# Digital Marketing Chatbot Using API Dialog Flow Case Studi ITB Stikom Bali, Jimbaran Campus

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**Abstract.** . The presence of technology in everyday life makes all activities fast and easy. Technology is also present and reaches all levels of society. Communities are competing to create innovations so that all community activities become more effective and efficient. The ITB Stikom Bali Campus, especially the Jimbaran Campus, in attracting prospective students in marketing by providing information to prospective students is often done manually. The same thing is repeatedly conveyed to prospective students who get information at school and those who come to campus. If the number of students is large, it will take a very long time, and some prospective students do not get information about the ITB Bali Stikom Campus. The Industrial Revolution 4.0 demands a digital marketing concept that can be combined with the capabilities of Machine Learning - Natural Language Processing (NLP), which is the study of how computers or systems can communicate with human language and can answer questions. The concept of NLP is used to create automatic answering services or chatbots. This study aims to build a chatbot system that can provide information to students about the STikom Bali ITB Campus. The chatbot that is built will use Dialogflow, a framework from Google. The method used in this research is the waterfall method. The results of the data analysis of the collection of questions from existing student candidates are compiled and the possible answers will be given by the chatbot. The results of this study indicate that the chatbot has been implemented well, it can be seen from the chatbot that has answered questions from users well according to the given keywords. Questions that can be answered include Cost Information, Study Program Information, Study Program Profile Information, and the registration process at the ITB STikom Bali Jimbaran Campus.

**Keywords:** chtbot,dialogflow, Stikom_Bali, API

## 1. Introduction

The presence of technology in the 4.0 industrial revolution in everyday life makes all activities fast and easy. Technology has also been present and reaches all levels of society[1]. People are competing to create innovations so that all community activities become more effective and efficient. Almost every community activity, such as in offices, companies, schools, homes, and anywhere else, always uses information technology, whether using computers, laptops or only through smartphones.[2] By utilizing this information technology, people can experience various conveniences such as the ease of storing data, organizing, and retrieving data. With the support of software that is always evolving, combined with the right hardware configuration, a more reliable information system will be created.[3]

The ITB STIKOM Bali Jimbaran Campus is one of the campuses that annually recruits prospective students. Student recruitment is carried out by visiting schools and conducting socialization with each student. Students who want to know about the STikom ITB Bali will communicate by telephone or come to the ITB Stikom Bali Campus. The marketing team will serve students who come or call one by one with relatively repetitive information. The marketing team's limitations resulted in fatigue in receiving calls and serving prospective students and even missing information about ITB Stikom Bali. The development of the Industrial Revolution 4.0 allows the concept of digital marketing to be combined with the capabilities of Machine Learning - Natural Language Processing (NLP)[4], which is the study of how computers or systems can communicate with human language and can answer questions. The concept of NLP is used to create automatic answering services or chatbots[5]. Chatbot system selection, because chatbot has criteria to convey information automatically and in real-time. One of the chatbot frameworks that is widely developed is Dialogflow by Google.[6] This study aims to build a chatbot using a dialog flow app to respond to questions regarding student registration information at the ITB Stikom Bali Jimbaran Campus. To develeop a software use a waterfall software lifecycle [3], [7], [8].

## 2. Method

The method used in this application is the waterfall method. The waterfall model is the most frequently used software development model. The waterall model to deveove a software must finish step by step in stage. If has problem must back to previous stage. The next stage will not be carried out before the previous stage has been completed, and one cannot return or repeat the previous stage

The Waterfall Model is sometimes called the classic life cycle, which implies a systematic and sequential approach to software development, starting with the specification of user needs and continuing through the planning stages. Modeling, constructing, and delivering systems/software to customers/users (deployment), which ends with ongoing support for complete software.



