Plants and Yields Patchouli (*Pogostemon Cablin*, Benth.)

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Abstract. Patchouli is a plant of essential oils cultivated dry land without any irrigation except rainfall only. The low amount of water in cultivation is a common constraint and hampers growth and patchouli yield. This study aims to obtain the appropriate level of water content on patchouli cultivation in rain-fed and how it impacts on growth and results. Implemented in Reuleut Timu Village Muara Batu District, North Aceh District from June to December 2015. Using randomized block design a repeated of 9 (nine) times with the following treatments: K_1 = water supply 100% of field capacity, K_2 = water supply 75% field capacity, K_3 = water supply 50% field capacity K_4 = water supply 25% field capacity. The results of this study indicate that the water content in the field capacity showed very significant difference to the patchouli leaf area. 75-100% moisture content results in better oil production and growth, while the highest patchouli alcohol content is achieved at 50% moisture content. The lower the water content given, the more negatively affect the growth and yield of patchouli plants.

Keywords: Patchouli Alcohol, Moisture Content, Water Shortage, Field Capacity.

1 Introduction

Patchouli (*Pogostemon cablin*, Benth) is an essential oil producing plant originating from the subtropical of the Himalayas, Southeast Asia and the Far East and is widely cultivated in Indonesia, China, Malaysia, and Brazil [1]. Aceh is the best quality patchouli oil producer and has become Indonesia's largest supplier of patchouli oil in the international market [2, 3].

Grows well in height up to 1,200 m above sea level. Patchouli cultivation is very suitable to be done in areas with sufficient rainfall, especially in the highlands. Patchouli cultivation in the lowlands is often lack of water and irrigation is needed to fulfill it. Plants with water shortages generally produce low growth and production and can have an impact on cultivar failure. The need for water or rainfall of patchouli plants to grow and produce well ranges from 2,500 - 3,000 mm per year [1]. Compared to the average annual rainfall in North Aceh of 1,478 mm/year, there will be a shortage or inadequate water demand so that patchouli plants

are potentially in a state of water shortage. Generally patchouli cultivated on land with irrigation from rainfall only. Patchouli plants have shallow rooting so less resistant to drought.

Such rooting morphological characteristics cause patchouli very easily to experience water shortages resulting in disruption of growth and production. Such root morphological characteristics and low rainfall and uneven fall in each month to make the patchouli cultivation of the place into the category does not fit.

In general, the average yield of leaves (terna dry) on patchouli plants is about 15 tons / ha or about 290-375 kg/ha of patchouli oil with 32-33% patchouli alcohol content.

To date, information on how moisture still in the patchouli plant tolerance to grow and produce well unknown. To know the level of moisture which is good for growth and results achieved, and then conducted research with the treatment the granting of different moisture on plant patchouli. This study aims to obtain the appropriate level of water content on patchouli cultivation in rain-fed and how it impacts on growth and results.

2 Materials and Methods

Research was conducted in Reuleut Timu village, sub-district of Muara Batu in North Aceh Regency height ± 8 m above sea level (asl). Implemented from June to December 2015. The material used is patchouli Pogostemon cablin Benth, cow manure, polybag, urea fertilizer, SP-36 and KCl, 3 G, fungicide and insecticide.

Tools used include oven, digital scales, leaf area meter. Implemented in a plastic housing using a non factorial randomized block design. The treatment given is the level of water delivery, which consists of 4 levels ie : K_1 = water supply 100% field capacity, K_2 = water supply 75% field capacity, K_3 = water supply 50% and K_4 = water supply 25% field capacity, repeated 9 times.

Cuttings for seedlings taken from branches that are young but have wood with a length of 15-20 cm. The topsoil mixed with manure as a seedbed medium is inserted into the polybag and arranged at a distance of 20 cm x 20 cm.

Each polybag planted with a patchouli seedlings and given a shade of paranet. Cuttings seedlings maintained until one month or have had shoots and then moved into large polybag (60 kg). The planting medium at 60 kilograms of size polybag is the soil top soil that was already crushed. The soil top soil mixed with cow manure with a comparison of 2:1.

The patchouli seedlings were planted into polybags of 60 kg and arranged with 60 cm x 40 cm plant spacing in each randomized trial plot. Planting is done by making the planting hole according to the size of polybag seedlings, then put the seeds along with the media seedlings. Each large polybag planted with one seed of patchouli plant.

To ensure perfect growth occurs watering, fertilizing, weeding and plant pests eradication. If there are plants that die or grow imperfectly done embroidery.

Provision of water treatment is done after the plant are thirty days after transplanting (dat) according to the percentage of field capacity, and carried up to the age of patchouli six months. To ensure the level of groundwater content, each treatment unit measured its water content with a tensiometer.

Weeding is done by unplugging the plant pest (weed) on each poly bag to suit your needs. For tackling pest plant disease is done by spraying with insecticides and fungicides. Spraying plant disease pests are done according to your needs.

Observation on the growth and yield were performed on plant height, leaf number, leaf area, root length, oil production, patchouli alcohol (PA) content at 180 days after planting. The

data were analyzed by anova and futher test the least significant difference (LSD) on levels 5%.

3   Results and Discussion

The result of variance analysis showed significant difference to leaf area due to treatment of water content. The highest leaf area was achieved at the K_1 treatment stage with 100% moisture content of 33.99 cm^2, followed by K_2 25.99 cm^2, K_3 22.47 cm^2 and K_4 21.70 cm^2.

The giving of water treatment does not show a significant difference against the high number of plants, leaves and the root length. Although not   a significant difference, the greatest plant height indicated by the extent of awarding 100% of water levels (K_1) of 45.07 cm followed by K_2 of 44.85 cm, K_4 of 39.80 cm, and K_3 of 38.80 cm. The same thing happened against the parameters of the length of the root, where the root is the longest in the show by K_1 of 26.91 cm followed by K_4 of 26.19 cm, K_2 and K_3 amounting to 25.89 cm by 22.00 cm, while the number of leaves in the show's highest level of treatment by K_2 of 51.13 strands followed by K_1 of 50.80 strands, K_4 of 45.00 K_3 of the strands and strands of 40.79 (Figure 1).

Treatment of water content is lower the negative effect on the growth of patchouli plants is the decrease in plant height, leaf area, the number of leaves, and the length of the roots of patchouli plants. Water content of K_1 treatment level on the parameters of plant height was better by 0.48% of K_2, 13.91% of K_3 and 11.70% of K_4. On the parameters of the large decrease of leaf number seen at K_3 and K_4 that is equal to 20.30% and 11.99% compared with K_1, while at K_2 level able to increase the number of patchouli leaves by 0.65%. Patchouli plant root length parameter which is the organ of water absorption and nutrients produces the highest root length on treatment water content level K_1 and larger 3.79% from K_2, 18.24% from K_3 and 2.67% from K_4. Against the broad parameters of leaves, granting the lower water levels cause a decrease in the broad leaves are getting bigger. When compared to K_1 treatment stage, the decrease of leaf area occurred at K_2 is 23.55%, at K_3 level of 33.88% and 36.18% in the K_4 level (Figure 1). The greater the water given the greater the effect on the increase of plant height growth, the number of leaves, the leaf area and the lenght of the patchouli plant roots, otherwise the smaller the water content given decrease the growth of patchouli plant.

The 100% water supply levels result in higher patchouli oil than other moisture content. This indicates that patchouli plants require a sufficient amount of water and are always available, but not excessive.   At low   water   availability levels,   the energy allocated for growth will decrease as a result of the amount of energy required to absorb water so that the respiration rate is greater than photosynthesis. Research results Wiroatmodjo, et al. [4]; Kadir [3] indicates that low water levels decrease the number of branches and the number of patchouli leaves Effects Water deficiency in plants causes a decrease in plant height and leaf area [5], significantly reduced fresh and dried biomass yields with increasing water shortages [6]. The research of Amiri, et al. [7], water stress significantly affects plant growth decline, for example at plant height. Severe water shortages are more damaging than moderate water shortages [8]. Low moisture depresses significantly the expansion of cells and growth due to low turgor pressure.

Setting the osmotic turgor maintenance can allow cells to survive or to aid plant growth under severe drought conditions [9]. Water shortages inhibit shoot growth as indicated by decreased growth in plant height, number of root and number of leaves [10].
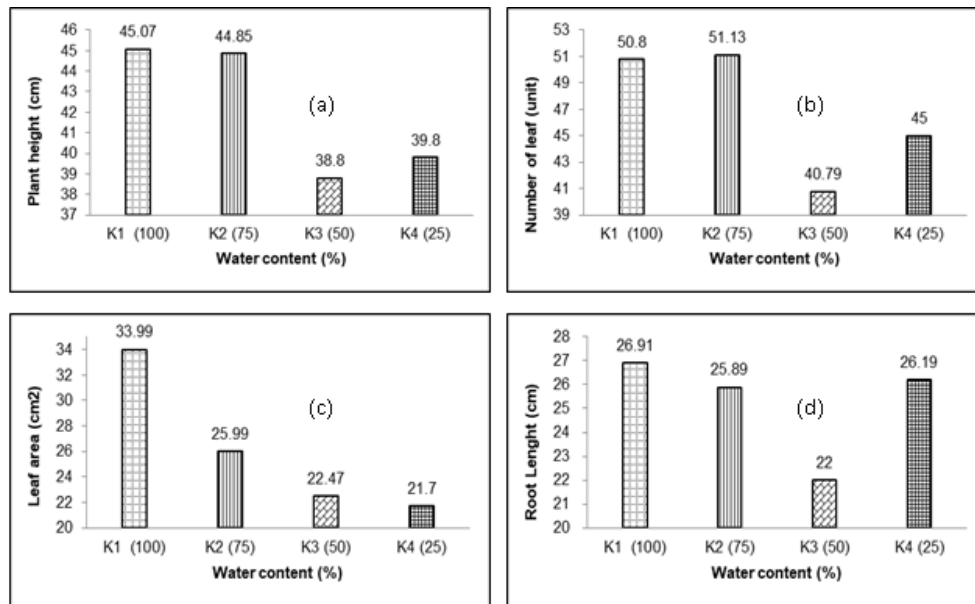
Figure 1. Patchouli growth on plant height parameters (a), number of leaves (b), leaf area (c) and root length (d) of patchouli plant.

In this research, plant patchouli has small leaves, the habitus is rather small and thick, reddish yellow green color somewhat because it is grown in the open. Patchouli plants grown in the open, less growth, smaller plants running, rather small and thick leaves, the leaves are yellowish and slightly red, it is because of the disruption of cell division which lowers growth and results, but higher oil levels [11, 12]. Low water content affects all plant growth variables observed. Plants given adequate water (75-100%) have a growing number of leaves, root biomass, plant height, and leaf area larger than the water supply of 25-50%. The low input of water causes low biomass growth of leaves and leaf area. Low water input causes low leaf biomass growth and leaf area. The formation of leaves, roots and stems is significantly influenced by the water content given [13]. Whilst Manivannan, et al. [14] revealed that the decrease in plant height associated with a decrease in cell enlargement and leaf aging, under water deprivation conditions. Increased water supply results in increased plant height and number of leaves, and low water delivery drastically decreases the number of leaves and leaf area [15, 16].

The low amount of patchouli leaves in the treatment of more severe water shortages caused by the existence of plants has waived its leaves to reduce excessive evaporation. In addition, research conditions under plastic house higher temperatures followed by the low humidity makes faster portion dismissed the patchouli leaves, especially old leaves. The plant is more sensitive to water shortage more abort the leaves [17]. Plant growth can be inhibited by low water potential, this can be shown in the growth of leaves and stems [18]

Height of plants under heavy water shortage is lower than in moderate water shortages, this may be due to more concentrated plants prolonging the roots to obtain more water from deeper sources, less root inhibition than upper canopy growth [19, 20]. Some roots continue to lengthen to a low groundwater potential and reduce shoot growth (Kirnak, et al. [18]. A productive root system can provide benefits for spurring plant growth at an early stage of its

growth and facilitating the rapid absorption of water lost by evaporation [21].). Increased root growth due to water stress occurs in sunflower as reported by Tahir, et al. [22] and plant Catharanthus roseus [23].

This study shows that patchouli plants can still continue the process of growth and development to water shortages at levels up to 25 percent, but in research Setiawan, et al. [24] the plant can still continue its life up to 20 percent groundwater content.

Treatment of water content resulted in the highest production of Patchouli oil at K_1 (100%) level of 4.91 gram followed by K_3 (50%) 4.90 gram, K_2 4.23 gram and K_4 2.64 gram (Figure 2a). In general, the greater the provision of water in patchouli plants produce oil is higherl, except in K_3 able to produce oil weight is almost equal to K_1. The treatment of the amount of water in decreased field capacity resulted in decreasing production of patchouli oil. Compared to K_1 treatment level, water supply in K_2 field capacity causes a decrease of patchouli oil production by 13.85%, K_3 decreases yield of 0.20% and K_4 decreases yield by 46.23%.
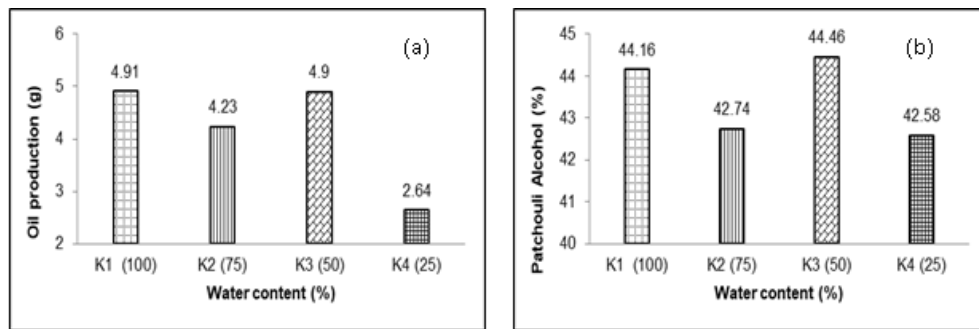
Figure 2. A comparison of patchouli oil production (a) and patchouli alcohol content (b) patchouli plants due to the treatment of moisture content.

Treatment of water content resulted in differences in patchouli alcohol content of patchouli oil (Figure 2b). The highest patchouli alcohol content was demonstrated at water content in 50% (K_3) field capacity with patchouli alcohol content of 44.46% followed by K_1 44.16% (0.67% lower than K_3), K_2 42.74% (3.87% lower than K_3) and K_4 42.58% (4.23% lower than K_3) (Figure 2).

The decline in crop production results related to a decrease in the number of leaves and interference in the process of cell division [25]. Water stress reduces fresh weight and dry weight of plants, but the more severe the water shortage will increase the essential oil content than light water stress [26]. Differently expressed in plants Matricaria chamomila the greater the water shortage that is given further lower the high content of essential oils and plants. A decrease in the content of essential oil may be caused by the presence of interference in photosynthesis, carbohydrate and production at the time of formation of water shortage, the formation of secondary metabolism due to depressed plant growth [8]. Lack of water pressed essential oil production instead of sufficiency of water gives higher oil production [27].

4 Conclusion

Giving different moisture content of patchouli plants has a very significant effect on leaf area. Although there was no significant difference in plant height, leaf number and root length, water content with 100% and 75% field capacity resulted in better growth and production compared to water content of 25% and 50% of field capacity. 100% and 50% moisture content resulted in the highest production of patchouli oil, while the highest patchouli alcohol content was achieved at 50%.

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Developing Assessment Rubrics in Pedagogical Content Knowledge for Mathematical Problems

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Abstract. Pedagogical content knowledge is a competence that must be mastered by teachers and also prospective teachers in learning process as ability to assess the students work. In addition, they are also required to learn the international standard problems such as PISA (Programme for International Student Assessment) to be taught to students. Because of incomplete and unclear scoring rubric, especially in answering PISA questions, this study purpose was to develop valid assessment rubrics in pedagogical content knowledge for mathematical problems. Assessment rubrics were rubric for students work in answering PISA questions for most difficult level, and rubric for prospective teachers' ability in assessing students work. Subjects in this study were eight prospective teachers' of Mathematics Education Department, Syiah Kuala University selected by purposive sampling. This development research used Plomps' development model in five phases. The results showed that both rubrics had the valid criteria that consisting of content and construct validity. Content validity was viewed of the suitability of PCK components, and substance and concept for PISA questions with thinking level of junior high school students. Construct validity was viewed of the suitability of aspects at rubrics with concept of PISA questions, and presented analysis aspects were structured as PCK components

Keywords: Development, Rubric, Assessment, PCK, PISA

1 INTRODUCTION

Along with the development of educational technology, the development of science also went through changes and improvements. Not exception to mathematics education is still felt difficult for some people. This not only happens to the students but also to the teacher who should be able to master the mathematical material appropriately which affects the students' abilities. One of the data obtained from the results of Indonesian student tests at the international level, PISA (Programme for International Student Assessment) for several periods, Indonesia is still in the bottom position. In PISA, there are contextual questions that are used to measure students' literacy abilities aged around 15 years. In addition, the problem

of PISA is also non routine in reading literacy, matehematics literacy, and science literacy [1][2].

Indonesia was ranked 64th out of 65 participating countries with an average score of mathematics of 375 which is well below the OECD average of 494 in 2012 ([3]; [4]). Especially in a matter of high level in PISA that is level 5 or 6, Indonesia got an average value of 0.3 from the average of OECD 12.6. On the contrary, for the low level below level 2, Indonesia scored very high (75.7) and even far from the average OECD score of 23.1. In 2015 Indonesia's ranking increased to the 62nd position from 70 participants with an average value of increasing although not significant [5]. This means, the ability of Indonesian students is still very low in mathematical problem solving related to the daily or non routine problems. Just for simple problems that can be resolved appropriately. In this case, students' cognitive abilities cause their difficulties in solving mathematical problems as memorized and recalled the fact that related to make a connection [6]. Several students' difficulties in mathematical problem solving are understanding the keywords of problems to mathematical sentences, unable to describe some information in the problem, answering without any thinking process, and do not like to read short or long mathematical problems [7].

In addition to students, teachers also have difficulty in understanding mathematical concepts that are very impact in solving mathematics problems. In this case, prospective teachers still have difficulty in solving and analyzing mathematics problems, especially non-routine problems such as PISA [8]. Bayrakdar [8] states prospective teachers' difficulties in solving the PISA problems caused their less strategies, so they can not using and adopting in difference points of problems. There is influenced their PCK in learning process later.

Content Knowledge of good teachers, both in mastering the concepts taught as well as material interrelationship with real life issues are very supportive in shaping and influencing students' knowledge and thinking processes. However, this can happen if the pedagogical knowledge of teachers for example in organizing learning is also good. The relationship between PCK-forming components in the conceptual framework of Sorto, et.al [9] is based on theories of teacher preparation, teacher capacity, and teaching practice.

One of PCK aspects of prospective mathematics teachers is the ability in solving non routine mathematics problems as PISA questions. Not only solve it but they can also transfer the knowledge for students and use in learning process. The impact of it, students can be easy to understand and solve PISA questions related problems in their life.

Many solutions to solve PISA problems, one of it is prospective teachers at education program must have and learn more about skills of problem solving as daily life problems related problems in situations and questions [8]. Because the rubric for analyzing PISA answers is not yet available, the purpose of this study was to develop valid assessment rubrics for students work and assessment rubric for prospective teachers' ability in assessing students' work. Assessment rubric for students work was used by prospective teachers to assess the students work in answering questions of PISA for most difficult level, while assessment rubric of prospective teachers' ability was used by researcher in assessing the results of the assessment done by prospective teachers.

2 Methods

This type of research is a development research for two assessment rubrics in valid criteria. There is assessment rubric of student's work, and assessment rubric of the ability of

prospective teachers in assessing student's work. The development follows the phases of the Plomp [10] in development model consisting of five phases: the initial investigative phase, the design phase, the realization/construction phase, the test phase, the evaluation, and the revision, and the implementation phase. However, in the development that is done only until the fourth phase. This is because the phase has been obtained in accordance with the purpose of research is the development of rubrics that meet the valid criteria, consisting of valid contents and valid constructs.

Subjects in this research are seven prospective teachers of International Standard Teacher Education Program (PGBI) at Mathematics Education Department of Syiah Kuala University. Selection of subjects by purposive sampling with the reason the subject is taking the course Teaching Mathematics I (Mathematics Learning Planning). This is because the course requires students to assess the learning outcomes and improve the shortcomings in the learning process. Therefore, subjects are required to assess students' work by suggesting appropriate assistance for students with problems or constraints.

3 Result and Discussion

3.1 Plemenary investigation phase

In this phase, some real PISA problems in most difficult level (level 5 and level 6) in 2012 and 2009 chosen for using in the first test. After translated, arranged the answer keys, and validated by the experts in mathematical contents, then done tests on junior high school students. The implementation of this test was conducted several times by replacing some of the problems in three different schools, SMPN 1 Banda Aceh, SMPN 9 Banda Aceh, and SMPN 8 Banda Aceh for students of class IX. This is because the expected answers are students' answers containing misconceptions, completion errors, various settlements and strategies used. The goal is the subject of research that students can analyze the student's answers by adjusting the components on the rubric developed. The results of this initial test finally got some student works or answers from three PISA questions that convene the criteria for using in research.

Before determining research subjects of prospective teachers, they were tested with the same problem given to junior high school students. The goal is to know their ability in completing and understanding the problem of PISA before the analysis of the results of student answers. Of the eight students there were only three students who could solve the PISA problem correctly for each question, and there was one student who answered rightly for two PISA questions. Furthermore, these three students will be the subject of research in developing the assessment rubric.

There are two developed rubrics. First rubric is for assessment student's work and prospective teachers in answering and solving PISA problem. In this rubric the assessment components are adapted of PISA components for most difficult level (level 5 and 6). The second rubric is rubric to assess prospective teachers' ability in assessing student work. Both rubrics are also adapted of PCK components associated with the ability to understand and solve problems and assessment of student work.

3.2 Design phase

In this phase, the design is done for both rubrics. The rubric component is adapted to aspects of PISA and PCK concerns. In addition, the rubric component is also adjusted between the assessment rubric for student's work, and the assessment rubric for the prospective teacher's ability in assessing student's work. The rubric design is based on PCK components developed from PCK components according to [11], [12], and [13].

Aspects of PCK assessment contained in the rubric for analyzing student work according to [12] is content knowledge and skill, analysis of student work, and feedback to students. PCK components according to [13] is knowledge of students' (mis)conceptions and difficulties, knowledge of instructional strategies, knowledge of mathematical tasks and cognitive demands, knowledge of educational ends, knowledge of curriculum and media, context knowledge, content knowledge, and pedagogical knowledge.

According to [11] the component of content knowledge assessment in pedagogical context consists of deep understanding of basic mathematics, content to deconstruct key components, mathematical structure and its relationship, procedural capability, and solution method. While the components of pedagogical knowledge assessment in content context are the purpose of learning, gain and maintain student focus, and classroom management techniques.

3.3 Realization/construction phase

This phase is an advanced phase of the design of activities to be undertaken. In this phase, developed the draft rubric is adjusted back to the appropriate PCK component and also validated with two valuators who are experts in the field of analysis and assessment. From the discussion results obtained each of four aspects for each rubric in general but related to the problem of PISA used for analysis of the answer.

Aspects of analysis for rubric assessment of student work consist of the accuracy of the use of mathematical concepts, the accuracy of calculations, identify the steps in solving problems on the problem, and put forward the reasons or ideas. The analytical aspects for rubric assessment of student analysis results consist of assessment of the accuracy of the analysis conducted on the student's work, the ability to understand students' thinking about misconception, the ability to judge according to the rubric, and the recommended strategy/assistance.

3.4 Test, evaluation, and revision phase

In this phase, the rubric that developed then tested for prospective teachers in a small group to see their understanding in the problem, readability, and also conformity aspects in rubric. In addition validation by two lecturers as valuators who are experts in the field of analysis and assessment. The validation process is done several times to get the rubric with the right components or aspects of PCK and PISA. Other than it can also be used in general aspect, but not apart from the context or aspects of the rubric.

The validation process is not only on the aspects of PCK that are the focus, but also the context of the PISA solution that will be analyzed and the use of language. In this case also note the capabilities required in solving the problem. In addition, the developed rubric was not only glued specifically on the problem of PISA used in research, but developed to be used in general on mathematics problems. The use of rubric can also be developed by adjusting the problem to be analyzed. The rubric that has been validated and revised can be seen in Table 1

for the assessment rubric for students and prospective teachers work in solving mathematics problems.

Table 1. Assessment Rubric for Student and Prospective Teacher Work

Aspects of Analysis	Scale 4	Scale 3	Scale 2	Scale 1
Appropriateness of the use of the mathematical concept	Using mathematical concept is right and accordance with the overall problems in the matter of	Using mathematical concept is precise, but less suited to a small fraction of problems in the matter of	Using mathematical concept is less precise, but in accordance with the problems in the matter of	Using mathematical concept is less precise and does not correspond with the problems in the matter of
Precision of the calculation of	Whole answer correctly, detailed, and ordered	Whole answer correctly, but not detailed and not sequential	Most of the answers correct, but less detailed and not ordered	Small percentage of correct answers, less detailed and not ordered
Identifying problems steps in the matter of	Able to identify appropriately any steps to resolve the problems in a matter of	Being able to correctly identify the majority of steps to resolve the problem in a matter of	Identify appropriately fraction steps to resolve the problem in a matter of	Only identify known or asked or part of the resolution process or just the end result
Suggested the reason or the idea	Wrote all reason or the idea of initial steps to resolve the matter until the end	Wrote largely the reason or the idea of steps to resolve the matter	Wrote fraction reason or the idea of steps to resolve the matter	not write down the reasons or the notion of steps to resolve the problem, or just write down ideas end briefly

Instructions Using the Rubric

The assessment rubric of students' work is a guide in doing assessment on the completion of mathematics problems. Mathematical problems in the question are a mathematical problem that requires completion with a complete stage that is not only procedurally. Problems can be non-routine questions, mathematics problem form story, PISA, and others.

Every lecturer, teacher and educator who wants to know the ability of learners by analyzing their work in solving the problem can use the guidance of this assessment rubric. This is because the aspect of analysis on the rubric is an aspect in general so that it can be used by everyone in analyzing the problem solving especially mathematics problems. In this rubric the score or value for each aspect of the analysis is the same is one because all aspects have the same part.

To analyze, take into consideration all aspects of the answer. Then focus on four aspects of the existing analysis.

1. Aspect of analysis: The accuracy of the use of mathematical concepts.

The mathematical concept in the question is the accuracy in the use of the formula in accordance with the problem on the problem.

2. Aspect of analysis: Accuracy of calculation.

The calculation is not only the end result but also the calculations performed on each problem solving step. In addition, not only the result of counting in the form of numbers but also the accuracy of the units used.

3. Aspects of analysis: Identify the steps in solving the problem on the problem.

Provide assessment for each step done in solving the problem in accordance with the problem on the question.

4. Aspects of analysis: Suggests reasons or ideas

Problem solving is not only done procedurally but also provides reason and introduction on every step of the settlement and makes conclusions for the final results in accordance with the problem on the problem.

Guidelines assessment rubric on the analysis of prospective teacher for students' works used by researcher based PCK components can be seen in Table 2.

Based on the research of [14] that to know the analysis of the ability of prospective teachers in analyzing students' understanding can be used the results of student work which is the result of student thinking. This is in accordance with research conducted using student's work. Therefore, according to [15] that prospective teacher can develop their understanding better for students' thinking if they take time to discuss about meaning of concepts, relationships, common conceptions, and student's difficulties.

Table 2. Assessment Rubric for the Result of Prospective Teachers' Analysis

Aspects of analysis	Scale 4	Scale 3	Scale 2	Scale 1
Rating accuracy of the analysis conducted to students' work	Assessing all aspects of analysis with appropriate	Assessing most aspects of analysis with appropriate	Assessing the few aspects of analysis with appropriate	Assessing less precise every aspect of analysis
Ability to understand students' thinking about the misconceptions	Able to recognize and understand any misconceptions of student work	Able to recognize most of the misconceptions of student work accurately	Able to recognize a small portion misconceptions of students work accurately	Able to recognize a small portion misconceptions of student work but not exactly

Aspects of analysis	Scale 4	Scale 3	Scale 2	Scale 1
	accurately			
Ability to give an assessment based on rubric	Able to provide an assessment for all aspect appropriately	Able to provide an assessment of most aspects appropriately	Able to provide an assessment of the few aspects appropriately	Able to provide an assessment of the few aspects but not exactly
Precision of the strategy / assistance recommended	Suggest aid / strategy appropriate to the whole thing on a matter	Suggest aid / strategy just right for most of the problems on a matter	Suggest aid / strategy just right for a small fraction of problems on a matter	Suggest aid / strategy but it is not appropriate and does not correspond with the problems on a matter

Instructions Using the Rubric

Assessment rubric of the results of prospective teacher's analysis is a guide in assessing the results of analysis conducted by prospective teachers to students' work in solving non-routine problems which in this case is PISA questions.

Every lecturer, teacher and educator who wants to know the ability of learners in their analysis can use the guidelines of this assessment rubric. This is because the aspect of analysis on the rubric is an aspect in general so that it can be used by everyone in analyzing and assessing the results of the analysis performed. In this rubric the score or value for the first analysis aspect is two because it is considered to have a large part in the analysis whereas the value for the other three aspects are the same is one because the three aspects have the same part.

To conduct the assessment, the overall aspects of the analysis are considered. Then focus on four aspects of the existing analysis.

1. Aspect of analysis: Assessment of the accuracy of the analysis conducted on students' work

The accuracy of the analysis in the problem is the overall aspects of analysis in analyzing students' work, such as the four aspects of the previous analysis on the guidelines assessment rubric of students and prospective teachers work.

2. Aspect of analysis: Ability to understand students' thinking about misconception

In analyzing the students' work, they also pay attention to the misconception and difficulties experienced by the students in solving the problem.

3. Aspect of analysis: The ability to judge according to the rubric

Provide an assessment of the assessment of student work by taking into account every aspect of analysis and assessment appropriately.

4. Aspect of analysis: The accuracy of the strategy / assistance provided

This aspect is an additional aspect. Used if the analysis and assessment conducted for the results of the analysis of the work of the students demanded assistance advice in overcoming students' difficulties in solving the problem.

4 Conclusions

The both rubrics have a valid criteria consisting of content validity and construct validity. Content validity is viewed based on the suitability of material and concept for PISA questions with thinking level of junior high school students and prospective teachers. Construct validity was viewed based on the suitability of aspects at rubrics with concept of PISA questions and PCK components, and presentation of analysis aspects in rubric structurally.

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Strategy To Poverty Alleviation Throught The Gampong Fund Allocation Program In Aceh Besar District

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Abstract. This study aims to find out poverty alleviation strategy through the Gampong Fund Allocation Program (ADG) and poverty alleviation efforts through increasing ADG absorption capacity in underdeveloped villages in Aceh Besar District. In this research use qualitative descriptive analysis method. Research data consist of primary data and secondary data. The data used in this study is primary data (primary data) by conducting interviews of respondents ie community and village tools and using a list of questions that have been prepared before and secondary data (secondary data) sourced from the Central Bureau of Statistics (BPS) and institutions is in Aceh Besar District. The results showed that the absorption capacity of the Gampong Fund Allocation Program in Aceh Besar District is very varied. Establishment of ADG in Aceh Besar District increases annually. Generally allocation of gampong funds is allocated or its use is more widely used for gampong apparatus or usually called wage jerih. It is therefore expected that local governments can develop a more flexible and non-standardized qanun. Providing an opportunity for the community to be involved in the preparation of the ADG program so as to encourage the community to live a decent life in solving the economic problems in the region so as to have a real impact on the problem of regional poverty.

Keywords: Strategy, poverty, gampong fund allocation

1 Introduction

Poverty is a very complex and multidimensional problem that not only deals with economic issues but also deals with non-economic issues such as politics, social, culture, assets, and the environment. This indicates the ineffectiveness of most of the poverty alleviation programs currently being proclaimed by the government. Basically the achievement of the welfare of the community is passed by way of life changes to a better life than before.

This is done through the development of society that is improving the economic, social, and cultural conditions of society, so that poverty and the environment of society will

experience a change to a better direction. Direct assistance such as the Gampong Dana Allocation (ADG) program is a concrete form of district government policy in the effort to develop the village, with this support expected to improve living standards in rural communities. Local governments are expected to focus their budgets to solve these poverty problems. Therefore, poverty alleviation assistance programs at the local level should be a priority and clearly reflected in the Regional Budget (APBD).

2 Literature

2.1 Poverty

Poverty is a condition of economic inability to meet the average standard of living of people in an area. This condition of disability is characterized by low income ability to meet basic needs in the form of food, clothing, and boards. This low income capability will also reduce the ability to meet the average living standards such as public health standards and education standards. The so-called poor condition of society can be identified by the ability of income to meet the standard of living [1].

In principle, the standard of living in a society is not just enough food for the need, but also the need for health and education. Adequate residence or settlement is one of the standard of living or standard of community welfare in an area. Under this condition, a society is called poor if it has a much lower income than the average income so that there is not much opportunity to prosper itself [2].

2.1.1 Poverty is seen as a multidimensional form

Based on the condition of poverty that is seen as a form of multidimensional problems, poverty has 4 forms. The four forms of poverty are [2]:

1. Absolute Poverty

Absolute poverty is a condition in which the income of a person or group of people is below the poverty line so that it is insufficient to meet the standard needs for food, clothing, health, housing, and education needed to improve the quality of life.

2. Relative Poverty

Relative poverty is defined as a form of poverty that occurs because of the influence of development policies that have not reached to all levels of society, causing an imbalance in income or imbalance welfare standards.

3. Cultural Poverty

Cultural poverty is a form of poverty that occurs as a result of the attitudes and habits of a person or society that generally comes from cultures or customs that are relatively unwilling to improve living standards with modern procedures.

4. Structural Poverty

Structural poverty is a form of poverty caused by the lack of access to resources that generally occur in a socio-cultural or socio-political order that is less supportive of the liberation of poverty.

