Analysis of Mobile Banking Acceptance in Indonesia using Extended TAM (Technology Acceptance Model)

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Article Information

ABSTRACT

The use of Communication and Information Technology which is developed through the years is one of the key of organization's success in business rivalry through pandemic era nowadays. In line with the development of technology and information, bank authorities also offer the facility of banking through mobile banking (m-banking) application that can be accessed by using smartphone. This research aims to analyze factors that can influence the acceptance of m-banking application in Indonesia. The data was gathered through survey of 412 m-banking users in Indonesia and it was analyzed by using Structural Equation Modeling (SEM) with Extended Technology Acceptance Model (TAM). The findings of the research showed positive attitudes, perceived usefulness and perceived ease of use felt by the m-banking users and become the main reasons in adopting this technology besides social influence and perceived risk of m-banking technology. Meanwhile, the fear of using technology in using m-banking technology has a potential to obstruct the technology adoption. The result of this research can help the bankers and stakeholder in formalizing strategical steps in improving the adaptation of m-banking technology and application, especially in Indonesia.

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1. INTRODUCTION

Covid-19 Pandemic which appeared first in Wuhan, China in early 2020 spread rapidly throughout the world including Indonesia [1]. Consequently, citizens must wear face mask, keep the distance, and avoid crowds [2]. This condition is also influence the banking authorities. The use of information and communication technology which is developed through years is one of the key of organization's success in business rivalry through pandemic era nowadays. The increase of mobile devices user like smartphone and with the support of telecommunication wireless network like 3G, 4G and even 5G, the process of business by using information and communication technology become a big potential of business [3]. In line with the development of information and technology, the banking authorities also offer banking facilities through mobile banking application in smartphone. Mobile banking is one of the development that combine information and application technology in the same time, by using the application, customers can get the service in anytime without coming to the bank [4]. By using mobile banking service, customer can make many transactions such as checking balance, making a bank transfer, paying loan credit and etc. without going to the bank or Automatic Teller Machine (ATM) [5].

However, there are some things that can block the intention in using mobile banking for example lack of information about the use and the way of using application, lack of technology awareness, the refusal of innovation, infrastructure support and the capability of application to interact with other application [6]. Moreover, security is another problem for customer while making transaction by using the application [7]. Customers are afraid of the leakage of their personal information while making the digital transaction [8]. In order to overcome the problems above, the previous research have proposed several factors that can influence the intention and the usage of mobile banking application sustainably [9].

The implementation of Technology Acceptance Model (TAM) states that the easiness of usage, attitude, trust, subjective evaluation are important factors that significantly influence the intention to use technology and finally use it sustainably [10]. This research aims to analyze factors that influence the acceptance of m-banking application by banking customers in Indonesia. In general, this research also contextualized the model of TAM based technology by adding new relevant variable and has potential to be important factors in m-banking acceptance in Indonesia.

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2. RESEARCH METHOD

2.1. Technique of Data Collection

The population in this research is all Indonesian citizens without any age, sex, educational level, job or other aspects grouping. The sample in this research is all citizens above 17 years old. Sampling technique was done thoroughly without limiting the brand of smartphone and operation system used in operating mobile banking. After the data gathered, about 532 sample, then the data were selected well and got 412 sample. The characteristics of sample can be seen in the following:

Table 1. Demography of Respondents

Characteristics	Categories		Total	Percentage
Age	17 - 25		245	59,47%
	26 - 35		150	36,41%
	>35		17	4,13%
Sex	Male		247	59,95%
	Female		165	40,05%
Origin	Java		198	48,06%
	Outside Java	Sumatera	161	39,08%
		Kep Bali dan Nusa tenggara	9	2,18%
		Kalimantan	25	6,07%
		Sulawesi	16	3,88%
		Papua	3	0,73%
Domicile	Java		222	53,88%
	Outside Java	Sumatera	138	33,50%
		Kep Bali dan Nusa tenggara	11	2,67%
		Kalimantan	22	5,34%
		Sulawesi	12	2,91%
		Papua	5	1,21%
		Abroad	2	0,49%
Occupation Sector	Civil		68	16,50%
	Non Civil	Private	184	44,66%
		Freelance	76	18,45%
	Unemployee		84	20,39%
Occupation Field	Banking		71	17,23%
	Students or College Students		63	15,29%

