# THE STUDY ON MOBILE BANKING APPLICATION USE: THE PERSPECTIVE OF TAM, PERCEIVED RISK, AND TRUST Written by:

#### Giovanni Muhammad Sulthon Rabbani

Supervisor:

#### Dr. Zaki Baridwan, Ak., CA., CPA., CLI., CTA

Accounting, Faculty of Economy and Business, Brawijaya University

Jl. MT. Haryono No. 165, Malang

# ABSTRACT

This study aimed to explain the factors influencing consumers to use M-Banking as a service provided by banks to carry out various banking transactions to their users based on the Technology Acceptance Model (TAM) theory. The research data were analyzed using a structural equation model (SEM) based on Partial Least Squares (PLS). Data were collected using a survey method, namely, a questionnaire. Respondents were 301 active undergraduate students from the Faculty of Economics and Business, Universitas Brawijaya. The data analysis technique used path analysis. The study results indicate that there is an influence from the perspective of use (perceived usefulness), perspective of ease of use (perceived ease of use), direct trust (perceived risk), and significant impact on behavioral intention (behavioral intention). The perceived risk is direct and insignificant towards Behavioral Intention. The analysis results show that perceived risk and behavioral intention directly and do not significantly influence using M-Banking.

#### Keywords: Behavioral Intentions, TAM, Perceived Risk, and Trust

#### **INTRODUCTION**

Currently, Mobile Banking (M-Banking) applications can be easily accessed through mobile phones connected to the internet. M- Banking has either positive or negative impact on the use of mobile trading services. Several use cases for M-Banking began to emerge, one of which came from BRI mobile banking users. Service users complained of decreased mobile phone performance that causes transaction failure caused by internet network problems. At the same time, Bank Nasional Indonesia Mobile (BNI Mobile) service users complain about the performance of M-Banking services to SMS banking, starting from inability to transfer to other banks until failure to top-up to electronic wallets such as Go-Pay (Hamdani 2019). One of Mandiri's mobile service users got problems but different cases, namely real account error and strange messages through SMS Banking (BINEKASRI, Bi 2019). Another problem came from a Bank Rakyat Indonesia Mobile (BRI Mobile) service user who failed to charge an electricity token. In this case, BRI Mobile service user bought an electricity token and immediately got a stroom number to put in the prepaid meter, but it was invalid and did not add up.

The growth of the internet has created a need for regular access in recent years. According to a survey by APJII, around 93.9% of Indonesians access the internet with a smartphone every day (apjii.or.id 2019). The increasing internet use through smartphones requires technological innovations to make it easier for users to carry out their activities, including expanding trade transactions. The new style was developed to serve as a way of transacting to support business activities. By involving mobile technology as a transaction tool, smartphones are positioned as a substitute for physical money or credit cards. As a result. smartphones can be used for purchase transactions: the smartphone involvement in this field is known as mobile payment.

Mobile trading is currently turning into a hotspot, researchers and outside specialists' focus, and the main and core interests of social and monetary. For now, the notion of mobile commerce has not framed ideas and definitions bound together at home and abroad, various specialists and researchers on multipurpose trade have diverse explanations (Ling, Xia, and Zeng, 2008; Lu, 2006; Lu, Chen, and Dong, 2008; Yang, Lu, and Liu, 2009; Wang, 2008; Zhou and Lu, 2010).

Conceptually, M-Banking can be defined as a set of banking assistance

offered through mobile devices. mobile connected to internet networks or cellular data, allowing users to make payments and perform almost all banking transactions associated with the current account.without the participation of employees (Gartner 2009; bank Hanafizadeh; Khedmatgozar 2012).

However, this study expands the range of factors that may influence the behavioral intentions of using M-Banking in the context of the Faculty Economics of and Business Universitas Brawijaya. This is done through , i.e. factors affecting accounting student in faculty of economic business and mobile banking adoption based on the technology acceptance model of Abadi et al. (2013). In that basis, this research takes a critical view of applying the Abadi et al model to test factors that influence bank customers to adopt and subsequently use M-Banking services at the Faculty of Economics and Business University Brawijaya. This research is using variables from Abadi et al. (2013)

The key question is why customers do not adopt mobile banking. Many factors can influence customer adoption. Therefore, it is understand necessary to the acceptance and adoption of mobile banking users and identify factors that influence their intention to use mobile banking. This information can help developers build mobile banking systems that consumers want to use or discover why potential users avoid using existing systems. Therefore, to identify factors related to the customer's behavioral intentions in using mobile banking services, this research study the Abadi et al expansion model.