2.2 Gampong Fund Allocation (ADG)

The allocation of direct funds to village is referred to the policy of Gampong Fund Allocation (ADG), which is stipulated in Local Government Regulation No. 7/1986 on Financial Guidance from the District Government to the Gampong Government, that the village finance must be managed effectively, efficiently, economically, transparently and responsibly taking into consideration the principle of compliance and benefit to society. The Gampong Fund Allocation, hereinafter abbreviated as ADG, is the funds allocated by the district government to villages which are sourced from the central and regional finance of balancing funds received by the Regency. Regional Tax Revenue Funds and Retribution Area funds that are allocated by the district government for villages sourced from the share of District Tax and District Retribution received by the District. Thus, the Gamppong Fund Allocation (ADG) is a fund allocated by the District Government for villages which sourced from the balancing funds and which received by villages.

2.2.1 The Management of Gampong Fund Allocation (ADG)

Financial Management of Gampong Fund Allocation (ADG) is an inseparable part of the Village Finance Management in the Village, therefore in Fund Management of Gampong Fund Allocation (ADG) must comply with the Village Fund Allocation Management Principles as follows:

ADG management is an integral part of the financial management of village funds in APBG.

All activities to be funded by ADG are planned, implemented and evaluated openly by involving all elements of the community in village.

All activities must be accountable administratively, technically and legally.

Gampong Fund Allocation (ADG) is implemented by using the principles of efficient and controlled direction.

3 Methods

3.1 Research Location

Besides divided the region into 3 (three) parts of the West, Central / Eastern Region and Northern Region and also divided the region based on the amount of ADG received. Therefore, the research sample was also divided into 3 (three) parts; the region with large, medium and small ADG.

3.2 Research methods

This research uses descriptive qualitative analysis method. Research data consist of primary data and secondary data. Primary data were obtained through interviews, questionnaires and observations.

3.3 Data Analysis Research

With the effort to collect data from various sources so that the necessary data can be collected optimally. The data collected through the questionnaire were processed by using descriptive statistics and presented in percentage form in order to produce indicators in each problem explained.

4 Results and Discutions

4.1 Poverty Eradication Strategy Through the Absorption Ability of Gampong Fund (ADG) in Aceh Besar District

The ADG absorption in Aceh Besar Regency is very varied. Establishment of ADG in Aceh Besar District increases annually. This is determined by several factors, including the wide area of gampong and the increasing number of head of household (KK) in the gampong. The following recapitulates the number of ADGs in Aceh Besar District in Table 1.

Table 1. Recapitulation of Gampong Fund Allocation (ADG) Regency of Aceh Besar Year 2014-2016

Districts	ADG 2014	ADG 2015	ADG 2016
Darul Imarah	2.050.751.000	4.220.041.000	5.863.836.000
Peukan Bada	1.548.217.000	3.077.487.000	4.241.171.000
Darul Kamal	820.598.000	1.679.948.000	3.230.954.000
Indrapuri	2.980.357.000	6.034.648.000	5.929.811.000
Simpang Tiga	1.002.705.000	2.014.187.000	3.599.171.000
Kuta Malaka	890.004.000	1.741.029.000	1.990.005.000
Kuta Baro	2.717.952.000	5.477.502.000	1.694.711.000
Darussalam	1.726.468.000	3.508.743.000	1.817.863.000
Baitussalam	841.912.000	1.734.116.000	5.963.836.000

Source: Central Bureau of Statistics (BPS) Aceh (Processed)

The location of this study in addition to dividing the region into 3 (three) parts of the West, Central / Eastern Region and Northern Region and also divide the region based on the amount of ADG received. Therefore, the research sample is also divided into 3 (three) parts ie the region with large, medium and small ADG. The following divisions of the region can be seen in Table 2.

Table 2. Subdivision of Kecamatan Research Sites Based on Group of ADG Total in Aceh Besar District 2015

Region	Large Fund Group		Medium Fund Group		Small Fund Group	
	Districts	Total of ADG	Districts	Total ofADG	Districts	Total ADG
West	Darul Imarah	2.050.751.000	Peukan Bada	1.548.217.000	Darul Kamal	820.598.000
Central/East	Indrapuri	2.980.357.000	Simpang Tiga	1.002.705.000	Kuta Malaka	870.004.000
Nouth	Kuta	2.717.952.000	Darussalam	1.726.468.000	Baitussalam	841.912.000

Region	Large Fund Group	Medium Fund Group	Small Fund Group
	Baro		

Source: Central Bureau of Statistics (BPS) Aceh [3]

In accordance with table 4.2 above can be seen that each district in Aceh Besar District get different amounts of funds in the Allocation Fund Gampong (ADG). As it is known that ADG is sourced from 10 percent of Aceh Besar General Allocation Fund (DAU) which is then added with 10 percent of Taxes and Area Restribusi. In the allocation of gampong funds done fairly and equitably, which means that is divided proportionally for each gampong based on the value of gampong weight.

In the channeling of gampong funds have a mechanism that there are 4 stages with each 25 percent. The disbursement of ADG is carried out through Bank Aceh, which is shown by the local government where every phase of fund disbursement should be accompanied by the recommendation of the Sub-district Head and the subsequent disbursement of funds after the gampong prepare the Consumer Accountability Report (LPJ) for the next quarter. Thus each gampong must prepare a monthly report to account for the realization of ADG users and all expenditures on the use of the Gampong Fund on the conformity between LPJ and Qanun issued by the local government of Kabupaten Aceh Besar.

4.2 Poverty Alleviation Efforts through Increasing the Absorption Ability of Village Gampong Allocation (ADG) in Disadvantaged Villages in Aceh Besar District

In the Year 2015 recorded that the population in Aceh Besar district is 392.584 people, can be estimated population density reached 135 people / Km2, and the rate of population growth reached 4.02%. In the same year the number of poor can reach 62,270 people, with a poverty line of Rp. 366,676 per capita / month and poor level 15,93%. The number of poor people in Aceh Besar district from year to year experienced a relatively satisfactory decline. This can be seen in the following table (Table 3).

Table 3. Number of Poor People (Thousand Soul) in Aceh Besar District

Years	Number of Poor People (Thousand Souls)
2014	62.37
2015	62.27
2016	62.03

Source: Central Bureau of Statistics (BPS) Aceh [4]

The provision of direct assistance in the form of Gampong Fund Allocation (ADG) and sourced from APBK becomes a real form of government policy in an effort to develop gampong by supporting the improvement of physical infrastructure and non-physical village. With this support is expected to increase the standard of living in gampong communities, where all parties namely the village community also took part in the development of the village. The allocation of funds is also used in the empowerment of rural communities to improve the power of the community towards an independent community condition.

5 CONCLUTION

We hope you find the information in this template useful in the preparation of your submission. Based on the results of research can be concluded that:

The ADG received by the Gampong Government is used for the Permanent Income of Keuchik and the Village Apparatus, the Keuchik Allowance and the Village Apparatus, the Tuha Peut Gampong Allowance, other Gampong Allowances, the Orphan Support and the Pre-Prosperous Family Rice Transports, and other expenditures.

Direct assistance in the form of Gampong Fund (ADG) allocation and sourced from APBK becomes the real form of government policy in the effort to develop gampong by supporting the improvement of physical infrastructure and non-physical village. With this support is expected to increase the standard of living in the community gampong.

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Development Model of Psycho-educative and Psycho-religious in Coping Deviant Behavior in Early Adolescence

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Abstract. This study aims to understand early adolescences parenting care models by parents in shaping psycho-educative and psycho-religious, by taking samples in North Aceh district, Aceh Province, Indonesia. The social reality of the last decade shows a wide range of behavioral changes among early adolescents that increasingly hit the world of education in general. Cases of bullying, sexual harassment, rape and drug abuse among teenagers have troubled parents, communities, child psychologists, educators and educational observers. This social fact in the cultural setting of Acehnese people in particular and Indonesia, in general, can be considered a shift of new behavioral values. The results of this study signal that families need to monitoring the progress of their children and need to focus on the care of psycho-educative and psycho-religious aspects, so that when children enter junior high school age and face the hustle and bustle of social reality, early adolescence is not rigid and able adjusting himself comprehensively with reference to his religious knowledge.

Keywords: Early adolescence, Parenting, Psycho-educative, and psycho-religious

1 INTRODUCTION

In the last decade, deviant behavior in adolescents such as; drug use, prostitution and criminality in various parts of Indonesia, including in Aceh spread drastically and craze. The latest data released by government agencies and non-government organization (NGo) is astonishing. The National Narcotics Agency (BNN) report 2014 mentions that nationally the projection and scenario of 2015 students who use drugs around 1,178,300 people. and will increase in 2016 to about 1,225,700 students. The projected increase in 2015 is around 211,900. Then the increase in 2016 increases the projection to about 218,900 people. In addition to the abuse of narcotics and illegal drugs, juvenile delinquency is related to sex, pornography, andpornoaction. In 2014, Deputy for Family Planning and Reproductive Health (BKKBN) released the results of the survey, which is 46% aged 15 -19 years have sex. National Census data even show 48 - 51 percent of pregnant women are teenagers. Furthermore, the National Commission for Child Protection also gave information about

teenage deviant behavior that of 4,726 respondents 97% had ever watched pornography, and 93.7% said they were not virgin. Even 21.26% admitted to having an abortion.

This condition is in contrast to the parenting process at home and also the teaching process of teachers in Indonesian schools. In general, parenting process and education process at school still put forward the application of moral values, the socio-cultural heritage of the nation. This is expressly mentioned in the Law of the Republic of Indonesia Number 20 Year 2003 on National Education System that the goal of national education of Republik of Indonesia to educate the life of the nation and develop humanity as a whole, that is man who believes and piety towards God Almighty and virtuous noble character, knowledge and skills, physical and mental health, a solid and independent personality and a sense of people and national responsibility.

2 LITERATURE REVIEW

2.1 Parenting Contexts

Education is practically oriented to a certain value to guide, teach and train students (children) so that the child can improve, develop and distribute all the potential of physical, spiritual, intellectual and lust, so the child can live more satisfied and good, productive and responsible morally in order to meet the needs of himself, his family and the broad community, nation and country, concluded Baihaqi [1], responded to the opinions of world education experts. Therefore, the parenting context is identical to educating the child to fit his or her desired expectations. The study of literature that the model of child care in various dimensions of life tends to pivot on modern thinking. For the most part, Indonesia's society and education system adopt modern parenting models. Yet the meaning of nurturing or educating children is not solely related to sending children to study science, but more broadly than that, namely to pay attention to mental-emotional, mental, intellectual, mental, social and mental-spiritual in the overall meaning that the child's growth will be complete. Parenting of child is generally understood as a parent or family way of educating their children. Educational views related to parenting as the behavior of parents to guide or teach children to be empowered cognitive, affective and conative aspects in a balanced and plenary. Parenting is a conscious effort made by parents to form the child's personality [2].

Daradjat [3], raising a child means educating and nurturing the child, taking care of his food, drink, clothing, and success in the first period until adulthood. Shochib (2010), explained in the pattern of parenting is known there are two dimensions of behavior that is directive behavior and supportive behavior, involving direct communication where parents describe the role of children and tell the child what they should do, where, when, and how to do a task. The second parenting style involves two-way communication where the parent listens to the child, encourages, encourages, poses positive strikes and helps to direct the child's behavior. A self-disciplined child has self-organization based on religious values, cultural values, societal rules, life-views, and meaningful life attitudes for himself, society, nation, and state. Indira [4] mentions several criteria of loving parenting so that it is considered this parenting pattern, effective in coaching the child's personality, between;

a. Pattern should be dynamic

Parenting should be consistent with the growth and development of children. For example, the adoption of parenting for children under five is certainly different from parenting for school-aged children.

b. Patterns must be in accordance with the needs and abilities of children.

The potential of the child has begun to look like if hearing the music, he is more interested than children his age, if parents already have a picture of potential children, then he needs to be directed and facilitated.

c. Mother and Father must be compact

Father and mother should apply the same parenting pattern. In this case, both parents should "compromise" in determining the values that may and should not.

d. Patterns must be accompanied by the positive behavior of parents.

Implementation of parenting also requires positive attitudes from parents so that it can be an example/role model for their children. Embed the virtues of goodness with an easy to understand explanation.

e. Effective communication

The requirement for effective communication is to take time to talk to the child. Be a good listener and do not underestimate the opinion of the child.

f. Discipline

The application of discipline also becomes part of parenting, start from small and simple things. For example, cleaning up the room before leaving for school children also need to be taught to create a daily schedule so that it can more regularly and effectively manage its activities.

g. Parents are consistent

Parents can also apply consistency of attitudes, such as children should not drink cold water when being coughing, but if the child is in good health it is okay.

2.2 Psycho-Educativeand Psycho-Religious in Parenting

The process of teaching children in the womb can only be done by their parents, and it is impossible to be done by teachers because all the needs of children in the womb can only be understood by their parents. Consequently, developmental psychologists share a few of developmental stages either before birth or after birth so that the educational process is carried out on the intended target. In many kinds of literature it is mentioned that the process of growing a child fully, is influenced-at least-by four factors that interact with each other, that is an inorganic-biologic factor, psycho-educative, psycho-social culture and psycho-religious. The child will grow healthy if all four factors are met well. Patterns of parenting by the family, not just give advice and knowledge guidance only. But need to pay attention to physical needs of children, such as kosher and nutritious food. Because in terms of intellectual mental development, ex: level of intelligence and mental-emotionalaccording to the study of health much determined by the development of the central nervous and other physical organs.

Therefore, a mother who is in the comb with her physical and mental condition must be primed so that her baby can grow healthy and well developed [5]. In the care of children also demand parents in a prime, good attitude, methods and good personality, so that the education is given to hit the target. Child behavior, according to psycho-educative and personality is driven by the imitation process and the identification of children against the behavior of parents or their families. Because the primary and first educational process of a human being

originated from his family. Therefore, the provision of psychological food to children will have a significant impact on the mental and moral development of children in the future. Batista (in [5]) says the most valuable inheritance parents can give to their children is a few minutes each day. Compassion, attention, education, and coaching are psychological foods that parents need to give to children, so that will give birth to a healthy generation psychologically in the reality of social life.

3 METHOD

3.1 Research design

This research uses the qualitative approach with descriptive method. While the informants of this study the parents in some of Village in North Aceh District, Aceh province, Indonesia, namely; Bungkah Village, Keude Mane Village (Muara Batu sub-district); Village of Sulu Barat Cot Murong (Dewantara Sub-district), Village of KeudeGeudong (Samudera Sub-district), Village of Keude Paya Bakong (Paya Bakong Sub-district).

3.2 Data Source

The taking of data of this research by means of; (1) in-depth interview, by asking questions to informant (head of household) to get complete, deep and comprehensive information; (2) observations were conducted to map the study sites and also to analyze the behavior of the new children, and (3) documentation studies, in the form of research reports, journal entries, and other relevant information.

3.3 Data Analysis

The data in this study were analyzed according to the interaction model of Milles and Huberman (1994) by means three stages:
1. Reduction of data is the process of selecting and simplifying rough data arising from field notes.
2. Presentation of data is the presentation of a collection of information in the form of narrative text assisted by metrics and tables.
3. Conclusions are searching for meaning, patterns, explanations, causal paths, and propositions.
   Based on the model, then the data analysis is done carefully and systematically by way of verification, cross-check and a checklist of various field notes, so that the existing data is validity tested.

4 RESULTS AND DISCUSSION

4.1 Parents' Knowledge of Child Care

To get a full review of parenting in the new educational process can be analyzed after the disclosure of parental knowledge related to the style and the way each of them educates their

children. Related information can be described based on a several of interviews with parents from somevillages in Nort Aceh districts. One of the people of Keude Mane, MuaraBatu sub-district of North Aceh District, him stated that: "*Yes, caring for ordinary children, as well as people by providing food, clothing, affection, sending and delivering to the place of study. For my children's education is very important, so they will be smart later. Yes ... the name is also the parents. Let ..want the future of the child better than us. Although I am not high school, for me, my children do not like his father is not high school*"(Interview with Abubakar [45th], 14/42016, a resident at Keude Mane village, Kreung Mane, North Aceh).

This knowledge of parenting by the residents is derived from the results of study and discussion with others, as well as the results of his observations on the reality of life. Also in accordance with the meaning of the role of parents as a role modelfor the family and the demands.Furthermore, another resident in an interview with TgkSulaiman, at KeudeBungkah village, North Aceh district, he is stated that: "*For me, giving a child's education is an obligation of parents, so that children know what the parents mean to them. Yes, it has been a religious command to educate our children, especially the important religious knowledge we prioritize in order to know God, know their obligations after their baliqh [Arabic term]. Public education is also important so that children are no less social, if combined religious and public education, I think children will be able to put themselves in this life well. The way we as parents also do not get bored to give understanding to them, even though they are adults, still our obligation to give good advice.*" (Interview, 15/4/2016).

However, parents always emphasize that children's education is an obligation of parents and all parents are determined to raise children by giving education as best they can, even though the villagers do not get a formal education commensurate with modern conditions. In the meantime, people in the interior of Aceh the eastern part of the north also has a similar view.

This is as expressed by Sabaruddin (50), that: "*Educating children is not easy, but it is the obligation of parents to make children happy. I even made a kind of schedule since my son was in elementary school. The goal is that they can set the time and discipline later when you can bathe yourself and rub your own clothes. Indeed the way we educate different children yes ... I sometimes often ask the opinions of ustadz [Arabic term) and community leaders when after prayers in congregation meunasah*". (Interview with Mr.Sabaruddin, 22/4/2016 at KeudePayaBakong sub-district, North Aceh, Aceh).

In the meantime, the results of interviews with residents Geudong village, North Aceh district, Aceh, related knowledge of parents about the pattern of parenting more refers to the condition of the parents' own history. This is stated by Mr.Bukhari (50th), as follows: "*Yes, it depends on how young we are, if we still have people and the time of school still hear and obey the mash and advice that our parents taught, when we already have children also contagious. I used to be trained by my parents quite tight, my parents want me to be a successful afterlife. My parents taught me also the ethics of life, I still remember until now, that you must succeed in school and have to study religion today, yes when I am old like this can teach my children, give soft advice and teach them with my ability to make their life well in the future*"(Interview with Mr.Bukhari, in KeudeGeudong, dated 23/4/2016).

The informant's experience also contributed significantly to the development of psycho-education and psycho-religious children. Various experiences and advice and lessons that parents have can be taught to cultivate aspects of psycho-education and religious children.

4.2 Development of Psycho-educative and Psycho-religious Child

Parents who become informants of this research generally know the term of general education, such as elementary to upper secondary school and religious education, such as recitation of the Qur'an in meunasah (Aceh term), mosques and wider religious knowledge in dayah or pesantren. With this review knowledge in general, the family/parents focus on the reality of parenting or providing education of children from primary school through high school to try their best in both aspects of education. Similar opinion Mr.Abubakar (45th) resident Keude Mane,MuaraBatu sub-district, North Aceh district, Aceh, he is sad: "I am not a long school, as I know, I educate my children by giving good teachings or advice. I put my children to the study site on the night about 2 hours and also accompanied them to study, and during the school day, in order to read and write. Basically we parents must meet the needs of our children, they don't know their parents when they are developing". (Interview,14/4/201).

Another informant, in MuaraBatu District, North Aceh.TgkSulaiman (48th), stated that: "In educating children at home, for me, it is important education, especially religious education. If our children do not know the religion, they are sure if they grow up, do not know their parents, do not know their environment, do not know God the Creator. So as much as I can teach the science of religion, although my children also I enter into the recitation, so they are more excited again to study and study the teachings of religion. Then I send them to school as well as Islamic school (madrasah), for example, the age of 7 years, I enter into Islamic elementary school (MIN), whose brother is 14 years old school in Islamic junior high public school (MTsN). That way what is taught in the house and in the place of the studying (the Qur'an) don't forget" (An Interview, 15/4/2016).

A similar understanding is also revealed from the habits of Mrs.Halimah (48th), a middle-aged woman who has been a 2nd-year singles parent for her family in Cot Murong village, North Aceh, his said: "I don't know the terms of today, sir, as told in the television. I take care of my children as well as other people, give and instruct the school gently, so do I with the science of religion, besides taking them to the recitation bale to be able to recite the right and know the correct ways of worship in place my Leung. That's how to raise my kids since his dad no longer exists. Alhamdulillah, my children still hear their mother, very grateful to me, hopefully, they can continue their study later"(Interview, 20/4/2016).

Furthermore, other residents also have a parenting way that is almost similar to previous informants. Mr.Sabarudin (50), who states that: "For me, the importance of my children-I can stabilize the inner needs of happy children, such as religious education as well as adequate general education while I am still healthy and aged by God, all I do for children. Although I am not a rich person, I am very grateful to be able to send my children to college and also able to include children's fatherhood. Right day school children, a night at Qur'an recitation center (dayah, term Arabic), his name also dayah in kampong I can control. So that's how I educate children if they have college also live in dayah". (Interview, 22/4/2016 at KeudePayaBakong, North Aceh).

Description ofsomeinterview result can be interpreted that the application of education from family at home is focused on the development of psycho-educative and religion. How to educate children also begins at elementary school, in this way when children enter the early adolescence years (ABG), although there is a fight within the child can still be neutralized, so with the strong attention of the family of children aged ABG can understand he still has a family. This informant takes care of loving care and attention to every important need for the development of her child, but firmly by not allowing her children into a non-directional relationship. This results in the care that the family expects in this social reality.

4.3 The Parental Barriers in Parenting of Early Adolescence

In relation to this condition, in the process of childcare does not mean there are no obstacles or obstacles faced by his parents, but quite a lot of obstacles and challenges, both driven by internal factors family and the influence of the surrounding environment. Some of obstacles in the new parenting of parents in North Aceh district, Aceh, can be seen from the following descriptions of interviews.

The experience of Kreung Mane residents, North Aceh district, Aceh-Indonesia Mr. Abubakar (45th) in educating his children, full of bitterness and lamented, but this person apply the patient patience always when faced with problems.

The description of the obstacle statement felt by the father of four children is: "*Oh, there are so many obstacles and obstacles that I feel in raising children and teaching useful knowledge for the future of children. His name is also a villager. The obstacles we face of course the problem of the family economyis mediocre, sometimes the money for the children's snacks alone is not enough, but with promises I promise, the children also understand. Other obstacles also exist, lazy children learn because of embarrassment there is no book package, because of not enough books package, yes forced to have a potato yes. Because loads like indolent children learn. This is when indolent learning sometimes a problem for me, yes one-one way is patient* ". (Interview with Mr.Abubakar, 14/4/2016, in Keude Mane village, Kreung Mane, North Aceh).

Similar views were also expressed by Mr.Sabarudin (50th), who works as a builder and planters in KeudePayaBakong village every day. According to him, "*Yes there are many obstacles and obstacles in developing teenagers, I have two children who are in junior high school, one woman is third grade, and the new men first grade junior high, his second brother is second class high school, the eldest already studying in Banda. Sometimes I almost cry when the kids ask for money again no money at all. We are in the village, the most to the rice fields and there is also a rambutan garden patch. That's my income, but once I try to make the children able to school and also diligently study and study the science of religion. I nurse them if at home often give advice only, and also prohibit if already neglected to learn*". (Interview with Mr.Sabarudin, in KeudePayaBakong village, 22/4/2016).

Furthermore, the statement submitted by Mr.Bukhari (50th), one of the residents of KeudeGeudong, who is a teacher of elementary school, is also not much different from the views of other residents. "*Obstacles and obstacles in guiding children at home must many once, but Alhamdulillah can be controlled. I think with the way I give confidence and choice in children, they turn out to choose to go to school, studying religion in dayah or they want to be homeless. I give advice and explanation as you know, children choose a school and also to dayah, accidental dayah near home, so no need to stay out studying Qur'anieleventh clock at home. I pray every time I pray that my children will be guided to the right path*". (Interview with Mr.Bukhari, at KeudeGeudongvillage, North Aceh, 23/4/2016).

Based on the description of the interview above, it can be understood that in general the people of the village experience difficulties in educating and nurturing their children. Constraints often occur in economic terms. In addition, if the child has less motivation to learn fostered back the spirit of learning so that enjoy children return to study.

4.4 Discussion

Theoretically, early adolescents are identic to teenagers, were a period of transition from childhood to adulthood. This period according to psychologists is a turbulent time in order to

stabilize maturity from the physiological, psychological and social. Usually, ateenager can be understood as anindividual who transitions from childhood to early adolescence, so that physical, psychological, social and economic conditions also change. From some psychological research reports about parenting, school children concluded there are at least two important things that must be recognized and considered parents/family at home and teachers in schools, namely the context of self-confidence and self-concept child or adolescent. WHO limits the concept of self-confidence as a behavior that makes individuals have a positive and realistic view of themselves and the situation around them [6]. Neill [7] said,self-confidence the extent to which an individual has faith in his judgment of his ability and the extent to which the individual can sense the rightness to succeed. Bandura (in Hurlock [8]) self-confident is a belief someone to be able to behave in accordance with expectations and desires. Therefore, it can be understood that self-confidence is an individual positive attitude that enables him to develop a positive assessment of himself and the environment or situation. In the meantime, self-concept is defined as all thoughts, beliefs, and beliefs that are individual knowledge of himself and affect relationships with others [9]. Calhoun & Acocella [10] explains that there are at least three important aspects of human self-concept: knowledge, hope, and self-assessment. From the findings of this study in various research purposes can be analyzed that from parents knowledge about parenting, illustrates that in general, the people of North Aceh have adequate knowledge in nurturing or educating school-aged children, including children of early adolescence.

5 CONCLUSION

In general, parent of knowledge in North Aceh in newly grown children (ABG Indonesian term), has a common view, that childcare is considered an obligation for every parent to provide a complete education for the child. In addition, according to residents parenting also the command of religion, so inevitably parents should be happy to provide education to children since elementary school age with a gentle and affectionate way so that the child's emotions stable in the face of reality.

The application of parenting is more focused on fostering and empowering aspects of psycho-educative and psycho-religious since both aspects are considered as something that can balance the conditions of child development in social reality in the future. In addition, residents also understand that the aspect of general education and religion of their children is very important for future life in line with the needs of the development of the era.

In the educational process of children, every parent perceives the various obstacles. The main constraints faced by society in nurturing the early adolescents are economic problems and the child's internal condition (understood as a different child character) as an implication of the physical and psychological development of the individual. In addition, the influence of cultural environment and social change also drain the energy of parents, both in the sense of physical and psychological in the reality of childcare.

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The Diagnosis of Conflict Management Within the Organization

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Abstract. The presence of the conflict within the organization is inevitable. The conflicts in the organization can occur among individuals, for instance, conflicts betweena leader and staff members, an individual and a group, and a particular group and the other. In fact, not all conflicts could harm the organization; it is widely believed that well-organized and controlled conflicts could inevitably benefit the organization as a unity. The discussion about conflicts within the oragiziation is strictly needed since conflict will unavoidably arise in every organization. Thus, in order to solve this issue, we need to understand how to diagnose and manage the conflicts properly so that we can cope with the conflict well

Keywords: Conflict Management, Organization

1 INTRODUCTION

A conflict tends to emerge in any groups and organizations.It is strongly related to the feelings of human beings, viz. negeleted, underrated, unappreciated, abondened, and annoyed due to disharmony during the work.The conflict itself derived from the Latin verb configure, which means to hit each other. Sociologically, conflict is defined as a process between two or more people, or even a group of people who is trying to get rid of the other parties through destroying and making them powerless.

Various feelings already mentioned above could cause outrage, which would potentially lead to conflict at anytime. Such circumstances will affect an individual performance and productivity in carrying out the organizational activities. The emergence of the conflict within the organization is caused by many factors such as state of the art technology, intense competition, cultural differences, value changes, and other individual personalities.

Handoko argued that organizational conflict is a mismatch between two or more members of the group, or groups of organizations arising due to the fact that they have to share limited resources or work activities; or simply because they have different status, purpose, and perception [1].

Based on above definition, it would then be related to the one of the most significant parts in the organization, which is how a leader has to understand the factors causing conflicts among both individuals and groups. A proper understanding about those issues would make it easier for a leader to overcome the conflicts.

A leader should be able to harmonize a different group of people, bring together various interests, and utilize all capabilities in order to achieve a goal. As stated by Robbins [2], "An organization is a consciously coordinated social entity, with a relatively identifiable boundary, that function on a relatively continuous basis to achieve a command goal or set of goals."The pattern of interaction in the organization is supposed to be regulated in order to obtain the balance and harmony among members, and avoid redundancy. Furthermore, a leader also has to ensure the critical tasks accomplished well and an organization should have a relative and identifiable boundary.

Restrictions could be changed in a certain period of time, but a real restriction should exist in order to differentiate the various interests. Conflict management is crucial; it is simply because any changes within an organization tend to lead to a conflict. For instance, it can be seen from Samudra University, during its transition period, there are a lot of institutional changes found in the university. It, then, alters not only the structure and personnel of the university but also impacts the organizational and personal relationships, which could potentially lead to a conflict.If the conflicts are not managed properly and thoroughly, it will disturb the balance of the resources and the relationships between the involved people.

The failure to overcome the conflict could lead to harmful consequences. Conflict can destroy the organization of an institution through the creation of a dividing wall among co-workers, causing poor performance, even resignation, and disunity within the organization body.Discussion of conflicts in organizational behavior is very crucial because there will be a conflict in every organization; hence, to overcome the conflict, we need to understand some issuesin order to deal and cope with the conflict well.

The performance of the organization requires an optimal level of conflcit because it is widely assumed that without a conflict, there will be no chance to bring success into the organization. Therefore, it is necessary to manage the conflict so that the conflict can be maintained at a certain level (optimal) in order to create a conducive situation within the organization and improve the quality of work. The main purpose of the organizatin is to achieve something. This "something" is a goal, and it can not be achieved by self-employed individuals. It can only be fulfilled efficiently through the group efforts.

2   Literature Review

2.1   Definition of Conflict

According to Robbins [3], the existence of conflict in organizations is determined by the perception of individuals and groups. If they fail to realize that there has been a conflict within the organization, there is no conflict then.Conversely, should they perceive that there is a conflict in the organization, the conflict then becomes a reality. Stoner and Wankel [4] stated that organizational conflict is a mismatch between two or more members of the organization, arising from the fact that they have to share in obtaining scarce resources, job activities or due to their different statuses, goals, values or perceptions.

Organizations recognize the need to coordinate the formal patterns of interaction of the organizational members.

Moreover, the organizational structure determines how the task will be shared, who reports to whom, and the formal patterns of coordination and interaction to be followed. As stated by Robbins [2] an organizational structure has three components: (1) complexity; (2) formalization and (3) centralization. Complexity considers the degree of differentiation that exists within the organization, including the degree of specialization or level of division of labor, organizational hierarchy and to what extent organizational units are dispersed. Formalization, looking to what extent an organization relies on rules and procedures to regulate the behavior of its members.

In general, the organizations operate with minimum standardized guidelines, and consider where the decision-making lies in order to be centralized within an organization. Problems are poured into the top management and appropriate action is then chosen; or the decisions are scattered down in the hierarchy but the realdecisions remain at the top management

Furthermore, Gibson, Ivancevich and Donelly suggests that conflicts within organizations arise as a result of communication problems, personal relationships, and organizational structures. Conflict can normally happen at any time and considered as a natural event and social reality occurring in the institutional process. Conflict is not an objective and real phenomenon, but it exists in the minds of the people involved in the conflict. So in dealing with conflict, a good leader is expected to be empathetic, understand the situation as perceived by the perpetrators of the conflict, and the most important element is persuasion, which is a subtle persuasion by giving good reason and prospect in order to successfully convince the perpetrators.

2.2 The Causes of the Conflict

According to Robins [3], conflict emerges because of the antecedent conditions. The condition, also called a source of conflict, consists of three categories, namely: communication, structure, and personal variables.

Communication, poor communication in the sen-se of communication that creates misunderstanding between the parties involved can be a source of conflict. That semantic difficulties, insufficient information exchange, and disruption in communication channels are a barrier to a good communicatio-

on and could create a conflict.

Structure, the term structure in this context is used to describe: size (group), degree of specialization given to group members, clarity of jurisdiction (work area), compatibility between member goals and group goals, leadership style, reward system and degree of dependence among groups. Research shows that group size and degree of specialization are the variables that encourage conflict, the larger the group and the more specialized the activity, the greater the possibility of the conflict.

Personal variables, other potential sources of the conflict are personal factors including: the value system of each individual, the characteristics of personality that make the individual unique and different from the other. The fact reveals that certain types of personality, such as emotional, anxious, tense, frustrated, and hostile, are considered as a real conflict. Should we fail to deal with the conflict immediately, it then could lead the involved parties to attack, threat, riot and other negative acts either verbally or physically.

The same opinion is expressed by Handoko [1], arguing the causes of the conflict are: (1)Communication, where misunderstandings are strongly related to sentences, incomprehensible language, or ambiguous and incomplete information; (2) Structures, i.e. interdepartmental power struggles with conflicting interests or judgment systems, competition

for limited resources, or the interdependence of two or more working people to achieve their goals. (3) The personal matter, which is the discrepancies of an individual's personal goals or personal values with the behaviors played in their positions, and differences in values or perceptions.

Kreitner and Kinichi [5] stated that there are 12 factors causing the conflict, namely: (1) incompatibility of the personality of the value system; (2) unclear or overlapping work limits; (3) competition for limited resources; (4) insufficient information or communication exchanges; (5) interdependence in work; (6) organizational complexity; (7) unclear or unreasonable rules, standards of work, and policies; (8) unreasonable job deadlines that are difficult to fulfill; (9) collective decision-making; (10) decision-making through consensus; (11) unfulfilled expectations and (12) fail to resolve and conceal the conflict. Further, Stoner and Freeman (1989) argue that the causes of conflict are: (a) shared resources, (b) differences in goals, (c) interdependencies of work activities, (d) differences in values or perceptions, and (e) individual styles and organizational ambiguities.