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	Enterpreneur	41	9,95%
	Information Technology, Telecommunication	24	5,83%
	Civil Servant	16	3,88%
	Service	96	23,30%
	Education	63	15,29%
	Unemployee	38	9,22%
Educational Level	High School	164	39,81%
	Bachelor	199	48,30%
	Magister	49	11,89%
Income	Low	348	84,47%
	High	64	15,53%

2.2. Data Analysis

After the data gathered and selected, then the needed data is processed to the next level, data analysis. The analysis is done by using Structural Equation Modeling (SEM) and R programming language [11] in RStudio Software [12] with Lavaan Package [13]. SEM is a statistical Technique that can be used to developed and tested statistical model, relationship between endogen variable (effect) and exogenous variable (cause) and this technique was used in previous research such as the use of mobile phone [14], m-learning [15] and m-commerce [16].

2.3. Technology Acceptance Model

There are some frameworks that are developed in order to explain the explain the use of information technology [17], one of them is Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Decomposed Theory Planned Behavior (DTPB), and Unified Theory of Acceptance and Use of Technology (UTAUT). From the models, TAM is considered and usually used to explain acceptance of information technology system usage [18]. TAM is firstly proposed by Davis [19] and developed and become popular and considered as the renewal of TRA. TAM was introduced by Davis [18] in 1986. TAM is a framework which is designed to analyze and predict the factors that influence the users' acceptance of information technology [20]. Although the TAM model is most often used to explain a person's behavioral intention to use technology, adding certain variables to the model is necessary to explain the intention to use a new technology [21]. Social Influence (SI) is a factor that can increase a person's intention to use mobile banking in Indonesia. This is very much in line with the characteristics of Indonesian people who tend to follow a trend, the high rate of cybercrime in Indonesia is also a factor that must be taken into account, then low awareness of

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technology is one of the factors that will hinder the use of mobile banking services. Pressure to use new technology is an inhibiting factor for using a technology [22]. Table 2 explain four variables (3 exogenous variables and one endogen variable) of TAM.

Table 2. Original Variable of TAM in this Research [18]

Variable	Description
Perceived Usefulness (PU)	Refers to the perceived usefulness that will be gotten, or the intention that in using a typical system will improve someone's performance perceived usefulness (PU) is usually more significant and important than other variables in influencing behavior, intention, and how is the behavior in using a technology
Perceived Ease Of Use (PEOU)	It can be defined as the ease in using a certain technology.
Attitude towards using technology (ATT)	Positive or negative attitude that someone's feel in using a certain technology.
Behavioral intention (BI)	It can be defined as intention to use a technology and behavioral tendency to use it sustainably. This variable is an endogen variable and in several research about TAM, it describe the actual usage that cannot be measured directly.

Besides using the four variables above, the researcher also did contextualization by adding several variables based on what is reviewed from the literature and also the consideration about technology used, as what is stated in the following table 3.

Table 3. Additional Variables for Extended-TAM in this research

Variables	Description	Citation
Social Influence (SI)	It can be defined as social influence, how the influence given by the environment (family, colleague, friend) toward the intention in using typical technology.	[23]
Perceived Risk (PR)	It can be defined as the risk that probably happen while using a technology. Mobile banking technology need wireless telecommunication network, if the obstacle happen, the transaction will get the trouble too. In nowadays, cybercrime can be happen, so that good security will improve the use of electronic devices.	[24]
Fear when using technology (FUT)	It can be seen as the fear when using technology. Lack of awareness of technology is one of the obstacles in using mobile banking. The pressure toward the use of new technology is also one of the obstacle in using the technology	[25]