According to above description, The research aims to perform a study on factors that affect behavioral intentions in using mobile banking. This research is using variables from former study, which is Abadi et al. (2013). Abadi et al (2013) used perceived ease of use, perceived usefulness, perceived risk, and trust as factors that influence individuals behavioral intention to use mobile banking. So perceived ease of use, perceived usefulness, perceived risk, and trust are the independent variable, while the behavioral intention is the dependent variable. The difference of this study with Abadi et al (2013) are

the context of the sample is in Brawijaya University of Malang city and sample used in this research is accounting student of Brawijaya University. The sample was chosen because accounting student are always follow technological development, especially in using mobile banking and the younger generation are tends to be more consumptive.

This research will be focused on how to solve the problems as follow:

#### LITERATURE REVIEW

#### **Information System**

An information system is a combination of human hardware, software, network communication, and data sources that collect, process, and distribute information within an organization. In the enterprise, information systems are crucially considered as information provides the basis of decision- making (O'brien, 2001).

#### **Mobile Payment**

Mobile payment in the form of combinative technology that

- Does Perceived Usefulness influence the attitude of behavioral intention to adopt mobile banking?
- Does Perceived Ease of Use influence the attitude of behavioral intention to adopt mobile banking?
- 3. Does Perceived Risk influence the attitude of behavioral intention to adopt mobile banking?
- 4. Does Trust influence the attitude of behavioral intention to adopt mobile banking?

provides consumers with the ability to complete a financial transaction in which monetary value is transferred over mobile terminals to the receiver via the use of a mobile device (Lu et al. 2011).

## **Technology Acceptance Model**

Technology Acceptance Model (TAM) is a theoretical model that explains and predicts users' attitudes and behaviour in receiving and applying information technology. This model was first introduced by Davis in 1989 as an extension to the Theory of Reasoned Action proposed by Ajzen and Fishbein in 1980. Davis (1989) explains that there are two factors that influence a person's behaviour in accepting an information technology, the first factor is the Perceived Usefulness and the second factor is the Perceived Ease of Use.

# **Perceived of Risk**

Perceived risk is the uncertainty about the result of the innovation's use (Gerrard and Cunningham 2003). In fact, the perception of risk among individuals has been proved in technology adoption literature as an important element in acquiring new technology or services (Laforet and Li 2005).

#### **Trust in Mobile Banking**

Customer trust is recognized as a critical factor for the success of mobile banking. With the surge of both electronic commerce (ecommerce) and mobile commerce (m-commerce), more studies have been conducted on the conceptual formation of structure. the mechanisms of trust and effects of trust (Kim et al. 2009).

Conceptual Framework and Hypothesis Development

This research referred to previous research related to mobile banking adoption by Abadi et al. (2013) "Factors entitled Affecting Accounting student in Faculty of Economic and Business Mobile Banking Adoption Based on the Technology Acceptance Model." This research aimed to evaluate the impact of factors influencing the adoption of mobile banking. Abadi et al. (2013), used the approach of the research based on the Technology Acceptance Model and other relevant research of factors, which influence adoption. In technology their research, the factors that affected behavioural intention. namely Perceived Risk, and Trust are used as independents. Furthermore the Perceived Usefulness and Perceived Ease of Use from TAM theory are also used as independent variables. Behavioural Intention is used as an dependent variable to measure mobile banking adoption.

Thus, in this research, the researcher intends to figure out empirical evidence and examine the influence of Perceived Usefulness, Perceived Ease of Use, Perceived Risk, and Trust, on the adoption of mobile banking at Universitas Brawijaya, Malang, Indonesia.



**Figure 1. Research Framework** 

# The Influence of Perceived Usefulness on Adoption of Mobile Banking

According to Davis (1989), Perceived Usefulness (PU) is a belief in usefulness, which is the degree to which users believe that technology or systems will improve their performance at work. Adapting Perceived Usefulness to the mobile banking context considers how mobile banking users might perceive the platform's usefulness to perform their transactions. Davis (1989) in his research, stated that Perceived Usefulness was significantly correlated with system use.