3 Methods

The diagnosis of conflict in this paper will be presented from a continuum view model of Greenhalgh [6], whose explanation is as follows:
a. Problems in question. If the issue of conflict is a matter of principle, then the conflict is difficult to solve, because sacrificing principles is viewed as sacrificing personal integrity. Once the principal issues are linked, the involved parties try to argue that the views of the other side are wrong. If such a thing happens, then the form of intervention that can be done is to ask all parties to acknowledge that they understand the views of each other, though still believe in their own views. This way is more likely for all parties to advance in the negotiation process, rather than remain in their respective positions.
b. The bet size, the greater the value at stake in the debate, the more difficult the conflict is solved. For example, the acquisition policy (data recording and then processed through the compiler) which the leader deems harmful to his position. Such leaders are subjective-minded and perceive the stakes are very high. He, therefore, will try desperately to oppose the acquisition process. Hence, in this case it takes a persuasive approach by delaying the settlement, so that all parties become less emotional.It is better to be done during the postponement period so that each side can reevaluate the issue at stake and try to be objective in their judgment.
c. The interdependence of the involved parties, the parties involved in a conflict can find out themselves in a series of "zeroes" interdependence to "positively". Mutual reliance amounting to zero is the perception that if a party obtains something from the interaction process, then it means the sacrifice of another party. The positive dependence of each other is should both parties equally benefit from the interaction process. A zero-sized relationship makes conflicts difficult to solve because this relationship focuses narrowly on personal gains, rather than on the acquisition of both parties through cooperation and problem-solving. If that happens then both parties must be persuaded to consider how they can benefit from one situation.
d. Continuity of interaction, the dimension of continuity of interaction relates to the time horizon in which all parties see themselves relating to each other. If they visualize interactions that occur as long-term interactions or something that is continuously

connected, then the conflicts that occur will be more easily resolved. Conversely, if interaction is seen as a short-term relationship then the conflict will be difficult to be solved. So the parties involved must be persuaded to realize that their relationship does not stop here, or when the conflict occurs, but there will be another continuous relationship in the future.

e. Structure of the involved parties. Conflicts are easier to resolve should one party has a strong leader who can unite his followers to accept and execute an agreement. If a weak leader is involved in a conflict, the agreed outcome may be hindered by those who may dislike some of the contents of the agreement.

f. Third party involvement, people tend to be emotionally involved in conflict. Such involvement can lead to some influences, viz. perception can be broken, irrational thought processes and arguments emerge, resulting in unwarranted stance, broken communication, and personal attacks arise. Such influences cause conflict to be difficult to be solved. Facing such a situation, the role of a neutral third party is indispensable. Neutral third parties will be more acceptable to the parties involved, because they prefer the evaluation of others rather than in the evaluation of the opposing party. The more authoritative, powerful, trustworthy, and neutral third-party, the more likely the parties involved in the conflict to control their emotion.

g. Conflict Progress, it is difficult to resolve the conflict if all parties involved are not ready for a reconciliation. If each party feels they are the most disadvantaged, then the conflict is difficult to be solved. So the important thing to do is to persuade the parties involved in order to make both of them suffering from the conflict. The involved parties should be brought in the same position so that they are willing to volunteer and take part in resolving the conflict.

4 Discussions

The following table is presented the model of conflict diagnosis based on Continent view:

Dimensions	Difficult Solution	Easy Solution
The questionable problems	Principle issues	Shared issues
The bet size	Large	Small
The interindependence of the involved parties	Zero	Positive Number
Interaction Continuity	Single Transaction	Long term relationship
Structure of the involved parties	Formless or fragmented, with weak leaders	Integrated with strong leaders
Third party involevement	No neutral third party	Trusted, strong, dignified, respected and neutral
The progress of the conflict is seen	Uneven, one party feels more harmed	The parties have harmed each other

4.1 Conflict Management

Dealing with the conflict through affective approach should know the ability of ourselves and those who have conflict. Spiegel cited in Juanita [7] explains there are five actions in the conflict management:
1. Competing, namely: actions taken when self-interest is preferred above the interests of others. This choice of action can be successful if the situation requires quick decision-making.
    A winning-losing situation will definitely occur in this action.
2. Avoiding conflict, this action is taken should one party wants to avoid conflict both physically and psychologically. Avoiding conflicts can be done if each side tries to cool the atmosphere or temporarily freezes the conflict.
3. Accommodations, namely: It happens when one party surrenders and sacrifices some of its own interests or the other party gets benefits from the conflict situation. This action is often referred to as self sacrifing behavior. The consideration between personal interests and good relationships is the main point here.
4. Compromise, i.e.: actions taken by both parties to understand each other and feel that maintaining good relations is strongly needed. Each side will sacrifice some of its interests to get a win-win solution.
5. Collaboration, namely: create a win-win solution by working together.

Kreitner and Kinichi (1995), also stated there are five conflict management styles, in which the model is intended to address dysfunctional conflicts within the organization. This model illustrates five different styles of conflict management. On the vertical axis, it is describing the side of other-oriented problem-solving (concern for others), and on the horizontal axis depicts the side of self-oriented problem-solving (concern for self). The combination of these two variables produces five conflict management styles: integrating, obliging, dominating, avoiding, and compromising, as shown in the figure below:
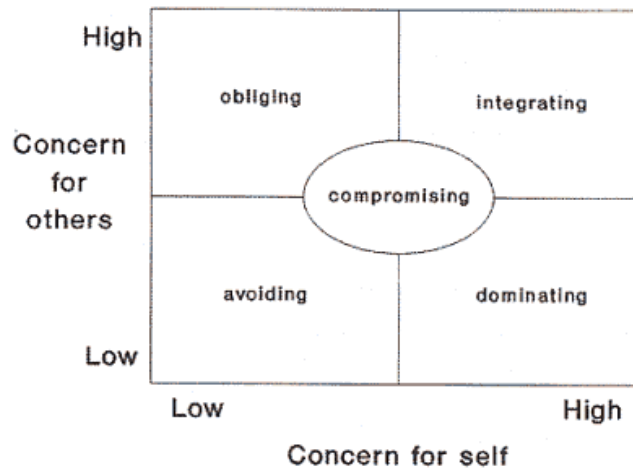
Fig. 1 Styles of Handling Interpersonal Conflict

Integrating, in this style, the stakeholders jointly identify problems encountered, then seek, consider and choose alternative solutions to solve the problems. This style is suitable for solving complex issues particularly caused by misunderstanding

*Obliging,*in accordance with its position in the above picture, someone who is more focused on efforts to satisfy the other than himself. This style is also often called smoothing, because it seeks to reduce the differences and emphasize the similarity and togetherness among the involved parties.

Dominating, Dominating, namely: a high self-orientation, and low concern for the interests of others. This style is often called forcing because it uses formal legality in solving the problem. This style is suitable if unpopular ways are implemented in problem solving; problems that have been solved are not very important, and the time to make decisions is short. However, this approach is not suitable for dealing with the issues requiring participation of those involved.

Avoiding, which is avoidance tactics, suitable for solving trivial problems, or if the costs incurred for confrontation far higher than the benefits gained. This style is not suitable for solving the difficult problems. This style can be used if we face a confusing or ambiguous situation.

Compromising, this style places a person in a moderate position, which equally blends between his own interests and the interests of others. This is the approach of giving and receiving approaches from the parties involved. Compromising is suitable for dealing with the issues involving parties with different goals but have the same power.

The above models are just one of many models that can be chosen in the conflict management. Yet, what model is chosen depends on several factors, including: (1) the background of the conflict; (2) categories of the involved parties in the conflict; (3) the complexity of the problem to be solved; and (4) organizational complexity

5 Conclusion

From above explanation, it can be seen that conflict inevitably arises in the workplace. The role of the leader is crucial for overcoming the conflict, managing it flexibly so that the daily work rhythm is not disturbed.Research proves that the leader spends 80 percent of his total time working on verbal interaction with others, where 20 percent of his time is dealing with conflict, so that the leader may be the first party to the conflict, either a mediator or a third party whose role resolve conflicts among other parties affecting the organizations and individuals involved in the organization they lead.

It can be concluded that a leader must be able to play various management strategies in dealing with conflicts such as: (1) inviting people in conflict with higher goals. (2) looking for common ground and meeting members in conflict.This technique seeks to find the similarities between parties involved in the conflict. It tries to look for similarities in differences since we can be in different rhythms, but we will remain on the same scale. (3) Changing the nature of the people in conflict is very difficult, but it is an effective long-term conflict management. As the leaders, we have to invite the organization member slowly to change his behavior, pay more attention patiently to him, guide him until finally able to become a good institution member .(4). Changing the structure is used when the conflict always blame each other, and (5) using power, this is the most ancient way for conflict management. When a person in

conflict does not want to end the conflict, a leader then has to use the power to overcome the conflict. For example by dismissing him from office, or do a mutation of office.

From all the above descriptions, The most important part of the leadership is able to create a competition, namely the use of power associated with the duties of its members through efforts to increase motivation among staff, resulting in a healthy competition and can work together. If the parties of the conflict work together to resolve the conflict, then the conflict can be resolved satisfactorily

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Language Politeness In Political Communication: Analysis of Leech's Politeness Principal on the Aceh Governor Candidate Debate in 2017

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Abstract. This study aims to analyze the realization of linguistic politeness in political communication of governor candidates' debate. One form of current campaign is a candidate debate. The Independent Electoral Commission (KIP) in Aceh also began conducting the first candidate debate in the 2017 governor election. It is hoped that from the debate, the people can choose their prospective leaders more objectively by looking at their vision, mission, strategy, and policy through the debate. Furthermore, the community also assessed their attitude, behaviour and speech acts of the candidates pairs. Speech acts reflecting the use of the candidate's language, in other words language is one of the main means of politics. The study was conducted by analyzing the data of candidate pair debate in Aceh involving 6 candidate pairs competing in the 2017 election in Aceh province. The data were then analyzed based on Leech's linguistic principle. This research shows that there are some violations of linguistic politeness during the debate process. Linguistic politeness strategy should be a serious concern for candidate pairs in the upcoming campaign, because language in the political dimension is one powerful tool to gain and retain power.

Keywords: Linguistic politeness, Political communication, Leech's linguistic principles

1 INTRODUCTION

Political communication and linguistic politeness of politicians get the spotlight in an effort to communicate their vision of mission to society. How to communicate in terms of content and language when dealing directly with members of the community, especially in the the debate of Aceh governor candidates, is a great concern for public speaking. Candidate debate forum or candidate dialogue is one means to improve the quality of candidates, because in this forum the candidates will explain the background of nomination and the agenda that will be done if elected. The candidates can also convince the people with constructive and critical minds. Communities are free and democratic will know the agenda offered by the candidates.

In addition to vision-mission, in a situation of inter-candidate competition, candidates must be able to create a good self-image. During the candidate debate forum, the candidate's self-image is not only seen from the gestures, but also from the speech. Candidates who can take care of themselves and the face of other candidates will get a good image in the eyes of the voting community. In the principle of language politeness, there is a concept of the face that explains that everyone has two faces or desires of the face / positive desire and face / negative desire. From the description, it is important to discuss how a language is used by politicians to maintain self-image by using language politeness strategies in political interaction

The Aceh Governor General Election 2017 has been done on February 15, 2017 and it has also been elected the Governor of Aceh period 2017-2022. The Independent Election Commission of Aceh passed 6 candidate pairs, with a composition of 3 pairs of independent candidates and 3 pairs of candidates from political parties. In contrast to other regions, the Aceh elections passed the presence of local parties, namely Partai Aceh (PA) and Partai Nasional Aceh (PNA) .The public debate was held three rounds, the first round was held on 22 December 2016 at Hermes hotel, Banda Aceh. the second was held on 11 January 2017 at Amel Convention Hall, in Aceh.The third debate was held on 31 January 2017 at Amel Convention Hall The three rounds of the debate were attended by 6 pairs of candidates for governor and vice governor.The Debate process was broadcasted both by local television channels and national television.Thus the entire people of Aceh both inside and outside of Aceh region could follow the course of the debate. Community can assess their future leaders not only in terms of intelligence, leadership, wisdom, but also in terms of politeness in both language in communicating and communicating ethics.

Politics and linguistic links are a phenomenon that politics is a speech (read: language) activity. Roelofs in his book "The Language of Modern Politics" states simply that "Politics is-talk, or rather politics is speaking" [1]. Politics is not just talk, but not all talk is politics. Politics certainly has its own ethics because basically it is the activity of people who manage their actions in a conflict of interests and goals. Every political setting is always marked by disputes and conflicts. On the other hand, language also has the power and dimension emancipotitic, transformative, and open in moral-ethical judgments. Language can be evil and bad especially when it is used as a means of manipulation and indoctination. Instead, language will be good when used as a means to improve human welfare. The phenomenon of language covers the field of socio-politics so that the phenomenon of language has a direct and significant impact on human political reality. Paletz and Lipinski [2] in their working paper states that it is indeed, in communications and political development, it is possible to analyze all social processes in terms of structure, contents, and flow of communication, because the flow of communications determines the direction and the pace of dynamic social development.

Media are now playing an active part in political field. Therefore, candidates of government leaders must be aware of this phenomenon since media can compose a societal institution for the political management of the public sphere and the media logic emerges. Kenterelidou [3] states that governments, in order to comply with the forenamed commitments and these newly coming trends, employ new communication policies and strategies. Furthermore, they set off modern publication, information, and tools such as "infoganda" (information and propaganda). Blumler [4] also stresses on the theories of communication in digital era, that there are a number of more freshly minted theories of voice, actors' roles, holistic and normative perspectives that are needed to be considered in doing public communication.

This paper analyzes speech acts in the framework of the politeness of candidates of governors in their political communication during the candidate debate process. The analysis rests on the relationship of language and politics, the role and function of language as one means to obtain and maintain power. During the campaign period, politicians use certain slogans to convince people of their vision, mission and policy.

2 THEORETICAL FRAMEWORK

2.1 Linguistic Politeness

Linguistic / linguistic politeness is a pragmatic science study, which means that if one discusses linguistic politeness is to talk about pragmatics. The definition of politeness according KBBI is refinement and good language and behavior. Modesty is a behavioral rule that is established and agreed upon by a particular society so that politeness becomes a prerequisite of social behavior. Modesty is a cultural phenomenon, so it may be that what is considered polite by a culture may not be the case with other cultural groups.

The purpose of language politeness is to create a pleasant, effective, and non-threatening interaction atmosphere. Fraser [5] mentions that there are at least four views that are used to examine the problem politeness in speaking, namely: (1) The Social-Norm View. In this view, politeness in speaking is determined based on the norms that apply to a particular society. Santun dalan speak has a parallel meaning of language premises etiquette (language ettiquette); (2) Conversational Maxim and Face Saving. A view that sees politeness as a perfunctory maxim [pan and as an advance facial effort. A politeness view as a conversational maxim assumes the principle of politeness as merely a complement to the principle of cooperation; (3) Conversational Contrast. This view sees politeness as an action to fulfill the requirements of fulfillment of a conversation contract. So being polite is parallel to a thoughtful account; and (4) Sociolinguistic View. Modesty is seen as social indexing. Such social indices exist in forms of social, honorific, and speech references.

Meanwhile, according to Chaer & Agustina [6] in general there are 3 rules that must be obeyed so that our speech sounds polite. The three areas are: (1) formality; (2) hesitancy; (3) and equality or camaraderie. It means that a speech is polite if it does not sound mamaksa or arrogant, giving speech choice of action to the opponent said, so the opponent said to be happy.

Good communication needs to consider the principles of language politeness as suggested by Leech [7][8]. He divided the theory of politeness into six maxim maxims: (1) Tact Maxim. The maxim of Tact dictates that every participant of the speech should minimize the loss of others, or maximize profit for others, (2) the maxim of Approbation requires the speaker to minimize self-gain and maximize his own loss, (3) Maxim of generousity. The maxim of generosity requires the speaker to minimize criticism against others, but must maximize praise to others, (4) the maxim of Modesty requires the speaker to minimize praise to himself, but must criticize himself as much as possible, (5) the maxim of Agreement requires one to maximizing agreements with others and minimizing disagreements with others and (6) maxim of Sympathy requiring speakers and spouses to maximize sympathy and minimize their sense of antipathy.

In addition to the above theories of politeness, Haugh [9] also suggests that politeness involves speakers' showing what they think about themselves and others, addressess'

perceptions of those evaluations. Therefore, in this paper, try to reveal some utterances produced by the politicians to show what they think about themselves and others.

2.2 Leech Politeness Model

In Leech's politeness model, the scale of Leech's politeness is divided into five, namely:
1. Cost benefit scale or loss and profit scale, referring to the magnitude of the loss and profits caused by a speech act on a speech. The more the speech is detrimental to the speaker's self, the more polite it becomes. On the contrary, the more the speech profits the speaker's self, the more discouraged the speech becomes.
2. Optionality scale or scale of choice, pointing to the many or at least options (options) conveyed the speaker to the partner said in the activity speak. The more the speech allows the speaker or the spokesperson to make the choice of a lot and freely, will be regarded the more polite the utterance. Conversely, if the utterance does not at all give the possibility of choosing for the speaker and the speaking partner, the speech is considered to be impolite.
3. Indirectness scale refers to the direct or indirect rating of the meaning of a speech. The more such a direct utterance would be deemed the less polite it is. On the contrary, the more indirect, the purpose of a speech, will be regarded the more polite the utterance.
4. Authority scale refers to the relationship of social status between the speaker and the speech partner involved in the speech. The further the social rank (rank rating) between the speaker and the speech partner, the speech used will tend to be more polite. Conversely, the closer the social status rankings are between them, the tendency to decrease the degree of politeness of speech used in the speech.
5. Social distance scale refers to the rank of social relationships between speakers and speech partners involved in a speech. There is a tendency that the closer the social rank distance between the two, the less polite it will become. On the contrary, the further the social rank distance between the speaker and the speech partner, the more courteous the speech will be.

2.3 Definition of Debate

The term debate comes from English, synonymous with the Sawala language derived from the Kawi language which means holding fast to certain arguments in the strategy of arguing or arguing for salaing defeating or winning the tongue. So the definition of debate is a way of conveying ideas logically in the form of arguments with evidence supporting the case of each debating party.

In Indonesia there are two streams of debate, the first of which is the conventional flow and the second is the flow that follows international standards and is being used in Indonesia. In general, debates are conducted in groups. According to Dipodjojo [10], debate is an oral communication process expressed in language to defend opinions. Any debating party will argue, give a reason in a way that the opposing party argues or the other party who hears the debate becomes confident and in favor of it. While the speech dictionary Dictionary Indonesian (KBBI) debate is the discussion or exchange of opinions about a matter with give each other reasons to defend their opinions.

3 METHODS

This research uses descriptive qualitative analysis where the researcher placed as main aspect. This research emphasizes the deep understanding aspect of a problem. The object of the study was the political debate session of Aceh governor candidate for gubernatorial candidate broadcasted by local tv and private tv. Language politeness in political debate sessions is reviewed comprehensively. Sources of data in this study is the recording of candidates for governor of Aceh in the first, second and third rounds. The first round was held on 22 December 2016 at Hermes hotel, Banda Aceh. The second round of debate was held on 11 January 2017 at Amel Convention Hall, in Aceh. The third debate was held on 31 January 2017 at the Amel Convention Hall.

The research instrument is an observation guideline that contains the maxim of Leech's language politeness with the choice of language politeness and violation of the principle of politeness of language. The scope of analysis are limited on the spoken sentences during the debate recorded and widely open in the www.youtube.com/watch2.

4 Results and Discussions

The result of the study consisted the subjects of 6 pairs of candidates or totaling 12 people all, the utterances taken from the first to the third round debate were 52 speeches that fit the principle of politeness with a percentage of 100%. Principles of politeness in question include: (a) Tact Maxim of 4 speech or 7.6%; (B) Generousity Maxim of 4 speeches or 7.6%, (C) Approbation Maxim of 14 speeches or 26.9; (D) Modesty Maxim of 17 speeches or 32.9%; (E) Agreement Maxim of 16 speeches or 30.76%; and (F) Sympathy Maxim as much as 7 utterances or 13.46%. All the politeness found in the description of the pairs' visions and missions. All of the candidates delivered their visions and missions in a proper and controlled way because their speech was mostly delivered by reading the prepared texts. The intonation and expressions are at accepted politeness.

However, after conducting a study of 52 selected speeches from the 12 Aceh governor candidates, several findings of a maximal courtesy violation were found. Here are some examples of maximal violations:

4.1 Violation of Approbation Maxim:

It contains a violation of the principle of language politeness at the maxim of Approbation because it has increased the loss of others and reduced the profit of others. The abuse of approbation maxim is demonstrated by speech that does not comply with simplicity, which is to reduce self-commendation, in other words the candidate doing maximum dispraises of others. The following is one of 9 violations found in this maxim.

Utterance: " *Bikin JKA mudah, bikin anak lebih mudah, tapi Apa Karya ga bisa itu ... dan saya bisa.*

(Making *JKA* is easy, making children is easier, but Apa Karya cannot do it ... but I can)

4.2 Violation of Generousity Maxim

It contains a violation of the principle of language politeness at the maxim of generousity. Almost all the candidates tried to humiliated the opponents by proposing questions about the oppenents' vision in the coming programmes but added closing sentences by asking some personal criticsm in the past government activities. It is violate this maxim because the spaker did not show the behaviour of giving generous appreciation to others to ask wise and "smart" question concerning the coming visions.

Utterance: " *Bagaimana cara anda menyelesaikan poin poin MOU Helsinky dan turunan UUPA yang belum selesai. Sedangkan anda tidak bisa membuat kekompakan dangan DPRA dengan wakil gubernur dengan partai anda dahulu bahkan dengan kepala dinas yang sering anda gonta ganti"*
(How do you complete the Helsinky MOU points and unfinished UUPA derivatives. While you can not make compactness with the DPRA, vice governor, and even with your party first even with the head of the service that you often mutually replace)

The reply of the oppenent also showed the same violation. The following is one of the examples:

Utterance: " *... Kemudian tadi saudara menyebut sebagai wakil guberbur. Saya itu boleh dikatakan bekerja sendiri. Satu tahun bekerja dengan saudara, kemudian habis itu putus tidak ada hubungan apapa. Jadi alasan sodara saya tidak memberikan jabatan itu salah besar. Jadi ada tugas gubernur anda wakil gubernur. Saudara bukan sopir saya, saudara adalah wakil gubernur saya ..."*
(....then you mentioned as vice governor. It can be said that I worked alone. One year working with you, then finished, no relationship whatsoever. So the statement that I did not give the job was totally wrong. So there are the tasks for governor and vice governors. You were not my driver, you were my vice governor ...)

4.3 Violation of Modesty Maxim

This maxim tries to lead the speakers to appreaciate politeness in delivering speech. In public we have a written standard concensus that in a formal and official event, moreover if it is broadcasted nationally, the have to use a national language. But some candidates in the debates even spoke almos along the speech in local language. It is, of course, not considered as a proper behaviour since not all audiences and tv viewers can speak the local language.

The following is the question proposed by one of the candidates, "*Bagaimana jika anda terpilih menjadi gubernur. Macam mana untuk membangun Aceh sedangkan anda todak memiliki DPRA satu persen pun ...*" (What if you were elected as a governor, whereas you do not have even one percent of voice in DPRA..)

Utterance: " *...Lon nyo peugah bahasa Aceh sebab tanyo mandun ureng Aceh... Jade peu yang ata awak DPR nyan hana lagot. Na dua boh, phon berarti DPR ata diboh le DPR, ata diboh le rakyat, kedua independen ata ipeek le rakyat, menyo han keumah geupulang le rakyat, nyan lheh laju....*"
(I speak now in Acehnese beacuse wea re all acehnese... So what DPR works did not work. There are 2 things, firsty DPR approved by DPR chosen by people, secondly independent.. elected by people, so if they are not trusted anymore.. just recll them....)

The recorded video showed that along the time given (5 minutes) in answering the question, the candidate used local language. Some viewers and even the floor felt uneasy when other audience bursted into tears laughing, while he or she did not understand the utterances of the candidates. As also revealed in the research entitled *Politeness in Cross-Cultural Communication* done by Huang (2008) that found what considered to be polite may not true according to other culture.

It is also found that at least three candidates showed to pay a little attention to the formality by using some local expression like *Bek publoe Mie lam eumpang* (don't buy a cat in a bag). In the earlier research done by Yasmeen *et al* (2014), it is observed that Pakistani politicians make the use of less formal and mixed language.

It was found that the most maxims violated by the candidates are at the three maxims, they are maxims of Approbation, maxim of generousity and maxim of modesty.

5 Conclusions

After conducting a review of the data obtained it can be concluded that most of the language decency violations committed by Aceh's candidate governors tend to violate the maxim of tact, maxim of generousity and maxim of modesty. This means that most of the candidates for governor in the candidate debate produce self-praise speeches, criticizing their political opponents by lowering the rewards. And the percentage of violations to the maxim of modesty is also very high, meaning many topics of discussion are not completed in the questioning, there is no conspiracy of view, but that there is self-defense and out of substance in question. There are several reasons so that speakers tend to try to violate the maxim of language decency in an effort to improve the excessive self-image, besides the governor candidates also tend to drop other candidates through his speech.

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The Influence of Corporate Profitability and Corporate Liquidity on Corporate Social Responsibility Disclosure

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Abstract. The study aimed to obtain empirical evidence regarding the influence of corporate profitability and corporate liquidity to corporate social responsibility (CSR) disclosure in manufacturing firm listed on Indonesia Stock Exchange year 2011-2015. This study is hypotheses testing by using random sampling method. The data used is secondary data. The study employed Multiple Linear Regression analysis. By utilizing slovin formula. the total of 60 sample studies is drawn from manufacturing firm listed on Indonesia Stock Exchange year 2011-2015. Multiple Linear Analysis provided by SPSS 21.0 version. The result shows that: (1) Corporate profitability positively influence corporate social responsibility disclosure, (2) Corporate Liquidity negatively influence corporate social responsibility disclosure, (3) Corporate profitability and corporate liquidity simultaneously affects corporate social responsibility disclosure

Keyword: Corporate profitability, Corporate Liquidity and Corporate Social Responsibility Disclosure

1 INTRODUCTION

In this globalization era, the economy continues to develop, it is indicated by the increasing number of companies that stand today either the small or the large scale. Thus, the number of companies that exist today will certain leads to a competition among the businesses of each company. This matter certainly makes the competition among companies will be more stringent. Competition among companies today are no longer only focused on sales or draw the consumer's attention, yet has spread to many other sectors. Therefore the company in the operations are required to always give the best in order to maintain the life-sustainability of the company as well as to bring profit for the company.

Pointing to the provisions Law No. 1 of 1995, CSR for the company is not something that must be implemented by the Company, but after the enactment of Law No. 40 of 2007 on Limited Liability Company (Company Law), CSR becomes the obligation of the Company. In the provision of Article 74 paragraph (1) of the Company Law, stated, "The Company is conducting its business activities in the field and/or related to the natural resources required to

carry out the responsibilities of social and environmental." Under the provisions of Article 74 paragraph (1) of the Company Law, the CSR becomes mandatory for the company which is engaged in the field of natural resources.

There are several objectives of the establishment of a company, but main reason is to get the maximum profit or to achieve the level of maximum benefit. Success in achieving the main objectives of the course will affect the prosperity of the owner of the company or the stockholder [1]. CSR is defined more broadly as the company's commitment not only to provide goods and services that are good for the community but also maintain the quality of social and physical environment, also gave a positive contribution to the welfare of the communities places so that emphasis on how the company delivers what people needs [2].

This study aims to determine the effect of corporate profitability and corporate liquidity on CSR disclosure. Corporate profitability and corporate liquidity will be influence corporate social responsibility disclosure. The background that has been described above is shown to give the empirical evidence about the relation how CSR disclosure influences the corporate profitability and corporate liquidity

2 Literature Review

CSR is well known in many context and culture. As one of the corporate responsibilities it implies that companies have an obligation to the environment itself. This obligation represents their responsibilities to the environment and also the society beyond their other obligation to the operation of company [3].

Profitability or gain of the corporate is the outcome of management policy and decision, therefore to measure corporate profitability showed the level of every management activity, indirect ways longterm investors to have a necessity.

The influence of corporate profitability and corporate reputation is quite new research. Most of the previous research found corporate social responsibility disclosure will influence the dependent variable which is profitability and liquidity. In this study, the researcher tries to conduct the different way that CSR itself influence by the independent variable which is corporate profitability and corporate liquidity influence corporate social responsibility disclosure.

Prior research studies shown that there is a positive correlation between the proportion of corporate profitability and the CSR disclosure [4]. However, there are many opinions came from previos research about the correlation itself. As resulted in the Meta Wahyu Rindawati (2015), shown that the profitability has a significantly positive to influence CSR disclosure. While, Maiyarni, Yetti and Erwati [5], told that profitability itself resulted negatively significant towards CSR disclosure.

According to Brigham and Houston [6], profitability is the net profit gained based on the policies and decisions taken by the company. Kashmir [7] told that profitability as one of the factor in measuring company health is the ability of companies in earning profit and having a highly effectiveness management of a company that is shown by profits which is generated from vantage company activity. Thus, based on these definitions can be concluded that profitability is a net profit generated by the company from its operations during a certain period. Liquidity has a strong possibility to be as an indicator to inform how well the ability of company to pay its short-range financial obligation as it due by using available liquid assets [8]. The formula used in this research is the current ratio as the measurement of liquidity.

According to Sutrisno [9], the current ratio is used to measure the proportion both current assets and current liabilities. The current assets is composed of cash, account receivable, inventory and so on. Liquidity ratios indicated a company's capability to complete its short-range financial duty. In case, the company needs to have a lot of resources to pay its lenders when the payment are due [10].

A number of previous studies test the association between Liquidity and corporate social responsibility disclosure. This liquidity ratio is used to provide an overview of the influence of availability companies against disclosure corporate social responsibility (CSR). Companies that are healthy finances, will likely more revealing CSR information compared with companies with low liquidity [11]. The previous research related to the influence of liquidity shows that no significant influence between liquidity challenge and CBZ bank`s corporate social responsibility programs [12]. While, Maiyarni and Erwati [5] resulted the liquidity was negatively influenced corporate social responsibility disclosure.

3 METHODS

The research about the influence of corporate profitability and corporate liquidity on corporate social responsibility shows that the company has well performance in gaining the profit. They have the ability in influencing those activities such as social responsibility, otherwise the liquidity of the corporate also has an effect in influencing the corporate social responsibility, for example this company has good liquidity means that they have chance to do the social responsibility. In this research, author used research variable, corporate profitability, corporate liquidity, and corporate social responsibility disclosure, which is the sample from manufacturing company lists on Indonesia Stock Exchange year 2011-2015.

While, the sample in this research study is all the manufacturing company sector listed on Indonesia stock exchange (IDX) years 2011-2015 that has met the criterion of this study. This research used random sampling technique which choose the sample based on the distribution patterns of the characteristics that researcher are interested in investigating the population. In determining the sample the researcher uses the slovin formula to define the minimum sample in this research. The sample of study in this research as follows:

Table 1. Sample of Study

Research Scope	Number of Companies
Total Manufacturing firm from the year of 2011-2015	152
Total Sample used from Manufacturing companies 2011-2015	60
Total companies used as the sample 60 x 5 years	300

Source: Data Processed (2017)

According to Sevilla et.al. [13] the slovin formula can be used to find the minimum sample in the research, the formula as follows:

$$\frac{152}{1 + 152(10\%)^2}$$
$$n = 60$$

The secondary data that collected in this study are used from the annual report that listed on Indonesia stock exchage (IDX) year 2011-2015. hence, it becomes necessary to collect data that are appropriate. The data collection method in this study is the annual report of each manufacture company which alredy available in Indonesia stock exchange, the data collected includes books, thesis, relevant journal, another documentation, and published annual report of manufacture companies listed on Indonesia Stock Exchange year 2011-2015. The annual report can be found by downloading directly from Indonesia stock exchange Website www.idx.co.id .

Dependent variable in this research is corporate social responsibility (CSR) disclosure. is measured by the corporate social responsibility (CSR) disclosure Index (CSRDI). Based on GRI-G4, the CSR includes 3 dimensions of economic, environmental, and social. The independent variable is a variable because a causal relationship or something that condition the occurrence of a change in another variable [14]. The operationalization of the independent variable consist of corporate profitability, and corporate Liquidity.

The linear regression models used are:

$$CSRD = a + b_1\,CPOF + b_2\,CLIQ + e$$

Where:
CSRD = Corporate Social Responsibility Disclosure
a = Constant
b_1 , b_2 = Regression Coefficients
CPOF = Corporate Profitabilit y
CLIQ = Corporate Liquidity
E = Error Term

4 . RESULT

4.1 Empirical Result

The following table of descriptive statistics of the research data can be seen in Table as follows.

Table 2. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
CSRD	300	.00	1.00	.6272	.30557
Profitability	300	-27.92	71.00	6.8020	12.72505
Liquidity	300	-.49	67.70	2.4888	4.56967
Valid N (listwise)	300				

Source: Output SPSS 21.0 (2017)

Table 4.1 shows the descriptive statistics for the variable of profitability (POF), Liquidity (LIQ), and Corporate Social Responsibility Disclosure (CSRD) of the total sample 300 sample studies. From the table, it can be seen that profitability has value of -27,92 minimum, 71,00 maximum, and 6,8020 at mean of manufacturing companies. Liquidity is -0,49 at minimum and 67,70 at maximum and 2,4888 at mean. While, Corporate social responsibility disclosure has 0,00 at minimum, 1,00 at maximum, and 0,6272 at mean value.

4.2 Classical Assumption Test Result

Based on Multicollinearity, Heteroscedaticity and Autocorrelation to seen Classical Assumption. The result of no multicollinearity, no Heteroscedaticity and no autocorrelation. can seen in table as follows:

Table 3. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	sig	Collinearity Statistics	
	β	Std. Error	Beta			Tolerance	VIF
1 (Coanstant)	.616	.021		29.713	.000		
Profitability	.006	.001	.264	4.709	.000	.977	1.024
Liquidity	-.013	.004	-.190	-3,401	.001	.977	1.024

Dependent Variable: CSRD
Source: Output SPSS 21.0 (2017)

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin -Watson
1	.301	.090	.084	.29239	1.657

a. Predictotors : (Constant), Liquidity, Profitability
b. Dependent Variable: CSRD
Source: Output SPSS 21.0 (2017)

Based on the table above, it shows that VIF less 10. The value is 1,024. That is no milticolonierity. And the result of heteroscedaticity using durbin Watson value is 1,657. The durbin Watson value will be compared with the constant Durbin-Watson table that has the significance value 5% with the total sample (N) 300 and 3 variables (K). According to the constant Durbin-Watson table, the upper limit score (du) is 1,824110 while (4-du) value is 2,17589. The provision equation of no correlation happened between the variables.

The value of durbin Watson is 1,704 meaning that 1,824110 < 1,657 < 2,17589. In conclusion, with the data value 1,657, there is no autocorrelation happened between the residuals in this research because the d value is greater than du and less than (4-du).