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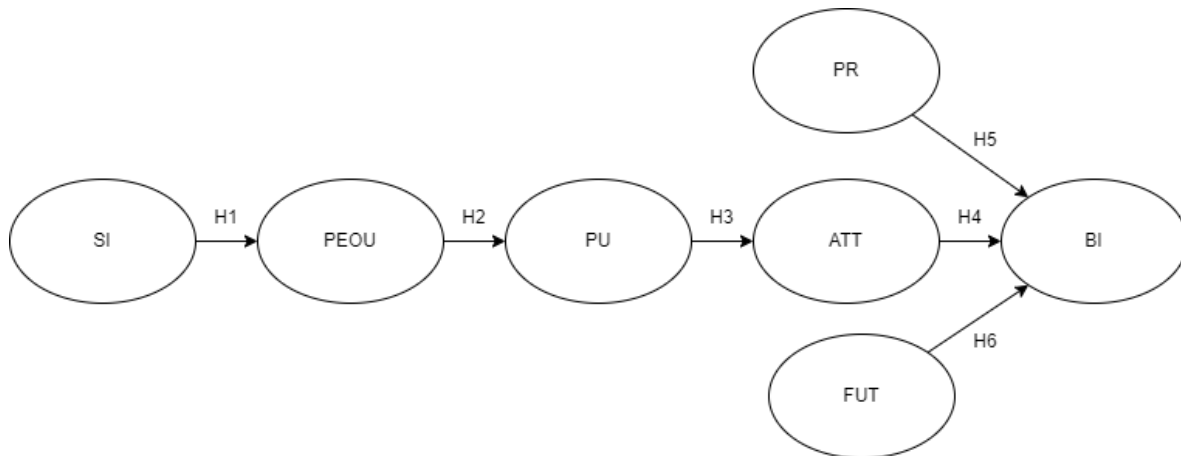The model of seven variables can be seen in the following picture.

Figure 1. The proposed model in this study

As seen in picture 1 above, there are 6 hypotheses in this research. The explanation for each hypothesis can be seen as follow:

- H1. Social Influence is significantly influenced Perceived ease of Use.
- H2. Perceived ease of Use is significantly influenced Perceived Usefulness.
- H3. Perceived Usefulness is significantly influenced Attitude Towards Using.
- H4. Attitude Towards Using is significantly influenced Behavioral Intention to Use.
- H5. Perceived risk is significantly influenced Behavioral Intention to Use.
- H6. Fear when using technology is significantly influenced Behavioral Intention to Use.

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3. RESULTS AND DISCUSSION

In order to know the validity of the model, some evaluations were done. First is Individual Item Realiability which is done by measuring cross loading value for each item of latent construct. If the value of loading higher than 0.5, so tha validation is strong enough to describe the construct, the higher the value the better the validation [26]. Table 4 explain 27 items of measurement for 7 latent variables together with mean value and loading factors

Table 4. Individual Item Reliability

No.	Code	Questions	Mean	Loading
1	si1	My family members are also using mobile banking	3,748	0,592
2	si2	My colleagues (work partner/classmates, etc) are also using mobile banking	4,08	0,858
3	si3	People surround me are also using mobile banking	3,971	0,830
4	si4	Banking authorities are recommending me to use mobile banking	4,051	0,639
5	peou1	Mobile banking is easy to use	4,493	0,837
6	peou2	mobile banking is clear and easy to understood	4,359	0,833
7	peou3	Financial transaction through mobile banking does not need much energy and time	4,498	0,744
8	peou4	I can easily understood the way to use m-banking	4,35	0,785
9	pu1	Mobile banking can help me to do daily activity	4,488	0,867
10	pu2	M-Banking make my financial transaction fast and easy	4,459	0,915
11	pu3	Financial Transaction by using m-banking can be use anytime and anywhere	4,354	0,761
12	pu4	Mobile banking give many easiness in financial transaction	4,357	0,856
13	att1	I have positive attitude toward mobile banking	4,119	0,842
14	att2	Mobile banking is something good	4,201	0,859
15	att3	mobile banking is something that need to be adopted by people	4,053	0,795
16	att4	Mobile banking is something sure through the time	4,051	0,742
17	pr1	I understand the risk in using mobile banking	3,893	0,830
18	pr2	I understand the misuse of personal information in using mobile banking	3,735	0,822
19	pr3	I know the risk of cancelation of financial transaction in using mobile banking	3,833	0,750
20	pr4	I know the risk of financial transaction in using mobile banking	3,515	0,664
21	bi1	I have intension in using mobile banking in any chance	4,015	0,787
22	bi2	I have intention to use mobile banking regularly	3,731	0,874
23	bi3	I have intention to always use mobile banking	3,704	0,860
24	bi4	I have intention to use mobile banking as my main application for my financial transaction	4,022	0,741
25	fut1	In certain situation and condition, there is a technical problem that make me fear of using mobile banking	3,687	0,877

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26	fut2	In certain situation and condition, there is a technical problem that make me difficult to use mobile banking	3,711	0,585
27	fut3	In certain situation and condition, there is a technical problem that make me reluctant to use mobile banking	3,388	0,718

Based on the measurement of Individual Item Reliability above, all items have the value of loading more than 0.5, and it means that the validity is strong enough to explain the construct. Moreover, Heterotrait-Monotrait Ratio (HTMT) which is the mean score of correlation of inter variable that aims to measure geometrical mean score of similar correlation of variable. Based on the result of HTMT testing showed in table 5, it can be understood that nothing of HTMT score above 0.85, so that the discriminant validity of 7 latent variables are gotten [26].

