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TAM Approach: Effect of Security on Customer Behavioral Intentions to Use Mobile Banking

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Abstract

As the use of mobile banking continues to grow, attention must be paid to the security of financial transactions. The purpose of this study is to investigate the impact of security levels on the intent of users of mobile banking. This study uses the widely used Technology Acceptance Model (TAM) to investigate user acceptance of information technology. By distributing an online survey, we used mobile banking to collect data from 100 respondents. The data analysis was processed using a SmartPLS application with structural equation modeling (SEM) methods. The results of this analysis show that the security of mobile banking has a significant positive impact on the perceived usefulness of mobile banking. However, security is not the main reason users use mobile banking. This means that customers will continue to use mobile banking, regardless of security. In addition, security does not significantly affect the ease of use of mobile banking. The study also found that the benefits of mobile banking have a significant impact on user intent. The ease of use of mobile banking also has a significant impact on the perceived benefits.

Keywords: mobile banking, TAM, technology adoption, security.

1. Introduction

The rapid development of technology affects various lines of human life. One of these technologies is cell phones. Based on BPS data, the proportion of the Indonesian population using cellular phones increased to 62.84 percent in 2020. In 2020, home computer ownership rose to 18.83 percent. The population using the internet also increased between 2016 and 2020, as evidenced by the increase in the percentage of people accessing the internet from around 25.37 percent in 2016 to 53.73 percent in 2020 (BPS, 2020).

Today, mobile phones are also called smartphones as well as voice calls and sending short messages. You can install various applications on your smartphone to meet different needs. This certainly affects a variety of areas, including the banking sector, education, economics, social issues, and finance. In the banking industry, provide various services via smartphones, including mobile banking. In Indonesia, the number of mobile banking users continues to grow by 300%. For example, 88% of transactions at BCA Bank are processed via mobile banking (Anggie, 2021).

Mobile banking makes it possible to carry out various financial transactions anywhere and anytime so that financial services can occur 24 hours a day. There are many benefits that can be felt with the existence of mobile banking both by banks and customers themselves (Aboelmaged & Gebba, 2013). Mobile banking can improve the process of banking services and financial data processing (Laukkanen & Lauronen, 2015) with minimal costs. Various services and menus that can be enjoyed by customers, such as balance checks, money transfers, bill payments, e-wallet purchases to online shopping.

Banking institutions provide mobile banking services to their customers and the number of users of mobile banking services is increasing. It is necessary to see and analyze the intentions of customers in using mobile banking. To view and analyze it, a method is needed to see user acceptance of the application of a technology. Many methods can be used

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to analyze user acceptance of an information technology. Some of the methods often used by researchers in the field of information systems include Innovation Diffusion Theory (IDT), Theory of Planned Behavior (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), FITT framework and Technology Acceptance Model (TAM) (Lim et al., 2013).

Many previous researchers discussed and analyzed user acceptance of mobile banking using the above methods. Such as research (Al-jabri & Sohail, 2013) which analyzes the implementation of mobile banking in Saudi Arabia using the Innovation Diffusion Theory method. From this study relative merit, compatibility, and observability have been found to have a positive impact on using mobile banking. However, trialability and complexity do not significantly affect the implementation. Perceived risk adversely affects acceptance. Another study (Yu, 2011) uses the UTAUT method in analyzing the impact of using mobile banking. Based on this research, it is known that those who use mobile banking are influenced by social conditions, costs, and bank credibility. The moderating effect based on gender and age in this study found that gender significantly moderated the effect based on performance and financial portfolio.

There is also research using the TAM method (Lule, 2012) which shows the results of Perceived Ease of Use, Perceived Usefulness, Perceived Self Efficacy and Perceived Credibility have a significant effect on user attitudes towards the use of mobile banking. In addition, research (Govender, 2014) shows that the significant influence of students in adopting mobile banking is influenced by trust in the application, perceived benefits and ease of operation. There is also user acceptance research on the application of ankle rehabilitation technology devices in the healthcare industry (Latip et al., 2017). This study aims to evaluate and investigate usability tests for Perceived usefulness, Perceived Ease of Use, User Satisfaction and Attribute of usability. Significant results were found between the proposed factors. In addition, a study was conducted in India regarding the use of internet banking (Kesharwani & Bisht, 2012). This study reveals that perceived risk has a negative impact on the behavioral intentions of internet banking users and trust has a negative impact on perceived risk. A well-designed website has also proven to be helpful in facilitating easier usage and also minimizing the perceived risk concerns associated with using internet banking. The impact of website design and trust on internet banking adoption has also been examined and proved to be significant in India in the context of internet banking adoption.