**Figure 1.** Waterfall method
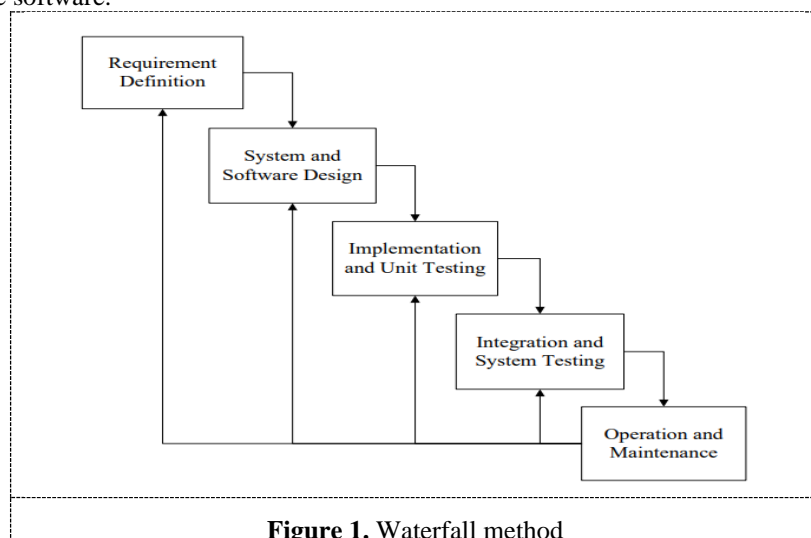
The chatbot design is carried out, which will be built from the needs analysis in the previous stage. At this stage, an overview of the data flow from the system will be given using a flowchart. The flowchart will contain a clear description of the system to continue to the implementation stage. Stage of implementing the design that has been made into a programming language that is understood by the computer through the coding process. Implementation is carried out following the system design stages that have been designed in the previous stages. At this stage, unit units that have been compiled and tested are also carried out. All units that have undergone testing that has become systems are merged. It is done to determine whether the chatbot system results are following the design and user requests for the needs analysis. This stage also provides several possible tests to determine whether there are still errors in the compiled chatbot.

Maintenance is also carried out at this stage, and maintenance includes correcting errors that were not found in the previous step so that later the system created can meet the objectives to be achieved. There is no shortage of data required. System Design is a process that focuses on the design of a system, including data structures, software architecture, interface representations, and coding procedures. This stage translates the system requirements from the requirements analysis stage into a design representation to be implemented into a program at a later stage. At this stage, all units that have undergone testing that has become systems are merged. It is done to determine whether the chatbot system results are following the design and user requests for the needs analysis. This stage also provides several possible tests to determine whether there are still errors in the compiled chatbot.

## 2.1 Chatbot

A chatbot is a computer program that is programmed to be able to interact between humans and computers using everyday language. Concrete examples like the Help Bot on Yahoo! Messenger and ALICE (Artificial Linguistic Internet Computer Entity) developed by Dr. Richard S. Wallace. A chatbot is a QA system or question answering system, which gives a computer the ability to interpret the natural language to have a conversation with a human or a user; a conversation that occurs is like two humans having a dialogue Dialog Flow will match the words from the user's request then processed by the "Agent" Machine Learning then provide feedback to the user-user with the Response and output data in JSON format.[9]

## 2.2 Dialog Flow API

Dialog Flow API is a Google technology that can interact with humans with computers based on voice and text conversations supported by artificial intelligence (Artificial Intelligence). Dialog Flow API is Google's proprietary technology for developing interactions between humans or users and computers using human language or in everyday language. The Dialog Flow API provides a platform that can allow developers to design and implement a conversation interface that can be embedded with external applications such as bots [10]

## 2.3 Natural Language Processing (NLP)

Natural Language Processing (NLP) is a form of representation of a message that is communicated between humans or users. One form of representation is in the form of a voice or spoken language, but it is often applied in the form of text or writing in questions from users. In language can be distinguished, namely natural language and artificial language. Natural languages are often used in everyday life, and artificial languages are languages specially made to meet specific needs, such as programming languages.[11]

# 3. Results and Discussion

## 3.1 Some of the Dialog Flow Features

The following is a picture of the workflow on the Dialog Flow API chatbot ITB Stikom Bali.