4.3 Multiple Linear Regression Analysis

This research is to test the hypotheses that using multiple linear regression analysis to determine whether there is influence of corporate profitability and corporate liquidity to corporate social responsibility disclosure either simultaneously or partially. Multiple linear regression analysis is used to obtain the regression coefficient that will determine whether the hypotheses is made will be accepted or rejected using a significance level of 0,05 (5%). The hyphoteses can be seen in Table as follows:

Table 5. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	β	Std. Error	Beta	t	sig	Tolerance	VIF
1 (Coanstant)	.616	.021		29.713	.000		
Profitability	.006	.001	.264	4.709	.000	.977	1.024
Liquidity	-.013	.004	-.190	-3,401	.001	.977	1.024

Dependent Variable: CSRD

From the Table it can be written as follows:

$$Y = 0{,}616 + 0{,}006\ X1 - 0{,}013\ X2 + e$$

Therefore, the linear regression equation in this research are:

$$CSRD = 0{,}616 + 0{,}006\ POF - 0{,}013\ LIQ + e.$$

Based on the equation of regression, it can be seen that:
1. Constant value of 0,616 means that if the factors of profitability and liquidity is considered constant then the value of corporate social responsibility disclosure is 0,616
2. Regression coefficient of Profitability (X1) is 0,006 means any 100% change on corporate profitability, it will decrease corporate social responsibility disclosure in manufacturing companies 0,6 % with an assumption that others variable are constant. Therefore the higher profitability the company can make then less the corporate social responsibility disclosure on manufacturing companies.
3. Regression coefficient of Liquidity (X1) is -0,013 means any 100% change on profitability, it will decrease corporate social responsibility disclosure in manufacturing companies 1,3 % with an assumption that others variable are constant. Therefore the higher liquidity the company can make then less corporate social responsibility disclosure on manufacturing companies.

4.4 F-Statistical Test Result

The result of F-test can be seen in the table as follows:

Table 6. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig
1 Regression	2.527	2	1.263	14,776	,000[a]
Residual	25.392	297	.085		
Total	27.918	299			

Source: Output SPSS 21.0 (2017)

In the table 4.5 it can be senn that the significance is 0,000 and lower than the significance level of 0,05 (5%). The results, the first hypotheses (H1) is accepted because the independent variable simultaneously affected the corporate social responsibility disclosure.

T-Test Result
The result of T-test can be seen in the table 4.4 and it can be described as follows:
1. The corporate profitability (X1) has a value of t 4,709 with the significance level of 0,000. The significance value is greater than the significance level of 0,05 (5%). Therefore, it shows that corporate profitability have effect on corporate social responsibility disclosure. Thus, the second hypotheses (H2) is accepted.
2. The corporate Liquidity (X2) has a value of t -3,401 with the significance level of 0,001. The significance value is greater than the significance level of 0,05 (5%). Therefore, it shows that corporate profitability have effect on corporate social responsibility disclosure. Thus, the third hypotheses (H3) is accepted.

4.5 Coefficient Determination (R2)

The test of multiple regression The result can be seen in the table as follows:

Table 7. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin -Watson
1	.301	.090	.084	.29239	1.657

    a. Predictotors : (Constant), Liquidity, Profitability
    b. Dependent Variable: CSRD

The table 4.6 above shows that the R square value is 0,090. It means that 9% from the change in dependent variable can be explained by the corporate profitability (X1) and corporate liquidity (X2). Meanwhile, the other 91% can be influenced by other variables that are not used in this research.

Based on the table 4.2 The value of regression coefficient for corporate profitability (X1) has a value of t 4,709 with the significance level of 0,000 which is lower than the significance level of 0,05 (5%). This means that in every 100% increase of profitability it will increase the corporate social responsibility by 470,9%. Based on the regression coefficient, It shows that the corporate profitability positively effect the corporate social responsibility in this study.

5 DISCUSSION

5.1 The Influence of Corporate Profitability to Corporate Social responsibility Disclosure

Based on the table 4.2 The value of regression coefficient for corporate profitability (X1) has a value of t 4,709 with the significance level of 0,000 which is lower than the significance level of 0,05 (5%). This means that in every 100% increase of profitability it will increase the corporate social responsibility by 470,9%. Based on the regression coefficient, It shows that the corporate profitability positively effect the CSR in this study.

This is contradictive with the result Meta wahyu (2015), who have found that profitability is positively influence corporate social responsibility disclosure. Based on the assumption, the greater number of this ratio means the company is considered to gain more profit. The higher ratio shows the better performance of the company in obtaining profit and also to avoid the default risk

Therefore, this result is inconsistent with the previous research that has been done by Mairani Reka et.al (2014), which stated that profitability negatively influence corporate social responsibility disclosure on the LQ-45.

5.2 The Influence of Corporate Liquidityto Corporate Social responsibility Disclosure

The corporate liquidity (X2) has a value of t -3,401 with the significance level of 0,001 which is lower than the significance level of 0,05 (5%). It shows that the corporate liquidity negatively effect the corporate social responsibility disclosure in this study. This is contradictive with the result liquidity negatively influences corporate social responsibility disclosure.

This means that in every 100% increaseof liquidity ratio it will increase the corporate social responsibility disclosure by 340,1%. This research is contradictive with the result of Maiyarni Reka, Susfayetti and Misni Erwati (2014), resulted that the liquidity negatively influence corporate social responsibility disclosure.

Therefore, this research result is inconsistent with the previous research that has been done by Ngwenya and chiwawa (2016). they found that liquidity has no significance influence to the corporate social responsibility disclosure.

6 CONCLUSIONS

The purpose of the study is to measure the influence of corporate profitability and corporate liquidity on CSR disclosure in manufacturing companies that listed on Indonesia Stock Exchange during 2011-2015.Based on the result and discussion of the research that has been started, it can be concluded that: Corporate profitability affects corporate social responsibility disclosure of financial report in manufacturing companies listed on Indonesia Stock Exchange year 2011-2015. Corporate Liquidity affects corporate social responsibility disclosure of financial report in manufacturing companies listed on Indonesia Stock Exchange year 2011-2015.

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Dynamic Formation Of Autonomus Agents Based On Algorithm Flocking Behavior

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Abstract. Approach to organizing group formations still are static, causingthe formation has not been able to adapt to the changing circumstances of both obstacle or barrier that will be encountered.This study was to model the behavior of autonomous agents formation dynamic moves past the obstacles and reshaping the initial lineup after passing obstacles based algorithm flocking behavior. There were four formations that are examined in this study i.e. column formation, a circle, a line formation and the formation of the triangle. All forms of word formation in narrow spaces and one labyrinth. The labyrinthine 121, 123 and labyrinth mazes is structuring three zigzag number of narrow spaces is bypassed by the formation of autonomous agents. The results of the error of the average position of the formation of autonomous agents in one narrow space is 0%. At 121 maze, the percentage error of the position of the movement of the formation is the largest circle formation agents namely 52.63% and the percentage error of the triangular formation is the smallest position i.e. 44.83%. In the maze of 123, the percentage error of the triangular formation is the largest position i.e. 55.42% and the smallest is the position error percentage column namely 42.42%. The percentage error of the position of the movement of the formation of the largest agencies in the maze of zigzag formation is the circle i.e. 90.69% and the smallest is the position error percentage column namely 48.488%.

Keywords: Dynamic, Formation Flocking behavior, past obstacles.

1 INTRODUCTION

Modeling and simulation of flocking get special attention in the field of multimedia and entertainment industry, especially in the production of commercials and movies. Flocking done animation of automation to reduce process and production costs. Group formation is a formation that is widely used to simulate large battle scenes in games and films such as real-time strategy like a Total War, and blockbuster, a movie like Avatar and The Lord of The Ring. The formation of the group becoming a challenge for researchers because it requires an efficient algorithm to handle a bunch of characters while maintaining the form formation and autonomy among groups.

Reynold [1], one of the researchers who introduced the model the behavior of a group of birds, animals and fish, concluded that the behavior of the group can be decomposed into several steering behavior is simple on the level of the individual, with concentrate on the coordination between local agents. Set steering behavior modeled based on physical parameters including mass, speed, position and orientation [1].

Steering behavior represents the movement of autonomous agent behavior of a virtual world. There are some simple behavior at steering the individualagents to drive agents namely seek, flee, budget, obstacle avoidance, leader following and flocking behavior.

On the research of Flocking for dynamic multi-agent systems: Algorithms and theory [2], explains the link between theory and algorithms in the field of flocking and dynamic multi-agent system. There are some fundamental questions of flocking and dynamic multi-agent system: 1. How to make a stability system that can keep the movement of a large number of agents on the frame-rate of 30 fps? 2. How to control the formation of agents that can maintain a specific formation? 3. how the formations agent avoid collisions and avoid obstacles by static and dynamic obstacles?

The behavior of flocking agents NPCS (non-player character) is implemented in the form of many top lines. The formation can be defined as a group of units with a specific purpose, are positioned to form a pattern or certain shape and applied to the destination pattern of assaults or as tactical defense. Approach to organizing group formations are usually still purely static. Static formations still hasn't been able to adapt to the changes of obstacles or obstructions.

On the research of the change movement formations of troops with fixed geometry pattern using the boids [3], discusses the State of the conduct of troops in formation that positioned in one specific point to form a specific pattern ordered by the leader and avoid a collision with fellow agent average speed. The shape of the formation can be a parallel line pattern, the shape of "V", column, circle and others. The form of this formation has a sense of history and is still used in modern military operations.

Formation in organizing groups usually still purely static. Static formations have not been able to adapt to changes in the barrier or obstacle faced by the Agency. To overcome the problem of static formations, then required the formation of a dynamic nature has the ability to pass through a narrow space with obstacles entering a predetermined path and was able to avoid a collision between agents. At the time of the formation of a narrow room facing agents, each agent automatically detach from the formation as well as continue to move past the narrow space, and then regroup into formations early after going through the obstacles and reshape the formation early and avoid the collision of fellow agent-based algorithm of flocking behavior.

2   LITERATURE REVIEW

The movement of the Group was first popularized by Craig w. Reynolds circa 1986, by making a model of computer animation in the form of coordinated animal motion, which is an imitation of the real world that is the motion of troop of birds. Of these groups of animals can be observed, every bird that is in that group have a behavior that makes it possible to coordinate the movement against friends who became his closest neighbors. The natural shape of the groups affected by the balance of contention two behaviors i.e. desire remains close to

his group (cohesion) and the desirability of avoiding collision between the Coulomb (collision avoidance).

The impetus for the Group (flocking) is usually influenced by the State of the environment in the vicinity, such as protection from predators (predator). In addition, birds can also avoid crowding each other between each other, so that if there is the addition of new members, the group does not become full or excess (separation). The last thing, every Member of the birds move with the speed of an average against his group and headed towards the same goal (aligment). From these conditions, to form a movement of a group of animation, Craig w. Reynolds made a rule, model bird modelled into a boid. Boid then given a wheel to be able to move, this is called steering steering behaviour and is most often used to boids is separation, cohesion and aligment. Steering behaviour this is a point of discussion on the topic of weight of this chapter. But before discussing such things, there are some basic theory to develop steering behaviour.

2.1 Formation

Its formation is defined as a unit setting or disposition. The formation is usually applied to tactical, objective and have been found in tribal societies such as Maori. The formations often look like a wall of shields, or wedge, which has historically and are still used in modern military [4].
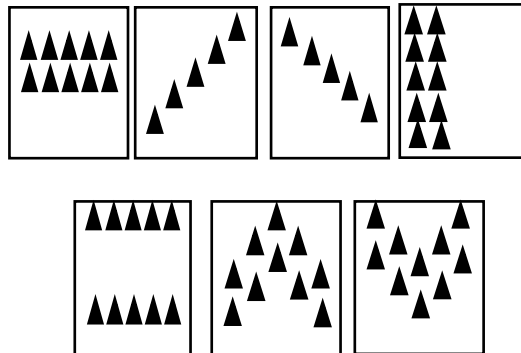
Fig. 1 Shape – the shape of the formation. (a) the form of the line formation, (b) the form of left-wing formations, (c) the form of the right-wing formations, (d) the form of a column, (e) the form of a box formation, (f) the shape of the wedge formation (g) Shape the formation of V
The formation is widely used in a variety of games, ranging from real-time strategy games to sports games. The formation became the flagship strategy to confront the enemy. There are several forms of formation that usually has a value of history in military operations, examples of the form formation can be seen in Figure 1.

2.2 Autonomous Intelligent Agent

Autonomy and intelligence agent, is the idea that everything is difficult to define. Agents are closely linked with the nature of the agent such as autonomy, situatedness and embodiment.
- *Autonomy*
The Agent has a mechanism that allows the agent to sense the environment and act upon it and does not require the intervention of another agent to executed.

Franklin and Graesser [5]defines: "autonomous agent is a system that is located within the neighborhood and is part of the environment as well as able to sense the environment and act on it." All the agent software is a computer program, but not all programs are the agents.

- Situatedness

Situatedness is the existence of the system in an environment as well as the interaction of the system with its surroundings is considered implicit properties of agents [6].

-Embodiment

Embodiment is a very important trait for autonomous agents. Embodiment is the nature of the agent which refers to property agents to have a body shape that can interact with the surrounding environment. This asset is important for agent capability. Usually refers to objects, such as animals or robots. Some quick research. Some quick research, Dautenhahn and Coles [7], argue that embodiment is not necessarily given by the materialitasnya, but a dynamic relationship with the environment and actions that may affect the environment. Realization can also occur in an environment other than the material world, such as computing. The environment can be simulated, or a truly computational physical environment, such as the Internet or the operating system.

- Intelligence

Intelligence is the ability of agents to learn from experience, to adapt to the new situation and changes in the environment, or to continue to think in the abstract. The MIT encyclopedia of the Cognitive Sciences States: intelligent agent is a device that interacts with its environment in a flexible, ways to achieve goals, recognize the importance of the environment and the circumstances of the Act to achieve the results desired [6].

Figure 2 provides a simple overview about the behavior of agents to the environment, which shows that the output action posed by such agents can affect the environment. In a complex environment that agents could not do full control (complete control) to the environment. That can be done by the agent is partial control (control per part) and this can affect the environment. An agent is something that can sense the environment through the sensor and give action to the environment through the effecto
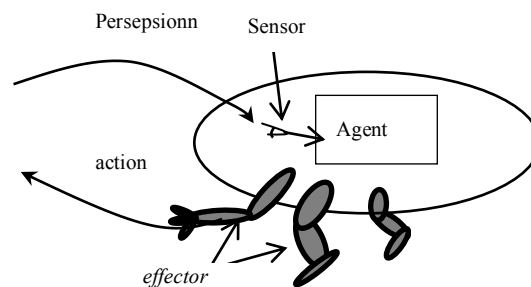
Fig. 2 Agents in their surroundings[8]

- Separation

Separation is one of the rules of conduct group agents who used to be able to keep distance between agents aiming to avoid a collision with its neighbors. Separation behavior also often referred to as collision avoidance steering Behavior i.e. to prevent collision between agents. Separation is the speed of decline (myrna I, 2011). Figure 3 shows that only the

neighboring Agent n within a radius of Rsep being evaluated. A vector v is the speed of the wheel resulting. Equations of Separation:

$$\text{Separation } = \frac{1}{M}\sum_{n=1}^{M}\frac{(Pi-pn)}{d(pi-pn)} \tag{1}$$

where 'M' is the number of agents from a distance of a minimum of agent 'i', pi is the position of agent 'i', and d (pi, pn) is the distance between the agent and the agent neighbors 'i''n'.

Speed separation agent i is the linear combination of the unit vector in the direction of the nearest neighbors. Thus, each agent neighbors give the same influence on the agent 'i', with only a change of direction.

The speed of separation of ditunjaukkan in Figure 3 where 'R' is the outer circle of the Environment Agency, the inner circle of Rsep is the distance of separation, Separation of the environment direct the agent 'i' avoid/approaching the neighbor 'n' until the minimum distance between the agent and the neighbor 'n''i' fulfilled [9].
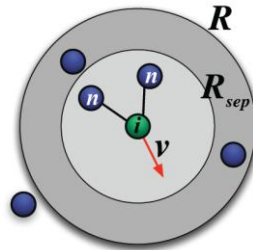
Fig. 3 The speed of separation

- *Alignment*

Harmony is a group of agents with rules of conduct each agent with a neighboring speed velocity aligning. Alignment behavior also often called velocity matching [9]. Figure 4 shows the alignment speed to match the speed and position of agent 'i' with neighboring 'n'. speed Steering behavior is calculated using equation 2.

$$\text{Alignment} = \left[\frac{1}{N}\sum_{n=1}^{N} v_n\right] - v_i \tag{2}$$

where 'N' is the number of agents in the radius R centered on the agent 'i '(R > Rsep). "vn" is the speed of the neighboring 'n'. Speed Alignment direction vector is a corrective to the desired speed, which is also the center of mass.

The speed of the alignment figure 4, the circle R is the Environment Agency 'i', vector "vi" working on agent 'i' is the desired speed, keselaransan match the position and speed of agent i' with neighboring speed 'n'[9].
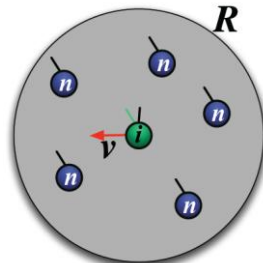
Fig. 4 Speed alignment

- Coheson

Cohesion is used to redirect the Agency toward the center of the swarm. The behavior of cohesion also often called flock, as the concentration of efforts in order that the Agency remains close to its neighbors. The formula that is used for cohesion is very similar to the formula that is used for the alignment. The difference is temporary agent positions using cohesion alignment using the speed agents [9]. Figure 5 illustrates the speed of cohesion that directs the agent 'I' toward the center of the neighborhood.

$$Cohesion = \left[\frac{1}{N}\sum_{n=1}^{N}p_n\right] - p_i \tag{3}$$

where 'N' is the number of agents in the local environment boid 'I', and 'n' is the position of the neighboring "pn". The direction of movement to the agent 'i' was headed for the center of mass of the agent in the local environment.

The speed of cohesion figure 5. the circle 'R' is the Environment Agency 'i', cohesion directs agents to their local environment 'i'[9].
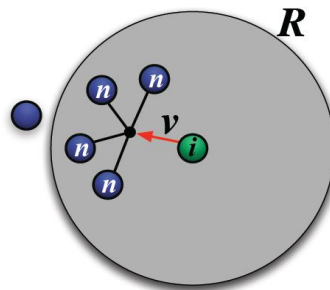
Fig. 5 The speed of cohesion

- Goal

The target is the behavior that can attract agents to specific locations in the global space. This location is static. Figure 6 shows the actions taken when approaching the target. Vector v shows the direction taken by the agent towards the goals. Vectors vi is the desired speed, while the dotted line is the actual path taken by the agent.

The behavior of the Target will adjust the speed of the dealer in a way that is aligned towards the target. Because the target is static, the equation (2.4) is used to calculate the desired speed that is a unit vector (from the agent to the target) and set the desired speed with the magnitude of the maximum speed allowed (maxspeed) to approach the target as soon as possible [9].

$$Goal = \left[\frac{(p_t - p_i)}{d(p_t, p_i)} * max_{speed}\right] - v_i \tag{4}$$

with "pi" and "vi" are the position and velocity of agent 'i', and "pt" is the position of the target. So agents will approach the goal
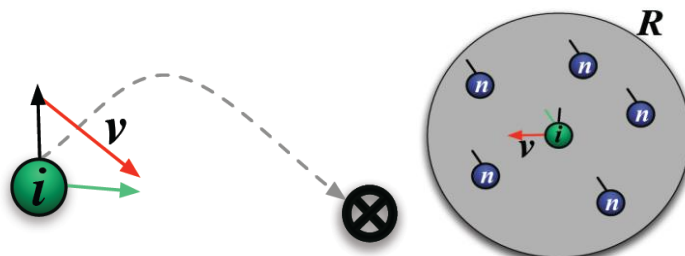
Fig. 6 : Target behavior: agent i approaches the target when it concerns the behavior of the Goal[9]

- Evasion (avoid)

Avoidance or avoid referring to wheel away from the static target agent in global space. This approach is the opposite of steering target. The desired speed avoid points in the opposite direction of the speed of the desired goals [9].

Figure 7, illustrates the Steering vector with the 'v' and the desired speed in the "vi". so, avoid the formula becomes: $-v_i$.

$$Evasion = -\left[\frac{(p_t - p_i)}{d(p_t, p_i)} * max_{speed}\right] \qquad (5)$$

The negative sign indicates that the point it towards the opposite direction with speed towards the goal.
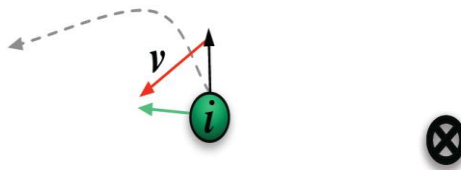
Fig. 7 Agent avoid Conduct 'i' move away from the target when subjected to behavioral avoidance[9]

- Leader Following

Leader following is behavior which characters follow one leader. If a leader has been marked then the character of the followers will follow the leader. The followers are generally located close to the leader but not clustered with the leader. If there is more than one follower, they are going to avoid collisions with each other. To implement this behavior use behavior is a budget and separation. The behavior of the function is a budget to keep up with the leaders so that the motion of the characters do not go beyond the leader.

Whereas the purpose of keep not clustered with other characters [9]. Figure 8 shows the behavior follow the leader with agents follower "n" follow the leader 'i'.
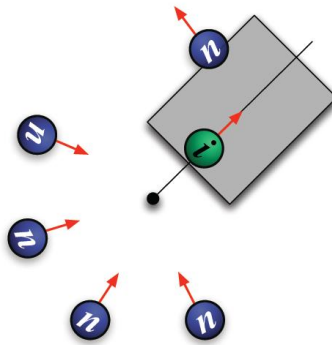
Fig. 8 follow the leader Behavior: Agent follower 'n' follow 'i' with leaders approached the leader[9]

3   METHODS

3.1 Formation Of Autonomous Agent Design

To move towards the target, any agent of the follower are designed following the agents leader as see. Each autonomous agent dynamic moves against the obstacles that have been determined.
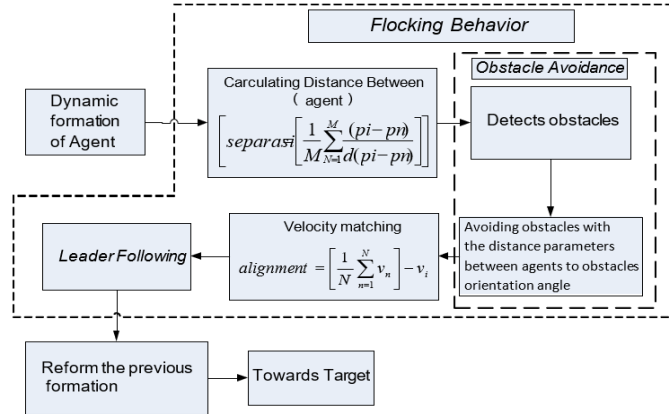
Fig. 9 Block Design Research

3.2 Desain Algoritma Flocking Behavior

Figure 10. shows the flowchart algorithms flockingbehavior formation of autonomous agents that used to pass through a narrow space and reshaping the initial formation.
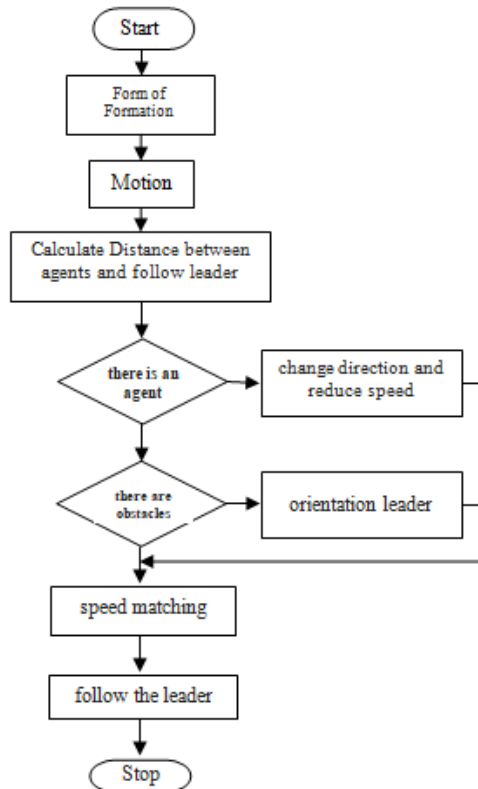
Fig. 10 Flowchart Algorithms Flocking Behavior

4 RESULT AND DISCUSSION

To evaluate the performance results from this research, used 30 agents in each formation. The formation tested against the obstacle is the formation of the line, column, circle and triangle. Any formation of autonomous agent moves to the target and passes through the obstacles that have been specified. The hurdles that must be crossed by the agent in the form of a narrow space the length of 28 meters and a simple maze. The maze is static obstacles impassable formation agent. The shape of the maze which bypassed the formation is a maze of 121, 123 and labyrinthine maze of zigzag. The labyrinthine 121, 123 and labyrinth mazes is structuring three zigzag number of narrow spaces is bypassed by the formation of autonomous agents. The movement of the watch at the time of an agent in the agent passes through a narrow space and movement of the formation of initial formation agent after passing through a narrow space.

At the moment will enter the narrow space, the distance of the agents in the count against the obstacle, the angle of the orientation of the agent, agent in need of time to go through the obstacles and the time needed to establish the initial formation of the agents as well as agents of the position after the error percentage passing through narrow space which is a parameter of the study. In testing, statistical calculations done 10 times simulations for each form formations are shown in table 1.

When passing trough the obstacles in the count at the time the agent moves until all agents have already made it through the obstacles. Time needed for formation early in the count at the time the agent moves until every agency was already in the initial positionand formed the original lineup.The percentage of error position is calculated by counting the number of agents that are not right in his position in for with the amount of agent in multiply 100%.

Table 1. The movement of formation of Agent passing through narrow space

	Movement Formation agent on labyrinth 121				Movement Formation agent on labyrinth 123			
	Column formation	Oval formation	Line formation	Triangle formation	Column formation	Oval formation	Line formation	Triangle formation
Time passes through obstacles	47.56	35.20	43.94	46.75	43.189	35.20	43.94	49.088
Formation time of initial formation	149.41	145.07	148.5	159.72	162.46	157.19	153.50	161.91
Percentage of position error	48.58	52.63	46.67	44.83	42.42	54	48.29	55.424

Table 2. The movement of agent formation passes through the labyrinth 121 and 123

Type Formation	Time passes through obstacles (seconds)	Formation time of start time (seconds)	Percentage Error position of autonomous agent
Column	43.066	83.214	0
Oval	36.74	76.24	0
Line	43.039	98.603	0
Triangle	51.86	88.93	0

Table 3. The movement of formations in the maze of zigzag

Type Formation	Formation time of start time (seconds)	Percentage Error position of autonomous agent (%)
column	200.881	48.488
oval	304.641	90.67
line	225.93	54.67
triangle	211.691	65.431

5 Conclusion

Based on the trial results and the analysis of the results for the four agents of the autonomic formation using an algorithm flocking behavior on one narrow spaces and maze with three narrow amount of space Setup, formation of autonomous agents can reshape the initial formation but there is the agent could not get through obstacles by the amount of error is the average position of the formation of autonomous agents that can not pass through obstacles to 46.49% column formations, formations, formations, 65.77% Circle line 49.88% and 55.22% triangle formation. The large amount of error is the average position of the formation of autonomous agents can be caused by not yet optimal avoidance technique when the agent passes through obstacles or its complexity is caused by the narrow space Setup. The more narrow spatial complexity that bypassed the agent then the greater the error position formation of autonomous agents.

For the study, recommended can do optimization of movement of autonomous agents in the formation of the maze so that the percentage of error smaller positions.

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Performance Assessment Of Irrigation System Using External Indicators For Decision Support System

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Abstract. This research is aimed to study the production cost for determining feasibility and return of investment (ROI) of farming and farmer income based on the crop yield in the Pante Lhong technical irrigation system. These system performances were evaluated using measured/rewarded/collected internal and external indicators that covered different aspect of evaluation. The Rapid Appraisal Process (RAP) is a visual assessment tool was used to evaluate the external indicators performance. The external indicators were crop yield and production cost. The data of crop yield and production cost were collected from the farmers in the three regions which were upstream, middle stream and downstream. Data were collected through field observation and face to face interviews with the irrigation staff and the farmers. The production cost data were calculated based on the land preparation cost, growth stage cost and harvesting cost. In the crop yield indicator, the average maximum productivity was 3.91 ton/ha and the income generated was Rp.11.730 million rupiahs/ha (US$ 1289/ha). The total production cost of the Pante Lhong technical irrigation system was Rp. 4.126 million rupiahs/ha (US$ 453.50/ha) and hence in term of return of investment (ROI), it is still profitable and feasible to be developed for the farmers.

Keywords: External Indicator, RAP, Crop Yield, Production Cost, ROI

1 INTRODUCTION

However, a total of 925 million people are still estimated to be undernourished in 2010 and 578 million in Asia and Pacific, representing almost 16 percent of the population of developing countries. The fact that nearly a billion people remain hungry even after the recent food and financial crises, indicates a deeper structural problem that gravely threatens the ability to achieve internationally agreed goals on hunger reduction: the first Millennium Development Goal (MDG) and the 1996 World Food Summit goal. It is also evident that economic growth, while essential, will not be sufficient in itself to eliminate hunger within an acceptable period of time [1].

Around a billion people globally do not have adequate food to meet their basic nutritional needs. The world faces a potentially even greater crisis in food security as the global population is expected to grow from about 6.9 billion in 2010 to more than   9 billion by the mid-century. The FAO has predicted that demand for food will grow by 50% by 2030 and

70% by 2050. However, global supply of food calories per person rose from 2254 kilocalories per day in 1961 to 2809 kcal in 2003. Therefore the challenge, in essence, is to meet the rising demand for food in ways that are environmentally, socially and economically sustainable, and in the face of evolving world-wide markets and distribution mechanisms, and global climate and demographic changes. In future, food supply (including production, processing and distribution) must – as far as possible – use the same or less land and fewer inputs, produce less waste and have a lower environmental impact [2].

Agriculture remains the largest employment sector in most developing countries and international agriculture agreements are crucial to a country's food security. Indonesia is an agricultural country where most of the population consumes rice as a major part of their diet. The population of Indonesia has reached 240 million people with a population growth of 1.49 %. The agriculture sector still play strategic, central and dominant role for national economic growth, because agriculture also provide a significant means of livelihood of Indonesia's population. Agriculture products contribute about 95.36 million US$ or 15.3% of Gross Domestic Product (GDP) and the country's employment work in agriculture than 39 % [3].

The irrigation performance in Indonesia has been reported 70 % as poor [3]. The cause of the poor irrigation performance has been blamed on technical, financial, managerial, social and institutional causes. The rapid expansion of the population and unstable production of the basic foodstuff is now beginning to expose a potentially dangerous imbalance between national supply and demand for food. To obtain continuous national supply, the government's Department of Water Resources Development constructs many irrigation canals to supply water to the fields to meet the demands of the nationally irrigated rice-crop system. Most irrigation projects in Indonesia use surface irrigation in which water is conveyed on to the land by gravity flow. To divert and raise the water level, a diversion weir is constructed across the river so that water can be diverted to a canal when it is required. Practically all the irrigation works are designed to supply water to the rice fields.

Three types of irrigation works are constructed in Indonesia. There are technical, semi-technical, and people's irrigation. Technical irrigation schemes are large works of a permanent nature, constructed and operated by a government agency. Semi-technical irrigation schemes are minor works, either permanent or temporary, constructed by government and operated by the farmer themselves. People's irrigation schemes are minor works with temporary or no weirs, constructed by the farmers.

Technical irrigation projects in Indonesia have been developed in all the three categories of service areas of less than 1000 ha, 1000 ha to 3000 ha and above 3000 ha, with management responsibilities distributed from district, province and national levels respectively. Irrigation areas of less than 1000 ha are considered small irrigation areas and are the responsibility of the district authorities. Irrigation areas in the range 1000 to 3000 ha and transdistrict irrigation areas are the responsibility of the provincial authorities. Irrigation areas of greater than 3000 ha and transprovince irrigation areas are the responsibility of the national government [4].

One of the greater irrigation system (more than 3000 ha) in Aceh Province is the Pante Lhong technical irrigation system. The Pante Lhong technical irrigation system located in Bireuen City, Bireuen Regency in Aceh Province of Indonesia ($5^o12'18''$ North - $96^o42'06''$ East) area of this modern network is about 5,578 ha and includes six districts. The water source of the water is from the Krueng Peusangan River and the catchment area is 1,879 km^2. The development of Pante Lhong technical irrigation system begun in 1979 and completed in 1991. It consumed amount of Rp. 12.5 billions (rupiah) funds that was financed by the central government and loan from government of Japan. The Pante Lhong irrigation since 2005 –

2008 had used substantial amount of money Rp. 15.59 billions (rupiah). The break down are for rehabilitation Rp. 14.02 billions (rupiah) (89.89 %), maintenance Rp. 1.37 billions (rupiah) (8.81 %) and operation 202.2 millions (rupiah) (1.30 %). The main water source is obtained from the Krueng Peusangan River which has a catchment area of 1,879 km^2. The Ogee type of headwork was constructed using concrete material, which has a 96 m in width and a 7.3 m in height.

The topography of the paddy field is almost flat which covered the four administrative sub districts. The operation and maintenance of the main system is controlled by the Bireuen District Irrigation Office authority. The current capacity area of the Pante Lhong technical irrigation system is 5,578 ha, which divided in to two irrigation system supplies there were continuous supply method and rotation supply method are used. The continuous supply method ensures farmer can access water every day from off-take structure and the service area is about 3,658 ha (66 %). The rotation supply method is where the farmer may access water only at certain time or about 24 hours per week and the service area used for the rotation supply method is about 1,920 ha (34 %).

In order to achieve irrigation objectives such as increasing the crop yield and achieving a low cost for operation and maintenance budget, the government proposed an irrigation reform agenda by means of increasing performance of irrigation system management. However, as the program is still under way, the performance of Indonesian irrigation system have not been nationally evaluated and current performance figures are not yet available [4].

