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Examine the Technology of Acceptance Model Among Mobile Banking Users in Indonesia

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Abstract— This study aims to investigate the TAM factors of mobile banking intention to use and use behaviors. This study employs a sequential explanatory strategy of a mixed-method, involving 140 respondents in Jakarta for the quantitative data, and conducting in-depth interviews with several of the respondents who filled in the data survey in quantitative data collection. The findings show that not all hypotheses of the TAM are accepted. The study proves that ease in mobile banking using creates the perception of usefulness in users' thinking. And the ease of use is an essential stimulus that encourages them to use mobile banking. But the usefulness perception does not prove to be a driver for using it. Finally, when users have ever used mobile banking, they want to use it again. The originality of the research is that although the ease of use influences perceived usefulness and the ease of use also influences the intention to use, this research shows that perceived usefulness does not change its intention.

Keywords— Technology of Acceptance Model, Intention to Use, Use Behavior, Mobile Banking, Indonesia.

1. Introduction

GROWTH IN INDONESIAN MOBILE BANKING BUOYS THE GLOBAL MARKET

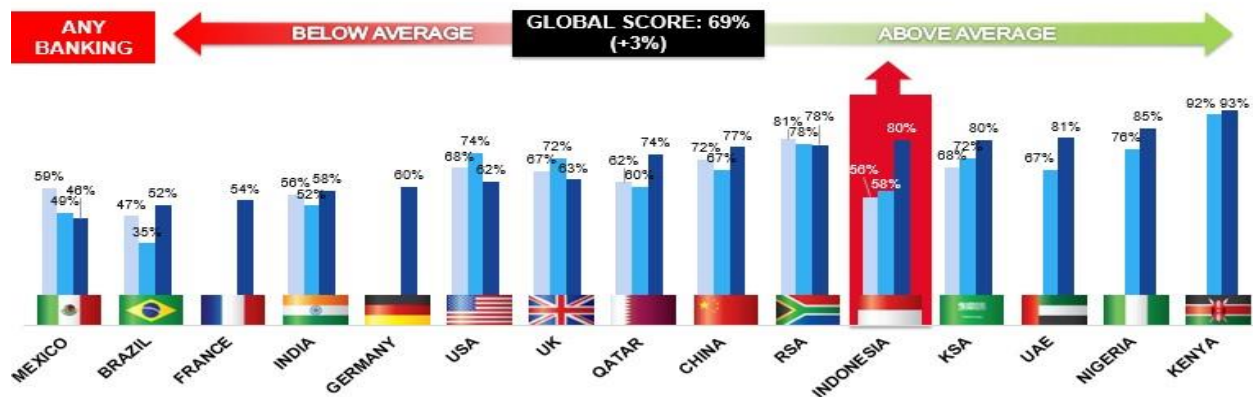


Figure 1. Growth in Indonesia Mobile Banking Source: <https://dailysocial.id/post/mobile-banking-indonesia>

Mobile banking is one of a type of e-commerce, and it is essential to support e-commerce activities in the smartphone era [25]. M-banking adoption ten years ago maybe is not significant [20]. gave the example that in [20]. reported that m-banking using had not met industry expectations. In 2008, Khan stated that from almost 25 million Bank of America customers, only four percent as m-banking active users. In the same year, [29] also said that only twelve percent of German customers consider m-banking in transactions. But, digital banking penetration is increasing significantly, at least in Indonesia [1]. As [1] reported McKinsey's survey,