**Figure 2.** Dialog Flow Process (Chandra, 2020)
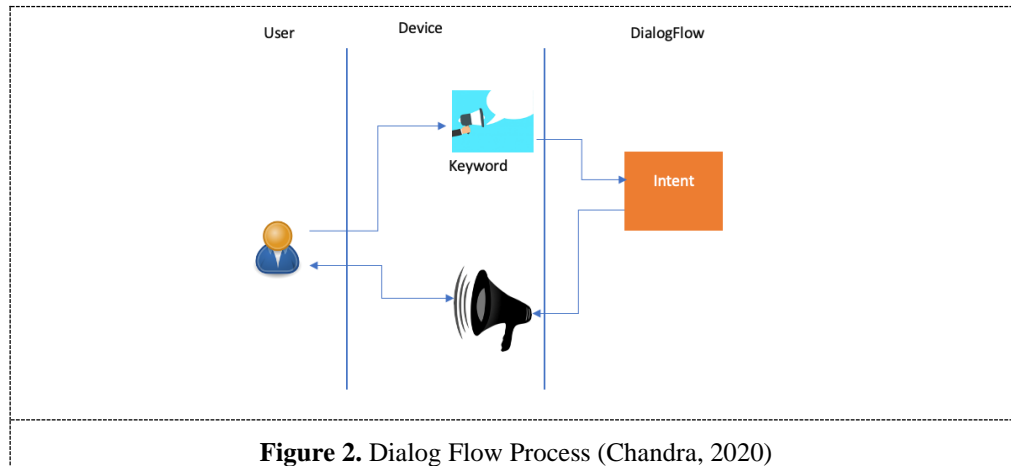
1. Agent, It is an NLU (Natural Language Understanding) module used for flow conversation management. Stages to create an agent are to go to the site http://dialogflow.com; on the dashboard, go to the console (Go to Console). After that, log in using a Google account, then the site will redirect a page to create a bot, which will then be directed to the console page where the bot is configured [12].
2. Intent, Intents is a conversation mapping between the user-user and the action given by the bot. Example
   User: Hai
   Bot: Haloo Welcome
   Sentence Users added to the menu Training phrase and to respond bot put in Response In the Intent we can also include Contexts are used to determine the flow of the conversation and the parsing of the parameters of the previous conversation Intent On chatbot Digital marketing Itb Stikom Bali is as follows table 1:

**Table 1.** Intent Digital Marketing chatbot ITB Stikom Bali.

| Intent 1 | Intent 2 | Intent 3 |
|---|---|---|
| Greeting Massage | Get_Name | Get_School |
| Default Fallback | | |
| Study Program | | |
| Register | Get_prodi | Get_Telpn |
| Price | | |
| Study Profile | | |