Rapid Appraisal Process (RAP) is a visual assessment tool that can provide a systematic evaluation of the irrigation system and internally water distribution process at the various levels. The internal indicators were selected from the RAP method that was considered relevant to the current assessment of irrigation management practice performance in the canal levels. In this method, the performance made use of the primary indicators that covered many aspects of the evaluation. The data of infrastructure maintenance performance was collected at third canal/tertiary canal and the data of water delivery service was collected at the third canal and final deliveries. The water delivery service aspects were flexibility, reliability, equity and measurement of volume deliveries using the RAP method. According to the RAP method, the sub component indicator of infrastructure maintenance performance were floor and canal bank, seepage, level of gate maintenance and available proper equipment and staff.

In general, these aspects consist of water structure condition, maintenance and water delivery service. Each of the main indicators has sub indicators which contain a number of criteria or statement description and related score value. These score have potential maximum values of 4.0 (best or the most desirable condition) and a minimum possible value of 0.0 (worst or indicating least desirable) was given based on the visual condition/observation and direct communication with the respondents by the surveyor. The rating score value was classified as worst (0.0), worse (0.5) very poor (1.0), poor (1.5), enough (2.0), quite enough (2.5), good (3.0), quite good (3.5) and excellent/best (4.0).

2 METHODS

2.1 Participant and Design

In this research, the external indicators used were crop yield and production cost of the farmers. The data for the external indicators such as crop yield and production cost were collected based on the field survey from selected respondents and locations. The numbers of

respondents for the survey are 81 farmers. The data on the current average crop yield was compared to the national average crop yield in ton/hectare (t/ha). The secondary data from BPS (Central Agency on Statistic in Indonesia) from the District, Province and the National office were used for the standard purpose. Production cost was calculated in Rupiah/hectare or Rupiah/m^2 (Rp/ha or Rp/m^2). The data on current production calculated were based on the land preparation cost, growth stage cost and the harvesting cost. The land preparation costs consist of the purchase cost of seed, seed nursery fees, ground processing costs (cleaning, plowing and piracy), the cost of tractors and the cost for the implementation of planting seeds. The growth stage of the cost includes the cost of handling and maintenance of plants, fertilizer costs and the cost of spraying insecticide. Cost of cutting when harvesting rice, threshing rice, the cost of transporting crops and water fees to water usher association (WUA) were included in the harvesting cost. The cost production was used on the analysis of the rice crop farming.

2.2 Data Collection Procedure

In this research, data were collected based on the qualitative and quantitative methods. The primary data were obtained based on the field surveys or observations done on the irrigation system. Data were collected through detail interview as well as discussions with farmers and/or heads of water user association (WUAs). The interviews were aimed at obtaining the details on the internal processes as well as identifying the problems related to the technical and non technical aspects. The secondary data were obtained from the district irrigation office and other sources.

Primary data were observed from the main intake point, main diversion structure and the 65 off-takes structures scattered along the 77.2 km concrete lining canals. Interviews were carried out with 25 field irrigation staffs, 81 farmers and a number of WUAs. Due to most of the primary data not being available both at the sub irrigation offices and district irrigation office, the related data were prepared based on the field observations and interviews with both irrigation staff, farmers and WUAs. Field data were interpreted in accordance to the RAP judgment criteria for the indicators. In this research, data of water delivery service performance and infrastructure maintenance performance were obtained based on tertiary canal/third canal and final delivery. The data for the crop yield and production cost were collected based on the field survey, questionnaire and interviews with 81 farmers.

The farmers were selected from the three regions based on the irrigation structure in the Pante Lhong technical irrigation system, there were block BPg.1 with plot Pg.1.Kn represent to at upstream, block BJb.2 with plot Jb.1.Kr represent to at middle stream and block BT.7 with plot T.7.Kr at represent to downstream in the irrigation system. Farmers as respondents/samples were identified based on the outlet location for each region and 27 farmers were selected as samples at each location (nine farmers at every location with their plot (paddy field) position are at upstream, middle stream and downstream of the canal. The farmers were selected randomly in each area and location. The irrigation conditions in all areas of the research were continuously carried out. Statistical formula ratio was used to analysis the data for the external indicators for characteristic of the sample. Break Even Point (BEP) and ratio of Revenue Cost (R/C) were used analysis was focused on the analysis profitable and feasible of the farming rice crop for farmer.

2.3 The Sample Characteristics

In this research, data were collected based on field surveys or observations on the Pante Lhoong technical irrigation system. Data were collected through detailed interview and discussion with irrigation staff, farmer and head of water usher association. The data was focused in continuous irrigation supply, with the canal tertiary level selected at LCS, RCS-1 and RCS-2. In the final delivery, the data selected for tertiary block, BPG.1 at July sub district representing upstream location, BJb. 2 at Kuala Raja sub district representing middle stream and BT.7 at Kuala sub district representing downstream. The farmers as respondents were selected in same tertiary block at final delivery. The amounts of the respondents were 81 farmers and the location selected at three tertiary blocks where each block had 27 farmers. Each block is representative of location with block BPg.1 with plot Pg.1.Kn representing upstream area, block BJb.2 with plot Jb.2.Kr representing middle stream area and block BT.7 with plot T.7.Kn representing at downstream area. In each tertiary block area, the farmers were divided into three sub area with the same location in the area of tertiary blocks. All of samples were located in continuous supply method.

The compositions of the respondent were based on gender where 88.89 % (72 farmers) were male, while 11.11 % (9 farmers) were female. They had the same position, duty and authority related field and responsibility. The majority of the farmer was older person, where most of them were more than 45 years old (67.90 %). Most of them have had experience in farming more than 15 years (69.14 %). Furthermore, majority of them just got the education at the junior high school level (71.60 %). All of them are able to read and write well. In this location research, the ownership of the field are divided into two categories, there were private field and rent field. Most of them had private field (70.37 %) compared to the rent field of (29.63 %). The average field size of the farmer are in the range of 2000 – 4000 m^2, although some of them had the field size less than 2000 m^2 (34.57 %) and few of them had the field size more 8000 m^2 (4.93 %).

3 RESULTS AND DISCUSSION

3.1 The Crop Yield of the Farmer

The data of crop yield (productivity) was collected based on the field survey from the selected respondents and location. The unit of measurement used for crop yield is ton/hectare (t/ha). The number of the respondents was 81 farmers and the location was selected at three tertiary blocks and each block consist of 27 farmers. Each block was representative of location with block BPG.1, plot Pg.1.Kn representing the upstream area, block BJb.2 with plot Jb.2.Kr representing the middle stream area and block BT.7 with plot T.7.Kn representing the downstream area. In each tertiary block area, the farmers were divided into three sub areas with the same location in the area of tertiary blocks.

During the study, the data was collected through field observation, face to face interview and questionnaires. The data obtained was based on the productivity/crop yield in ton/ha during the period of three years. The data from each farm was collected and average for each tertiary block and is divided into three groups, namely upstream, midstream and downstream.

Based on the interviews, the farmers conceded that water distribution is normally better (quicker and easier) in the upstream region. On the other hand, the upstream region also required a lot of other costs for production because most distributions of water are being done

from field to field, although a lot of them can be obtained water directly from irrigation channels/tertiary channels. Distribution from field to field has to be done because the channel is unconnected directly to in each field. This problem is caused by the diverse size and shape of each field. The fields downstream received water depending on the circumstances upstream. The good role of water user association (WUA) and understanding of the farmers are required. The control of flow influences the productivity/crop yield.

The other average crop yield (secondary data) was obtained from BPS (Central Agency on Statistic in Indonesia) of district, province and national office. The productivity in Pante Lhong is the lowest of all. The Pante Lhong technical irrigation system targeted production of 4.5 ton/ha. This result indicates that the Pante Lhong crop yields are still below average compared to production at the local, regional and national. This result indicates that there are problems both in terms of engineering (technical) and non engineering (non technical) factors that resulted in the irrigation performance being below the intended target. The productivity of the Pante Lhong technical irrigation system is always at the lowest level when compared with other productivity in Indonesia.

However, the result is directly related to the performance of the internal indicators in the technical aspect. According to Styles and Marino [5], this condition indicates a strong correlation between the internal performance indicators and one external indicator i.e. the relative yields. Based on the above evaluation, the lower performance of the sub internal indicators on infrastructure maintenance and water delivery service performance influenced the crop yields. The sub indicators are the control of flow to costumers to the next level and canal, and the general condition of floor and canal banks. The control of flow to customers to the next level of performance indicator is a sub indicator which get score values less than 1 and categorized as worst performance. Although the average in yield in Pante Lhong technical irrigation systems is still low compared to others, therefore efforts and increased technical improvements should be done in order to increase production.

Furthermore, Clemmens and Molden [6] stated that substantial improvements are not possible by making big improvements at only one level within the system. Physical or management improvements are needed at all levels before substantial improvements in performance can be taken. Deng et al. [7] added that mechanization and technology application are keys to increase production. In addition, non-technical factors other than being described above such as pests and plant diseases, rodents and fertilizer also affected the yield of the crop farmers.

3.2 The Cost of Production for the Farmer

The cost of production for the farmer is one of external indicator in this research. The unit of measurement used for crop yield is Rupiah/hectare (Rp/ha or Rp/m^2). The total cost of production is all the costs contained and related in the production process that will relate to the income of farmers. Rice prices applicable at the farm level are determined by the market price at the time of harvested.

Data on current production was calculated based on the land preparation cost, growth stage cost and harvesting cost. The land preparation cost consisted of seed cost and preparatory cultivation cost. The growth stage cost involve maintenance cost, fertilizer cost and insecticide cost. Cutting cost, threshing, transport (including transporting rice from the fields to the road or home and factory) and water fees are part of the harvesting cost.

The average cost of land preparation is Rp.71/m^2 or Rp. 710,000/ha. Based on interviews from the farmers and analysis of the data received, the cost of paddy seeds is the main

contributor to the of land preparation. Some farmers had bought seed crops and some had used their own seeds obtained from their crops. More than half (60.71 %) the farmers at plot T.7.Kn used the seeds from their harvest compared to other plots. The main reason why farmers buy seeds are that the seeds bought are of better quality and can increase yield. The cost of land preparation by using tractors does not only depend on land area, but the price is based on the lacation of fields and is negotiable. Further cultivating is done by human labor, which is usually done by the farmers themselves or by other farmers paid to cultivate the land.

Moreover, the advantages of the rice farming are derived from the calculation of base price multiplied by the average rice yield then divided by the total production cost. The results of the analysis showed that the amount of the average profit earned by farmers is Rp. 7,603,300/ha (US$ 835.50/ha) for each harvest or Rp. 72,412/ha/day (US$ 8/ha/day). In the Pante Lhong technical irrigation system, the ownership of fields are divided into two groups, private ownership was 70.37 % and those renting ownership was 29.63 % (refer to Table 3.12). As for the farmer with rent ownership, their profit is shared with the land owner where the workers took 2/3 part (70%) and 1/3 part (30%) for owner, where all production costs are covered by workers.

3.3   The Assessment of Return Of Investment (ROI)

The Return Of Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate the ROI, the income after-tax of an investment, before interest is divided by the cost of the investment and the result is expressed as a percentage or a ratio. In this study, the ROI analysis approach is to evaluate the potential of farming (growing rice) especially in its ability to provide income and incentive to farmer. The Break Even Point (BEP) and ratio of Revenues and Cost are used to evaluate the feasibility of the farming.

According to BPS data for Aceh in 2009, rice consumption levels per capita in Aceh is 130 kg per year with average number of people per household 4.58 people per family. The average total rice consumed by a family is 596 kg per year. Minimum income that must be obtained by the farmers to be able to buy rice demand is Rp. 1,788,000/year (US$ 196.48/year) or Rp. 149,000/month (US$16.37/month). Land area used as the basic assumptions to calculate the income eligibility level is 3000 m^2 or 0.3 ha, because more than 50% farmers have the fields 3000 m^2 (Table 3.13). Based on Table 4.21, the average income of farmers per year in is Rp. 23,460,000/ha (US$ 2,578/ha), assuming they planted rice twice in a year in one hectare. Based on land area assumption of 0.3 ha, the income earned by farmers is Rp. 4,561,980/year (US$ 501.31/year) or Rp. 380,165/month (US$ 41.78/month). Thus the majority of farmers are only able to earn a profit of Rp. 231,165/month (US$ 25.40/month). Therefore, farming is still profitable.

The way to increase the farmer's income is to increase the production level. As mentioned earlier, production is closely related to the technical factors and non-technical factors. In relation to the technical aspect, production is directly related to the performance of the internal indicators. According to Styles and Marino [5] this condition indicated a strongly correlation between the internal performance indicators and one external indicator, i.e. the relative yields, where the internal or process indicators measuring one aspect, and external or output indicators measuring the others [6]. Therefore improvements of various aspects and indicators are needed for the well being of the farmer and his family.

4 CONCLUSION

This research is very closely related to the improved performance of irrigation and crop yield. The increasing performance of irrigation, will lead to the increase of the crop yield. The increasing of crop yield will give impact and benefit to improving the living standard of the farmers and Indonesia's economy because agriculture's, activity and output constitute a major contribution to Indonesia's GDP and eventually being able to fulfill food supply to the world community. This research has also added some knowledge and methods in terms of assessment and improvement performance of an irrigation system.

For the crop yield indicator, the average maximum productivity for yield was 3.913 ton/ha. The results revealed that the productivity level was low relative to the irrigation objective and this result indicate that the Pante Lhong technical irrigation system crop yield was still below average when compared to the production standard at the local, regional and national levels. However, this result is directly related to the performance of the internal indicators in the technical aspect.

According to the production level the total income was Rp.11,730,000/ha (US$ 1289/ha) and the production cost at the Pante Lhong technical irrigation system was Rp. 4,126,700/ha (US$ 453.48/ha). The amount of the average profit earned by farmers was Rp. 7,603,300/ha (US$ 835.53) for each harvest. Therefore, the can concluded that farming paddy is still profitable and feasible. This conclusion results from the analysis of the coefficient ratio of revenues and costs (R/C) of more than 1, the majority of farmers were able to obtain profit monthly, minimum field size of 3,158 m^2 was required to break event point (BEP) and return on investment (ROI) was obtained 156.61 %.

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Factors Affecting Profit Distribution Management of General Islamic Banks In Indonesia

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Abstract. Operational of Islamic Banking always prioritize the principles of Muamalat (transaction or dealing), fairness, and togetherness between the bank and the customer. These principles are the foundation resulting in Islamic banks outperforms other conventional banks. The fairness principle is also used in dividing the profit including Profit Distribution Management (PDM). PDM is the profit distribution based on the ratio agreement between the Islamic bank and depositor. The fluctuation movement of PDM is influenced by several factors including internal and external factors. Some internal factors of Islamic banks influencing PDM including are Capital Adequacy, Effectiveness of Depositors Funds, Asset Composition, Deposits, Productive Assets Management, and Inflation Rate. This study aims to investigate and analyse the factors affecting PDM. This study was conducted at 11 general Islamic bank registered in Indonesia in the period of 2012 to 2016. The results show that there are four factors significantly influencing PDM, namely: Capital Adequacy, Effectiveness of Depositors Funds, Asset Composition and Deposits. Two other factors, namely: Productive Assets Management and Rate of Inflation have no significant influence on PDM.

Keywords: Profit Distribution Management (PDM), Capital Adequacy, Effectiveness of Depositors Funds, Asset Composition, Deposits, Productive Assets Management, Rate of Inflation

1 INTRODUCTION

It puts a greater emphasis on the principles of muamalat (transaction or dealing), fairness and togetherness, in both obtaining profit and overcoming the risk. The Islamic Banking than conventional banking are more interest free banking based from [1]. Recent studies almost investors choose Islamic Banking for religious reasons rather, even though the depositors may make a comparison between rates of profits from one Islamic Bank to another.

In the process of both collecting and distributing the fund, GIB implements the profit system using revenue and profit sharing as well as risk sharing, its mean the Profit Distribution Management (PDM). Profit Distribution Management is its profit sharing to

smoothing their profit, such as to maintain higher rate of return [2],Profit Distribution Management was in process of both collecting and distributing the fund, GIB implements the profit system using revenue and profit sharing as well as risk sharing [3]. According to [4], Profit Distribution Management based on effect differential timing of investment, debt, capping the profits with an early buy-out option the fund, and Guarantee of compensation for loss of capital. The result of this statement that The Distribution Management influenced by the fund of investors are called The Third Parties Fund.

The movement of fund gathered from the society in GIB in Indonesia is significantly growing. The Third Parties Fund increases from the gyro product, saving and deposit. The latest data from [5] is presented in Table 1

Table 1. The Third Parties Fund General Islamic Banks in Indonesia

The Third Parties Fund	Giro	Saving	Deposit	Total
The Third Parties Fund (Rp Trillion)	19.65	64.73	122.02	206,41
Growth (yoy)	32.15%	22.76%	13.73%	18,02%

The growth of third parties fund in GIB presented in Table 1.1 indicates that the society trust on the Islamic principles has been fully conducted in the bank operational. The growth of third parties' fund is also the biggest contributor to improve the performance of GIB. The Third Parties Fund is also one of the indicator was measure the growth of performance together with Total Asset Bank and Landing Financing. The performance movement of third parties' fund GIB is illustrated in table 2.

Table 2. Indicators Performance General Islamic Banks in Indonesia

Indicators	2012	2013	2014	2015	2016
Asset (Rp. Triliun)	147,58	180,36	204,96	213,42	254,184
Growth (yoy)	26.21%	22.21%	13.64%	4.13%	19.10%
The Third Parties Fund (Rp Trillion)	117,81	143,17	170,72	174,89	206,407
Growth (yoy)	22.03%	21.52%	19.24%	2.44%	18.02%
Landing Financing (Rp. Triliun)	112,39	137,26	147,94	153,968	177,48
Growth (yoy)	34.28%	22.13%	1.99%	3.56%	16.41%

Based on the two phenomena presented in Table 1and 2, this study is designed to further analyse the factors affecting the activity of Profit Distribution Management (PDM).

Profit distribution Management (PDM) is the profit sharing of Islamic banks to the customer based on the agreed ratio each month. PDM is managed based on the product chosen by the customers and its rate of ratio. PDM is also known as the distribution of business profit or the distribution of income and the distribution of profit sharing.

2 LITERATURE REVIEW

Bank Indonesia defined profit-sharing distribution as the profit-sharing of Islamic banks to deposit customers based on the agreed ratio every month.[6] stated that Profit Distribution

Management (PDM) is an activity of managers in allocating the distribution of profit-sharing of Islamic banks to their customers. Profit Distribution Management is activity conducted by managers in allocating the distribution of profit-sharing of Islamic banks to their customers every period/month agreed. The calculate the Profit Distribution Management that refers consider all revenue and expense, and provide the spread between total asset return on assets[7]. So indicator of Profit Distribution Management is:

$$PDM = \frac{Profit\ After\ Tax}{Total\ Asset}\ x\ 100$$

Profit Distribution Management influenced by several factor, one of them is a Capital Adequacy. Capital Adequacy can be interpreted as bank ability to cover the loss caused which is supported by the availability of fixed asset and investment[6]. The indicator used to measure the Capital Adequacy is CAR (Capital Adequacy Ratio).

$$CAR = \frac{Capital}{Total\ of\ ATMR}\ X\ 100$$

The greater this ratio means the healthier of the bank to conduct their performance. The high CAR enables banks to overcome the risks resulting in the managers being braver in organizing the *profit distributionmanagement* (PDM) referring to the interest rates as the bank is a safe condition. In relation to the stakeholder theory, Islamic banks will increase the PDM referring to the interest rates to satisfy the depositors. Its similarity result from [8]is a positive relationship between capital adequacy and the level of profit and sharing the return.

H1: CAR has effect to Profit Distribution Managment

The second factor is Effectiveness of Depositors Fund. According to[9], Effectiveness of Depositors Fund witch proxy by Financial to Deposit Ratio is measurement the bank ability to return withdrawls made my investors and by relying on financing provides as sourceliquidity. Effectiveness ofDepositorsFunds can be measured by financing todeposit ratio (FDR) [2]The indicator of FDR is:

$$FDR = \frac{Total\ Financing}{Total\ The\ Third\ Parties\ Fund}\ x\ 100$$

According to[10], Effectiveness of Depositors Fund is reflection of intemediary function between the investor as the owner of the third parties fund and the bank. On in other words as a costumer realitoinship. Thereofer the bank will increase Profit Distribution Management on . The high FDR indicates that the the refers to the level of profit sharing.This will automatically increase the rate of profit sharing.

H2: FDR has effect to Profit Distribution Management

The third factor is AssetComposition. Asset Composition can be said also as a proposition of non-invesment financing and is flat. The financing is based on the initial agreement at the time of the contract. So that price and profits are recognized at initial agreement without any change of interest rate durings the financing [8]. The amount of Asset Composition determines the amount of return thatt will be returned mitmach so that Islamic Banking can detemine the amoun of Profit Distribution Management. Especially the exposure financing with fixed interest rate, may influence the extent the banks manage the profit distribution to the

depositors. According to [2], AssetComposition can be measured using the ratio of LoanAssetto Total Asset (LATA). LATA is

$$LATA = \frac{Loan\ Asset}{Total\ Asset}\ x\ 100$$

LATA determines the level of which the Islamic bank conduct profit distribution management to return mismatch in the market condition when interest rate changes [10]. Therefore, the higher ratio corresponds to the higher rate of PDM.

H3:   LATA has effect to Profit Distribution Management

The fourth factor is Deposit. Deposit is the variables describing the level of bank dependency towards depositors. Consider that[10], Deposit explains how much the banks attachment to Third Parties Fund. If insufficient fund accur then the bank can not perform its functions with maximum even not work at all . Deposits is measured based on the percentage of depositors' fund of the total asset. [2]argued that Islamic bank holding smaller proportion of third party fund than the shareholders tends to manage PDM.

$$Deposits = \frac{The\ Third\ Parties\ Fund}{Total\ Asset}\ x\ 100$$

In the stakeholder theory the bank will handle the depositr, thus maximing the level of Profit Distribution Mangement. With a high rate Profit Distribution will be impact to increase the external funding. Another that a high proposition of funds was effect possibilityof withdrawal funds by depositors, [11].
H4: Deposit has effect to Profit Distribution Management

The fifth factor is Productive Asset Management. Productive Asset Management Productive Assets Management shows bank ability in producing income based on the performance of Islamic banks in channeling the financing, considered that bank operational income highly depends on the difference of spread and the financing channeled[1]. Productive Asset Manegement too explained the capability in generating revenue by performance of the Islamic Banking in distribution the financing[12]. Productive Assets Management can be proxied by Net Interest Margin (NIM). It be measure that

$$NIM = \frac{Net\ Interest}{Net\ Revenue}\ x\ 100$$

Based on result research by[10];[13], that argued that the failure in considering the spread between the interest rate and financing margin will have an impact on the loss of profit margin, the loss of better quality of debtors, failure in calculating the loss of non-performing loan and the decrease of the profit-sharing quality, concluding that Productive Asset Management gives effecting on Profit Distribution Management.
H5:   NIM has effect to Profit Distribution Management

The last factor is Rate of Inflation. Rate of Inflation is the continuous increase of general price level in economy. The rate of inflation year by year in Indonesia can be observed from the percentage of the change of consumer price index (IHK). Based on result [6] that high

inflation rate cause costs to increase and less profitable productive activities. According to[12], the increase inflation rate may effect to reduce the corporate earnings, including Islamic Banking, so its consequently to reduce the Profit Distribution Management. Itssimilary that result by [10], Indonesia's macroeconomic condition has not been able to provide a positive bussiness climate for Islamic Banking industry. If its associated with stakeholder theory, the hight rate of inflation resulted in the level of Profit Distribution of islamic banks tend to decrease. While indonesia's economic growth is not high enough and strong enough to drive the real sector that becomes the source of revenue for the result of Islamic Banking. The rate of inflation year by year in Indonesia can be observed from the percentage of the change of consumer price index (IHK).

$$IHK = \frac{IHK_t - IHK_{t-1}}{IHK_{t-1}}$$

H6:   Rate of Inflation has effect toProfit Distribution Management.

3   METHODS

This study used statistics model proposed bymultiple regression analysis using Ordinary LeastSquare (OLS). The multiple regression analysis was conducted to examine the accuracy of the relationships between PDM (dependent variable) and Capital Adequacy,Effectiveness ofDepositors Funds, Assets Composition,Deposits,Productive Assets Management,and Rate of Inflation as the independent variables. And than the resarch used descriptive analyze and analyze hypothesis test.Hypothesis testing is done by accepted if the significancy value less than 0.05 or 5%.

The formula of regreession analysis is:

$$Y=\beta_1 CAR+\beta_2 FDR+\beta_3 LATA+\beta_4 DEPOSIT+\beta_5 NIM+\beta_6 IHK \tag{1}$$

The sample in this study was 11 GIB in Indonesia from the period of 2012 to 2016. The detailed information is presented in table 3

Table 3. Sample of Research

No	The Name of GIB
1	PT. Bank Muamalat Indonesia
2	PT. Bank Victoria Syariah
3	PT. Bank BRISyariah
4	PT. Bank Jabar Banten Syariah
5	PT. Bank BNI Syariah
6	PT. Bank Syariah Mandiri
7	PT. Bank Mega Syariah
8	PT. Bank Panin Syariah
9	PT. Bank Syariah Bukopin
10	PT. BCA Syariah
11	PT. Maybank Syariah Indonesia

4 RESULT & DISCUSSION

Descriptive statistics provides a brief overview of Islamic banks in the table 4.1. The PDM variable has a minimum of -1,7401 for Bank Victoria Syariah in 2015. While the maximum of 2,2826 is Bank Maybank Syariah Indonesia in 2014. The means of PDM is 0.9520 with standard devation of 0.77353. It indicates the data have distribution normal. The other data have be seen in the Table 4Descriptive Statistic

The model of analyz regression of the data is (based on table 5):

Y =0,487 + 0,45CAR + 0,577FDR -0,366LATA + 0,381DEPOSIT + 0,520 NIM + 0,547 IHK

Based on the above regression formula can be concluded that each independent variable has a positive relationship to dependent. It means every increase of independent variable causes the increase of dependent variable.

Table 4. Descriptive Statistic

	N	Minimum	Maximum	Mean	Std. Deviation
PDM	54	-1,7401	2,2826	,638443	,7735348
CAR	54	-,1825	,5941	,200430	,1199760
FDR	54	,7277	1,5777	,952281	,1507153
LATA	54	,0407	1,0818	,558889	,2446383
DEPOSIT	54	,0060	1,2525	,768930	,2155089
NIM	54	-,2784	,1394	,044459	,0510223
IHK	54	-,5993	,9488	,075567	,5108780
Valid N (listwise)	54				

Table 5. Coefficients

Model	Unstandardized Coefficient		Standardized Coefficients	Sig.	R	R Square
	B	Std. Error	Beta			
(Constant)	.487	.156		.675		
CAR	.405	.322	.063	.0361		
FDR	.577	.015	.112	.0372		
LATA	.366	.462	-.116	.0433	.6514[a]	.8070
DEPOSIT	.381	.604	-.106	.0499		
NIM	.520	.472	-.034	.0834		
IHK	.547	.227	.361	.0200		

For the analyse Hypothesis the result is In the Capital Adequacy that has the sig value is 0.0361 or has a sig level more than 0.05 (0.0361<0.05).

CAR have the positive effect to Profit Distribution Management, with coefficient is 0.450 or 45%. CAR be effect to Profit Distribution Management (H1 is accepted). The higher level of Capital Adequacy of a Islamic Banking observed from the Capital Adequacy Ratio (CAR) will encourage increased Profit Distribution Management.

The test results are in line with previous research conducted by[14];[9];[10]; [15]. But not linear with result by[6]that CAR not effecting to Profit Distribution Management and [9] with car have a negative effect

Effectiveness of Depositors Fund with the indicator is FDR has a significance level below 0.005 (0.0373<0.0500). It means that hypothesis 2 (H2) is accepted. FDR be effect to Profit Distribution Management, with the coefficient is 0.577 or 57.70%. Its mean FDR has positive effect to Profit Distribution Management. So the higher the FDR of a bank can be a benchmark to increase Profit Distribution Management. Its result same with previous research by[10];[15];[6]; and[11], but difference with previous research by[13]

Asset Composition (LATA), Deposit (Deposit), and Inflation Rate (IHK) variable have significance level with sig. value below 0.005. that each value 0.0433 for LATA, 0.0499 fot Deposit and 0.0200 for IHK. Its result same with previous research by [8] and [12] But its not similarity with research[10]; and[11].

Assets Management with the indicator is NIM. NIM Variable had a different result. NIM has the sig.value is 0.0761 or has a sig level more than 0.05 (0.0834>0.05). its mean to rejected hypothesis. NIM not be effect to Profit Distribution Management (H5 was rejected). This research is in line with[11].

The significance test of the research model has value of $R2 = 0.8070$ which means that 80.70% of independent variable (CAR, FDR, LATA, DEPOSIT, NIM and IHK) can explain the effect to dependent variable (Profit Distribution Management).

5 CONCLUSION

Based on the analysis results, it can be concluded that four factors positively influence Profit Distribution Management at General Islamic Bank in Indonesia, namely: Capital adequacy (CAR), Effectiveness of depositors' funds (FDR), Asset Composition (LATA),Deposit, and Rate of Inflation (IHK), while is the Assets Management (NIM) have no impact on the PDM.

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Applications Of Lipase Enzyme In Fatty Monoethanolamide Synthesis Based On Palm Fatty Acid Distillate

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Abstract. Monoethanolamide is a compound of nonionic surfactant which can be obtained through a reaction between Palm Fatty Acid Distillate (PFAD) with alkanolamine. It has OH^- group, so it dissolves easily in water and is widely used in the cosmetics industry. The screening of enzyme was conducted in temperature of 60^0C and the ratio of biocatalyst 0.2 % (w/w) in three types of lipase enzymes, which are *Rhizomucor meihei*, *Candida antartica* and *Lipase sp*. The determination of mole ratio level for PFAD/ethanolamine was conducted in four hour reaction times. The level of mole ratio of PFAD/ethanolamine was varied from 1:1 up to 1:10. Crude fatty monoethanolamide which is soluted in alcohol was separated from biocatalyst by using filtration method and carried on with distillation process to separate the ethanol from the product. Pure fatty monoethanolamide was gained as bottom product. Monoethanolamide was then confirmed in infra red spectrum (FT-IR). From the results of enzymes screening, it is known that *Rhizomucor meihei* is a type of enzyme that is able to hold the amidation reaction to provide the highest product conversion of 29.51% compared to other types of enzymes. While the increase in the ratio of moles PFAD/monoethanolamine gives the best results on the 1:4, and the conversion obtained is 86.25%.

Keywords: amidation, enzymes, PFAD, monoethanolamine, *Rhizomucor meihei*

1 INTRODUCTION

Alkanolamide is obtained from the reaction between fatty acid with alkanolamine. The fatty acid used is that with $C_{12} - C_{18}$ carbon chain so it can allow palm fatty acid distillate (PFAD) as the raw material. Usually, alkanolamide is produced chemically by using oil or fat with alkanolamine in certain temperature and this way is assumed as the conventional way. But, it has some debilities regarding the energy use and the forming of the unwilling side product. The synthesis of alkanolamide with conventional way is held by using alkali catalyst in the temperature of 120^0-150^0C. Finally, the product will contain amine soap which raises pH, so it is necessary to have purification process afterward. For this reason, an enzymatic process is developed to obtain monoethanolamide from PFAD by using biocatalyst. The

biocatalyst could be from lipase enzyme but it should have the specific characteristic in the substratum which contains palmitic acid. The specific characteristic is the ability of an enzyme to activate in one type of certain substrate [1].

Rhizomucor meihei, Candida antartica and *Lipase sp.* are types of lipase enzymes which usually used in the reaction of fatty acid esterification to produce fatty acid methyl ester (FAME), cosmetic (palm oil emulsifier) that contain high palmitic acid, food industry (cocoa butter), vegetable oil industries such as corn oil, sunflower oil, and olive oil [2]. The using of enzymatic reaction in fatty acid and vegetable oil has several advantages, they are: (i) the characteristics of high lipase which will gain pure product, (ii) relatively use low pressure and temperature, (iii) relatively lower cost of waste management and (iv) the product resulted is more eco-friendly than product resulted from chemical process conventionally [3].

Monoethanolamide is a compound that classified as fatty amide and nonionic surfactant that used widely as the material in producing shampoo, shower foam, latex stabilize, corrosion resistor, cleaning house products and liquid detergent [4]. A surfactant is a compound that has two groups which are hydrophobic (lipophilic) and hydrophilic (lipophobic) in one molecule, so it is called as amphilic compound [5]. Indonesia import of surfactant raise around 44.500 tons and it is predicted to raise more year to year in line with the growth of cosmetic, food, pharmacy, textile and tannery industries [6].

Indonesia is one of the biggest producers of palm oil in the world. Some of the products are exported in raw palm oil and the rest is used as the raw material for domestic industries. The consumption of palm oil in the country is only as cooking oil, margarine, soap and oleochemical industries that produce palm fatty acid, methyl ester, and a fatty alcohol. In cooking oil industry, there is a refining phase which intends to improve the quality of the oil. In this phase, besides the main product, cooking oil, it is also produced the side product which is palm fatty acid distillate (PFAD) that contains high palmitic acid, about 56.55%. This indicates the availability of the raw material for surfactant industries which involved enzymatic reaction.

Enzym functions as a catalyst in the biochemical process occurring in a cell inside or outside a cell. An enzyme can accelerate the reaction 10^8 up to 10^{11} faster than the reaction without a catalyst. Thus, an enzyme can be an efficient catalyst, besides it has a high specification. Like other catalysts, an enzyme can lower the activating energy of a chemical reaction. Some chemical reactions need energy (endergonic reaction) and some produce or release energy (exergonic). This specific characteristic of enzyme makes it only able to work in one reaction only [1].

