Research Pilot Study for Delone Success Model with the E-Business Model among SMEs in Medan Area

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Abstract. The development of SMEs in the Medan city area is growing along with the significant development of information technology (IT). The increasingly important use of IT in SMEs will increase productivity, marketing, and efficiency. This study will measure the success rate in the application of IT which is used to explore the success rate of IT applications and to examine the factors that influence its implementation in addition to the index value established by the threshold. Software for partial least squares structural equation modeling (PLS-SEM) will be used to process the data. The model used is the integration of the Delone & McLean success model with the adoption of an e-business model. The stakeholders of Small and Medium Enterprises were the focus of the survey in the city of Medan, which was conducted using interview techniques and questionnaires with responses (n = 212). Interviews and surveys were performed with decision-makers in SMEs companies so that the data obtained would provide accurate results. The results showed that most respondents (96.7%) answered that they were willing to interview and fill out the questionnaire. Experience using IT over five years 24.53% between 4-5 years as much as 27.83%. Meanwhile, from the ability level, only 22.64% cannot use IT. Six reject indicators and four hypotheses were rejected from the measurement and structural tests in PLS-SEM.

Keywords: SEM; E-Business;Delone Success; Respondent; SMEs.

1 Introduction

SMEs entrepreneurs in Medan City, where some findings show that smartphone features and the dominant use of information technology are used as promotional media to provide useful results. Of course, utilization of online marketing channels expanding, namely e-business, is backed up by how much faith its consumers have in it. Customers' trust in online retailers is founded on their belief that they would adhere to recognized business procedures and be able to deliver the goods and services they have been promised. However, if users believe that the system is prejudiced or improper, they may begin to doubt it, which, in the worst case scenario, could have a detrimental effect on how well a website performs. The aspect of website quality has also been shown to be a relevant factor influencing the overall value of internet shopping and repurchase intent of customers [1, 2].

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Several empirical research has been done to look at the use of e-business in SMEs, resulting in research finding that several perceived factors influence the adoption of e-business by small and medium enterprises in Indonesia. Utilization, technological preparedness, innovation , IT experience , and IT capabilities. Then the research was conducted by [3, 4] where the results of their research found that relative advantage and competitive pressure have a positive impact on the use of e-business.

These findings are not supported by the results of research results that the majority of small and medium business entrepreneurs are unsure about the relative benefits that can be obtained from the implementation of e-business [1, 5]. Then researched the analysis of SMEs, namely exporters in Thailand who adopted e-business for the export market. This study concludes that e-business adopted by SMEs exporters in Thailand does not positively impact the intensity of exports and imports for the country [6, 7]. In this study, a new model will be used, namely a combining the DeLone and McLean models combined with the e-business model developed by Zhu and then updated by Chatzoglou [8, 9]. This research is a follow-up study that has been carried out on two previous studies, namely the integration of the Delone success model with the e-business adoption model and then, continued with conducting an initial study, namely testing the questionnaire, to determine the psychometric properties and the level of validity of the questionnaire.

This study's objective is to ascertain how much influence the use of information technology, especially the use of the e-business model in SMEs, has by looking at the phenomenon based on the perspective of the Delone & McLean success model. These results are expected to be a reference for users of information technology in terms of e-business in using it and applying it to SMEs and SMEs in the city of Medan. It is important to note that currently, the interest of users of information technology is large, but it is not supported by the ability and performance of the users themselves. The outcomes of this analysis will offer a summary of how the level of success of the use of e-business in its application to SMEs.

Two research inquiries will serve as a guide in conducting this research.

RQ1. What is the relationship between the Delone & Clean Success model and the e-business adoption model in the perspective of the use of information technology among SMEs in the city of Medan?

RQ2. Will these factors affect one model with another model in the previously developed model?

There will be four sections to this essay essential parts in conducting research. The initial portion is an introduction that explains the context for choosing the title, problem formulation, aims and issues for the research. The second part is the research method which will discuss how this research will be carried out, the theories that support the research, and also the stages in research and sampling. The third part is the results and discussion, which explains the analysis of the SEM calculations, the resulting path diagrams and the resulting hypotheses. The fourth part is the conclusion of the entire series of research that has been carried out.

2 Research Methods

E-business is the integration of information technology (the internet), operational procedures, and managerial techniques. In their study, Zhu et al. found that organizations adopting information technology can alter their organizational structure and company operations dramatically. Additionally, information technology use by enterprises affects interactions with clients, suppliers, and other business partners [10, 11].