## 3.2 Entities

The entity is a feature used to retrieve parameter values from queries sent by the user[13]. Entities are divided into three: System Entities are entities created directly by Dialog Flow such as @ sys. time, @ sys. date, @ sys. Email, @ sys. Phone-number, and others. Programmers themselves create developer Entities, and the three User Entities are created based on the user's session id, such as items that users have purchased or playlists from users. In designing this chatbot, researchers added some entities to meet the extra value parameter, including @prodi, @nama, @telpn, @sekolah, @prodi_profil, @ Costs, @ Register. Conversational flow presence aims to be a conversation between the chatbot, and customers has a flow and standard rules. The customer will ask about something, but before the customer's wish is fulfilled, steps must be followed. The following is a workflow image from the conversation flow for a chatbot at ITB Stikom Bali.
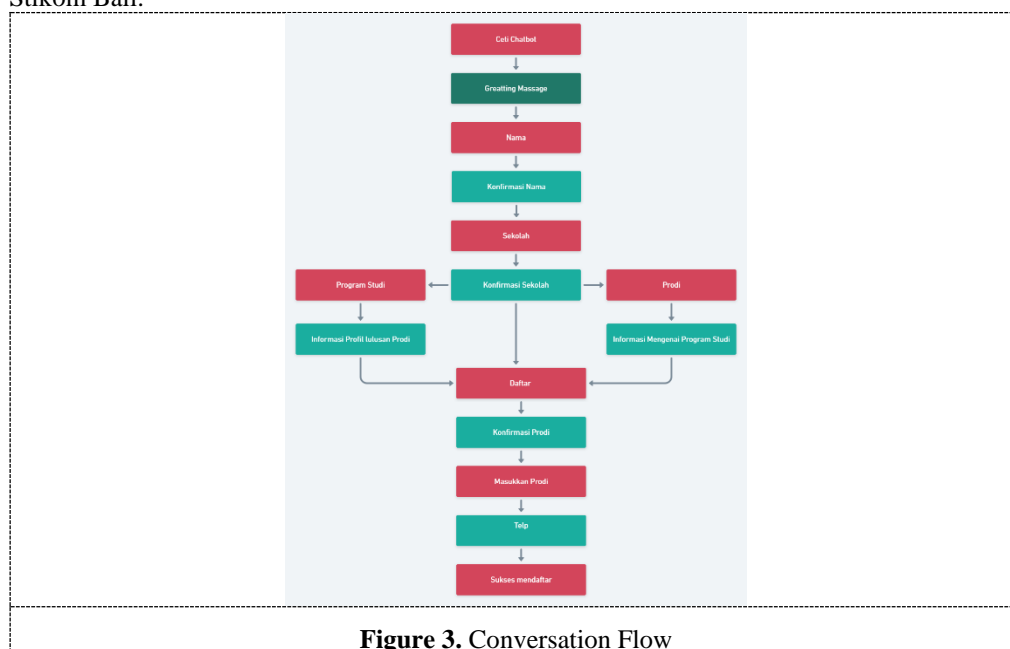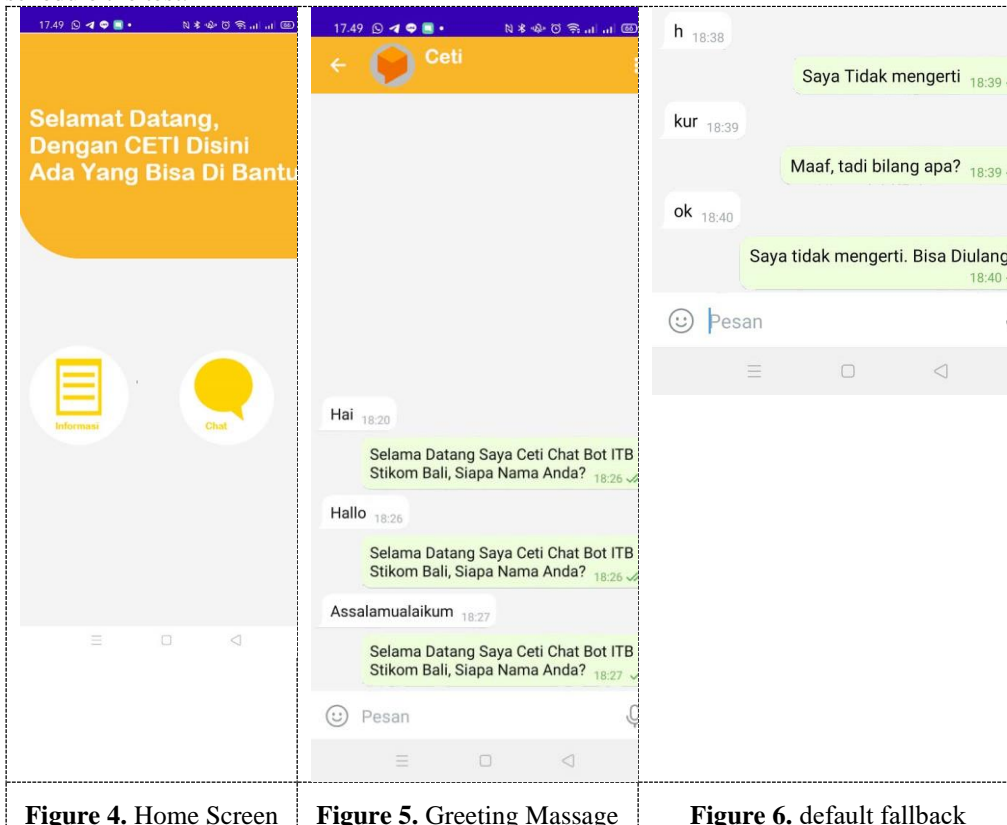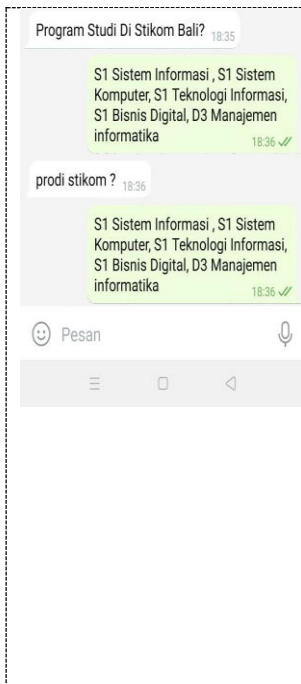