mobile banking users increased among Indonesia's bank customers, from 36 percent in 2014 to 58 percent in 2017. And according to the MEF report, 80 percent of respondents in Indonesia admits using mobile banking as Figure 1. The above phenomena are a reason that it is important to study m-banking acceptance and adoption in Indonesia. Many previous studies applied TAM to investigate the determinants of mobile banking acceptance in different countries. [20] apply TAM and IDT to investigate m-banking acceptance. They mention that one of their research limitations is the research only focuses on young customers in German, a developed country. So necessary to investigate m-banking use TAM in other countries. [12] also extended TAM and IDT to examine internet banking adoption among Greek customers, and they give the recommendation for future research to test the TAM and IDT in other territories in Greek. It will be important to test it in other countries. [2] extended TAM to investigate m-banking adoption among Turkey students and give a recommendation for future research recommendations. Since the study was conducted in emerging countries, future research can be conducted in industrialized countries. But, we think it is also necessary to test the model in other emerging countries anymore. The limitations and recommendations of future research are gaps to be filled in. Therefore, this research investigates mobile banking use TAM in an emerging country, Indonesia. [9] extended TAM and Diffusion of Innovation (DOI) to investigate m-banking adoption among India's bank customers. Their study's limitation does not include the actual usage behavior or use behavior in the proposed model. It will interest if future research includes the use behavior into the TAM model. Therefore, this research includes the use behavior variable as a dependent variable.

So, the objectives of this study are to examine:

1. How the effect of perceived ease of use on mobile banking perceived usefulness in Indonesia?
2. How the effect of perceived ease of use intention to use m-banking in Indonesia?
3. How the effect of perceived usefulness on the intention to use m-banking in Indonesia?
4. How the effect of intention to use m-banking on use behavior among mobile banking users in Indonesia?

2. Literature Review

The Technology Acceptance Model (TAM) is the model that be adapted from the Theory of Reasoned Action (TRA) to investigate the factors that lead to technology acceptance [11], [24]. Then Davis et al. [8] conceptualized that intention to use technologies or innovations as the impact of attitudes towards a product, and the attitudes are influenced by perceived ease of use and usefulness of the product. Researchers examined the TAM to investigate m-banking adoption in various countries. Koenig-Lewis et al. [20] investigate the barriers of m-banking among Germany young people use TAM and IDT. Giovanis et al. [12] also extended TAM and IDT to examine internet banking adoption among Greek customers. Akturan and Tezcan [2] extended TAM with perceived risk to investigate m-banking adoption among Turkey students. Deb and Lomo-David [9] extended TAM and Diffusion of Innovation (DOI) to investigate m-banking adoption among India's bank customers. Baabdullah et al. [32] extended TAM with Task-Technology Fit (TTF) model to investigate m-banking adoption among Saudi banking customers.

2.1 Perceived ease of use and perceived usefulness

Koenig-Lewis et al. [20] stated that the Internet has moved from the cable connection to wireless, so by mobile devices, customers can access and include financial transactions whenever and wherever. Therefore, from the ease in using a move to perceived usefulness of the innovation adoption. If a customer does not see benefits in m-banking using, they will not interest in using it. Therefore, a bank must increase its support to make m-banking using easier. Akturan and Tezcan [2] found that when bank customers perceive that use m-banking

is easy, it will create and increase positive perceptions of useful. Giovanis et al. [12] found that ease of internet banking using increased the perception of usefulness among Greek customers. Base on the previous findings, the hypothesis is proposed as following:

H1: Perceived ease of use has a significant impact on perceived usefulness.

2.2 Perceived ease of use and m-banking adoption

In the mobile banking adoption context, perceived ease of use is expected that mobile banking uses effortless [2]. Farah et al. [10] found that effortlessness is a factor of m-banking adoption among Pakistan customers. Customers need technologies that ease to use that can make their activities become simple and require little effort. So they become very dependent on these devices in their daily. Less effort in m-banking using is the stimulus to adopt it. Tan and Leby Lau [27] found that young consumers in Malaysia like to adopt mobile banking because it is easy to be learned and operated. The transaction process speed and concise will be a stimulus to adopt mobile banking. Clear guidance for operating the system will be helpful. Therefore, the bank needs to provide it to their customers. Akturan and Tezcan [2] said that when mobile banking makes it easier to conduct bank transactions and complete their tasks quickly, it will encourage them to accept it. Giovanis et al. [12] found that ease of internet banking using increased the intention to use it among Greek customers. Baabdullah et al. [32] stated that mobile devices give benefits instruments in payments, balance and statement checking, and other bank transactions quickly make customers adopt m-banking. Base on the previous findings, the hypothesis is proposed as following:

H2: Perceived ease of use has a significant impact on intention to use m-banking.

