Adoption of E-banking Services in South Tangerang Using Technology Acceptance Model (TAM) Approach

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ABSTRACT

This study is aimed at investigating the characteristics and acceptance of e-banking services in South Tangerang, based on the variables of Technology Acceptance Model (TAM). The aim is to increase the number the users of E-Banking Services in South Tangerang. Data was analysed using SPSS software. The results showed 51% of e-banking users here have used its services between six months and 1.5 years where the frequency of e-banking service usage per week is not less than ten times. About 31% of e-banking users of South Tangerang have made the largest transaction between IDR 1,501,000 - IDR 5,000,000. Since most of the e-banking users in South Tangerang work, 53% of them use the services during the day (08.01 - 15.00). Of all TAM variables, the variables which have the largest path coefficient value is behavioural intention, namely 0.320. It means that this variable has the greatest influence on actual use or adoption of e-banking service in South Tangerang.

Keywords: Behavioural intention, E-Banking adoption, path analysis, technology acceptance model

INTRODUCTION

There is stiff competition in the consumer banking sector due to increasing demand for ease and simplicity of banking procedures. In response, the banks have begun to offer various services such as phone banking. The service has now improved through e-banking. This new service has advantages over the previous service since it can be accessed anywhere using a mobile phone, PC, laptop or notebook. Besides, it can be accessed anytime as long as the service is available. E-banking makes it easy for everyone to check their, pay bills or

transfer funds. E-banking also does not require attendance and transactions can be done quickly, precisely and safely. The advantage for customers is that they can make transactions quickly without time and distance limit, and e-banking transaction is relatively cheap. As one of the independent cities in Banten, South Tangerang, is a growth barometer for the region of Banten. Due to its population, South Tangerang is the second largest city in Banten Province after Tangerang City and the fifth largest in Jabodetabek area. The economic growth of South Tangerang will also be further boosted once the city is designated as one of the national activity centres in the national spatial plan.

According to Sharing Vision, the value of internet banking transactions in Indonesia has reached IDR3.642 trillion in 2012. The amount exceeded the value of ATM + debit transactions which stood at IDR3.476 trillion during the same period. Internet banking growth is driven by its users whose growth is quite rapid. According to a survey conducted by Sharing Vision in six major banks in Indonesia, the number of internet banking users reached 5.7 million people in 2012. In other words, 9% of internet users in Indonesia are internet banking users, and the figure is expected to increase corresponding with growth of internet users. The TAM (Technology Acceptance Model) was used to show how customers can receive and use an innovation. The TAM is very well known and has been used extensively in studies focusing on end users of technological innovation (MRI, 2016).

The focus of this study is on the adoption of e-banking services in South Tangerang using the Technology Acceptance Model (TAM). The following research questions will be addressed in this study: 1) What are the characteristics of e-banking users in South Tangerang?; 2) What are the e-banking services which have been used by customers in South Tangerang?; 3) What are the variables of TAM which affect the adoption of e-banking users in South Tangerang?; 4) Which TAM variable has the greatest impact on e-banking user adoption in South Tangerang?; 5) What is the strategy to increase the number of e-banking users related to TAM variables which has the biggest influence on the adoption of e-banking services?

LITERATURE REVIEW

A key to successful implementation of information and communication technology within companies is the willingness to receive and use these technologies among the users which can be examined using Technology Acceptance Model (TAM). This method was used in many studies focused on cell phone service, for example, Carlsson, Hyvönen, Repo and Walden (2005). The TAM is well known and has frequently been used in research focusing on user adoption of technology (Carlsson et al., 2005). According to Davis et al. (Wikipedia, 2016), TAM defines two things that affect the user's acceptance of the technology, namely perceived user's perception of ease of use and of using the technology (perceived usefulness). What

are the reasons for accepting or rejecting an information technology? Previous studies have proposed two crucial factors (Davis, 2001). First, people tend to use or not to use an application based on their belief it will help their work get better. This first variable is called perceived usefulness.