2. Literature Review

2.1. Mobile Banking

One of the banking efforts in improving service to customers is the existence of a mobile banking application. Almost all banks in Indonesia provide this service. With the various menus available in mobile banking and various financial management facilities, it is necessary to look at the factors that influence users in adopting mobile banking.

Mobile banking is one of the focuses of banking development that combines banking, payments and two-way data communication that can be done in real-time wherever and whenever (Puriwat & Tripopsakul, 2017). For this reason, the existence of mobile banking is indeed compatible with the lifestyle of people who have high mobility (Govender, 2014). Banks need to pay attention to mobile banking services with the level of need and prioritize the security of consumer data. To maintain and increase mobile banking users, it is necessary to provide sufficient information about the mobile banking system and its benefits (Amin, 2006). In Indonesia, there is a significant increase in the use of mobile banking. Based on OJK data in 2016, transactions with mobile banking were Rp. 1,159 trillion, but a significant increase of up to 300 percent of Rp. 4686 trillion in 2021 (Intan & Yolandha, 2021).

2.2. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is one of the methods used to see user acceptance of the application of information technology which was first developed by Davis in 1985 (F.D.Davis, 1985). The TAM method can provide an assessment of the application of information systems, knowledge of technology design and implementation and can measure user motivation in using new technology. TAM to understand why users adopt new technologies and why they refuse to use them. The application of the TAM model is quite easy and simple, so many previous researchers have used

this method (Kesharwani & Bisht, 2012). TAM has been tested and valid to test the acceptance and use of information technology (Davis & Venkatesh, 1996).

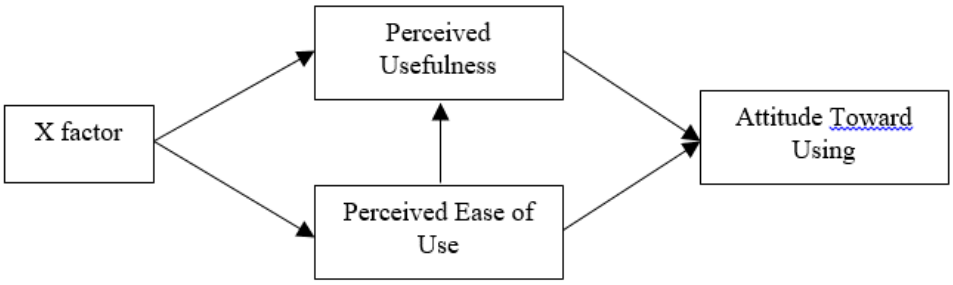

Figure 1. Technology Acceptance Model (F.D.Davis, 1985)

Based on the model proposed by Davis (1985) there are 2 main constructs that influence users in adopting new technology (Von Davier et al., 2012), that is Perceived Usefulness dan Perceived Ease of Use.

Perceived Usefulness can be defined to the extent that people believe that using a particular system will increase their ability to perform their tasks (F.D.Davis, 1985). Perceived Usefulness is also related to consumers' feelings that using technology will increase the effectiveness of their (F.D.Davis, 1985) work and activities (Doll et al., 1998). This becomes an important role for companies in evaluating the value of their products in the eyes of consumers. If the product provides significant utility for consumers, the company can increase its productivity. Conversely, if the product is not useful for consumers, the company can stop production. From this point, it can be understood that consumers will not use a product or technology if it does not provide significant added value and usefulness (Rouibah et al., 2011).

Perceived Ease of Use is the extent to which a person believes that using a particular system eliminates physical and mental effort. Users believe when they use technology it will make it easier to use and learn it (Doll et al., 1998)(Rouibah et al., 2011). The ease of using technology will affect consumers in adopting the technology. Apart from the ease of adopting it, it is also easy to learn the technology. So that users have various accesses to use technology, such as asking for help from friends, coworkers, and so on. When users are more productive on a small number of tasks due to the ease of use of the new system, they are automatically more productive overall. On the other hand, users who find it difficult to use technology will look for easier alternatives with the same benefits.