2.3 Perceived usefulness and m-banking adoption

Farah et al. [10] found that individuals' beliefs that m-banking can help them increase their job performance are the factor that encourages them to use it in real life. Consumers are interested in using m-banking because it is convenient and useful, and they believe that their performance will be better by using it. Tan and Leby Lau [27] found intention to use among millennial generation in Malaysia is influenced by their perception of mobile banking's benefits. Then Tan and Leby Lau [27] suggest to a bank to conduct marketing campaigns about the benefits of m-banking using to educate consumers. Akturan and Tezcan [2] found that when bank customers perceive that by using m-banking, they can increase their performance, or it is helpful. The perception will develop a positive attitude towards it, and they will like to use it. Koenig-Lewis et al. [20] stated that bank customers would get benefits by m-banking using. It is not only about the ease of use, but the benefits include cost and time savings. Giovanis et al. [12] found that the positive perception of internet banking benefits increased the intention to use it among Greek customers. Base on the previous findings, the hypothesis is proposed as following:

H3: Perceived usefulness has a significant impact on intention to use m-banking.

2.4 M-banking adoption and use behavior

Use behavior is the next step after customers use the product. Farah et al. [10] found that when bank customers perceive ease and benefits of m-banking, the factors influence their interest to use it, then use behavior will increase after recognizing the benefits of m-banking using. Danyali [5] found that when mobile banking users feel ease and benefit of the application after use it, they think necessary to use it again at the future. Base on the previous findings, the hypothesis is proposed as following:

H4: Intention to use m-banking has a significant impact on use behavior.

2.5 Theoretical Framework

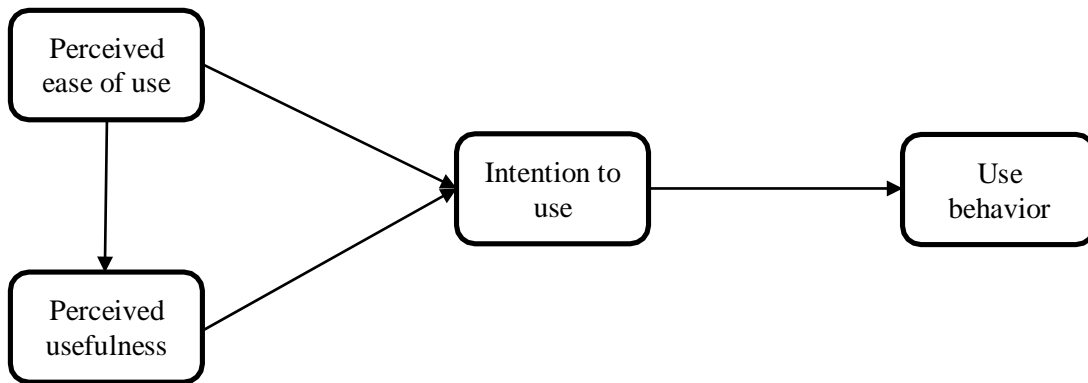


Figure 2. Theoretical Framework

3. Method

This study will employ a sequential explanatory strategy of a mixed-method. Therefore, it will conduct two steps: firstly, collect and analyze quantitative data to prove the hypotheses, and then, secondly, collect and analyze qualitative data to explain the quantitative findings [4]. According to Criswell [4], the sequential explanatory strategy is most popular in mixed-method research and often used by researchers inclined to the quantitative paradigm. Therefore, in the sequential explanatory strategy of a mixed-method, quantitative data is more priority.