Table 5. Heterotrait-Monotrait Ratio (HTMT)

Variable	PEOU	PU	PR	ATT	SI	BI	FUT
PEOU	1,000						
PU	0,841	1,000					
PR	0,264	0,246	1,000				
ATT	0,703	0,729	0,243	1,000			
SI	0,486	0,462	0,293	0,497	1,000		
BI	0,552	0,577	0,193	0,728	0,544	1,000	
FUT	0,194	0,135	0,729	0,108	0,222	0,045	1,000

Furthermore, in order to see the suitability between data and the model, table 6 explains 5 indexes of suitability (Goodness-of-fit) which is used more in previous research. The findings show that the model used in this research is already fulfill one of the condition in TwoIndex Presentation Strategy by [27], in the second category where RMSEA score is 0.075 under 0.08, and the score of SRMR is 0,007 under 0.08. in short, it can be said that the model used have high suitability with the data gathered in this research.

Table 6. Suitability Indeks

Goodness-of Fit Index Item	Result
X^2 / df	3,336
SRMR	0,077
RMSEA	0,075
CFI	0,919
TLI	0,908

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Moreover, SEM analysis was done through 2 steps. First step was done by testing six hypotheses of the research in order to see the direct relationship between latent variable in the model of this research. The result of the analysis can be seen in table 7, and the six hypotheses were accepted.

Table 7. The Conclusion of Hypotheses Testing

Code	Hypothesis	Coefficient Std	Conclusion
H1	SI – PEOU	0,503***	Accepted
H2	PEOU - PU	0,836***	Accepted
H3	PU – ATT	0,746***	Accepted
H4	ATT - BI	0,687***	Accepted
H5	PR – BI	0,218***	Accepted
H6	FUT – BI	(-)0,234***	Accepted

Note: Level of Significant * in 0,05, ** in 0,01, *** in 0,001

In the second step, SEM analysis was done by implementing path analysis process in order to see the direct effect and indirect effect of each variables, exogenous and endogen. The result can be seen in table 8.

Tabel 8.Total Effect of each exogenous and endogen variable of BI

Direct Path	Indirect	Direct	Total Effect
SI – BI	0,215	-	0,215
PEOU – BI	0,428	-	0,428
PU – BI	0,512	-	0,512
ATT - BI	-	0,687	0,687
PR – BI	-	0,218	0,218
FUT – BI	-	-0,234	-0,234

The attitude towards using (ATT) variable is a significant and most influential variable in the acceptance of mobile banking applications because it has a significant value. Influence in the acceptance of mobile banking applications because it has the highest Standardized Estimate value is the highest, which is 0.687 with a p value accept the existence of new technology for banking services through mobile banking applications will make users accept to use mobile banking applications. banking application will make users accept to use the mobile banking application for daily banking service activities. for daily banking service activities. Meanwhile, the test results on the fear when using technology variable show a p value of 0.006 with a coefficient of -0.234 so it can be concluded that the fear when using technology variable has a significant negative effect on behavioral intention to use. The existence of fear in using new technology, in this case the mobile banking application, reduces the intention to use the mobile banking application.

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4. CONCLUSION

Based on the series of SEM analysis done, it can be seen that three additional variables in Extended Model of TAM which are SI, PR, and FUT have significant effect in the acceptance of m-banking in Indonesia. Especially, SI and PR gave positive contribution in improving the acceptance of m-banking, meanwhile FUT gave negative contribution in the acceptance of m-banking. In other words, the citizens who are surrounded by the m-banking users will use the application sustainably and they understand the risks of the technology. On the other side, the fear of technical problems in m-banking usage can be a specter that avoids the acceptance of m-banking for the citizen. Otherwise, the result of this research also showed that the three exogenous variables of TAM had higher effect compared with the additional variable. In other word, positive attitude, perceived usefulness and perceived ease of use in using m-banking still be the main reasons in adopting this technology.

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