**Figure 3.** Conversation Flow

The chatbot system has two different responses related to user experience input, including: Default Fallback, which is the chatbot response to user questions about the problem topic. Non-Default Fallback, namely chatbot responses related to user questions outside the topic of the problem
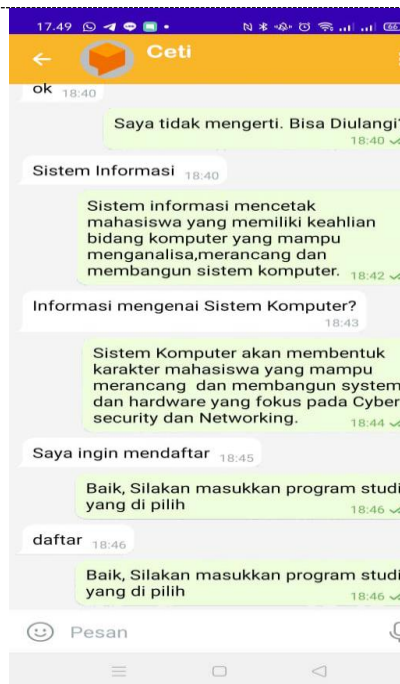
## 3.3 System Implementation

System starting with the home screen from the home screen application, there are two menu developer information and starting a conversation seen in figure 4. The intent is the greeting the bot gives the first time the user-user starts a conversation. The bot will respond accordingly. For example: 'Hi' or 'hello.' As shown in the following figure 5. The intent is a process where the user-user provides a response that is not contained in the intent, then the 'bot' will respond in the

form of an error message to the user-user, For example: 'h,' 'our,' or 'ok' as shown in the following figure 6. A process where the user-user will be given a response in the form of a list of study programs in ITB Stikom Bali shown in figure 7. In figure 8, the User is given a response regarding the graduate study program and an explanation of the Study Program in the STIKOM. Figures 9 and 10 explain the chatbot responses regarding registration and costs for each study program; after the user-user is successful in registering, Marketing ITB Stikom, Bali will schedule the test.
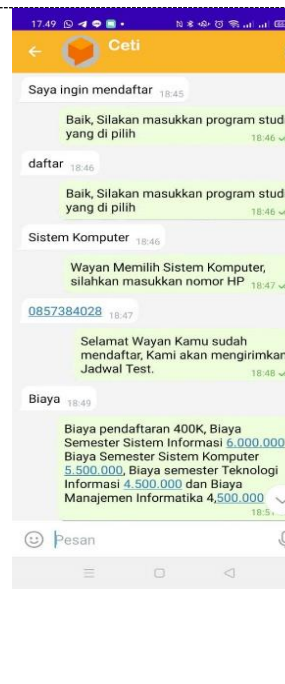


| **Figure 4.** Home Screen | **Figure 5.** Greeting Massage | **Figure 6.** default fallback |

| **Figure 7.** Intent Prodi | **Figure 8.** Intent Profile Of Prodi | **Figure 9.** Register Intent |
|---|---|---|



**Figure 10.** Price Of Study

## 4. Conclusion

From the implementation, it can be concluded that the chatbot that is built can answer questions given by the User in real-time. The chatbot can also provide a response when the user enters a word that does not match the one in the intent. The chatbot will give an optimal response if the User provides keywords following those created in the intent. This chatbot only handles questions about study programs and registration at the ITB Stikom Bali Jimbaran Campus. The Recommendation for the future is to develop the chabot and add features to the chatbot. In the future, it is recommended that chatbots be able to recognize regional languages so that they can communicate like friends.

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