Second, although a potential user believes that a given app is useful, they may believe the system is hard to use. In addition to usefulness, the usability or benefit is theoretically influenced by perceived ease of use.
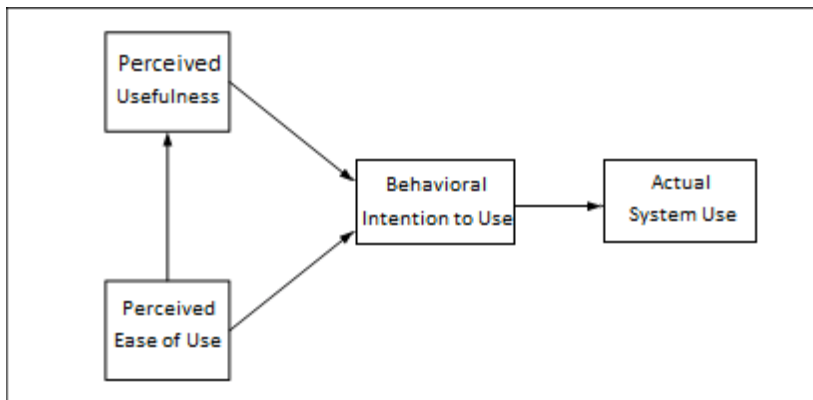

Figure 1. Technology Acceptance Model (TAM) Davis Version
Source: www.istheory.yorku.ca/Technologyacceptancemodel.html, 3 January 2007

The Technology Acceptance Model (TAM) presents a significant theoretical contribution to support understanding of the use of new technology and acceptance of it. As the previous researchers noted, the theory of TAM has one disadvantage: it does not look at social influences in the adoption process. To compensate for this deficiency, many researchers are making changes to TAM to suit their respective research objectives. Malhotra and Galletta (1999) used a modified TAM with TRA (Theory of Reasoned Action). The TRA describes the relationship between beliefs, attitudes, norms, intentions, and behaviours. According to TRA, attitudes and behaviours of a person are determined by the purpose in presenting these behaviours, and which are in turn directly influenced by individual attitudes (Dillon & Morris, 1996). The Theory of Planned Behavior (TPB) was used by Irawan, Hendayani and Widyani (2016) to study of the adoption of e-toll by residents of Bandung. The diagram below describes the relationship.
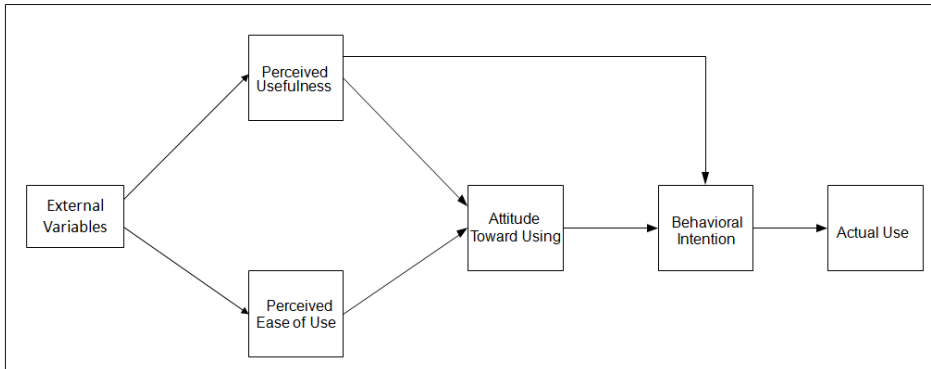
Figure 2. Technology Acceptance Model (TAM) Malhotra & Galletta Ver
Source: (Malhotra & Galletta, 1999)