To be able working with a compound or substratum, it must relate or connect with the substratum. An enzyme has bigger size that substratum, therefore not all part of an enzyme can connect directly with the substratum. The relation between substratum and enzyme only occur in a certain part. The part of the enzyme which relates or connect with the substratum called active site. The relation might only happen if the active site has space to accommodate the substratum. If the substratum has other size or confirmation, it cannot be accommodated in the active site of the enzyme. In this case, the enzyme has no function to the substratum. This is the reason why every enzyme has the specific characteristic to the certain substratum. The relation or connection between the enzyme and the substratum cause the complexity of substratum enzyme. This complexity is an active one which is temporary and will be decomposed if the expecting reaction has occurred. Simply saying, the decomposition of a compound or substratum by the enzyme can be described as a following reaction:

$$E + S \leftrightarrow ES \leftrightarrow E + P \tag{1}$$

E, S, ES and P, each of them symbolize the enzyme, substratum, enzyme substratum complexity and the product (for enzyme composition which is the multiple of identical subunits, E describes the site activity of enzyme molecule and non-enzyme molecule). Based on this model, if the concentration of the substratum becomes high until it is enough to change enzyme completely to ES form, so the second step of the reaction has the limit of speed and the whole of reaction level become not sensitive [7]

2 METHODS

2.1 Material

PFAD, monoethanolamine, n-Hexane, *Rhizomucor meihei* (Novozyme), *Candida antartica* (Lipozyme) and *Lipase sp*.

2.1.1   Biocatalyst Screening

Enzyme Screening is intended to choose the type of biocatalyst which has the highest conversion to amidation reaction through yield obtained. It is done in 60^0C, the mol ratio of PFAD/ monoethanolamine is (1:4) and biocatalyst ratio is 0.2 % (w/w) in 3 (three) types of lipase enzymes, which are *Rhizomucor meihei*, *Candida antartica*, and *Lipase sp*. Yield product of fatty monoethanolamide formed is described through the percentage of conversions decrease of free fatty acid (FFA).

2.1.2 Synthesis of Monoethanolamide

Type of enzyme which gives the highest yield in the screening phase is chosen as the enzyme in synthesizing the next fatty monoethanolamide. In this phase, the reaction of enzymatic amidation is occurred based on PFAD as the limit reactant and excessive monoethanolamine. The usage of monoethanolamine is more intended to raise the power of formed peptide bond.

The reaction of the monoethanolamide formation discribes in equation (2) while the synthesis of monoethanolamide is shown in Figure 1.

$$COOH \; + \; H - NH - CH_2CH_2OH \; \rightarrow RCONHCH_2CH_2OH \; + \; H_2O$$

PFAD   Ethanolamine   Monoethanolamida   water
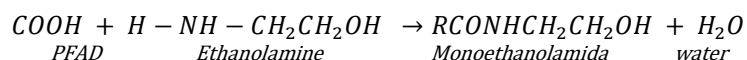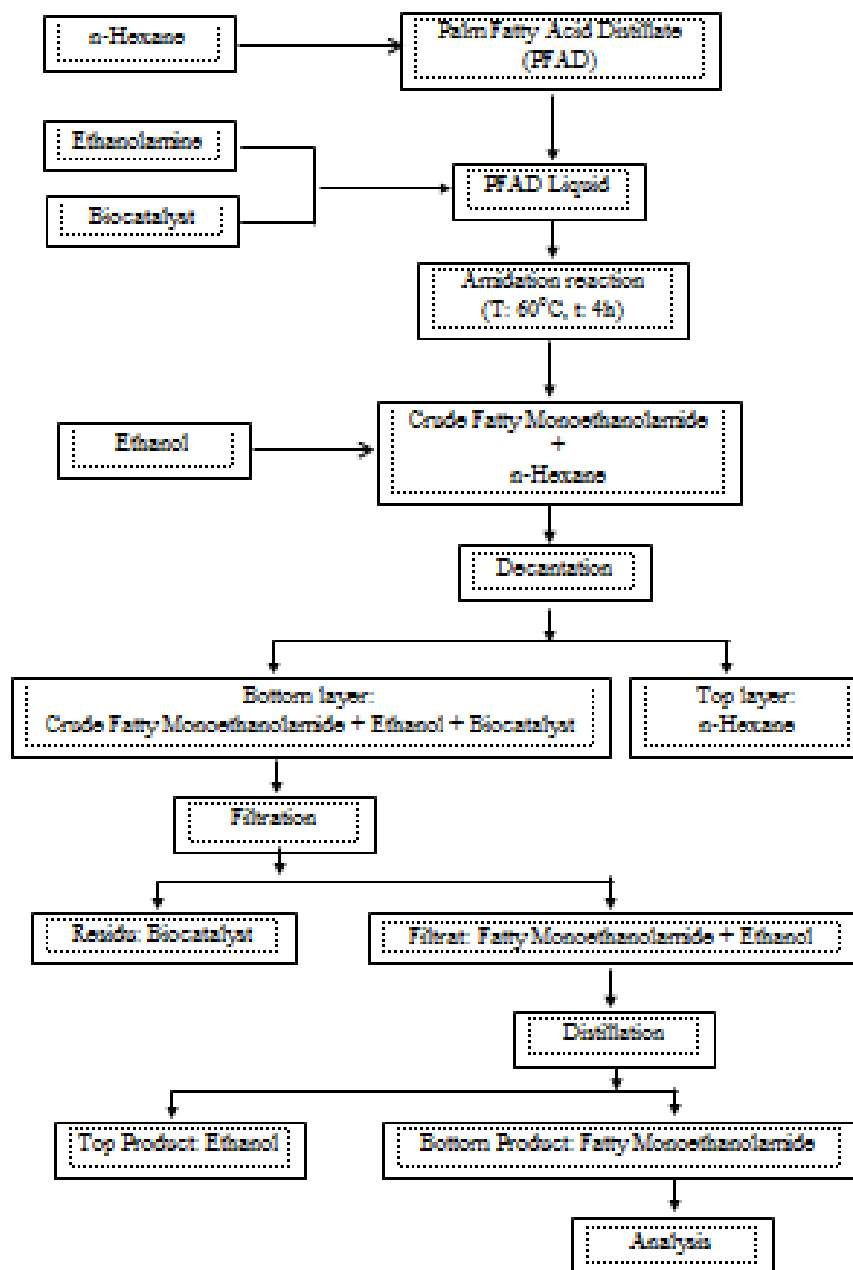
Fig. 1 Fatty Monoethanolamide Synthesis

3 DISCUSSION

3.1 Biocatalyst Screening

From the result of biocatalyst screening that has been done to the three types of biocatalyst; *Rhizomucor meihei* (Novozyme), *Candida antartica* (Lipozyme), and *Lipase sp*. It is known that *Rhizomucor meihei* gives the highest conversion compared to other types of enzymes. The conversion is calculated from the change of free fatty acids content of the raw material and the product. High percentage of FFA reduction indicates that many palm fatty acids which are formerly free (no bond with the second substratum) become bonded with the second substratum, in this case, ethanolamide forms product enzyme complex.
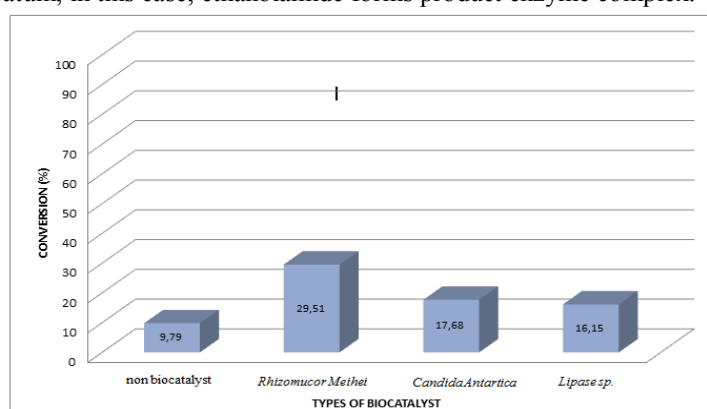
Fig. 2 The effect of Biocatalyst type to the conversion of Monoethanolamide

It is known that *Rhizomucor meihei* has high specificity to the amidation reaction based of PFAD with 29.51% conversion. *Rhizomucor meihei* is able to work in PFAD substratum with medium up to long chain fatty acids (C_{14}-C_{18}) as the biggest component. This is in accordance with the previous research done by [8] and [3] about the usage of *Rhizomucor meihei* in the substratum with medium up to long chain fatty acids, which gives positive effect to biocatalyst variables. Based on the survey during this research, it can be concluded that *Candida antartica* is only able to work in the substratum with medium chain fatty acids content, thus the conversion gained is not real, while *Lipase sp* is known unable to hold the amidation reaction along the reaction time because its characteristic is more sensitive to the temperature change and the condition of the reaction. As the control to the reaction, the amidation reaction is done without enzyme to observe the specificity owned by each of the biocatalysts. For the amidation reaction control, the reduction of FFA is about 9.79% which shows the significant effect of the enzyme variables to the continuity of enzymatic reaction of amidation. For further research, *Rhizomucor meihei* is used as a permanent variable for the type of biocatalyst. The spectrum FT-IR of monoethanolamide is shown in Figure 3.
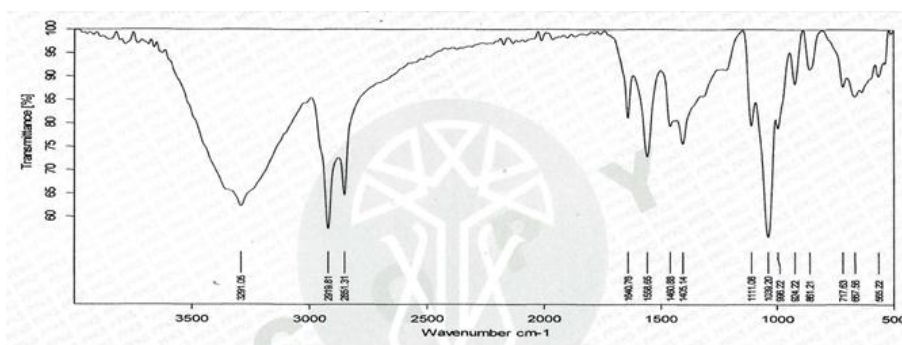
Fig. 3 Spectrum FT-IR of Monoethanolamide

Table 1. Non enzyme Fatty Monoethanolamide wavenumber.

Wavenumber (cm^{-1})	Functional group
3374.09	- O-H
2916.47	- C-H
1774.24	- C-O (amine ester)
1645.95	- C = O (amide)
1466.60	- C-N
715.77	- C-H$_2$

Table 2. Fatty Monoetanolamide (*Rhizomucor meihei*) wavenumber

Wavenumber (cm^{-1})	Functional group
3364.77	- O-H
2916.95	- C-H
1644.18	- C = O (amide)
1455.60	- C-N
715.85	- C-H$_2$

3.2 Fatty Monoethanolamide Synthesis

Monoethanolamide is a type of nonionic surfactant which functions as foaming boaster in cosmetic. Fatty monoethanolamide is produced by using ethanolamine and fatty acids. This research used PFAD as the source of fatty acids and excessive ethanolamine as the reactant. Excessive ethanolamine is used as observed reactant carrier.

The usage of excessive ethanolamine will chance to increase the power of formed peptide [9], however, the usage of the excessive ethanolamine may form more H$_2$O molecules, so it is necessary to determine the precise mole ratio in this amidation reaction.

In this research, the level mol ratio of PFAD: Ethanolamine was examined from 1:1 until 1:10 to determine the optimum of mole ratio. The selection of mole ration PFAD : Ethanolamine is done in the condition of reaction in 60^0 C, with biocatalyst ratio 0.2% (w/w). This condition is shown in Figure 4.

Based on the result, it is known that the level mol ratio of PFAD:Ethanolamine (1:4) gives the optimum conversion, it is proven by doing the raising of ethanolamine and the conversion gained decrease significantly. This is caused by the barrying of substratum in the reaction

system, because the substrate has completely bonded with the biocatalyst and together form the substratum enzyme complex and this fact is appropriate with the research done by Rahman (2003), that the raising of ethanolamine ration up to 1:10 give the reality of the decrease of product conversion.
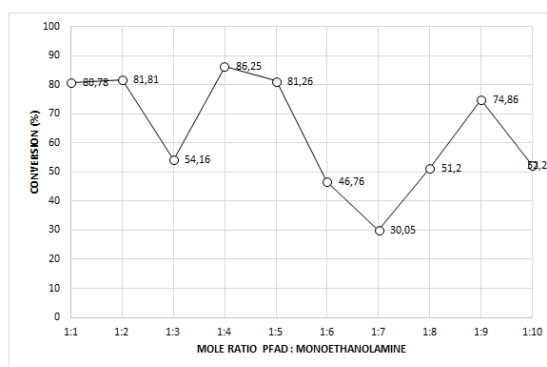
Fig. 4 The Effect of Mole ratio PFAD:Ethanolamine to the conversion of Monoethanolamide

4 CONCLUSIONS

From this research, it is known that *Rhizomucor meihei* gives the positive effect to the result of fatty monoethanolamide product conversion. *Rhizomucor meihei* is selective to the medium up to long chain fatty acid and able to hold the enzymatic amidation reaction. Mol ration of PFAD/ethanolamine (1:4) gives the best conversion, while the raising of ethanolamine ratio shows the substrate barrying in the substrate enzyme complex reaction because PFAD has reacted with monoethanolamine completely

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The Relationship Of Infest Proportion With Types And Reaction On Lepsory Patient In The Regional Hospital Of Dr. Zainoel Abidin Banda Aceh

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Abstract. Leprosy is a chronic disease caused by the bacteria Mycobacterium leprae that attacks the nervous, skin, mucosa (mouth) organs, upper respiratory tract, endothelial reticulocyte system, eyes, muscles, bone and testis. Infections of worms are associated with leprosy comorbidities, it may affect disease travel and immunoregulation process and disease metabolism including leprosy, so breed leprosy and leprosy reaction. To know more about worms in leprosy patients and withleprosy and leprosy reactions. The diagnosis is based on history, physical examination, smear examination/smear skin cleft and faecal examination. This research is using cross sectional method, and the statistical analysis with chi square test. The results of the study over 22 subjects were found male patients more 12 (54.5%), and there are more MB type patients around 17 patients (77.3%). Patients with a history of 14 white ENL reactions (63.6%) are greater than without reactions. The onset of reaction, patients during MDT treatment were more that 8 patients (57.1%) compare to before and after MDT treatment. The parasite was found in 2 MB leprosy patients with ENL reaction with positive parasite results ie Ancylostoma Duodenale and Trichuris Trichiura.

Keywords: Worm infestation, Leprosy Reaction, Leprosy Patient, RSUDZA

1 INTRODUCTION

Leprosy is an infectious disease caused by Mycobacterium leprae. Clinically a leprosy is consists of several spectra that depend on the patient's immune response. Leprosy attacks many societies with low socioeconomic conditions. This condition is associated with poor nutrition and result in lower body immunity in general. Environmental factors and poor hygiene are always found in patients infected with M. leprae. 1-2 Factors to consider in leprosy patients are the pathogenesis of disease, mode of transmission, socioeconomic and environmental conditions, genetics related to susceptibility, immune change, and the possibility of reservoirs outside of humans. The pathogenesis of leprosy is influenced by

the immune response to M.leprae both in determine the type of leprosy or the development or absence of the disease. T cells and macrophages play an important role in the process of recognition and response to M. leprae antigen.1-3 One of the infections associated with leprosy comorbidities is the infection of the worms. This infection is one of the highest endemic and chronic diseases in Indonesia and the case rises sharply during the rainy season and the flood. The worms enter the body in the larval phase and spread to various places to invade the human body.

From the latest research found that worm infections can affect the course of disease and immunoregulation process and metabolism of diseases including leprosy. The spectrum of leprosy is affected by the body's response to M. leprae bacteria, so that worm infections in the body can affect the clinical manifestations of leprosy and leprosy reactions.

2　RESEARCH METHOD

The purpose of this research is to know the proportion of worm infestation in leprosy patients. Place and time of research of Skin and Gender of Regional Hospital (RSUZA), Banda Aceh, March 2017 until August 2017.

The population in this study is leprosy patients who came to the Skin and Gender RSUZA Clinic, Banda Aceh. Inclusion criteria: lepers aged 18-60 years old, new or moderate patients receiving MDT treatment, and signed informed concent. Exclusion criteria: patients receiving medication other than MDT have received anti-worming medication in the past 3 months, or have received laxatives/saline hypertonic in the last 14 days and suffer from severe systemic diseases such as HIV, tuberculosis. The patient research procedure consists of: identity, anamnesis, and clinical data, type of leprosy, smear examination and faecal examination. Stool examination: each patient is taken at least 1 gram, which then performed direct smear examination and sedimentation to get the worm parasite.

The patient control was performed every 2 weeks during the 3-month study period. Clinical evaluation at the end of the study was made according to clinical criteria. At the end of the study there were clinical evaluations and documentary photographs. At each visit all clinical abnormalities were noted.

3　RESEARCH RESULT

This research was conducted at the regional hospital RSUDZA, Banda Aceh. The population of this study was all patients with leprosy. Worm infection is one of the comorbid infections that can be found in Hansen's morbus (MH) patient. This current research has shown that worm infections can affect various travel diseases through their effects on immunoregulation and metabolic processes. The clinical spectrum of MH has been known to rely heavily on host immune responses to M. Leprae bacteria, so intestinal helminth infection is also suspected to have a role in clinical manifestation of MH and erythema nodosum leprosum (ENL) reactions. Leprosy can affect humans in both sexes, male and females, but some types of males tend to be more common than women. The number of male patients is more likely to be more women than women, and it is associated with greater sexual activity in larger urban areas.

From the results of the study found that there are still many patients with leprosy who do not want to seek treatment to the hospital with a variety of reasons. So, the early handling is

not maximal. Those all description above could be the main source of Leprosy transmission is human. Leprosy bacteria are nested in the skin and mucosa of the human nose. Leprosy bacteria have an incubation period of 2 - 5 years can even take more than 5 years. Not yet known exactly how the transmission of leprosy germs. Theoretically, a person is infected with a leprosy germ since they have been in direct contact for a very long time with people affected by leprosy who have not taken the medicine. Moreover, the indication of the infaction over the leprosy germs to others is estimated through the upper respiratory tract.

Table 1. Demography Overview of the Leprosy Patient during May - July 2017

No.	Demography Overview	Leprosy Type n (%)		Total
		Paucibasiler (PB) (n = 5)	Multibasiler (MB) (n = 17)	n (%)
1	Gender			
	- Male	3	9	12 (54,5)
	- Famale	2	8	10 (45,5)
2	Age			
	- 18 - 29 year	2	9	11 (50)
	- 30 - 44 year	2	7	9 (40,9)
	- 45 - 60 year	1	1	2 (9,1)
3	Education			
	- SD	0	3	3 (13,6)
	- SMP	1	6	7 (31,8)
	- SMU	3	4	7 (31,8)
	- S1	1	4	5 (22,8)
	- S2 - S3	0	0	0 (0,00)

Regarding to the Table 1 it is known that the number of male patients is 12 patients or 54.5%, while female is 10 patients or 45.5%. By age group, patients with age group 18 to 29 years were 11 people or 50%, age group 30 to 44 years were 9 patients or 40.9%, and the age group 45 to 60 years were 2 patients or 9.1%. Based on the level of education, patients with elementary school education amounted to 3 patients or 13.6%, junior high school education amounted to 7 patients or 31.8%, high school education amounted to 7 patients or 31.8%, and education S1 amounted to 5 patients or 22.8%.

This is consistent with the previous study conducted by Lukas et al., that uncovered the most age groups in the 30-39 year age range of 35 people (22.2%) and the male sex of 108 (68.4%) compared to women 50 people (31.6%).[20] Epidemiological studies in India reported National Institute of Epidemiology states leprosy is more common in men (58%) than females (42%).[21] Phillips DA, Rio dejainero reported that cases of leprosy type MB more commonly found that is 76%, with an average age of 48 years and men more than women.[22] As one of the factors penyularankusta, men tend to work more than women. Halini is closely related to the customs, where the man as the head of the family is demanded to be able to work to meet the needs of his family. However, as the development of the matter is little by little changed in because there are many women who now become the backbone of his family.

Leprosy is closely related to the factors of knowledge (education). Where the incidence of leprosy is more common in patients who have low knowledge about leprosy.Because of ignorance then they do not immediately seek or check themselves. The period before the

treatment is a moment prone to spread leprosy to others. This is what usually triggers the increase of new sufferers in an area that result in the loss of leprosy in society.

Table 2. Clinical Features of Leprosy Patients

No.	Clinical Overview	n	Percentage (%)
1	Leprosy Type		
	- PB	5	22,7
	- MB	17	77,3
2	Medical Treatment History		
	- MDT – WHO Treatment	12	54,5
	- RFT ≤ 6 Months	4	18,2
	- RFT > 6 Months - 1 Year	6	27,3
3	Reaction History		
	- Without reaction ENL	8	36,4
	- Reaction ENL	14	63,6
4	Onset Reaction		
	- Before Treatment MDT – WHO	4	28,6
	- During Treatment MDT – WHO	8	57,1
	- After Treatment MDT – WHO	2	14,3
5	Treatment duration of Kostecosteroid Reaction		
	- ≤ 12 Months	14	100
	- > 12 Months	0	0

The number of patients with PB type leprosy is 5 patients or 22.7%, while the MB type is 17 patients or 77.3%. On the be half of the history of treatment, patients in MDT-WHO treatment were 12 patients or 54.5%, treatment history of RFT ≤ 6 months was 4 patients or 18.2%, and treatment history of RFT> 6 months - 1 year was 6 patients or 27.3%. regarding to reaction, patients with ENL reaction amounted to 14 patients or 63.6%, whereas without ENL reaction was 8 patients or 36.4%. Additionally, the onset of reactions, patients before treatment of MDT - WHO were 4 patients or 28.6%, during treatment of MDT - WHO was 8 patients or 57.1%, and after treatment MDT - WHO 2 patients or 14.3%. Beside, in term of the duration of treatment, patients with treatment duration greater than or equal to 12 months amounted to 14 patients.

The finding is supporting the prior research by Oktarina et al., they found that the most reaction types of MB as many as 61 people (75.3%) and PB as many as 20 people (24.7). (24) Then, direct contact with patients either skin contact between families, neighbors or friends is the main source of transmission between humans. In general, both in terms of age and sex, people with MB leprosy type (MultiBasiler) have a risk of passing the bacterial by physical contact to others by fifth to eight times compared with two times only PB (Pausi Basiler) .

World Health Organization (WHO) recommends the MDT regimen with duration of six months for patients who produce prostatic and lupus punctures for patients with multibacillary

leprosy. These regimens are effective for the eradication of M. valves to leprosy patients. The treatment may take longer if some patients have high bacterial indexes to prevent relapse.

Table 3. The overview of Leprosy Patient With Positive Parasite Results (n : 2)

No.	Leprosy Type		Parasite	Infection Intensity	Amount
1	MB	MB	*Ancylostoma Duodenale*	Weight	20 egg/gr
2	MB	MB	*Trichuris Trichiura*	Weight	16 egg/gr
Total		2			

From the Table 3 above, there are 22 subjects were obtained 2 patients with MB leprosy with ENL reaction and positive parasite result that is Ancylostoma Duodenale and Trichuris Trichiura. Phillips DA, Rio dejainero, 2017 reported that worm infections can affect the transmission of leprosy in endemic areas. Lukas et al., also reported that from his research, the infestation of Hemoglobacteric nematodes was 1 (1.4%) and multibasiler MH 72 people (98.6%). The subjects of the study were 36 peoples (42.4%) and multibacillary MH 49 people (57.6%). (22) Diniz et al., conducted the previous study in Brazil which state the frequency of infestation of worms is worse than that of the MH multibaciller patients compared with the pausibasiler. (25, 26) Prost's study, et al., Reveals the prevalence of intestinal worm infestation of nematodes found in multibacillary MH. (25) In leprosy patients with frequent reactions, protozoan and intestinal parasites. The most common protozoa are E. Histolytica (25%), G.lamblia (8%), whereas the most common parasites are A.duodenale, S. Stercoralis and H.nana.

Table 4. An Overview of Leprosy Patients With Parasitic Infections

	Negative Parasite Infection (%)	Positive Parasite Infection (%)	Total n (%)	p value
Pausibasiler	5	0	5 (22,7)	1,000
Multibasiler	15	2	17 (77,3)	
Total	20	2	22 (100)	
ENL Reaction	12	2	14 (63,6)	0,515
Without ENL Reaction	8	0	8 (36,4)	
Total	20	2	22 (100)	

This research uses chi square test, as showed in table 4, it is stated that p-value value for testing the relationship between leprosy type with parasitic infestation is 1,000 > 0,05, which means that there is no relationship between leprosy type and infestation parasite.

Based on the result of Chi Square test, the p-value for testing the correlation between reaction history with parasite infestation is 0,515 > 0,05, meaning that there is no correlation between reaction history with parasitic infestation.

Singh SK, et al., performed a study in Nepal 2015, they found that from 200 patients with reactions and non-leprosy reactions obtained 33% protozoa ie 5.5% Trichomonas hominis worms, Strongyloides stercoralis and Ancylostoma duodenale in leprosy patients with reactions. There is a relationship between intestinal parasite co-infection and leprosy. (28) Octaria, et al. Reported from 81 leprosy patients found 11 patients with parasitic infections namely Trichuris trichiura mild degree in 5 patients and severe stercoralis Strongyloides in 6 patients. Wherein there may be a correlation between worm infection and leprosy severity.

In this study the results obtained were very low in only 2 MB leprosy patients with ENL reaction with parasitic infestations Ancylostoma Duodenale and Trichuris Trichiura. Although the results of statistical test analysis there is no relationship between parasite infestation with the type and leprosy reaction, but parasitic infestations obtained need to be observed to determine the progression of the disease.

4 CONCLUSION

Leprosy is also known as Lepros disease or Hansen Disease which in history note that this disease has been known to the public since 300 BC. This disease is a chronic infection caused by Mycobacterium Leprae bacteria. The bacterium was first discovered by G.A. Hansen in 1873. This bacterium undergoes a process of division long enough between 2 - 3 weeks. Life survival of leprosy germs reaches 9 days outside the human body.

The main source of Leprosy transmission is human. Leprosy bacteria are nested in the skin and mucosa of the human nose. Leprosy bacteria have an incubation period of 2 - 5 years can even take more than 5 years. Not yet known exactly how the transmission of leprosy germs. However, it is theoretically known that a person is infected with leprosy bacteria because it has been in direct contact for a very long time with people affected by leprosy who have not taken the medicine.

This is a preliminary study and the results of this study show that parasitic infestation does not play a role with leprosy type and reactions. However, further research is needed with a larger number of patients and a longer period of study to determine the role of parasitic infestation in leprosy patients, although the role of parasite infestation is unclear in influencing the progression of leprosy type and reactions.

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The Financial Crisis Impact on Firm Performance, Financial Decision and Corporate Governance of Indonesia Listed Firms

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Abstract. The purpose of this study is to investigate the impact of global financial crisis on firm performance, financial decision and corporate governance of the Indonesian listed firms. The financial data are retrieved from Reuters Data stream and annual reports for 212 firms over the period 2003-2013. Hence, the data is a balanced panel data with 2332 observations. The impacts of the financial crises on the research variables are tested using a special two-way cell-means (ANOVA) model of each of the research variables by Time-Period, and Sectors. The factor Time-Period (TP) has three levels, namely before, during and after crises, respectively and the factor Sector has two levels; Manufacturing and Service sectors respectively. The findings of cell-mean parameter show that market performance (TOBINS_Q) is lower during crisis period compared to before and after crisis period, indicating the mean parameters are significantly greater than its mean during the crisis period for both sectors. Meanwhile, accounting performance (ROA) appears to have lower mean parameter during crisis period compared to after crisis. However, based on the coefficient of firm performance, the impact of financial crisis is more on the market performance and less on the accounting performance. The findings also show that investment is lower during crisis period compared to before and after crisis period, while leverage is lower during crisis compared to before crisis period for both sectors. Interestingly, the results show that financial crisis had no impact on dividend per share, while free cash flow and corporate governance are less impacted by the financial crisis. This study extends the current understanding of firm performance, financial decision and corporate governance by providing new empirical evidence of the impact of financial crisis by sector.

Keywords: Firm performance, financial decision, corporate governance.

1 INTRODUCTION

The global financial crises occurred at the end of 2007 had caused economic crises with no exceptions to developed and developing countries, that have changed the shape of the world economy. The crisis changed the global economy generally, and it especially affected the financial market in developing countries. Specifically, the financial crisis most affected the stock market performance in emerging economies, such as Indonesia and Malaysia and others [1]. In Indonesia, the impact of the global financial crisis was seen in the economic decline in some sectors; the crisis fall-out at the end of 2008 caused the rate of interbank loans to increase. Besides, the growth of Indonesian companies for all sectors had declined during the crisis, in which the most sectors impacted by the crisis are manufacturing, plantation, mining (oil and gas), constructions and trade sectors.

The uniqueness of Indonesia during financial crisis 2009 was recorded relatively high and positive economic growth compared to its neighbouring countries such as Singapore, Malaysia, Thailand and Philippines which has the highest decline in the economic growth [2]. Even though it showed positive growth, the global financial crisis caused weakening exports and tightened up the financial market and global liquidity. Hence the exports-oriented companies falling and in turn influencing the consumption and investment, so definitely the crisis affected Indonesian companies in all sectors, while the manufacturing sectors have suffered the most from the crisis in terms of retrenchments [3].

Even though the worldwide economy has been recovered from the crisis, it should reconsider how the Indonesian listed companies increase their capability to cope with the declining the firm performance, financial decision such as investment, financing and dividend policy during the financial crisis [4] [5]. Past studies documented that firms faced financial constraints and it is difficult to access the external fund to finance their investment, thus investment will tend to decline during the crisis period. Hence, firm with higher cash could mitigate declined the investment, and thus it can alleviate underinvestment problem when the cost of external finance is higher. In this case, the internal fund is considered the most important for financing investment as compared to the external funds [6]. However, the firms rely extensively used bank-credit during the crisis. Accordingly, revealed that investment declined during financial crisis caused by the change of investment opportunities, for financially constrained firms with firm low cash reserves or high net short-term debt prove to be the greatest decline [4].

On the other hand, regard to dividend policy and corporate governance, it appears that Indonesian firms has concentrated ownership structure with family firm as the most dominant business structure that pays lower dividend [7], even though the number of dividend payers is increased amidst the growing number of listed firms, in which the mean of dividend payout ratio was 32 percent for the period 2008 to 2012 [8].

Even though there are many competing explanations that have been offered, only few studies that focused on the financial crisis impact on firm performance, financial decision behavior and corporate governance in different manner [5] [4] [9]. Moreover, those studies do not focus on time variations (before, during and after) financial crisis by sector. Hence, this study is motivated by the issue to investigate the extent of financial crisis impact on firm performance, financial decision, free cash flow and corporate governance of Indonesia listed firms by sector and time-period

2 LITERATURE REVIEW

The financial crisis affects Indonesian companies in all sectors, and especially manufacturing firms is most suffered. There are few studies that focused on the financial crisis impact on firm performance, investment, capital structure, dividend policy and corporate governance have been documented [4] [5] [10] and others. Dolenc et.al [11] examined the effects of the global financial crisis on ROE, found that the global financial affect ROE negatively. Also, Akbar et.al [5] and Zeitun et.al [12] found financial crisis has a negative impact on accounting performance.

Investment is a transaction that increases the amount of real aggregate wealth in the economy, generally by buying new real fixed assets for production purposes. The value of firm is determined by investment decision [13], despite in perfect capital market, investment decision is independent of capital structure, in which external funds serve as a perfect replacement for internal capital [14]. In response to the financial crisis and investment of Indonesia companies, it is revealed that the crisis is related to demand shock and financing constraints. The crisis might condense firms which are more likely to abandon investment decision. Past studies has shown that investment declined over these crisis periods [4] [5]. In the meantime, Bo [15] also found that the financial crisis affected the corporate investment negatively, whereas state controlled firms were less. Moreover, financial distress also affects investment in a different manner, depending on investment opportunities available in the firms [16]. On the other hand, the real effect of financial constraints during crisis has affected the chief financial officers (CFOs) to cut more investment in the US, Europe and Asia [17]. Moreover, the companies rely extensively on the credit provided by the bank during the crisis [18].

Capital structure is one of the most important financial decisions, whether to finance its investment by debt or equity. Firms with a higher leverage ratio indicate that firms suffer from agency costs, which is the cost due to the conflict of interest among the agents [19]. Higher leverage will subject firms to certain risks, especially when managers do not manage them wisely, leading to the increase in costs. The effect of financial crisis on capital structure has been developed in past studies [4] [5] [20], the results shown that the crisis has negatively affected the capital structure of the firms. Then they suggested that the level of leverage decreased due to costly external financing and credit supply shock. Furthermore, Akbar et.al [5] suggested that the flow of credit to these firms was reduced during the financial crisis period in UK private firms.

Studies on financial crisis and dividend policy still limited. Akbar et.al [5] examined the effect of financial crisis on dividend payout, found that financial crisis is positive and adversely affect dividends payout. This implies that the private firms did not scale back shareholders distributions during crisis period. Moreover, Pathan et.al [21] examined financial constraints and dividend policy for US listed firms during period 1989 to 2012, founds that constrained firms show worse stock market reaction to new equity issue announcement following dividend increase. Conversely, constrained firms increase dividends during the financial crisis period. Besides, Floyd et.al [22] pointed out the staying power dividend payout follows the free cash flow explanation for industrial firms.

The free cash flow defines how much cash is available in corporations after financing new investment in positive net present value [23]. Excessive free cash flow may cause managers to over-invest by undertaking new investment with negative NPV value, instead of distributing cash dividends to shareholder [19] [23]. The agency conflict between owners and managers

can mitigate through raised debt and dividend payments. However, cash holding as a hedging effect depends on the corporate governance system and risk awareness.

The characteristic of corporate governance in Indonesia is unique, where high concentrate ownership structure and companies escorted by family members. Moreover, In Indonesia, the corporate governance system adopts the two-tier board system, i.e. Board of directors (BOD) and Board of commissioners (BOC), in which the BOC's role is to take care of shareholders' interests and is to control the BOD. The global financial crisis is predicted to have an impact on corporate governance. The financial crisis has awakened investors to the fact that they need protection for their investment. Moreover, there are various empirical researches that have highlighted the global financial crisis impact on corporate governance [24] [25]. Accordingly, small board is better compared to large board in terms of the efficiency and effective decision making [26].