2.3. Security

Security is an important concern in all activities related to the internet. With the development of internet technology, it is directly proportional to the crimes that appear in cyberspace. Especially financial services whose processes use internet facilities. Security is an important thing that must be considered by companies that provide financial services. Because this is related to the trust of those who entrust their money to the company. Many aspects increase consumer confidence in internet-based financial services, such as word of mouth, experience, brand, reputation, and so on.

Security refers to the public's perception of a mobile banking system that securely processes financial transactions and maintains the confidentiality of personal information (Patel & Patel, 2018). This affects the willingness to adopt Internet banking. Many studies have analyzed the effect of security on the use of mobile banking. Research (Laforet & Li, 2005) found security as an important factor for consumers to adopt mobile banking. Studies (Luarn & Lin, 2005) show that two important elements related to consumer intention to adopt mobile banking are privacy and security. In addition, research (Wong & Mo, 2019) shows that security and trust systems encourage consumer intentions to use mobile payments in Hong Kong. Then research (Dufour et al., 2017) found that security has an impact on consumer acceptance and affects their behavior to use it.

This study aims to look at the level of security in influencing the user's intention to use mobile banking as a financial service need. Other factors relate to the ease of using mobile banking, the perceived benefits of mobile banking applications. However, the study will look specifically at the effect of security on the intentions of users to use mobile banking.

3. Research Method

3.1. Data collection

This study measures user acceptance of the use of mobile banking. The proposed construct relates to the intention of user acceptance related to the security that exists in the mobile banking application. Then the questionnaire was designed by adjusting the users of mobile banking from active internet users. Questionnaires were distributed by confirming that the respondents were mobile banking users. From the questionnaires distributed there are 100 data that can be processed with the completeness of the data filled in 100 percent. Respondents are active users of mobile banking by utilizing various available services.

3.2. Hypothesis and Research Framework

This study uses a quantitative approach based on the Technology Acceptance Model (TAM) to evaluate user acceptance of the use of mobile banking in their financial services. Figure 2 shows the research framework based on the proposed hypothesis. In this study, the researcher suggested six hypotheses:

H1: Perceived usefulness has a positive and significant effect on individual behavioral intentions to use mobile banking services.

H2: Perceived ease of use has a positive and significant effect on individual behavioral intentions to use mobile banking services.

H3: Perceived ease of use has a positive and significant effect on perceived usefulness for using mobile banking services.

H4: Security has a positive and significant effect on perceived usefulness for using mobile banking services.

H5: Security has a positive and significant effect on Perceived ease of use to use mobile banking services.

H6: Security has a positive and significant effect on individual behavioral intentions to use mobile banking services.

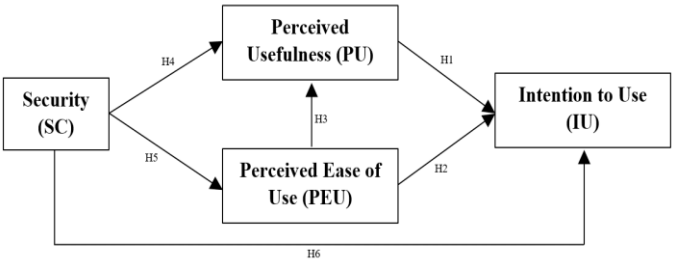

Figure 2. Research Framework

Figure 2 shows the design of the research framework using the TAM method based on the proposed hypothetical constructs.

3.3. Measurement

In this study, data were obtained by distributing questionnaires to users who use mobile banking applications. The questionnaire consists of two parts: first, it is the demographic data of the respondents. Second, the questionnaires that

have been prepared are based on predetermined constructs. The constructs are related to perceived usefulness, perceived easy of use, security and intention to use. The questionnaire was in the form of a linkert scale survey of 1 (strongly disagree) to 5 (strongly agree). Questionnaire items are mostly inherited from relevant previous questionnaires, with required validation and word changes adapted for mobile banking.