The TAM model used in this study is a modified version and adapted to the Theory of Reasoned Action (TRA) and the variable of economic sacrifice. Considering that this research is about hi-tech service, it is assumed that there is benefit from adopting the new technology compared with the cost (Relative Advantage). This research does not use the model of external variable influence so it is assumed there is a relationship between perceived ease of use and perceived usefulness. Both of them, as well as the economic sacrifice, relate to the attitude toward using which directly affects the attitude of a technology user or behavioural intention. The behavioural intention, in addition to being influenced by the attitude toward using, is also influenced by perceived usefulness. And finally, the real user of technology is affected by his or her behavioural intention. The TAM as applied is described as below:
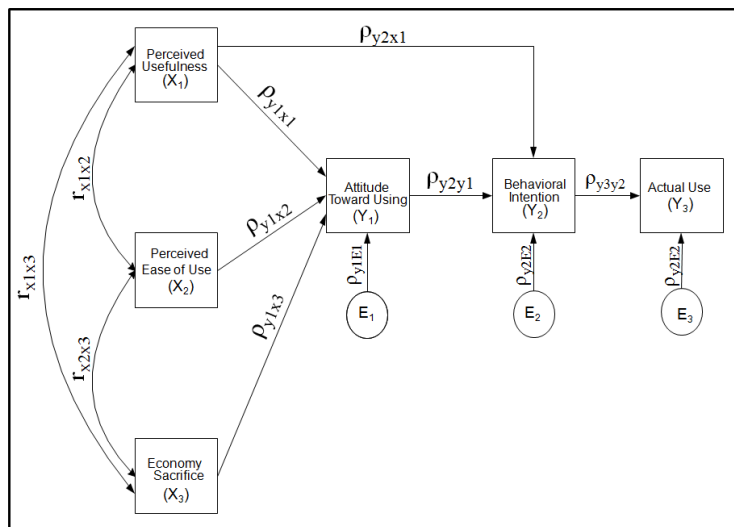

Figure 3. Technology Acceptance Model (TAM)
Source: Data Processed

The following hypotheses is proposed:

- There is a correlational relationship between perceived usefulness and perceived ease of use.

- There is a correlational relationship between perceived usefulness and economic sacrifice.

- There is a correlational relationship between perceived ease of use and economic sacrifice.

- Perceived usefulness, perceived ease of use and economic sacrifice significantly influence attitude toward using.

- Attitude toward using and perceived usefulness significantly influence behavior intention.

- Behavioural intention significantly affects actual use.

Structural equations:

$Y1 = \rho y1x1.X1 + \rho y1x2.X2 + \rho y1\varepsilon1$

$Y2 = \rho y2x1.X1 + \rho y2y1.Y1 + \rho y2\varepsilon2$

$Y3 = \rho y3y2.Y2 + \rho y3\varepsilon3$

MATERIALS AND METHODS

This is a quantitative research which used a survey questionnaire method to test the hypotheses and explain the causal relationship. Operationalisation of variables used in this research instrument is the Technology Acceptance Model as shown in Figure 3 above. Primary data is obtained from the responses and secondary data in the form of literature review. The Likert and Ordinal scale was used to measure the responses because according to Cooper and Schindler (2006); Sekaran (2006); Riduwan and Kuncoro (2007), this scale measures one's attitude towards something, which, in this case, is the e-banking service. A total of 100 respondents were recruited for this study using the Bernoulli formula. A set of 120 questionnaires were distributed e-banking service users in South Tangerang using the Convenience Sampling technique. Path analysis was used to analyse data.

Population refers to the entire group of people, events, or interests that are a subject of investigation (Sekaran, 2006). The population in this study is all e-banking users in South Tangerang, who fulfilled the following criteria: 1) Banking customers domiciled in South Tangerang; 2) Banking customers who have registered themselves as the users of the e - banking facility; 3) Banking customers who have been actively using e-banking facility for at least six months.