This study is a progression from earlier work research that both incorporates and modifies earlier theories. Most prevalent well-known models in the study of computers is the Delone & MacLean success model. Three variables make up the success model: information quality (IQ), system quality (SQ), and service quality (CQ). The TOE (Technology-Organization Environment) framework, developed by Tornatzky and Fleiscer, is the theoretical foundation for the second model, the E-business Adoption model [12, 13]. According to this strategy, the business's choice to adopt organizational culture influences new technology, environmental, and technological factors. Technology Competency (TC), Company Scope (FC), Company Size (FZ), Consumer Readiness (CR), and Competitive Pressure (CP) are the five variables that make up the TOE concept. The model's final output is the readiness of SMEs for Net Benefit (NB).

Table 1. List of the variables and indicators

Variables	Indicators	References
IQ	IQ1; IQ2; IA33; IQ4; IQ5.	[14-18]
SQ	SQ1; SQ2; SQ3; SQ4; SQ5.	[14-19]
CQ	CQ1; CQ2; CQ3; CQ4; CQ5.	[14-18]
TC	TC1; TC2; TC3; TC4; TC5.	[9, 10, 16-18]
FC	FC1; FC2; FC3; FC4; FSC5.	[9, 10, 16-18]
FZ	FZ1; FZ2; FZ3; FZ4; FZ5.	[9, 10, 16-18]
CD	CD1; CD2; CD3; CD4; CD5.	[9, 10, 16-18]
CP	CR1; CR2; CR3; CR4; CR5	[9, 10, 16-18]
NB	NB1; NB2; NB3; NB4; NB5.	[16-18]

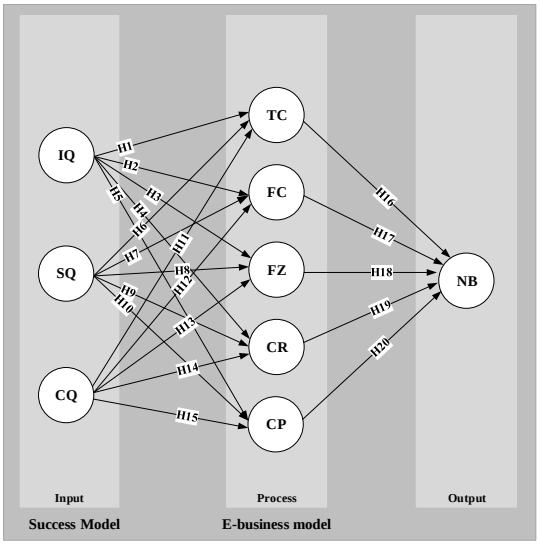

Figure 1. The Developed Model

Based on the research methodology developed, eight process stages will be passed. The model development was continued by making research designs and questionnaires from the results integration of the previous model. The next stage is collecting and analyzing the existing data to make a complete report and publish the existing report.

When using the sample method, the researcher randomly emailed or personally delivered surveys to potential respondents. The targeted respondents are either employees or previously successful SME owners their businesses using information technology or certain software. The next stage is data processing, where data is entered into a computer format using Microsoft Excel 2019, and the completeness of the answers has been checked according to the instructions for the instrument used. From the results obtained, an analysis was done utilizing the SmartPLS 3.3 statistically software by considering the software's capabilities Simultaneously in data analysis without initial assumptions, it is also due to the consideration that the data obtained is the data used for the pilot study.

For interpretative evaluation, the computation results will be verified using the input references. In the analysis stage of an interpretive assessment details on the respondent, including information about their demographics and personalities might be taken into account. Following the completion of the analysis, the statistical data and interpretive analyses will be used as the findings and suggestions.

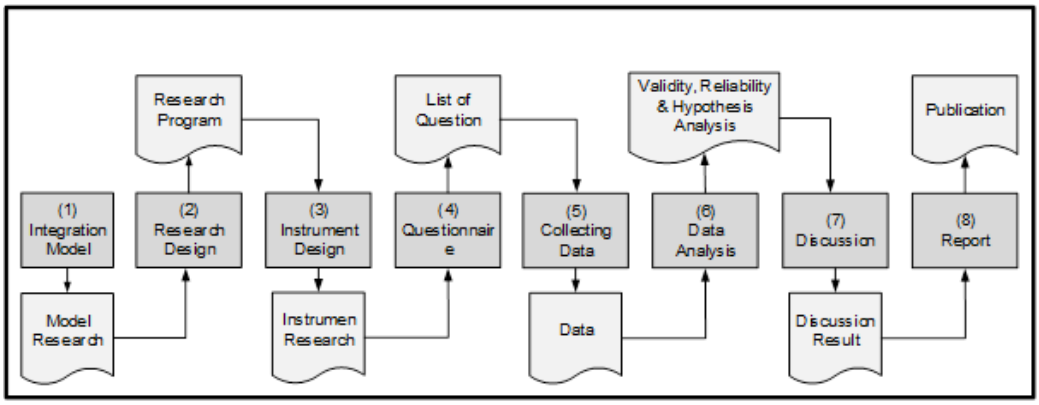

Fig 2. The Research Methodology

3. Result and Discussion

Three demographic respondent categories - education, position, SMEs regional, readiness factors influencing, and level of preparedness for IT use - are described in the table below.