In this perception, if mobile banking users believe that using mobile banking is useful and would enhance their transactions, they will use it. However, if they believe that using mobile banking is useless and not helping their transaction, they would decide not to use it.

Based on some studies mentioned above, the researcher wanted to examine the influence of Perceived Usefulness on the adoption of mobile banking. Therefore, the researcher formulated the alternative hypothesis as follows:

H1: Perceived Usefulness has a direct and significant positive influence on Behavioral Intention. The Influence of Perceived Ease of Use on Adoption of Mobile Banking

Perceived Ease of Use (PEOU) is defined as an individual belief in the degree to which physical and mental effort can be used easily and freely using technology or system. The intensity and interaction between the user and the system have to show how easy it is to learn and use a system (Davis 1989). Davis (1989) in his research, states that Perceived Ease of Use was significantly correlated with system use. The effort required to learn and use mobile banking would be minimum. Adapting Perceived Ease of Use to the context of mobile banking considers how the application is easier to use than the others.

In this perception, if mobile banking users believe that mobile banking will reduce their efforts and make it easier for users compared to users who do not use the system to conduct their transactions, they will use it. However, if they believe that using mobile banking is more complicated to do their transaction, they decide not to use it.

Based on some studies mentioned above, the researcher wanted to examine the influence of Perceived Ease of Use on attitude towards using. Therefore, the researcher formulated the alternative hypothesis as follows:

H2: Perceived Ease of Use has a direct and significant positive influence on Behavioral Intention.

The Influence of Perceived Risk

## on Adoption of Mobile Banking

Perceived risk is an uncertainty phenomenon encountered by the customers in the purchasing process due to their wrong or unsuitable resulting from their decisions subjective assessments in the decision making process (Murphy and Enis, 1986). According to Kim et al. (2007), consumers' perceived risk can also be defined as a consumer's belief about potential uncertain negative outcomes from e-transaction. Based the on consumers' perceived risk theory, consumers perceive risk as they face uncertainty and undesirable consequences due to unsuitable decisions (Taylor 1974).

Based on some studies mentioned above, the researcher wanted to examine the influence of Perceived Risk on attitude towards using. Therefore, the researcher formulated the alternative hypothesis as follows:

H3: Perceived Risk has a direct and significant negative influence on Behavioral Intention.

The Influence of Trust on the Adoption of Mobile Banking

Based on Fishben and Ajzen's Reasoned Action Theory, attitude toward using is influenced by the trust (Davis, 1989). Gefen (2000) explains trust as a belief that users have based on expectations seen from people who have done it or based on past treatment. Trust is considered an important element in mobile commerce (Lee, 2005). According to Heijden et al. (2003), trust is important in technology platforms as transaction data is personal, sensitive, and confidential. In Grazioli and Jarvenpaa (2000), a relationship found between purchase behaviour, willingness to buy, attitude towards using, risk, and trust.

In this perception, mobile banking

## **RESEARCH METHOD**

#### **Research Design**

In this research, the researcher used explanatory research to define each investigated variable in some situations. The purpose of this explanatory research is to provide researcher a history and illustrate a relevant aspect with phenomena of an object. According to Malhotra users believe that using mobile banking might help overcome their concerns and encourage them to adopt the product. Trust by the user will be able to overcome emerging perceptions. Even though they know that there is a risk, trust still encourages them to adopt the technology. However, if they do not trust mobile banking offers, they would decide not to use it.

Based on some studies mentioned above, the researcher wanted to examine the effects of trust on attitude towards using. Therefore, the researcher formulated the alternative hypothesis as follows:

# H4: Trust has a has a direct and significant positive influence on Behavioral Intention.

(2010), explanatory research is acknowledged as one kind of research with the main goal to present insight and understanding of the research problem situation.

#### **Population and Sample**

The research population includes the students of the Faculty of Economics and Business in Universitas Brawijaya, Malang. Therefore, students of Faculty of Economics and Business students were chosen because the discussion of this study is related to an information technology system.

This study employed nonprobability sampling with the convenience sampling method. sampling Convenience in this research refers collecting to information from members of the population who are conveniently available (Bougie and Sekaran 2013, p. 252). It is the easiest method to take match samples that sample requirements from a particular population.