Table 1 Demographics of respondents

	Criteria	People
Responden	User	100
	Non User	0
Gender	Male	68
	Female	32
Age	< 20	2
	20-30	38
	31-40	37
	41-50	14
	>50	9
Education	SD	-
	SMP	1
	SMA	22
	D3	1
	S1	44
	S2	29
	S3	3

4. Findings of the Data Analysis

Based on the demographics of the respondents in Table 1, it can be seen that the respondents are dominated by productive ages ranging from 20 to 50 years and with variations in educational background. The analysis was carried out using Structural Equation Modeling (SEM) based on the constructs that have been determined according to the proposed hypothesis. SEM is commonly used to describe statistical models by evaluating the validity of substantive theories with empirical data (Lei et al., 2007). SEM tests the hypothesized pattern of directed and undirected relationships between a set of measurable variables and latent variables (Ullman & Bentler, 2013).

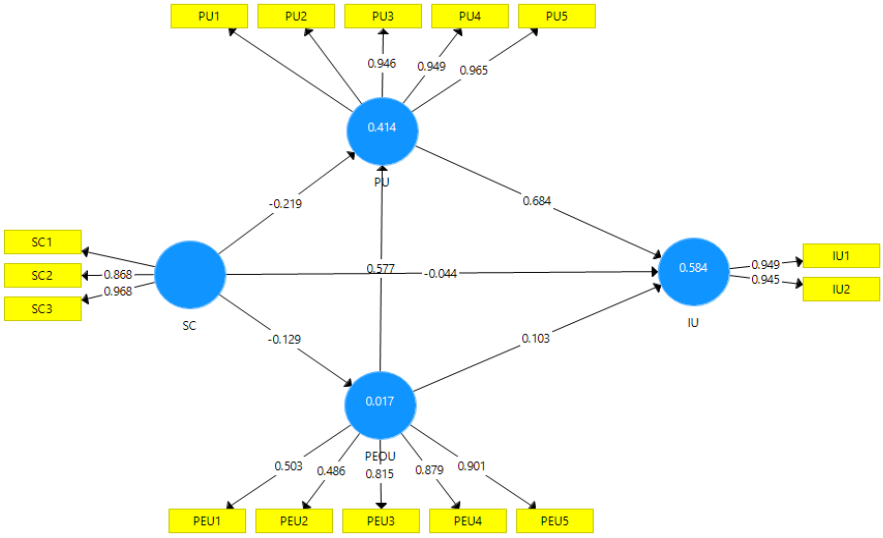

Figure 3. Desain Modeling

Latent variables in the covariance structure are assumed by theoretical models that explain the linear relationship with the observed variables. The figure 3 are the results of the modeling design based on the research framework design. There are 4 constructs analyzed, namely perceived usefulness with 5 variables, perceived easy of use there are 5 variables, intention to use 2 variables and security 3 variables.

Based on the results of the analysis conducted, three variables were found with invalid results. For this reason, a reconstruction was carried out on the initial hypothesis proposed, in order to obtain results such as table 3.

Table 2. Component analysis results and reliability

Variabel	IU	PEU	PU	SC
IU1	0,949			
IU2	0,944			
PUE1		0,501		
PEU2		0,487		
PEU3		0,816		
PEU4		0,879		
PEU5		0,901		
PU1			0,888	
PU2			0,923	
PU3			0,947	
PU4			0,909	
PU5			0,957	
SC1				0,696
SC2				0,886
SC3				0,952

Table 3. Reconstruction of the results of component analysis and reliability

Variabel	IU	PU	PU	SC
IU1	0,949			
IU2	0,944			
PEU3		0,816		
PEU4		0,879		
PEU5		0,901		
PU1			0,888	
PU2			0,923	
PU3			0,947	
PU4			0,909	
PU5			0,957	
SC2				0,886
SC3				0,952

Table 4. Validity and Reliability

	Cronbach's Alpha	rho_A	CR	AVE
IU	0,884	0,886	0,945	0,896
PUE	0,852	0,859	0,910	0,772
PU	0,958	0,960	0,968	0,856
SC	0,834	1,093	0,917	0,846

From the results of the reconstruction to see the validity and reliability by determining the Composite Reliability (CR) and Average Variance Extracted (AVE) of each construct and latent variables. From table 5 it can be seen that the CR and AVE values are greater than 0.6 and 0.5, respectively, indicating that the configuration is reliable and the convergence is valid (Fornell & Larcker, 2016).