Table 2. Profile Respondents

Item	Description	%
Gender	Male	70.75
	Female	29.25
Interview	Yes	96.70
	No	3.30
Education	High School	43.40
	Diploma	30.19
	Graduated	26.42
Location	Medan Area	100.0
Position	High Level	48.11
	Middle Level	41.98
	Etc.	9.91
Experience	> 5 Years	24.53
	4 – 5 Years	27.83
	3 – 4 Years	25.47
	2 – 3 Years	15.57
	< 2 Years	7.08
Skills	Expert	16.04
	Skilled	26.42
	Capable	34.91
	Unskilled	22.64

The google form application was used to disseminate the questionnaire, which was then sent via WhatsApp or email. Those who have the right to fill out the questionnaire are the person in charge of the SMEs or someone appointed as the manager of the SMEs. In total, there are 51 questions consisting of six general questions and 45 questions on a Likert scale, and these are questions that must be filled out as part of the survey instrument.

The data collected was 212 SMEs; where the researchers did not categorize the type of SMEs business but randomly distributed a questionnaire with a note that the UKM had used information technology in running and operating the SMEs.

Measurement Model Assessment

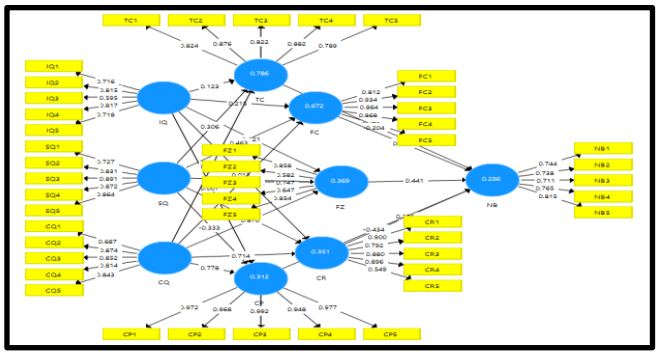

Figure 3. The Path Diagram Outer Model

The measurement of the model is carried out by conducting confirmatory factor analysis [20]. Namely by testing convergent validity and discriminant validity , and the results are:

- Reliability indicator by looking at the value of Cronbach Alpha (CA) with a threshold value of 0.7 in testing using the SmartPLS application. Nine variables were declared reliable because the overall value was above 0.7.
- Validity indicator by looking at the value of cross loading (CL) with a threshold value of 0.7 on the test results. Six indicators are declared invalid because their Values are lower than the cut off point. The six indicators are IQ3, CQ1, FC5, FZ2, FZ4 and CR5.

Table 3. Value of Cross Loading and Cronbach Alpha

Var	Indic	CL	Validity	CA	Reliability
Inform Quality	IQ1	0.716	Valid	0.791	Reliable
	IQ2	0.815	Valid		
	IQ3	0.595	Invalid		
	IQ4	0.817	Valid		
	IQ5	0.718	Valid		
System Quality	SQ1	0.727	Valid	0.893	Reliable
	SQ2	0.831	Valid		
	SQ3	0.891	Valid		
	SQ4	0.872	Valid		
	SQ5	0.864	Valid		
Service Quality	CQ1	0.687	Invalid	0.874	Reliable
	CQ2	0.874	Valid		
	CQ3	0.852	Valid		
	CQ4	0.814	Valid		
	CQ5	0.843	Valid		
Tech Compet	TC1	0.824	Valid	0.895	Reliable
	TC2	0.876	Valid		
	TC3	0.822	Valid		
	TC4	0.882	Valid		
	TC5	0.789	Valid		
Firm Scope	FC1	0.812	Valid	0.850	Reliable
	FC2	0.934	Valid		
	FC3	0.864	Valid		
	FC4	0.868	Valid		
	FC5	0.473	Invalid		
Firm Size	FZ1	0.858	Valid	0.794	Reliable
	FZ2	0.582	Invalid		
	FZ3	0.747	Valid		
	FZ4	0.647	Invalid		
	FZ5	0.854	Valid		
Cons Readi	CR1	0.900	Valid	0.863	Reliable
	CR2	0.792	Valid		
	CR3	0.880	Valid		
	CR4	0.896	Valid		
	CR5	0.549	Invalid		
Comp Press	CP1	0.972	Valid	0.985	Reliable
	CP2	0.968	Valid		
	CP3	0.992	Valid		
	CP4	0.948	Valid		
	CP5	0.977	Valid		
Net Benef	NB1	0.744	Valid	0.812	Reliable
	NB2	0.738	Valid		
	NB3	0.711	Valid		
	NB4	0.765	Valid		
	NB5	0.815	Valid		

All of the aforementioned indicators display fantastic results because only the owner or top management, who also has a strategy for a successful future, can respond to the questionnaire questions. However, same questionnaire test has been used in prior research, and those results included five indicators that were disregarded [16]. Researchers believe that the improvement in these results is also a result of gains achieved by the manufacturing industry's sector in the development and application of information technology in its SMEs.