This study used the level of accuracy (α – 5%) at 95% confidence level so that the value obtained Z = 1.96. The error rate is set at 10%. Meanwhile, the probability of the questionnaire being correct (acceptable) or rejected (false) is 0.5. By using the above equation, it is then shown:

$$n \geq \frac{[1,96]^2\,0,5.0,5}{0,1^2}$$

$$n \geq \frac{[3,8416]\,0,25}{0,01}$$

$$n \geq \frac{0,9604}{0,01}$$

$$n \geq 96,04 \approx 100$$

The minimum sample for this research is 100. This analysis will be used to test the amount of contribution directed by the path coefficients on each path diagram to show the causal relationship between variables X1 and X2 to Y1, Y2, and Y3. The correlation between Perceived Usefulness (X1) and Perceived Ease of Use (X2) to Attitude Toward Using (Y1), Behavior Intention (Y2) and Actual Use (Y3) are analysed using multiple linear regression which is the basis for path coefficient calculation.

RESULTS AND DISCUSSIONS

A total of 58.8% of respondents were male aged between 31 and 42 years. The majority of respondents (48 %) have jobs and 35.3% of them have an income ranging from IDR 5,001,000 to IDR 10,000,000. About 73.5% of the respondents used Telkomsel operators when conducting their e-banking. The characteristics of e-banking users in South Tangerang city are shown in Table 1 below:

Table 1
Characteristics of use of e-banking services

Item		%
Frequency of use per week	≤ 10	59.8
Max number of transactions nominal	IDR 1,501,000 – IDR 5,000,000	30.4
Location usage	Outdoor activities	52.9
Time usage	08.00 a.m.– 03.00 p.m.	52
Transaction type	Individual transaction	75.5
Destination of bank transfer	Transfer between accounts within the same bank	53.9
Destination of the furthest transaction	Inter-provinces	63.70

Source: Data processed

The results showed that 102 respondents have used the balance information service. Other services used by the respondents are inter-account transfer (91 respondents) and reload services (71 respondents). None used information seeking service, commerce for mutual funds, commerce shares, and other commerce. The inadequate use of the type of services offered by e-banking led to the banks to focus only on essential services such as balance, transfer, credit and other information so that there are some types of services that have never been used by e-banking users in South Tangerang. Additionally, the adoption of e-services offered by banks is still low. This is not good for the development and adoption of e-banking services in the future and therefore, banks must intensify their promotional activities, socialisation, and education for customers, especially for those who have registered as e-banking users in order to increase customer awareness of e-banking services. In addition, if the use of e-banking services increases, its adoption rate will also increase.

Path Analysis was used to analyse the influence of TAM variables to describe the adoption of e-banking services in South Tangerang city. The table below summarises the path analysis:

Table 2
Summary of path analysis of e-banking services

Influence of Variables	Path Coefficient (Beta)	Results	Coefficient of Determination	Other Variable Coefficients
X1 → Y1	0.313	Reject H_o	0.372	0.678 or 0.823^2
X2 → Y1	0.225	Reject H_o		
X3 → Y1	0.218	Reject H_o		
X1 → Y2	0.249	Reject H_o	0.176	0.824
Y1 → Y2	0.229	Reject H_o		
Y2 → Y3	0.320	Reject H_o	0.102	0.898

Source: Data processed

The result of the calculation gives the following equations:

- Structure 1 Equation:

  $$Y1 = \rho_{y1x1}.X_1 + \rho_{y1x2}.X_2 + \rho_{y1x3}.X_3 + \rho_{y1}\varepsilon_1.\ \varepsilon_1;\ R_{square}$$

  $$Y1 = 0{,}313.X_1 + 0{,}225.X_2 + 0{,}218.X_3 + 0{,}678\varepsilon_1;\ R_{square} = 0{,}372$$