From table 7 it can be seen that the results of data processing are based on the proposed hypothesis. The ease of operating mobile banking does not significantly affect the desire to use it. On the other hand, perceived benefits influence users' intentions to use mobile banking more. In addition, the ease of using mobile banking has a significant effect on the

perceived benefits. That is, mobile banking users feel significant benefits from using mobile banking so that it affects them in utilizing existing facilities. Many aspects affect users in using mobile banking. Ease of using mobile banking applications, complete menu facilities for all financial and billing services, able to answer the needs of users who need fast, accurate and timely services.

Table 5. Correlation of each construct

	IU1	PU2	PEU3	PEU4	PEU5	PU1	PU2	PU3	PU4	PU5	SC2	SC3
IU1	1,000	0,793	0,410	0,440	0,506	0,673	0,701	0,652	0,722	0,726	-0,080	-0,269
IU2	0,793	1,000	0,402	0,448	0,501	0,665	0,631	0,647	0,668	0,690	-0,159	-0,298
PEU3	0,410	0,402	1,000	0,568	0,633	0,377	0,447	0,487	0,492	0,491	-0,087	-0,165
PEU4	0,440	0,448	0,568	1,000	0,768	0,341	0,468	0,474	0,518	0,511	-0,134	-0,152
PEU5	0,506	0,501	0,633	0,768	1,000	0,437	0,510	0,562	0, 568	0,579	-0,048	-0,069
PU1	0,673	0,665	0,377	0,341	0,437	1,000	0,797	0,792	0,716	0,824	-0,210	-0,310
PU2	0,701	0,631	0,447	0,468	0,510	0,797	1000	0,878	0,762	0,835	-0,184	-0,361
PU3	0,652	0,647	0,487	0,474	0,562	0,792	0,878	1,000	0,834	0,878	-0,160	-0,310
PU4	0,722	0,668	0,492	0,518	0,568	0,716	0,762	0,834	1,000	0,879	-0,150	-0,279
PU5	0,726	0,690	0,491	0,511	0,579	0,824	0,835	0,878	0,879	1,000	-0,203	-0,332
SC2	-0,080	-0,159	-0,087	-0,134	-0,048	-0,210	-0,184	-0,160	-0,150	-0,203	1,000	0,716
SC3	-0,269	-0,298	-0,165	-0,152	-0,069	-0,310	-0,361	-0,310	-0,279	-0,332	0,716	1,000

Table 6. Hypothesis conclusion

	Original Sample	Sample Mean	Standart Deviasi	T Statistic	P Values	Label
PEU→ IU	0,127	0,141	0,099	1,286	0,199	Not Significant
PEU→ PU	0,567	0,573	0,096	5,928	0,000	Accepted
PU→ IU	0,691	0,671	0,084	8,187	0,000	Accepted
SC→ IU	-0,022	-0,031	0,058	0,382	0,702	Not Significant
SC→ PEU	-0,137	-0,153	0,086	1,597	0,111	Not Significant
SC→ PU	-0,236	-0,229	0,092	2,561	0,011	Accepted

The results of the hypothesis analysis indicate that the security of mobile banking does not significantly affect the intentions of users and the ease of using mobile banking applications. This shows that respondents are not concerned with security in mobile banking applications. That is, as long as the application is easy to use, they will use the application regardless of security. However, unlike the benefits of using mobile banking, security has a positive effect on the benefits felt by respondents.

Finally, in this study, security has a significant positive effect on the benefits of mobile banking perceived by respondents. However, security does not significantly affect the respondents' intention to use mobile banking. In line with that, security also does not affect the ease of using mobile banking.

5. Conclusion

The development of mobile technology makes financial services available through smartphones. One of the things that need to be important in financial services is security. Security is a risky thing that needs to be considered in financial transaction services. For this reason, it is necessary to conduct research related to user acceptance in using mobile-mobile banking financial services. The results obtained from this study that the security of mobile banking is not the main reason for users to use mobile banking. Even so, this is not an excuse for banks to ignore the level of security in financial services. Because this is also related to the level of user trust in entrusting their money.

Information technology acceptance research is concerned with security. Constraints faced by the validity of the answers given by respondents because it was done online. Using this method can be further developed by researchers who are interested in getting better results with different data and frameworks.

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