Since the actual sampling frame is unknown, convenience sampling is chosen to carry out the survey (Leong et al. 2013). Convenience sampling is more practical rather than a truly random or stratified random sample (Weir and Jones 2008). Convenience sampling is one type of nonprobability sampling that prioritizes aspects of ease and efficiency of sampling. Thus, this study sample is a member of the research population of any undergraduate student in the Faculty of Economics and Business, Universitas Brawijaya who uses mobile wallets. Sample size may reflect the population that is very

important in this research to generalize the research results. The method used in this research to determine the sample size of a population is the Slovin method. The researcher used a 5% error rate from the list considered as representative sampling. The smaller the error tolerance, the more accurate the sample describes the population.

The formula of Slovin method is depicted as follows:

$$n = \frac{N}{1 + N (e)^2}$$

Where:

 $\Pi$  = Number of samples N = Total Population

e= Error Range

The total population of the whole undergraduate students in the Faculty of Economics and Business, at Universitas Brawijaya both the regular program and international programs in 2020 is 1,107 students. The following formula presents the computation of the sample size based on the Slovin method.

1,107 / [1 + 1,107 (0.05)<sup>2</sup>] = 1,107/ [1 + 1,107 (0.0025) = 1,107 / [1+2.7675] = 1,107 / 3.7675

# = 294 students

Thus, in this research, the minimum sample size is 294 students. Afterward, the researcher decided to distribute 300 questionnaires to reach the samples within the range.

# Data Sources and Data Collection Methods

Data collection is a procedure that needs to be accomplished to obtain data in the research. The data collection method used in this research is survey method by providing questions (Bougie and Sekaran, 2013 p.147). This method requires contact between the researcher and the subject (respondents) to obtain the necessary data. The data collection tool or survey instrument used in this research is a questionnaire, consisting of a set of prepared questions to gather information from individuals with a close-ended type of questions (Kothari 2004). Providing questionnaires are beneficial to cover a large sample at a modest cost and representative of its population (Akbayrak 2000).

# FINDING AND DISCUSSION

#### **Results of Data Collection**

In this chapter, the researcher tested the hypothesis by using SEM PLS 2.0 to find which hypothesis is indicated to have a positive effect on behavioural intention to use Mobile Banking and the moderate influence, by using 300 respondent data, which was already collected by distributing questionnaires.

#### **Descriptive Statistics**

 Table 1. Descriptive Statistics

Variable	N	Mini mal	Maximum	Mean	Standard Deviation
PU	301	1	7	5.73	3.2
PEOU	301	1	7	5.96	2.3
PR	301	1	7	2.00	1.7
Т	301	1	7	6.06	2.5
BI	301	1	7	5.75	1.98

Table 1 shows that the respondents (N) in this study were 300 people. The minimum value indicates the lowest value for each variable, while the maximum value indicates the highest value for each variable in the study. In this research, (n) is used to determine the number of respondents. Number 1 to 7 determines the scale of response. Frequency (f) is used to determine the number of responses preferring that scale. The mean value is utilized to determine the average opinion given by respondent on each item statement for each variable. If the mean value for each variable is greater than 4.00, it shows that the average respondents agree to the overall statement items in each variable in this research.

#### **Convergent Validity**

Table 2

#### **Outer Loadings**

	BI	PEOU	PR	PU	Т
BI1	0.892				
BI2	0.891				
BI3	0.903				
PEO U1		0.809			
PEO U2		0.835			
PEO U3		0.889			
PEO U4		0.859			
PR1			0.894		
PR2			0.865		
PR3			0.876		
PU1				0.786	
PU2				0.770	
PU3				0.843	
PU4				0.802	
PU5				0.822	
T1					0.857
T2					0.887
Т3					0.846
T4					0.753

Table 2 illustrates the value of the loading factor (convergent validity) of each indicator. The loading factor value> 0.7 can be said to be valid, but the rule of thumb interpretation of the loading factor value> 0.5 can be said to be valid. From this table, it is known that all the loading factor values of the variables used in the study are greater than 0.7. It shows that the indicators are valid.