3.1 Population and Sample

The study population is mobile banking users in Jakarta, and it is unknown numbers, so the study uses non-probability or convenience sampling techniques. The sample size in non-probability sampling in the quantitative method is five or ten times the number of manifest items [6], [26], [23], [21], [3]. Since the items of the study are 14, then 140 samples are qualified. Qualitative data is then collected by in-depth interviews with several of the respondents who filled in the data survey in quantitative data collection.

3.2 The measurement scale

The measurement instrument of perceived ease of use and perceived ease of use variables are adapted from Davis [7] and Davis et al. [8]. Measurement instruments of intention to use and use behavior are adapted from Venkatesh et al. [31], [21].

3.3 The analysis techniques

SEM-PLS analyzes the quantitative data survey use Smart-PLS software and conducts the outer and inner evaluation. Outer loading ought to > 0.70, Composite reliability ought to be > 0.70, and Cronbach's alpha should be > 0.70 to demonstrate reliability, and AVE ought to > 0.50 to show validity [13]. For the inner model, t-statistic ought to > 1.96, and the p-value should 0.05 to confirm the hypotheses [14]. Then, qualitative data is interpreted to confirm the quantitative result.

4. Result

4.1 Outer Model Evaluation

Table 1. Indicator Reliability

Indicator Loadings	Indicator Loadings
--------------------	--------------------

Perceived Use of Use		Intention to Use	
PEOU1	0.863	ITU1	0.873
PEOU2	0.883	ITU2	0.880
PEOU3	0.838	ITU3	0.859
		ITU4	0.853
		ITU5	0.857
Perceived Usefulness		Use Behavior	
PU1	0.864	UB1	0.867
PU2	0.895	UB2	0.916
PU3	0.888		
PU4	0.893		

Table 2. Construct Reliability & Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Perceived Use of Use	0.827	0.896	0.742
Perceived Usefulness	0.909	0.935	0.784
Intention to Use	0.899	0.925	0.713
Use Behavior	0.746	0.886	0.795

Table 1 shows that all items of variables are reliable because of their indicator loadings of all items > 0.70 [13]. Then, Table 2 shows that all variables are reliable because Cronbach's Alpha is > 0.70, and the Composite reliability > 0.70. Table 2 shows that all variables are valid because AVE is > 0.50 [13].

Table 3. Discriminant Validity

	ATT	BI	PE	PEOU
ITU	0.844			
PE	0.557	0.862		
PEOU	0.360	0.541	0.885	
UB	0.468	0.423	0.249	0.892

Table 3 shows that all variables comply with discriminant validity according to Fornell–Larcker criterion (see [13], [22], [17], [30]).

According to Hair et al. [13], R-square values of 0.75 is substantial, 0.50 is moderate, and 0.25 is weak. Table 4 shows that the R-square value of the intention to use, perceived usefulness, and use behavior is weak because under 0.50 [13].

Table 4. R-Square

Endogenous variables	R Square
Intention to Use	0.315
Perceived usefulness	0.293
Use Behavior	0.219