According to the above explanations, further elaborates the sets of hypotheses which are representatives of the objectives of this study, namely, to identify the impacts of the global financial crisis on the firm performance, investment, leverage, dividend policy, free cash flow and corporate governance with the general hypotheses as follows:

$H1$:   *The global financial crisis (time-period) has impacts on the research variables by sectors.*

Thus, the sub-hypotheses for H1 are constructed as follows:

H_{11}:   *The mean of each research variables during crisis are lower than before the crisis for manufacturing sectors.*
H_{12}:   *The mean of each research variables during crisis are lower than after the crisis period for manufacturing sectors.*
H_{13}:   *The mean of each research variables during crisis are lower than before the crisis period for the service sectors.*
H_{14}:   *The mean of each research variables during crisis are lower than after the crisis period for the service sectors.*
H_{15}:   *The effect of Time-Period (TP) on the research variables depend on SECTOR.*

3 METHODOLOGY

This study employ yearly of 212 listed firms for the period from 2003 to 2013. The financial data are retrieved from Thomson's Datastream and annual reports. Hence, this study has an annual observation of over than 11 years period per company, producing a balanced panel data of 2332 observations. This study used numerical variables to measures dependent variables; the firm performance measures based on two perspectives, namely accounting-based measure and market-based measure (ROA and TOBIN'S Q) [27]. Moreover, financial decision measured by investment, leverage, dividend per share (DPS) and free cash flow (FCF). Lastly, because of Indonesian companies adopted two-tier board system, then this study using board size (B_SIZE) and board of independent commissioners (B_ICOM). The independent variable are generate or define a nominal dichotomous variable, namely SECTOR with two levels: Manufacturing and Services, and three levels of ordinal variable TIME-PERIOD (TP): before crisis, during crisis and after crisis. ROA is defined as the ratio of net profit divided by total assets. TOBINS_Q is the ratio of market value of equity plus book value of the total debt divided by the book value of total assets each firm and years.

Meanwhile, investment is calculated as log natural of total asset at the time/year t divided by total assets in the previous year (t-1). This measure has been employed by. This study defines leverage as the ratio of total debt to total asset. Dividend per share is the total amount of dividends paid to the total of share outstanding. The FCF is measured as the operating FCF minus interest and dividends payment scaled to book value of total assets, in order to eliminate any size effect.

The simplest way to study the impact of the global crisis on firm performance, financial decision, free cash flow and corporate governance is to study the means differences of each research variable between the three levels of the time-period (TP). Therefore, we have to study and test the hypotheses on the differences of each research variable between two or more cells or groups generated by the two factors, SECTOR and TIME-PERIOD (TP), using a two-way cell-means (ANOVA) model. Thus, the two independent samples t-tests are inappropriate to be applied. Then, at least the means and variances differences of each research variable over the three time-periods can show the degree of impacts of the global financial crisis by sectors. There are several alternatives of the two-way cell-means models presented in Agung [28]. Thus, the model applied in this study has a specific equation as follows:

$$Y \quad C \quad @Expand(Sector,@Drop(2))$$
$$@Expand(Sector)*@Exp \ and(TP,@Drop(2)) \tag{1}$$

Additionally, its statistical results using Eviews will present the following equation.

$$Y_{it} = \ C(1)+C(2)*DS1+C(3)*DS1*DTP1+C(4)*DS1*DTP3$$
$$+C(5)*DS2*DTP11+C(6)*DS2*DTP3+[CX=R] \tag{2}$$

where Yit can be ROA, TOBIN'S Q, Investment, Leverage, Dividend per share (DPS), free cash flow (FCF), and two corporate governance; board size (B_SIZE) and Board of independent commissioners (B_ICOM) of firm i at time t, $C(1) = \beta0$ is the cross-section random variable, DS1 and DS2 are the dummy variables of (Sector=1) and (Sector=2), respectively, DTP1 and DTP3 are the dummy variables of (TP=1) and (TP=3), and the term [CX=R] indicates the error term of the cross-section random effect model. Therefore, in this study, the following six cell-means applied. Moreover, note that the dummy variable of the level (TP=2) is not used in the model, since it will be used as the reference group.

In addition, for the testing hypothesis, Table 1 presents the mean parameters of Y by SECTORS and TP based on the cell-mean model (2), for all numerical research variables, where TP=2 is selected as the reference group, for the Manufacturing and Service sectors.

Table 1. Parameters of the two-way ANOVA model (2) for each research variable by time-period (TP) and Sector

	TP=1	TP=2	TP=3	TP(1-2)	TP(3-2)
1. Manufacturing	C(1)+C(2)+C(3)	C(1)+C(2)	C(1)+C(2)+C(4)	C(3)	C(4)
2. Service	C(1)+C(5)	C(1)	C(1)+C(6)	C(5)	C(6)
Difference-in-Differences (DID)				C(3)-C(5)	C(4)-C(6)

4 RESULTS AND DISCUSSION

The testing hypotheses on the impact of financial crisis on the firm performance (ROA and TOBINS_Q), financial decision (INVESTMENT, LEVERAGE, DPS, FCF) and corporate governance (B_SIZE and B_ICOM) by SECTOR and TP=time-period (before, during and after the global financial crisis) based on the two-way cell-mean (ANOVA) model (3.2) are summarized and presented in Table 2. Column (1) presents the F-statistic for testing the joint effects of SECTOR and TP on each of the research variables, or the impacts of financial crisis on each of the research variables by SECTOR. The results show that the impacts of financial crisis (TP) by SECTOR on all of the research variables are significant, except for B_SIZE. Column (2) to (5) present the t-statistic for testing the four one-sided sub-hypotheses on the means of differences of each variable between pairs of the time-periods (TP=1 & TP=2) and (TP=2 & TP=3). In column (6) presents the F-statistic for testing the fifth sub-hypothesis H_{15}.

In Table 4.1, the results show that the mean of ROA during crisis is indeed greater than before crisis for both the manufacturing and service sectors. This implies that the mean parameters of ROA for the period after crisis is significantly greater than its mean parameter during the crisis period at 1 percent level of significance. This results support the alternative sub-hypothesis H_{12} and H_{14} respectively. It can be concluded that the level of ROA during crisis is higher compared to before crisis and to have lower than after crisis period for both sectors. These findings are in line with the study carried out by Dolenc et.al [11], who found that the firm performance was lower during the crisis period. Similarly with and Akbar et.al [5] founds that financial crisis has a negative impact on firm performance (ROA).

While comparing to market performance, the mean parameters of TOBINS_Q before and after the crisis (TP1 & TP3) are greater than its mean during crisis period (TP2). TOBINS_Q is indeed lower during crisis period compared to the other periods. This means the data support the sub-hypothesis H11 and H_{12} respectively. Similar results with the service sectors, which show that the means parameters of TOBINS_Q before and after the crisis are also greater than its mean during the crisis period. Thus, the data support the alternative sub-hypotheses H_{13} and H_{14} because of the fact that TOBINS_Q is lower during the crisis period for both manufacturing and service sectors. This implies that the financial crisis affects the market performance significantly. This finding is in line with past studies [1] who suggested that financial crisis affected stock market performance. This finding is also consistent with Zeitun and Saleh [12] who found that Tobin's Q is significantly affected by the financial crisis.

The results of the means differences of investment before and after crisis are greater than its means during crisis for manufacturing sectors. These results suggest that the level of investment before and after crisis is significantly higher than its mean parameter during crisis. Hence, it can be concluded that the data supports the sub-hypotheses H_{11} and H_{12} specifically for manufacturing sector. Similar results are found for service sectors, however, only the sub-Hypothesis H14 is accepted, in which the mean parameter of investment after crisis is significantly greater than during the crisis. Hence, the data support the theoretical prediction that investment is lower during crisis period than after crisis period. These results suggest that financial crisis impacted investment for both sectors and it seems to be significantly higher after the crisis period. This finding is in line with (Duchin [4]; Akbar et.al [5]; Gupta et.al [25] who reported that investment declines during the financial crisis. Campello [17] also proposed that investment is reduced during the crisis period caused by the credit crisis in 2008. Then, Dolenc [11] also pointed out that the financial crisis affects the investment significantly, which suggests that the investment of private companies declined during the crisis period.

Table 2. Summary of the testing hypotheses on the cell-means parameters of all research variables based on two-ways ANOVA models

VARIABLE	SECTOR=1 (Manufacturing)			SECTOR =2 (Service)		SECTOR*TP
	(1)	(2)	(3)	(4)	(5)	(6)
Coefficient t-Statistic	F-test (Joint ffect)	μ(11) > μ(12) C(3) > 0	μ(13) > μ(12) C(4) > 0	μ(21) > μ(22) C(5) > 0	μ(23) > μ(22) C(6) > 0	DID F-Stat./Df
ROA	17.0390***	-0.0173 -2.743	0.0209 (3.1969)***	-0.0093 -0.8173	0.0378 (3.2156)***	0.8517 (2, 2326)
TOBINS_Q	17.0519***	0.0765 (2.7833)***	0.2075 (7.2882)***	0.0966 (1.9512)**	0.2106 (4.1111)***	0.0971 (2, 2326)
INVESTMENT	7.9916***	0.0227 (1.5176)*	0.0733 (4.7419)***	0.0063 0.2329	0.0728 (2.6151)***	0.2601 (2, 2326)
LEVERAGE	27.7402***	0.0254 (2.9784)***	-0.0392 -4.4521	0.0489 (3.1905)***	-0.0316 -1.9925	1.1457 (2, 2326)
DPS	11.8171***	-0.0135 -0.8738	0.073 (4.5762)***	-0.0041 -0.1492	0.021 0.7308	3.0895 (2, 2326)**
FCF	5.45031***	-0.0104 -1.1426	0.0111 1.1823	-0.0305 -1.8588	0.0259 (1.5273)*	2.7181 (2, 2326)***
B_SIZE	0.6302	0.063 0.5116	-0.0231 -0.1817	0.184 0.8306	-0.045 -0.1962	0.2768 (2, 2326)
B_ICOM	26.1371***	-0.046 -6.6024	-0.0047 -0.652	-0.0398 -3.1734	0.0364 (2.7990)***	5.8937 (2, 2326)***

Notes: The t and F statistics in parentheses with ***, **, * denotes significant at 1, 5 and 10 percent level, respectively. Sector=1 is manufacturing sectors and Sector=2 is service sectors. TP=1 is before crisis, TP=2 is during crisis and TP=3 is after crisis. μ(ij) is the mean parameter of Y for Sector=i and TP=j. DID is difference-in-differences of the mean parameters. C(1) to C(6) are the model parameters. Investment measured by natural logarithm of growth total assets, leverage measured by total debt to total assets, DPS is Dividend per share, FCF is Free Cash Flow, B_SIZE is total number of Board of directors, B_ICOM is total number of Board of independent commissioners over total number of BOC.

Moreover, the mean parameter of leverage before crisis is significantly higher than its mean during crisis for manufacturing and service sectors. This result reveals that leverage is lower during the crisis period compared to before crisis. Thus, the data only support the sub-hypothesis H11 and H13. These findings suggest that the financial crisis has an impact to the financial leverage of Indonesian listed companies, where the leverage appears to be lower during the crisis period compared to before crisis. Nevertheless, it seems to decrease after the crisis period where the decreasing mean parameters of leverage after the crisis period serves as the result of the financial crisis impact. It could be that the Indonesian firms find it difficult to access external finance and limited credit from bank sector during these periods. This result is consistent with prior studies, for instance [4] [5] who suggested that financial crisis has an impact on firm leverage.

In addition, the interesting finding is the mean difference of dividend per share (DPS) is indeed higher after crisis for both sectors. However, only for manufacturing sectors has the mean parameters of DPS after crisis are significantly greater than its mean parameter during

the crisis period. In other hand, DPS is higher during the crisis period compared to before crisis period. Therefore, the data support the sub-hypothesis H_{12} only. This finding is in line with the previous studies, who found that financial crisis has a positive and significant impact on dividend. Similar study conducted by found that the mean comparison of the dividend payout ratio is higher during the crisis compared to pre and post-crisis periods. The finding also suggests that the financial crisis is positive and significantly impacts the dividend payout ratio. Moreover, the mean difference of the free cash flow (FCF) is less significant, its shows the parameter of FCF is significantly higher than its mean parameter during crisis for service sectors only. In other words, FCF during crisis is lower than after crisis. Hence, the data only supports the fourth sub-hypothesis H_{14}. Lastly, the mean differences of corporate governance, which is B_SIZE and B_ICOM, seem to have less impact of financial crisis for both sectors. The results show that only the mean parameter of B_ICOM is significant after crisis period, this indicates that the mean parameter of B_ICOM is greater than its mean parameters during crisis. It can be said that the data accepted sub-hypothesis H_{14}.

Furthermore, the results of the interaction effect of time-period and sector on the research variable presented in Table 4.1 column (6), show that the data supports the sub-hypothesis H_{15} for only three out of the eight research variables, namely the variables DPS, FCF, and B_ICOM. In other words, the impact of financial crisis (TP) on DPS, FCF, and B_ICOM are significantly depends on SECTOR, or the *Difference-in-Differences (DID)* of the means of DPS, FCF, and B_ICOM by SECTOR and TP are significant.

5 CONCLUSION

This paper investigates the extent of the global financial crisis impact on firm performance, financial decision and corporate governance in a sample of 212 non-financial Indonesian listed firms over the period 2003 to 2013 which this study has an annual observation of over than 11 years period per company, producing a balanced panel data of 2332 units for the data analysis. The regressions of two-way cell mean results provide strong support to the firms to increase their capability to cope with the declining the firm performance, investment and leverage during financial crisis. Thus, the finding of the testing hypotheses on the cell-mean parameters of research variables reveals that the mean parameters of market performance (TOBINS_Q), investment and leverage are statistically significant mean differences. This indicates that those are lower during the crisis period compared to before crisis. Meanwhile, ROA, TOBINS_Q, investment and DPS appear to have significant mean differences impact, indicating that these mean parameters after crisis period are greater than during the crisis period, or it can be said those are lower during the crisis period compared to after crisis period, conditional for manufacturing sectors. Comparing to the service sector, the results show that TOBINS_Q and leverage only have significant mean differences between before and during crisis period. Moreover, firm performance seems to have significant mean differences between during and after crisis period, indicating that the mean parameters of ROA and TOBINS_Q are statistically higher than the mean parameters during the crisis period, which is similar to manufacturing sector. Furthermore, investment, FCF and B_ICOM were indicated to have significant mean differences, suggesting that those mean parameters were lower during the crisis period. This study extends the current understanding of firm performance, financial decision and corporate governance by providing new empirical evidence of the impact of financial crisis by sector.

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Zakat on Sustainable Development Goals (SDGs 2016-2030)

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Abstract. Zakat has an important role in poverty alleviation, there is research conducted Institution on Manajemen Zakat (IMZ) on the performance of zakat 16 zakat managers (BAZ and LAZ include BAZNAS) on 2011, 2012, and 2013. As a result, the amount of poverty mustahik can be reduced by 21,11 %. Blessing of zakat is seen from the time of poverty alleviation, ie without zakat program, it takes 7 years, but with the intervention of zakat to 5.1 years That is, zakat programs can speed up the time to alleviate poverty 1,9 years. Although new around 1 % funds raised from that potential Rp217 trillion, the zakat has been felt by the benefits 9% the poor in Indonesia. When the awareness movement to pay zakat continue dilakukaan so that the potential of a large zakat, which is about Rp 217 trillion per year can be achieved, then so many benefits of the people (community) that can be realized with the wealth of zakat. This is certainly very much in line with the idea *Sustainable Development Goals* (SDGs). *Sustainable Development Goals* (SDGs 2016-2030) actually a continuation of *Millennium Development Goals* (MDGs 2000-2015). he SDGs have 17 goals and 6 goals in line with the purpose of zakat among others (no poverty, zero hunger,Good Health and well-being, Quality Education, Clean Water and Sanitation, Reduced inequalities).

Keywords: Zakat, Proverty, Sustainable Development Goals.

1   Introduction

BAZNAS on January 17, 2018 the age of 17 years. There have been many works that have been produced and this is a solid foundation for struggling to overcome various problems of people, such as ignorance, unemployment and poverty. There is one strong determination that the next five years BAZNAS seeks to alleviate poverty by 1% per cent. Poverty alleviation or solving poverty problems are becoming an important issue worldwide today especially in low-income countries.

The poverty rate in Indonesia is increasingly alarming, according to Central Bureau of Statistics (BPS) data, in September 2017, the number of poor (people with per capita expenditure per month below the Poverty Line) in Indonesia reached 26.5 million people (10.31 percent) with a population of 257.9 million people in 2017. The number of poor people of that number was the majority of Muslims.

The government's plan to target zakat for development programs is apparently not just a discourse. Previously, the Head of National Development Planning Agency (Bappenas) Bambang Brodjonegoro said that the discourse was re-affirmed by Finance Minister Sri Mulyani. Later the plan became more clearly directed towards Sustainable Development Goals (SDGs). The use of zakat funds for development programs is increasingly clear, in order

to succeed the Sustainable Development Goals (SDGs) agreed upon by the world. "The implementation of SDGs as a tool to achieve the National Development Agenda can be complemented by the support of the implementation of zakat.

The SDGs are a change from the Millennium Development Goals (MDGs), ratified by 193 UN member states in the 70th general assembly in September 2015. Enacted for 15 years, the goal of Sustainable Development is expected to change the world in 2030.

SDGs have 17 goals (goals) set, Each has terget, with a total of 169 targets. The first goal (7 targets) ends any form of poverty anywhere. The second goal (8 targets), ending hunger, achieving food security and improving nutrition, and encouraging sustainable agriculture have 8 targets. The third goal (13 targets), ensuring a healthy life and encouraging welfare for all people of all ages. The fourth objective (10 targets), ensuring inclusive and just education and encouraging lifelong learning opportunities for all, focuses on these four objectives on the grounds that these four goals are very much aligned with the concept of empowerment of people with the use of zakat funds.

2 Methods

This study uses a qualitative-quantitative approach. Sugiyono [1] while qualitative study Kuncoro [2] is a complex process or effort, through information reported from informants and done in natural situations. While the qualitative study is the decision-making process that departs from the data.

3 Discussion

3.1 Zakat

The law of zakat is mandatory which is a religious command set out in Surah Al-Hadid verse 7: "Have faith in Allah and His Messenger and spend some of your treasure that Allah has made you satisfy. Then those who believe among you and spend (some) their wealth earn a great reward. Surah Al-Baqarah verse 43: "And establish a prayer, make zakat and ruku'lah beseta the people who ruku."[3]. Sabiq, A.S. [4] zakat is the name for the property issued by a Muslim from God's right to be channeled to the rightful group. Zakat comes from the word az-zakah which means to grow, holy, and blessing as Quranic verse of Quran. At Taubah (9: 103) Meaning: "Take alms from some of their possessions, with that charity you cleanse and purify them. Verily, your prayer is the peace of their souls. And Allah is Hearer, Knower. " [3]

Al-Qardawi [5] notes that some Muslim scholars claim that the Qur'an mentions zakat in 82 places, whereas according to Al-Qaradawi himself, the word is said about 30 times, while 27 events affirm together the order of prayer or fasting. This is evidence of the importance of zakat in the teachings of Islam.

Fundamentally, zakat can not only fulfill the legal and substance of the Shari'a but it is also relatively easier to promote social faces and alignments to the real sector of shariah itself. That is, zakat must be able to spearhead the fulfillment of existing maqasid shariah. Zakat should "have more right" to use the framework of maqasid syariah thinking in all its processes [6]. Although the recipient of the zakat is determined to (1) the indigent; (2) poor; (3) amil; (4)

converts; (5) Riqab (slave); (6) gharim (the indebted); (7) Fiisabillilah (who fought in the way of Allah, and (8) ibn sabil (who was on the way)

3.2 Maqashid Syariah and the Concept of Islamic Development

The Shariah Maqashid is built on a basic assumption that the Shari'a which Allah the Maker of Shari'ah has established through the main sources of Islamic ontology, namely the Qur'an and Sunnah, is built on the goal of attaining the benefit, not only for the individual but also the social.

Ibn Ashur [7] maqashid is a plural form of maqsid which means intent, purpose, principle or subject, intention, goal, or ultimate purpose. Kamali [8], maqashid Syariah is an objective of the implementation of Shari'a (Islamic law) in everyday life. This concept becomes a conception of thinking inherent in the development of Islamic economic and financial theories and practices. A very comprehensive concept in regulating how Islamic economy should be built both in the micro and macro level.

Although support for the concept of maqashid shariah which focuses on the fulfillment and improvement of 5 (five) aspects of life is very large, but this concept is not spared from the lack. One of the identified deficiencies lies in the restriction of the aspect of maqashid shariah which needs to be met and improved. To ensure the management of zakat in accordance with the fundamental values held by Islamic economics, maqasid syariah should be used as the basis for consideration, at least inspired from the perspective of the maqasid sharia [6].

3.3 The Purpose of Sustainable Development Goals (SDGs 2016-2030)

SDGs become the successors of the MDGs that contain universal goals by considering highly dynamic issues relating to the environment, politics and, of course, the economy. By 2030, it is hoped that the 17 (seventeen) large objectives of SDGs as shown in Figure 1.

Figure 1. The purpose of sustainable development
Sumber: http://sdgsindonesia.or.id/index.php/apa-itu-sdgs

Table 1. Purpose and Target Capacity of SDGs

No	Purpose	Target
1	Without Poverty	7 target
2	Without Hunger	8 target
3	Healthy and Prosperous Life	13 target
4	Quality Education	10 target
5	Gender equality	9 target
6	Water Supply and Sanitation Decent	8 target
7	Clean and Affordable Energy;	5 target
8	Decent Work and Economic Growth;	12 target
9	Industry, Innovation and Infrastructure	8 target
10	Reduced Gaps;	10 target
11	Cities and Settlements	10 target
12	Sustainable;	11 target
13	Consumption and Production are Responsible;	5 target
14	Climate Change Handling;	10 target
15	Ocean Ecosystems;	12 target
16	Mainland Ecosystems;	12 target
17	Peace, Justice and Institutional Tough; a global partnership for sustainable development	19 target

Zakah and SDGs will be energized because both have the same goal. Of the 17 points of the SDGs, the zakat movement outlines the 11 issues of poverty eradication, elimination of hunger, improving health quality, providing decent education, gender equality, clean water and sanitation, energy, economic growth, reducing inequalities, climate change , and partnerships.

The government and scholars also support the utilization of zakat to support the achievement of SDGs. This is illustrated by one of the Indonesian Ulema Council (MUI) declares that the property of zakat, infaq, alms and waqf can be utilized for the development of clean water and sanitation facilities as one of the objectives of SDGs.

4. Conclusion

Having understood the model and the relationship between Maqashidsyariah and SDGs, as well as the model and relationship between the purpose of zakat and SDGs in literature, then for we will see the average proportion of the four goals of SDGs (without poverty, without hunger, healthy and prosperous life, and quality education) based on Weight Eigen Value and perform percentage related analysis based on the weighting.

This is to see how the relevance of zakat's objectives towards achievement of sustainable development goals, as well as what goal goals are prioritized based on the goal of zakat to meet the achievement of SDGs for these four goals.

Table 2 Eigen Value Weight

Kreteria	Subkreteria	Bobot
Without Poverty	Comprehensive social protection	0.247
	Financial services	0.253
	Sustainable Livelihood	0.257
	Durability	0.243
Without Hunger	Food security	0.277
	Investment research and technology development	0.253
	Quality of Consumption	0.227
	Welfare of business actors	0.243
Good health	Access to health services	0.270
	Disease Control and Environmental Health	0.257
	HR Health	0.236
	Quality of pharmacy and alkes	0.238
Quality Education	Access to education and training	0.265
	Educational services	0.247
	Learning environment	0.249
	Literacy and counting skills	0.239

Source: Baznas 2017 Strategic Review Center

The first objective of the achievement of SDGs is without poverty, if we examine the criteria without poverty from 4 (four) subcreteria SDGs it can be explained that the first is sustainable livelihood (25.7 percent), both financial services (25.3 percent), Third Social protection comprehensive (24.7 percent), Fourth Endurance (24.3 percent).

The second point of objective achievement of SDGs is Without Hunger, with sub-criteria with weight of the first largest Food Security (27.7 percent), Second Investment research and technology development (25.3 percent), third Welfare of business actors (24.3 percent) , and fourth Consumption Quality (22.7 percent).

The third goal point of the SDGs is good health, with subcreteria with the greatest weight of first access to health services (27 percent), both Disease Control and Environmental Health (25.7 percent), third Pharmaceutical and alkes (23.8 percent), and fourth health human resources (23.6 percent).

The fourth point of the purpose of SDGs is quality education, with subcreteria with the greatest first weight of educational access and training (26.5 percent), both learning environments (24.9 percent), three educational services (24.7 percent), and four literacy skills and calculate (23.9 percent).

In detail can be elaborated from the subcreteria at point one to four with the aim of the SDGs to show that the urgency of the objectives of the SDGs is very relevant to the concept of zakat in making a real contribution to the four points.

The real manifestation of the distribution of zakat in the form of distribution of assistance in the form of consumptive which is intended for the fulfillment of food, clothing, home

renovation, distribution for formal and informal education and for health given to mustahik who is entitled to suit eight asnaf.

In addition to the distribution in the form of consumptive distribution of zakat funds is also in the form of economic empowerment of people (productive zakat), this is done as an effort to open wider access to the mustahik to be independent and encourage mustahik be muzaki environment respectively.

The alignment of objectives to be achieved from maqashid syariah and SDGs becomes highly relevant. The relationship between SDGs and Maqasyid shariah shows that zakat has an important role in the success of sustainable development that has been practiced thousands of years ago. From the first point to four with the subcreteria of the highest points each pointing in harmony with the purpose of the SDGs

The first point with the highest subcreteria is sustainable livelihood (25.7 percent), the second point of the highest subcreteria of food security (27.7 percent), the third point of health service subcreteria (27 percent), and the fourth point of the subcreteria of education and training (26.5 percent). Achieving the goal point 1-4 SDGs is a fundamental issue for every country, especially poor countries and become a humanity problem that currently occurs in various parts of the world.

Zakat which has the role of putting forward direct efforts that can answer the four basic issues of humanity with the effort to optimize the acceptance of zakat (zakat maal) professional management of zakat management, political support and awareness of eating muzakki will make the new power of the ummah in answering the issue. With these powers zakat will become one of the important fiscal instruments in various parts of the world with the condition of management in accordance with the rules of jurisprudence based on the Qur'an and hadith.

The result of zakat relationship analysis in succeeding SDGs is very clear with some conclusions. First, zakat is one of the financial instruments that aims to improve the maqasyid of individual shariah. Second, the purpose of zakat itself is wider when compared with the purpose of SDGs. Thirdly, objectively if examined from the perspective of the purpose of zakat, the goal of SDGs has the highest weight with the order of economic field, education, social humanity, health, and da'wah.

SDGs have 17 objectives that can logically be reviewed and contributed through zakat but not all of them are the responsibility of the zakat management agency. There is a large portion of the responsibility to be the responsibility of the government as a governing organizer who can manage and manage the community because the four criteria that have been described above have not yet fully can be done with zakat funds. Zakat funds currently only limited complementary and has not touched upon all mustaqik in accordance with the provisions of the law.

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Mechanical Properties of Polyester Sandwich Composites Wood Flour Reinforced Fiberglass

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Abstract. The use of wood flour as filler in thermoset polyester composites has some advantageous since it is cheap and abundant, mild, not abrasive, and environmentally friendly. In this study, these advantages are in depth explored in order to produce an innovative sandwich composite material that meets the requirements of engineering construction material for various purposes. Study of mechanical properties is focused on the preparatory process of the wood flour till the formation of a composite sandwich. The effect of pre-treatment on wood flour, size and dimensions as well as the reinforcing process using fiberglass to form the sandwich construction, then it studied experimentally. The specimens manufacturing by casting in open mould and testing are using the ASTM C 1341-06. The results showed that the treatment process at the wood flour and the addition of coupling agent MAH did not have a positive influence on the mechanical properties of wood flour polyester composite. The soft wood filler with the medium to coarse size of filler and the composition within ± 60% polyester resin has the best bending strength. Therefore, the size factor, dimensions and type of wood flour as filler has the influence on the mechanical properties, whereas the filler size of 2-3 mm eligible to be used economically and technically. While wood flour composite reinforcement with fiberglass as the sandwich type has been able to increase its bending strength up to ±45% fibres and making this material allows it to be used as construction material. The types of fiberglass also have an effect, in which the type of woven fiberglass has a reinforcing effect that up to 45% better than fiberglass type CSM, but use 2 layers of fibre CSM, gains almost the same as the first layer Roving fiberglass type.

Keywords: Wood flour filler, Polyester composite, Mechanical properties, Fiberglass, and Sandwich composite.

1 Introduction

Throughout the human history, wood has been used widely in almost all facets of human life both for structural or non-structural purposes such as housing, furnishings, bridge structures, vehicles, boats, ships, railroads, paper materials, etc. As a result, wood always sought to meet the needs of various sectors. Therefore, due to an imbalance of demand and supply, wood with the good quality become expensive and inadequate [1]. Consequently, engineers then seek for some alternatives material that design base on the wood into the alternative solutions and constantly being developed to meet the increasing demands. The wood composite is one of the products that are made, wherein the wood in various forms (powder, wood fiber, sheet) at the join using an adhesive to form a new material in the form such as particle board, fiberboard, plywood, hardboard, plywood, thermoplastic and thermoset

of wood composite [2]. The use of various types of material tailored to the needs of the product to be made that the mechanical properties of wood composite must be meet to the technical requirements of the product.

When compared to the fiber composites, the wood flour composite tend to be more brittle because the wood flour is lack of capability of absorbing energy as well as that carried by the fiber composite. However the wood flour that has dimension and size of longer form look like the short fibers have the energy absorption better thus, it is more resilient than the wood flour composite square-shaped [3]. Proper to create a composite sandwich between the wood flour composite (core) and a thin layer of fiberglass composites on both sides as a skin can improve the mechanical properties [4]. The use of wood flour as filler will also improve the efficiency of wood flour utilization, which has not been fully utilized, and many were wasted in vain. In Aceh Province, the potencies of wood flour as filler are huge, producing by the wood processing of home industry. Filler type of wood dust is very economical in its use, since it is easy to obtain and inexpensive, nature also can prevent the occurrence of slippage in the resin and can be fastened properly by resin [5].

2 Methods

2.1 Materials and Equipment

The materials used in this research are unsaturated polyester resin BQTN 157-EX, hardener peroxide. The fiberglass type of chopped strand-mat (CSM) $300gr/m^2$ and woven Roving $\pm550gr/m^2$. Moreover, the equipment used is the universal testing machine (UTM) for testing the mechanical properties, optical microscopy for fractography and high-resolution digital camera for macro photos.; molding, fiberglass roller and brush, micrometer, fernier caliper, jigsaw and milling machine for the formation of the test specimen.

2.2 Research Procedures

The research was designed in several stages: (1) preparing an open mold and (2) preparing the wood flour in various sizes (fine, medium, coarse to very coarse) through screening, (3) provide treatment borax alkaline and borax on the wood flour (4) preparing the unsaturated polyester resin, hardener Mekpo and fiberglass, (5) mixing the resin with wood flour with a volume fraction of 50:50 % volume and stir for ± 3 minutes, and then allowed to stand for ± 3 minutes so that air bubbles disappear, then mixing with hardener Mekpo ± 1% wt of the resin and stirred slowly for ±1 minute, (6) the molding process to produce a wood flour polyester composite specimen; that is made through the stages of making one layer of composite fiberglass (±1 mm thick) on the bottom of the mold, then a mixture of polyester resin and wood powder and hardener is poured into the top layer of the composite polyester fiberglass with a thickness of 8 mm; then on the upper surface of the first layer of the composite made of polyester fiberglass with a thickness of 1 mm. (8) the process of hardening (curing time), which takes between 10-15 hours, until the mold can be opened. The process sequence is repeated by varying the size and type of wood flour and the type of fiberglass.

Furthermore, 3-point bending test specimens were made through the process of cutting and sanding/polishing the specimen base on the standard ASTM C 1341-06 with the specimen

size refers to the L/D=16/1; thickness (d)=10 mm, support length (L) = 16 mm, the length of specimenl = 18mm and specimen width = 20mm.

3 Result and Discussion

3.1 Effect of the alkaline and the borax treatment of the wood flour filler on the bending strength.

The alkaline treatment is intended to improve the surface of the wood flour for improving the interface bonding with polyester resins and the borax treatment is done to preserve the wood flour. Figure 1 indicates the effect of these two types of treatment on the bending strength of wood flour composite.
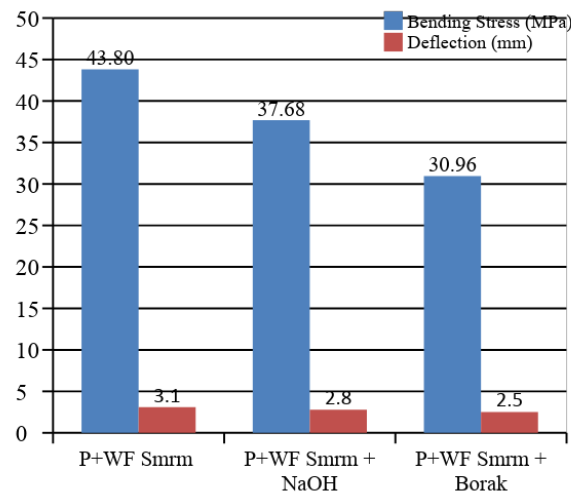
Figure 1. Effect of alkaline treatment and borax to the bending strength of polyester composite wood powder Seumaram (smrm)

Figure 1 illustrates that the wood flour of Seumaram polyester composite that do not undergo the process of alkaline or borax treatment have better bending strength, so it can be seen that the experimental treatment on wood flour filler no positive effect for increasing the strength of the composite material. This is related to the condition of the wood flour used is the wood flour option that has been dried naturally so that alkaline treatment to remove lignin and cellulose does not give a positive effect, even possible for damaging the structure of the wood flour filler that contributed to reduce the strength of material as indicated in Figure 1. Economically, this is very beneficial, given the abundant and less valuable wood flour can be directly processed into wood flour composite materials without having to go through a chemical process that is expensive, but it possible to process as naturally through drying.