Structural Model Assessment

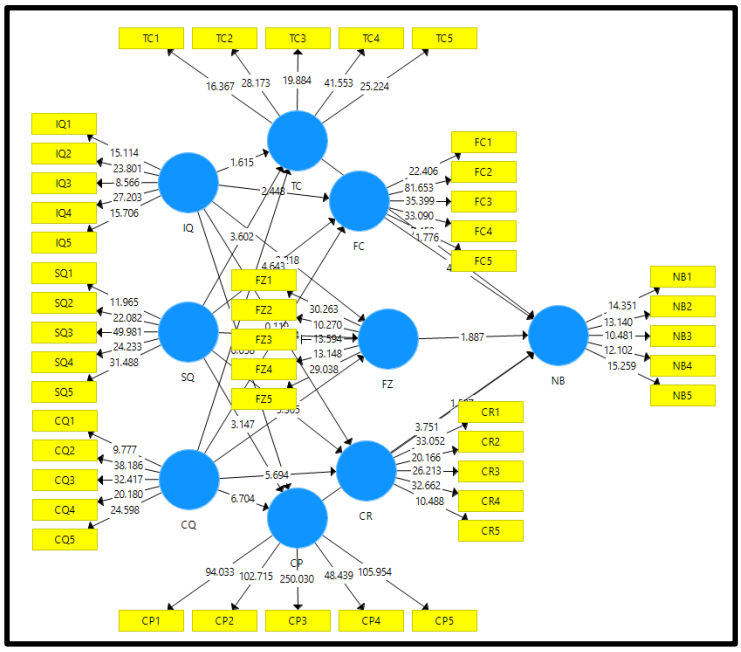

Fig 4. The Path Diagram Structural Model Assessment

The results of the structural model test path coefficient values, where a value of 0.05 indicates a substantial influence. The two-tailed test used for hypothesis testing (T-Stat) has a significance level of 5%, which indicates that a hypothesis will be accepted if its T-Stat value is greater than 1.96. The table shows that there are sixteen accepted hypotheses.

Table 4. Decision of Hypothesis

No	. Hypothesis	Decision
1	Does IQ have a significant influence on TC	Accept
2	Does IQ have a significant influence on FC	Accept
3	Does IQ have a significant influence on FZ	Accept
4	Does IQ have a significant influence on CR	Reject
5	Does IQ have a significant influence on CP	Reject
6	Does SQ have a significant influence on TC	Accept
7	Does SQ have a significant influence on FC	Accept
8	Does SQ have a significant influence on FZ	Reject
9	Does SQ have a significant influence on CR	Reject
10	Does SQ have a significant influence on CP	Accept
11	Does CQ have a significant influence on TC	Accept
12	Does CQ have a significant influence on FC	Accept
13	Does CQ have a significant influence on FZ	Accept

14	Does CQ have a significant influence on CR	Accept
15	Does CQ have a significant influence on CP	Accept
16	Does TC have a significant influence on NB	Accept
17	Does FC have a significant influence on NB	Accept
18	Does FZ have a significant influence on NB	Accept
19	Does CR have a significant influence on NB	Accept
20	Does CP have a significant influence on NB	Accept

4. Conclusion

The availability of technology and data from its use will stimulate, motivate, and drive someone to utilize it. However, it has been revealed that the development of organizational cultures for using these technology goods will have an impact on the delone success model. The results of the analysis process, which began with a study of the demographic characteristics of respondents, analysis of the measurement model (outer model), analysis of the structural model (inner model), and analysis of the data show that there is a significant correlation between the success model variable and the IT adoption variable. Testing using a measurement model has a high level of validity and reliability. The twenty analyses utilized in the structural model testing yields positive psychometric outcomes as well. Stage-by-stage testing is done to give readers information that may be applied to future research development. The completion of this research was greatly aided by the employment of the PLS-SEM approach and the SmartPLS gadget.

Despite thorough investigation into the difficulties surrounding the technique and data used in this study, it is impossible to avoid limitations in its field application. For instance, the methodologies and instruments for data collecting and analysis employed in this study, as well as sampling, type, and sample size. As a result, it may not be possible to extrapolate the results to other studies using different data and techniques. Other than the suggested model, methodological considerations and the data used in this study may be taken into account in future research. It is hoped that numerous recommendations can be made for the creation of further techniques, particularly for the creation of models for information systems.

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