#### **Discriminant Validity**

#### Table 3

# Cross Loading

	BI	PEOU	PR	PU	Т
BI1	0.851	0.646	-0.555	0.515	0.572
BI2	0.915	0.590	-0.483	0.659	0.597
BI3	0.900	0.587	-0.579	0.542	0.618
PEOU1	0.634	0.867	-0.522	0.444	0.545
PEOU2	0.648	0.926	-0.612	0.502	0.526
PEOU3	0.494	0.765	-0.455	0.508	0.443
PEOU4	0.560	0.878	-0.609	0.282	0.416
PR1	- 0.614	-0.711	0.907	- 0.452	- 0.565
PR2	- 0.367	-0.392	0.837	- 0.413	- 0.372
PR3	- 0.567	-0.531	0.906	- 0.560	- 0.378
PU1	0.632	0.328	-0.426	0.758	0.373
PU2	0.447	0.387	-0.564	0.819	0.275
PU3	0.329	0.423	-0.318	0.784	0.241
PU4	0.372	0.323	-0.351	0.789	0.354
PU5	0.627	0.520	-0.453	0.835	0.367
T1	0.656	0.558	-0.463	0.345	0.951
T2	0.683	0.575	-0.439	0.395	0.948
T3	0.551	0.504	-0.511	0.323	0.862
T4	0.433	0.301	-0.378	0.437	0.749

Based on the table, it is concluded that the discriminant validity is met for each indicator in each variable reaching beyond 0.7. Despite the same conditions as the evaluation of the previous loading factor assessment, if it is a value of lower than 0.7, it is still considered valid because they have other parameters with the value of more than 0.5.

#### **Composite Reliability**

# Table 4

Goodness of Fit

		Composite	Cronbach's
	AVE	Reliability	Alpha
PEOU	0.720	0.911	0.870
PR	0.771	0.910	0.852
PU	0.648	0.902	0.865
Т	0.701	0.904	0.857
BI	0.802	0.924	0.876

Besides the construct validity test, a construct reliability test is also measured by the criteria test of composite reliability and Cronbach's alpha of the indicator block measuring the The construct. construct is declared reliable if the composite reliability and Cronbach's alpha values are above 0.70. So, it can be concluded that the construct has good reliability. Besides, the AVE value of each study variable also has a value above 0.5.

# *R-Square* $(\mathbf{R}^2)$

<b>R-Square</b>
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Variable	R Square
Y	0.5175

Table 5 shows the R-square Behavioral Intention value of 0.5175. This value shows the Behavioral Intention (Y) variable is influenced by Perceived Usefulness (X1), of Perceived Ease Use (X2), Perceived Risk (X3), and Trust (X4) of 51.75% while the remaining 48.25% is influenced by other variables outside the one under this research.

## **Predictive Relevance** (Q<sup>2</sup>)

The Q2 has a value in the range 0 <Q2 <1, where the closer to 1 means the better the model. The value of Q2 is equivalent to the coefficient of total determination in the path analysis. According to Table 4.15, the calculation of predictive relevance is as follows:

Score  $Q^2 = 1 - (1 - R^2)$ Score  $Q^2 = 1 - (1 - 0.6583)$ = 0.6583

Description: Q<sup>2</sup> : *Predictive Relevance* 

# $\mathbf{R}_{1}^{2}$ : *R*-Square BI

From the results of these calculations, it is known that the Q2 value is 0.5175, which means that the amount of data diversity from the study that can be explained by the structural model designed is 51.75%, while the remaining 48.25% is explained by other factors outside the model. It can be said, based on these outcomes, that the structural model in this study is quite good because it is closer to the value of 1.

#### **Hypothesis Test**

## Table 6

Variable Relationshi p	Original Sample (O)	T Statistics ( O/STERR )	p-value
PU -> BI	0.248	4.765	0.000
PEOU -> BI	0.189	2.389	0.018
PR -> BI	-0.157	2.157	0.032
T -> BI	0.252	3.855	0.000

#### **Test Result of Path Coefficient**

The value of the Perceived Usefulness variable on Behavioral Intention with a path coefficient of 0.248 and t statistic of 4.765, the value is greater than t table (1.64) or p  $\leq$  0.05. From the results above, it shows that H0 is rejected and H1 is supported. It means that the first

hypothesis is accepted. So that Perceived Usefulness has a direct and significant positive influence on Behavioral Intention.