3.2. Effect of size and dimension of wood flour on the bending strength of wood flour composites

The calculation of bending strength of wood flour polyester composite material used wood flour in the various sizes and a square dimension is shown in Figure 2. The size and type of wood flour have an effect on the strength of the wood flour polyester composite material. The types of wood flour that studied were the kind Damasui, Jeumpa as soft wood species and hardwood species as Cengai made with the composition of 50:50. The wood flour of medium size (1-2 mm) and fine powder has the most strength compared to coarse wood flour. The strength of wood flour polyester composite that use the rough of wood flour also has a pretty good strength that can be improved further through the sandwich process with the fiberglass. So that the manufacture of the wood flour polyester composite or sandwich composite with fiberglass can directly use the wood flour the wood processing home industry, without having to go through a complex treatment process such as smoothing that required an additional cost.
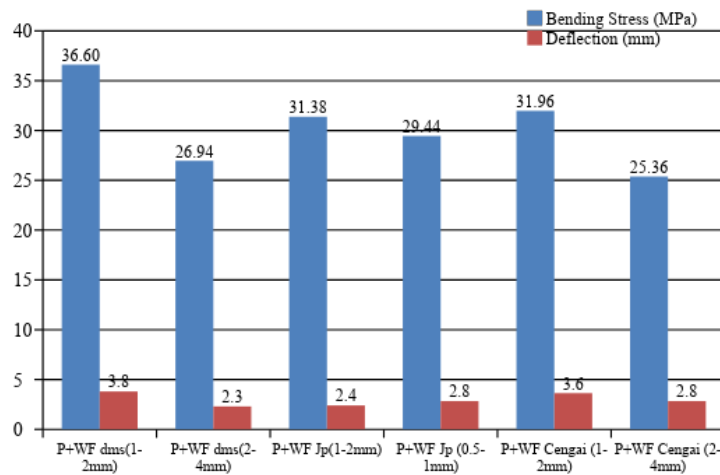
Figure 2. Effect of the size of the wood flour particles (WF) Damasui (DMS), Jeumpa(Jp) and Cengai on the bending strength of the wood flour polyester composite.

The size and dimensions of wood flour obtained from wood processing home industry in several of size and dimension. There are 4 types of the size and dimensions of wood flour in the investigation that is moderate/medium (1-2 mm), coarse (2-3 mm) and very coarse (3-5 mm) and the length dimension as shown in Figure 3.

Figure 3. Macro Structure of wood flour : very course, course, fine/medium and length dimension

The dimensions of wood flour as the filler are also investigating both a square shape and the shape resembles a short fibre length. 2 types of wood flour (semaram and cengai) was observed as hown in Figure 4.
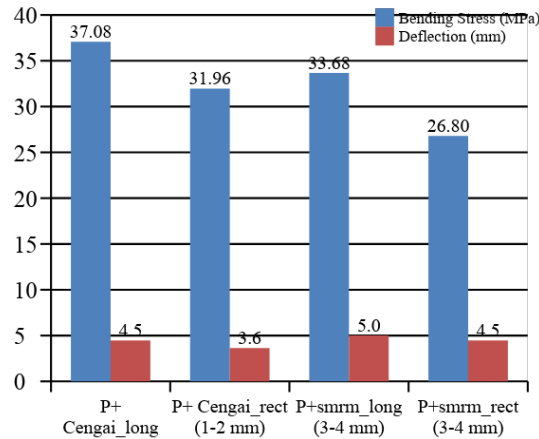
Figure 4. The influence of the dimensions of the wood flour filler of cengai and seumaram (long and square) on the bending strength of the wood flour polyester composite materials

The shape/dimension of wood flour as filler has an influence on the strength of wood flour polyester composite materials. Base on the figure 5, filler in long dimension resemble to fiber is better bending strength than the rectangle one. The failure mechanism was initiated from the micro cracks and will propagate due to external forces that loading up the material to failure. The presence of wood flour as filler in length shape was possible to become an obstacle to crack propagation, or can change the direction of crack propagation which is possible to delay of failure that make the material stronger, as shown by Figure 5.
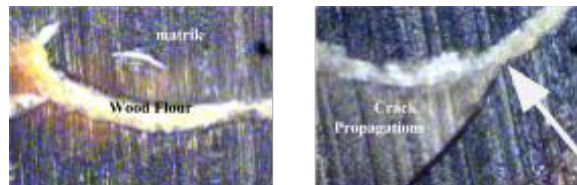
Figure 5. Macrostructure of length wood flour filler (resemble as wood fibre) could inhibit the direction of crack propagation

On the other hand, the fine of wood flour filler in form of rectangular dimension, the bending strength is slightly lower due to dimension effect.

3.3 The influence of the type of wood flour Filler

There are 5 types of wood flour filler were investigated such as: wood flour filler of Jeumpa, Meuranti, Damasui, Seumaram and Cengai. The three kinds the fist wood flour are classified as softwood, while the latter two types are classified as hardwood. Figure 6 shows

the influence of the type of the rough wood flour on the bending strength of the wood flour polyester composite materials.
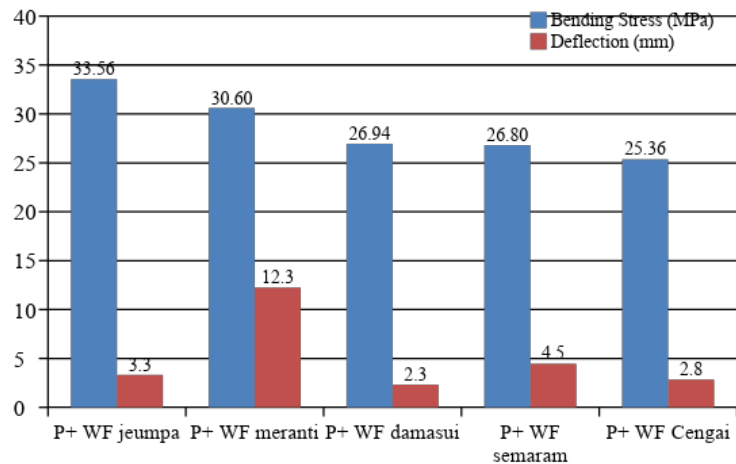
Figure 6. Effect of type of wood flour filler on the bending strength of wood flour polyester composite materials

Figure 6 explains that the wood flour of Jeumpa has the highest bending strength, followed by Meranti, Damasui, Seumaram and cengai. This indicates that the kind of hard wood filler tend to have lower bending strength than the soft wood filler. This phenomenon is closely linked to the condition of the bond formed between wood flour filler and the polyester resin matrix. The good bonding will establish when the polyester resin can enter seep into the wood flour to form 'cross linking'. The ability of softwood filler in absorbing resin (wettability) looks good enough to produce a bond which is quite compact on the interface, while coarse sawdust filler looks less solid at the interface as shown in Figure 7.
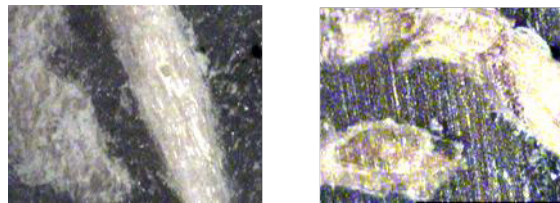
Figure 7. Macro Structure of the Jeumpa wood flour filler shown more cohesive at interface and the Cengai wood flour shown less coherent within the polyester matrix.

The wood flour fillers of Cengai types showed a cavity in the interface between wood flour filler and polyester matrix that possible to becomes a source of crack initiation as a trigger for the specimen failure. On the other hand, the soft wood flour filler shows the compact bonding at the interface.

3.4 Influence of sandwich with the fibre glass to bending strength of wood flour polyester composite.

The wood flour Polyester composite material has a low strength so it cannot be applied to the engineering structural materials. By reinforcing with the glass fiber on both surfaces to form a composite sandwich, it was expected to be more robust and suitable for structural applications. The influence of reinforcement using fiberglass on both surfaces of the wood flour polyester composite are shown in Figure 8. It explains that the sandwich with polyester of fiber glass (as skin) can improve the strength of the wood flour polyester composite (as core) up to ± 45 % so that the material has good prospects for structural applications. It was resulted from a good combination of both that produce the good bonding at the interface.
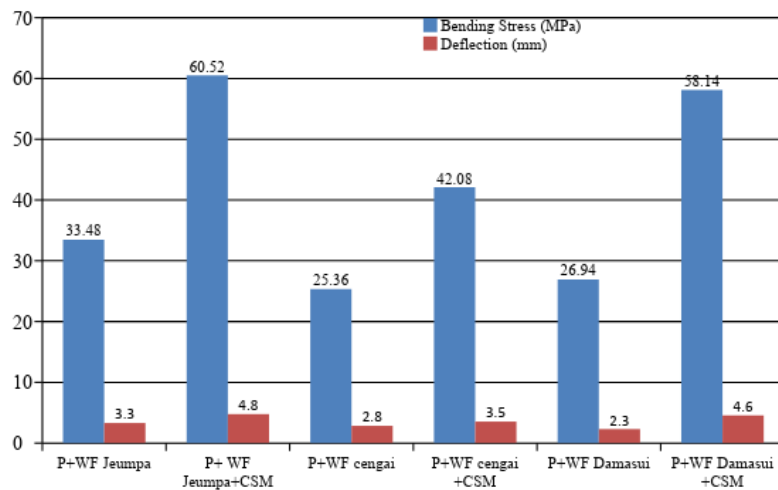
Figures 8. Effect of CSM fiber glass reinforcement on the bending strength of the wood flour polyester composite
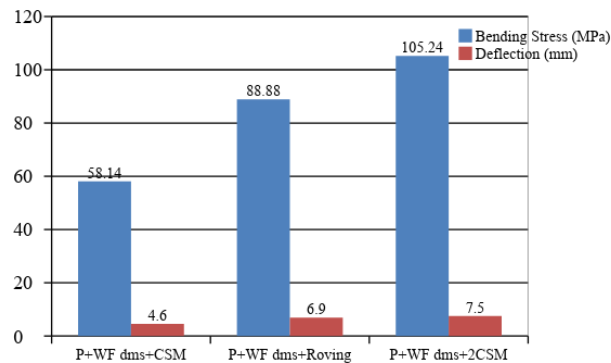
Gambar 9. Effect of type of fibre glass reinforcing (CSM and Roving) on the bending strength of the wood flour polyester composite material

The fiberglass plays an important role in the process of making the sandwich composite materials between the wood flour composite and fiberglass composite. There are two types of fiberglass used widely by the community; it was Chopped Strant Mat (CSM) and the type of fiber roving. The effect of strengthening that produced by these two types of fibers to the wood flour polymer composite was very different, as shown in Figure 11. It can be shown that the reinforcement with Roving fiberglass provide a greater effect than the CSM fiber glass. However, the two layers of CSM fiberglass provides an increase in strength is proportional to 1 layer of roving type of fiberglass. This indicates that the density of the fibers has a considerable influence on the reinforcing effect produced.

4 Conclusion

The alkaline and borax treatment for the wood flour and the addition of coupling agent MAH did not provide a positive influence on the strength of the wood flour polyester composite materials. The size and dimensions of wood flour filler have the influence on the bending strength, in which a medium-size ($\pm$ 2 mm) and the length dimensions can provide a good reinforcement effect. While the type of soft wood flour filler can produce a better bending strength than the hardwood filler. Furthermore, the process of sandwiches using 1 layer of fiberglass can increase the strength of the wood flour polyester composite materials up to 45 %, where the type of woven fiberglass (Roving) has a reinforcing effect that up to 45 % better than fiberglass type CSM. However, when CSM fiber in use two layers, the effect is almost the same gains with 1 layer of fiberglass Roving type.

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Analysis of Security Level Image Steganography Using Secret Key and Gray Codes

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Abstract. In Dagar et al (2013) research, message concealment into grayscale image file with Least Significant Bit (LSB) algorithm, where before it is inserted, the message is encrypted with function SN function and converted into binary value from gray code. The result of this research is that resistance to image manipulation is entered into intermediate level where the stego image of insertion result is not resistant to compression and addition of brightness. So in this study suggested to increase data security, resistance to image manipulation and efficiently hide data and time of extraction. In this research we have done Analysis of Security Level of Image Steganography Using Secret Key and Gray Codes with result obtained that on MSE parameter and image size, SNS Function Gray MLSB algorithm has image with MSE and the smallest file size compared to SN Function Gray LSB algorithm has an image with MSE and the largest file size. For process time parameters, it is concluded that each algorithm has almost the same processing time depending on the size of the image and the message to be inserted. SN Function Gray MLSB algorithm based on MSE parameter shows that, process time and image size is better than SN Function Gray LSB algorithm.

Keywords: Cryptography, Steganography, Least Significant Bit algorithm, Modified Least Significant Bit.

1. Introduction

In Dagar et al (2013) research, message concealment into grayscale image file with Least Significant Bit (LSB) algorithm, where before it is inserted, the message is encrypted with function SN function and converted into binary value from gray code. The inserted image format is the BMP format with grayscale color mode. The result of this research is resistance to image manipulation is entering into middle level, meaning stego image insertion result can not stand against compression, addition of brightness and other image processing. In this study it is suggested to add data security, resilience to image manipulation and efficient in the ability to hide data, data insertion and time of extraction.

In this research, data security will be improved on Dagar et al research by encrypting text data using Secret Key and Gray Codes algorithm and inserting ciphertext into image file (cover image) with MLSB algorithm. The insertion is performed on pixels that are randomized in RGB color

mode. So if the steganalysis is about to detect the embed, then the embed can not know the location of the pixel and its contents are still in the encrypted state.

2. Sn Function And Gray Code

Gray-code or also known as reflected binary code named by Frank Gray. Gray code is a binary numbering system where two adjacent values only have exactly one digit difference. Gray-code was originally used to prevent the false output of an electromechanical signal. Today, Gray-code is used extensively to facilitate error correction in digital communications.

In the hiding data is encrypted using a symmetric key (ks) which is known to both sender and receiver. Data is encrypted using SN function which uses gray code and symmetric key. The main advantage of SN function is that it can encrypt the plain text as well as decrypt the cipher text with small changes. So in this way SN function is very easy to understand and implement (Dagar et al2013).

The SN Function cryptography algorithm is a Gray Code function algorithm in binary form that uses incrementing methods that differ from one digit to the next (Varalakshmi, R. & Uthariaraj, V. R. 2013). Gray Code is the most popular type of absolute output encoder because its use prevents certain data errors that can occur with Natural Binary during changing circumstances.

For example, in highly capacitive circuits or sluggish system responses, a natural binary state change from condition 0011 to 0100 can cause counters to look like a 0111. This kind of error is not possible with Gray Code, so the data is more reliable. With a gray code, only one bit changes from one position to another. This feature allows the system designer to check the error that if more than one bit changed, then the data can be said not true. The respresentation of decimal numbers, natural binary and Gray Code can be seen as in Table 1.

Decimal	Natural Binary	Gray Code
0	0000	0000
1	0001	0001
2	0010	0011
3	0011	0010
4	0100	0110
5	0101	0111
6	0110	0101
7	0111	0100
8	1000	1100
9	1001	1101
10	1010	1111

Table 1. Decimal Representation, Natural Binary and Gray Code
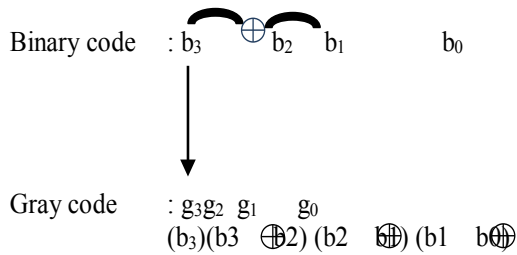
Conversion from Gray Code to Binary Code

Let Gray Code be g3 g2 g1 g0. Then the respective Binary Code can be obtained as follows:

Gray code   : g_3 g_2 $g_1 g_0$

Binary code : b_3 b_2 b_1 b_0
(g_3) $(b_3 \oplus g_2)$ $(b_2 \oplus g_1)$ $(b_1 \oplus) g_0$
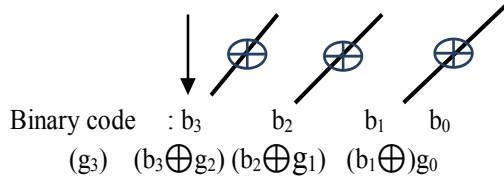
Let Binary code be b3 b2 b1 b0. Then the respective Gray Code can be obtained is as follows

Binary code : b_3 $\oplus$ b_2 b_1 b_0

Gray code : $g_3 g_2$ g_1 g_0
$(b_3)(b3 \oplus 2) (b2 \oplus) (b1 \oplus)$

1. Modifiedleast Significant Bit (MLSB)

Modified Least Significant Bit (MLSB) or modification of the LSB algorithm is used to encode an identity into a file. MLSB uses the manipulation of several levels of insertion bits before encoding the message (Zaher, 2011).Modify messages with MLSB algorithm where message bits that should have 1 character have an 8 bit ASCII code will be modified to 5 bits. In this algorithm characters and numbers are represented in 5 bits which will then be inserted into the original file by LSB technique. The insertion is done by processes:

1. The process of altering insert data with ASCII code. For example the message "STEGO with 05 bits" which if converted to binary requires memory of 18 x 8 bits = 144 bits. In the MLSB algorithm the above message is converted to ASCII (hex) to: 53h, 54h, 45h, 47h, 4fh, 20h, 77h, 69h, 74h, 68h, 20h, 30h, 35h, 20h, 62h, 69h, 74h, 73h. Then done normalization with table Control Symbol like Table 2.

Table 2. Control Symbol

Hex Representation	Operation
1 Bh	Define Small Letter
1 Ch	Define Capital Letter
1 Dh	Define Space
1 Eh	Define Number
1 Fh	Define end of text

2. Read the insertion data (ASCII) until the space mark (20h) is 53, 54, 45, 47, 4f.
3. All values are reduced by the lowest value of 40 to 53-40 = 13, 54-40 = 14, 45-40 = 05, 47-40 = 07, 4f-40 = f.
4. The first group insertion data is 1ch, 13h, 14h, 05h, 07h, 0f where 1ch is the Control Symbol for uppercase (capital).
5. The second group insertion data is 77h, 69h, 74h, 68h reduced by the lowest value (60) to 77-60 = 17, 69-60 = 09, 74-60 = 14, 68-60 = 08.
6. The second group data is combined with the first group and assigned a Control Symbol 1dh (space) and 1bh (lowercase) to 1dh, 1bh, 17h, 09h, 14h, 08h.
7. The third group data are: 30h, 35h minus the lowest value being: 30-30 = 0, 35-30 = 05.
8. The data is combined with the previous group plus Control Symbol 1dh (space), 1eh (number) to 1dh, 1eh, 00h, 05h.
9. The data of the fourth group are: 62h, 69h, 74h, 73h reduced by the lowest value to: 62-60 = 02, 69-60 = 09, 74-60 = 14, 73-60 = 13.
10. The data is combined with the previous group plus Control Symbol 1bh (lowercase), into 1dh, 1bh, 02h, 09h, 14h, 13h and end of data (1fh).

So the message becomes:
1ch, 13h, 14h, 05h, 07h, 0hh, 1hh, 08h, 1hh, 1h, 00h, 05h, 1bh, 02h, 09h, 14h, 13h, 1fh. The above message requires 22 x 5 bits = 110 bits and converted to binary to:
11100, 10011, 10100, 00101, 00111, 01111, 11101, 11011, 10111, 01001, 10100, 01000, 11101, 11110, 00000, 00101, 11011, 00010, 01001, 10100, 10011, 11111.

2. Method Of Analysis

In this research, the analysis adds data security level to image file with cryptography technique and steganography on Dagar et al. Secured data in the form of secret text that is inserted into digital image files that are in BMP, JPG or PNG format with Modified Least Significant Bit (Modified-LSB) algorithm. Before being inserted, secret text is encrypted with SN function algorithm using Gray Code. As a comparison in this study, data security is done by SN encryption algorithm with Gray Code and insertion with Least Sifnificant Bit (LSB) algorithm. To measure the reliability of the insertion of each algorithm, measurements of size, dimensions, Mean Squared Error (MSE) and Peak Signal to Noise Ratio (PSNR) values of the stego image were measured. And to measure the reliability of data acquisition embed, then calculate the value of Data Recovery Rate (DRR) as the value of extraction.

The Flowchart Research consists of two parts namely the flowchart insertion and extraction. Flowchart Insertion is a process flow for inserting text files into image media (cover image) to generate stego image, while flowchart Extraction is a process flow to extract insert data from stego image. Flowchart insertion can be seen as in Figure 1.
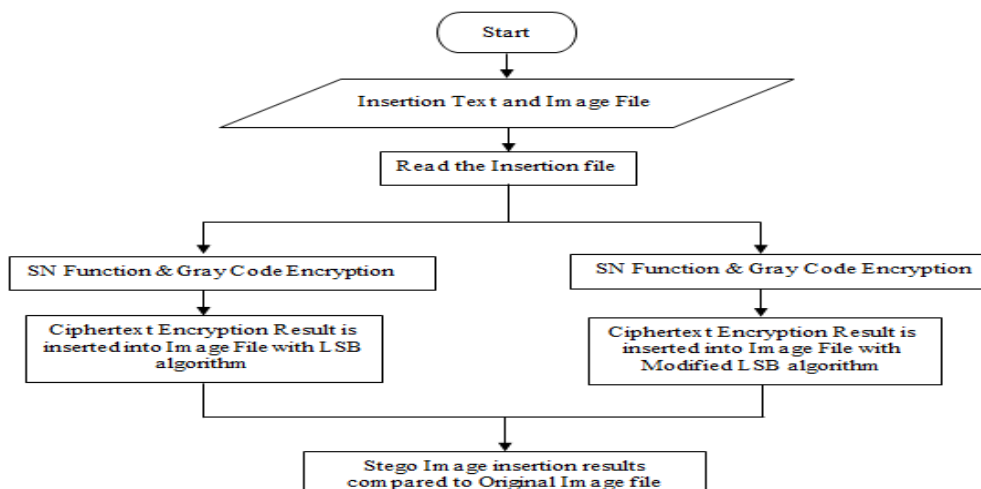
Figure 1. Flowchart Insertion

Information:
In the flowchart above there are two paths of encryption and insertion process are:
1. Encryption algorithm SN function Gray Code LSB
In this algorithm is inserted data input txt format, then do the reading file to get data and then done by encryption to insert with LSB algorithm to get ciphertext file. The ciphertext file obtained is inserted into the image file with MLSB algorithm and then calculated the value of MSE and PSNR the stego image file obtained.

2. Encryption algorithm SN function and Gray Code Modified-LSB

In this algorithm input data input inserted txt format, then do the reading file to obtain data and then done by encryption to insert with Modified-LSB algorithm to get ciphertext file. The ciphertext file obtained is inserted into the image file with the Modified-LSB algorithm and then the MSE and PSNR values of the stego image file are obtained. Flowchart Extraction of insert data from the stego image file can be seen as in Figure 2.
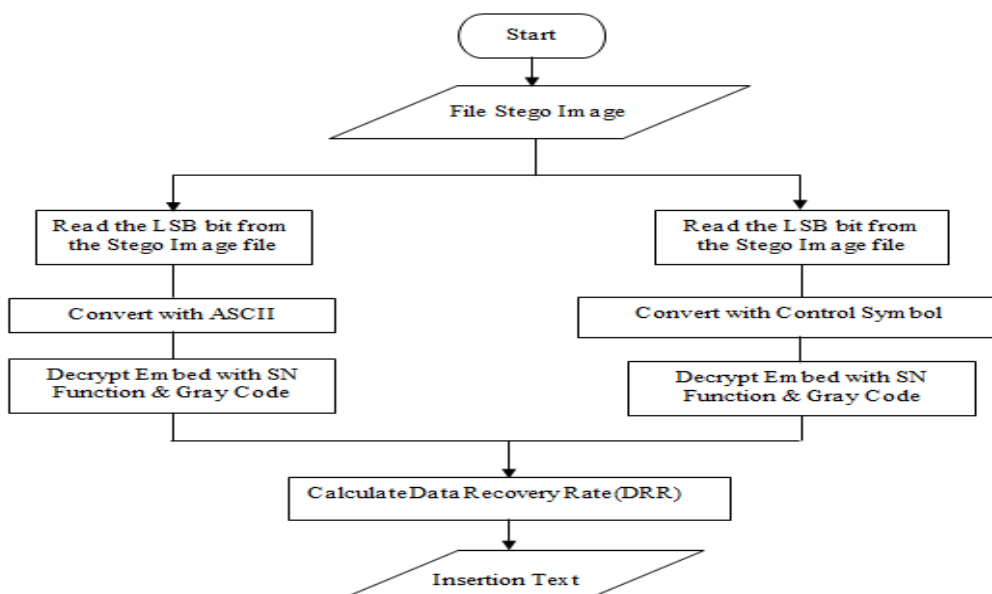
Figure 2. Flowchart Extraction

Information:

In the flowchart above the input stego image file that has been inserted, then read LSB bits and and converted into ASCII and Control Symbol. After conversion, the embedded decryption is done with SN Function and Modified-LSB algorithm to obtain the data of encrypted bits, then done decryption process to the insert file to get the plaintext and then calculate the value of Data Recovery Rate (DRR) as the extraction value.

3. Insertion of Sn Function and Gray Code Lgorithms

The insertion algorithm with SN Function and Gray Code is the insertion of the text of a secret message into a digital image file in BMP, JPG or PNG format with the LSB algorithm. Before being inserted, the first text message is encrypted using Gray Code and SN Function. The insertion steps with SN Function and Gray Code are as follows:

1. For example, the pixel value of the cover image is 8 x 5 pixels as shown in Table 3.

Table 3. Cover Image Matrix

50	10	60	50	58	40	44	12
10	52	40	20	34	74	30	87
12	24	45	25	60	28	20	77

| 10 | 60 | 40 | 30 | 54 | 32 | 24 | 85 |
| 12 | 55 | 22 | 24 | 33 | 45 | 37 | 110 |

2. Convert insert text into binary value, for example the text is "DANI" with binary is:

D = 01000100
A = 01000001
N = 01001110
I = 01001001

3. Formation of Ciphertext Gray Code with SN Function Encryption

Plain Text D is 01000100

Key 10011001

Encryption: (Plain Text) XNOR (Key) (same equals = 1 else 0)

          01000100
  XNOR 10011001
          00100010

Gray code for 00100010 is 00110011

Cipher text D = 00110011

So ciperteks "DANI" is 00110011 01000001 00111100 00111000. Binary messages are inserted into an Image cover file as in Table 4.

Table 4. Cover Image Matrix

50	10	60	50	58	40	44	12
10	52	40	20	34	74	30	87
12	24	45	25	60	28	20	77
10	60	40	30	54	32	24	85
12	55	22	24	33	45	37	110

4. Convert The image cover pixel value in Table 4 above is converted into binary into Table 5.

Table 5. Binary Image Cover Image Matrix

00110010	00001010	00111100	00110010	00111010	00101000	00101100	00001100
00001010	00110100	00101000	00010100	00100010	01001010	00011110	01010111
00001100	00011000	00100101	00011001	00111100	00011100	00010100	01001101
00001010	00111100	00101000	00011110	00110110	00100000	00011000	01010101
00001100	00110111	00010110	00011000	00100001	00101101	00100101	00110010

5. The insertion is done by the LSB method on each byte on the rear binary value (LSB) as in Table 6.

Table 6. Binary Image Matrix Stego Image

00110010	00001010	00111101	00110011	00111010	00101000	00101101	00001100
00001010	00110100	00101001	00010100	00100011	01001011	00011111	01010111
00001100	00011000	00100101	00011001	00111101	00011100	00010100	01001100
00001010	00111100	00101001	00011111	00110110	00100001	00011001	01010101
00001100	00110110	00010111	00011001	00100001	00101100	00100101	00110011

After insertion, the representation of the stego image pixel value becomes as in Table 7.

Table 7. Grayscale Image Stego Image Matrix

50	10	61	51	58	40	45	13
10	52	41	20	35	75	31	87
12	24	45	25	61	28	20	76
10	60	41	31	54	33	25	85
12	54	23	25	33	44	37	111

4. Findings And Discussion

The analysis by the author of the security level analysis of Image Steganography using Secret Key & Gray Codes is to increase the level of data security into image files with cryptographic and steganographic techniques as in the research of Dagar, Kumar and Bagoriya. Secured data in the form of secret text that is inserted into digital image files that are in BMP, JPG or PNG format with the Modified Least Significant Bit (MLSB) algorithm where before being inserted, secret text is encrypted with Secret Key & Gray Codes algorithm.For comparison, data is inserted into digital image files in BMP, JPG or PNG format with Least Significant Bit (LSB) algorithm and prior to being inserted, in secret text encryption with SN function using Gray Code.

The test is performed using five different sized digital images where each image will be inserted with five different text watermarks. The parameters to be obtained are the MSE, the length of the process and the result file size. From the test results obtained as shown in Table 8. and Table 9.

Table 8. Results of Steganographic Insertion of GrayKey SN Function LSB

No	Cover Img	Size (byte)	Embed File	Num Char	Parameter		
					MSE	PSNR	t (S)
1	Pic01.jpg	110.020	Pesan1.txt	29	5.63	40.62	1.30
	Pic01.jpg	110.020	Pesan2.txt	73	15.02	36.36	1:28
	Pic01.jpg	110.020	Pesan3.txt	158	29.86	33.37	1:32
	Pic01.jpg	110.020	Pesan4.txt	185	34.94	32.69	2:02
	Pic01.jpg	110.020	Pesan5.txt	228	47.32	31.37	2:15
2	Pic02.jpg	148.525	Pesan1.txt	29	0.33	52.85	2:46
	Pic02.jpg	148.525	Pesan2.txt	73	1.16	47.47	2:43
	Pic02.jpg	148.525	Pesan3.txt	158	1.93	45.25	2:46
	Pic02.jpg	148.525	Pesan4.txt	185	2.24	44.62	2:46
	Pic02.jpg	148.525	Pesan5.txt	228	4.47	41.62	2:46
3	Pic03.jpg	194.710	Pesan1.txt	29	0.029	63.48	1:28
	Pic03.jpg	194.710	Pesan2.txt	73	1.41	46.63	1:34
	Pic03.jpg	194.710	Pesan3.txt	158	1.82	45.52	1:34
	Pic03.jpg	194.710	Pesan4.txt	185	2.33	44.45	1:35
	Pic03.jpg	194.710	Pesan5.txt	228	5.28	40.90	1:36
4.	Pic04.jpg	138.358	Pesan1.txt	29	2.16	44.78	3:55
	Pic04.jpg	138.358	Pesan2.txt	73	6.86	39.76	3:54
	Pic04.jpg	138.358	Pesan3.txt	158	11.46	11.46	37.53
	Pic04.jpg	138.358	Pesan4.txt	185	13.41	13.41	36.85
	Pic04.jpg	138.358	Pesan5.txt	228	22.64	22.64	34.58
5	Pic05.jpg	223.932	Pesan1.txt	29	2.30	2.30	44.49
	Pic05.jpg	223.932	Pesan2.txt	73	7.68	7.68	39.27
	Pic05.jpg	223.932	Pesan3.txt	158	12.26	12.26	37.24
	Pic05.jpg	223.932	Pesan4.txt	185	14.34	14.34	36.56
	Pic05.jpg	223.932	Pesan5.txt	228	25.55	25.55	34.05

Table 9. Insertion Results of GrayKey SN Function Modified-LSB Steganography

No	Cover Img	Size (byte)	Embed File	Num. Char	Paramter		
					MSE	PSNR	t (S)
1	Pic01.jpg	110.020	Pesan1.txt	29	0.000035	92.65	1:2
	Pic01.jpg	110.020	Pesan2.txt	73	0.000084	88.84	1:2
	Pic01.jpg	110.020	Pesan3.txt	158	0.000165	85.93	1.2
	Pic01.jpg	110.020	Pesan4.txt	185	0.000197	85.17	1:2
	Pic01.jpg	110.020	Pesan5.txt	228	0.000281	83.63	1:2
2	Pic02.jpg	148.525	Pesan1.txt	29	0.000024	94.31	2:4
	Pic02.jpg	148.525	Pesan2.txt	73	0.000052	90.92	2:4
	Pic02.jpg	148.525	Pesan3.txt	158	0.000097	88.22	2:4
	Pic02.jpg	148.525	Pesan4.txt	185	0.000098	88.19	2:4
	Pic02.jpg	148.525	Pesan5.txt	228	0.000134	86.84	2:4
3	Pic03.jpg	194.710	Pesan1.txt	29	0.000034	92.72	1:3
	Pic03.jpg	194.710	Pesan2.txt	73	0.000089	88.60	1:3
	Pic03.jpg	194.710	Pesan3.txt	158	0.000155	86.21	1:3
	Pic03.jpg	194.710	Pesan4.txt	185	0.000182	85.51	1:3
	Pic03.jpg	194.710	Pesan5.txt	228	0.000216	84.77	1:3
4	Pic04.jpg	138.358	Pesan1.txt	29	0.000016	95.87	3:4
	Pic04.jpg	138.358	Pesan2.txt	73	0.000015	91.94	3:4
	Pic04.jpg	138.358	Pesan3.txt	158	0.000075	89.58	3:4
	Pic04.jpg	138.358	Pesan4.txt	185	0.000098	88.17	3:4
	Pic04.jpg	138.358	Pesan5.txt	228	0.000120	87.30	3:4
5	Pic05.jpg	223.932	Pesan1.txt	29	0.000014	96.65	3:2
	Pic05.jpg	223.932	Pesan2.txt	73	0.000039	92.17	3:3
	Pic05.jpg	223.932	Pesan3.txt	158	0.000101	88.05	3:3
	Pic05.jpg	223.932	Pesan4.txt	185	0.000084	86.66	3:3
	Pic05.jpg	223.932	Pesan5.txt	228	0.000111	87.66	3:3

5. Conclusion

Based on comparison of SN Function Gray LSB and SN Function Gray MLSB algorithm on three comparison parameters: MSE image, process time and image size obtained that on MSE parameter and image size, SN Function Gray MLSB algorithm has image with MSE and the smallest file size compared to the SN Function Gray LSB algorithm that has the image with MSE and the largest file size. For process time parameters, it is concluded that each algorithm has the

same processing time depends on the size of the image and the message to be inserted. SN Function Gray MLSB algorithm data show that based on MSE image parameter, process time and image size is above SN Function Gray LSB algorithm.

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