4.2 Inner Model Evaluation

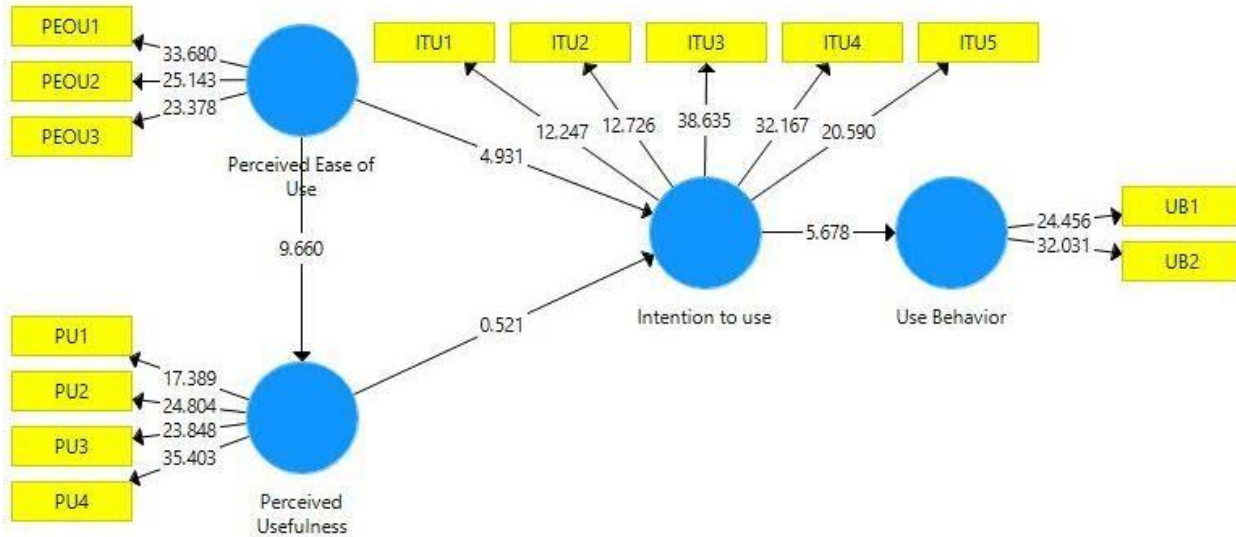


Figure 3. Inner Model

Table 5 and Figure 3 show that only H3 is rejected because T-statistic < 1.96 and p-value > 0.05. But other hypotheses are accepted. The result shows that when m-banking users perceive that using the application is easy, effortless, they feel its benefits. Then when because they evaluate that the application is effortless, they interest in using it. The positive impression when using the application will lead them to continue to use.

Table 5. Path Coefficients

	T Statistics (O/STDEV)	P Values	Status
Perceived Ease of Use -> Perceived Usefulness	9.660	0.000	Accepted
Perceived Ease of Use -> Intention to Use	4.931	0.000	Accepted
Perceived usefulness -> Intention to Use	0.521	0.603	Rejected
Intention to Use -> Use Behavior	5.678	0.000	Accepted

5. Discussion

The study proves that ease of use that perceived by users can create perception about its usefulness significantly. The finding proved statement of Koenig-Lewis et al. [20] that the wireless Internet that makes bank customers access and conduct financial transactions use m-banking whenever and wherever will make customers see its benefits. Therefore, a bank must increase its support to make m-banking using easier to improve customers' perception of its usefulness and encourage them to use it.

FGD result shows that the informants feel the benefits of mobile banking because of its ease. KW said,

“I use mobile banking mainly to view balances and payments.” JD said, *“I installed the mobile banking application to facilitate financial transactions. It is useful to facilitate online transportation order, shopping in e-commerce, top-up e-wallet.”*

DC said,

“I use mobile banking to make it easier to check balances and top up e-wallet transactions (such as Gopay, Ovo, Dana) and fund transfer transactions.”

RS said,

“Mobile banking makes it easy for me to make transactions. Especially now, all of e-payment and every e-payment we do can get feedback in price discounts, points, and cashback.”

MJCS said,

“It's faster to conduct various financial transactions without going to the bank.”

MHS said,

“M-banking makes it easy to transact anywhere and anytime, saving time, and safely thereby minimizing fraud. We can find out the activities of financial transactions carried out. The BCA mobile uses the access code for login and password for each transaction made.”