From the results of data processing using SmartPLS, the original sample value (O) is obtained, which is the path coefficient value and the t statistical value show to its significance. The test results of the second hypothesis indicates that the relationship between the variable Perceived Ease of Use and Behavioral Intention shows a path coefficient value of 0.189 with a statistical t value of 2.389. This value is higher than the t table (1.64) and significant or p <0.05. From the results above, it shows that H0 is rejected. It means that the second hypothesis supported. It also means that the Perceived Ease of Use has a direct and significant positive influence on Behavioral Intention.

Perceived Risk has a negative influence on Behavioral Intention with a path coefficient of -0.157 and t statistic of 2.157 greater than t table (1.64) or p <0.05. From the results above, it shows that H0 is rejected. It means that the third hypothesis is supported, which means that Perceived Risk has a direct and significant negative influence on Behavioral Intention.

Trust has a positive effect on Behavioral Intention with a path coefficient of 0.252 and t statistic of 3.855, greater than t table (1.64) and a significance or p < 0.05. From the results above, it shows that H0 is rejected. It means that the fourth hypothesis is supported, which means that Trust has a direct and significant positive influence on Behavioral Intention.

# CONCLUSIONS AND SUGGESTIONS

#### Conclusion

This study aims to test the influence of perceived usefulness, perceived ease of use, perceived risk, and trust on behavioral intention to adopt mobile banking. Based on the results of the hypothesis tests that have been done in the previous chapter, it can be drawn the following conclusions. The results show that perceived usefulness, perceived ease of use, and trust have positive influence on behavioral Intention to adopt mobile banking. On the contrary, perceived risk has a negative influence on behavioral intention to adopt mobile banking. This study succeeded in supporting all of the hypotheses proposed.

#### **Research Implication**

In addition, to provide a good and useful explanation of the underlying motivations of the intention to use Mobile Banking, this research is also expected to reinforce empirical evidence from previous research. This research shows determinant factors that can influence interest in using Mobile banking, namely: Perceived Usefulness, Perceived Ease of Use, Trust, but not for Perceived Risk. In moderate effect, only the gender can determine the condition of the medium affect facility on the Behavioral Intention. In addition, this research also provides a good and useful explanation of the influence of Behavioral Intention and habit on Use Behavior.

The results of the study using online questionnaires are expected to provide understanding for Mobile Banking in developing mobile payment service applications by providing data on factors that influence the Customer's Behavioral Intentions in using mobile payment applications. This research explains the experience of FEB UB students towards the use of Mobile Banking that is beneficial to them. Therefore, Mobile Banking services are expected to gradually innovate and add new features through app updates to attract more customers.

Customers who are satisfied with Mobile Banking services will become loyal users and will most likely the influence people in their community to use Mobile Banking. Providing the necessary knowledge and resources such as support services sites, online tutorials, 24hour customer service, and qualified bank personnel to offer assistance to customers is also important to improve the customer's intention to use mobile banking services.

If many customers are satisfied with the use of Mobile Banking as their mobile payment option and if the intention to use from the public is high, the likeliness to use it will also increase. Then this service will continue to grow, and the company can benefit a lot from customer satisfaction.

#### **Research Limitations**

The researcher realized that this research had limitations, such as:

- Respondents in this study only came from active undergraduate students of FEB UB class of 2016, 2017, 2018, 2019 and 2020, so the results of this study could not be generalized to different respondents.
- 2. Online Questionnaire has a drawback that we as researchers can not be sure if the respondent who filled out the form is an undergraduate student of FEB UB.
- The use of convenience sampling methods also have drawbacks, such as lower generalization rate compared to other sampling techniques.
- However, the convenience sampling method was chosen because researchers do not know the number of undergraduate students of the Faculty of Economics and Business Universitas Brawijaya who have or still utilize Mobile Banking.

## **Research Recommendation**

Suggestions that can be given for further research is by using random sampling method to gather the sample. With random sampling method, researcher will get better and generalized survey results to produce a representative sample for the entire population in the study because it removes bias factor. In that way, the results of sample analysis will be more valid and researcher can find out the exact number of user samples that can represent the population of users who have used Mobile Banking.

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