The study proves that when user feels effortless in mobile banking using, it encourages them to use it. Ease is key for people's interest to use, and the study proves the hypothesis. As Koenig-Lewis et al. [20] stated, the Internet plays a significant role in financial activities to access mobile banking and other bank services 24 hours a day. Therefore, it makes all activities that involve financial transactions become easy. Baabdullah et al. [32] stated that increasing mobile banking users was caused by its instruments improving. The improvement offers easiness and simplicity that attract customers to take advantage of it. Jeong and Yoon [16] stated that when customers feel free from difficulty and free from hard effort, they will think that the m-banking is easy and effortless and will encourage them to use it. But when users get difficult to register their account, and the transaction steps are complex, it will hinder them from using it.

FGD results show that they like to use mobile banking because using it is easy and gives many other conveniences. KM said,

“Mobile banking facilitates financial transactions. With M-banking, we don't need to go to an ATM or bank branches to do a transaction, just through the smartphone application. Many transactions can be done through M-banking. We can pay electricity, telephone, top-up, insurance, send money, check balances, fill E-money card balances, etc. Even BCA M-banking can make cash withdrawals at ATMs without using an ATM card. So, for example, we want to withdraw money at an ATM but forget to bring an ATM card, we can still withdraw money with the M-banking earlier.”

JD said,

“By having mobile banking, of course, you don't need to look for an ATM. Just for non-cash transactions.”

Jauw and Purwanto [15] stated that usefulness more important than ease of use, but this study fails to prove that perceived usefulness influence intention to use. In FGD, when asked if anyone might have felt the benefits of mobile banking but were not interested in using it? Some of the informants answered thus:

JD said,

“Maybe someone who does not understand the benefits of m-banking itself as a whole; his knowledge of m-banking is still minimal, will not interest to use mobile banking.”

DC said,

“He knows the benefits of m-banking using. But maybe he worries that it will be complicated.”

KM said,

“In my opinion, people who know a little about mobile banking benefits don't intend to continue using it. They don't know that there are many benefits to using M-banking. They feel that M-banking is only a banking service to facilitate transactions. They may be like that, too, because of the banks' lack of information.”

The study proves when users use the application, they want to continue to use it. FGD results also show that when users use mobile banking, they want to continue to use it.

KW said,

“I will continue to use it. Because having mobile banking makes it easy to see balances and transfers.”

JD also said,

“Of course, I will continue to use it, because m-banking makes it easy for my daily financial transactions wherever and whenever needed.”

Likewise, DC said,

“I will continue to use it because it makes it easier to make transactions faster and easier.”

As well as KM said,

“Yes, of course, I will continue to use it. Because I feel the many benefits that I get by using M-banking and seeing the development of increasingly advanced technology are also a supporting factor for me using M-banking. I do many activities that require me to use M-banking, so I continue to use M-banking until now.”

RA said,

“Yes, I will continue to use it. More and more promos are offered e-commerce when using m-banking from various banks.”

Also, MMS said,

“Yes, I will continue to use it. M-banking is very useful, providing convenience and convenience in transactions and practical.” And MJCS said, *“I will continue to use it.”*

6. Conclusion and recommendation for future research

The study finds that not all hypotheses of the TAM are accepted. The study proves that ease in mobile banking using creates the perception of usefulness in users' thinking. And the ease of use is an important stimulus that encourages them to use mobile banking. But the usefulness perception actually does not prove to be a driver for using it. Finally, when users ever use mobile banking, they interest in using again in the future. According to McKinsey survey report, mobile banking users increased among bank customers in Indonesia, from 36 percent in 2014 to 58 percent in 2017, but at the year, digitized financial services users only five percent of the population [1]. It is lowest than Myanmar at 6 percent) and Thailand at 10 percent. But, digital banking is increasing today. According to research that Tang [28] quotes explain that 60 percent of bank customers thin that digital banking will improve convenience. Therefore, banks are increasing digitalized service amid competition with FinTech players, to offer ease payment features. Tang [28] stated in Bank Central Asia case, 97 percent of its customers use digital channels to do bank activities and transactions. Therefore, we suggest investigating the factors of digital banking and digital payments in future research.

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