- Structure 2 Equation

  $$Y2 = \rho_{y2x1}.X_1 + \rho y_{2y1}.Y_1 + \rho_{y2\varepsilon2};\ R_{square}$$

  $$Y2 = 0{,}249.X1 + 0{,}229.Y_1 + 0{,}824\varepsilon_2;\ R_{square} = 0{,}176$$

- Structure 3 Equation

  $$Y3 = \rho_{y3y2}.Y_2 + \rho_{y3}\varepsilon3\ ;\ R_{square}$$

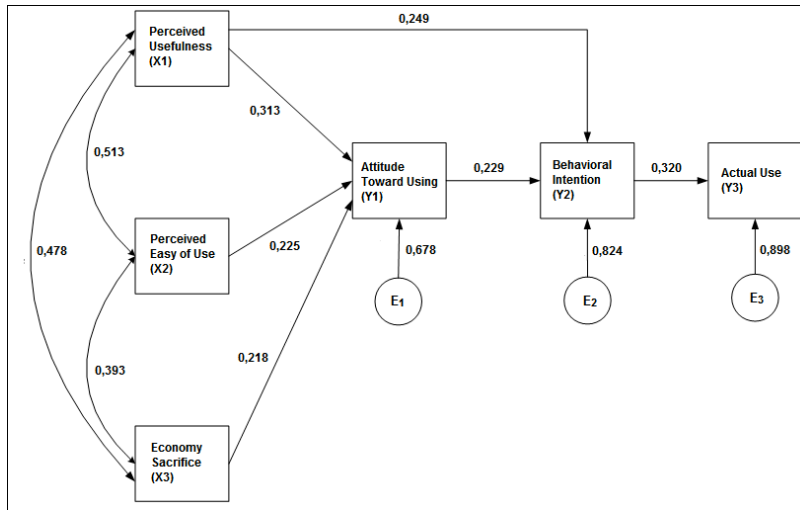 $$Y3 = 0{,}320.Y_2 + 0{,}898\varepsilon_3;\ R_{square} = 0{,}102$$

Figure 4. Path analysis diagram
Source: Data processed

The adoption and usefulness of mobile banking (e-banking) from the point of view of technology acceptance by the users, and the model for studying the acceptability of the technology called Technology Acceptance Model (TAM) is the focus of this study. According to Teo and Pok, this model is one of the popular approaches used in research in Information Systems or Technology Adoption (Carlsson et al., 2005, p. 10). The TAM variables used in this study are Perceived Usefulness (X1), Perceived Ease of Used (X2), Economic Sacrifice (X3), Attitude Toward Using (Y1), Behavioural Intention (Y2), and Actual Use (Y3). To measure the influence of one variable on others, the researchers used the Path Analysis Technique. This technique will be used in testing the contribution shown by the path coefficient on each path diagram of the causal relationship between variables X1, X2, X3 to Y1 and

Y2 and their impact on Y3. Correlation and regression analysis is the basis of path coefficient calculation using SPSS program for Windows. Al Rashid in Sitepu (Riduwan & Kuncoro, 2007) stated that social research does not merely express the relationship variable as a statistical translation of the relationship between natural variables, but reveals causal relationships between the variables.

An important point of perceived ease of use is that this variable has been supported by the design of a service. Most of the designs or format of the current mobile service have made it easier for users, but other services resulting from technological developments should still promote the use of such services (Carlsson, et al., 2005). Carlsson et al. (2005) stated that the development of technology could give people a better experience. The TAM supports the relationship between perceived

ease of use and attitude towards using. The coefficient for perceived ease of use is 0.225 which means that the perceived ease of use variable simultaneously affects attitude toward using (from the rejection of Ho) but the value of the effect is 0.225. Banks should be able to communicate and educate e-banking users and non-e-banking users to improve the positive impacts of e-banking users to increase the frequency of use of e-banking services.

Users are charged a small fee for use of e-banking service. This cost consists of two types - financial and non-financial. However, these costs should not be burdensome. Therefore, the banks should lower the cost of e-banking services (evaluative effect) to encourage its usage.

The benefit gained in TAM is called perceived usefulness, while the sacrifice is called economic sacrifice. Both of these variables are significant and simultaneous with attitude toward using in TAM. The value of the relationship based on path analysis is 0.313 and 0.218. Perceived usefulness is not only related to attitude toward using. In the TAM model, we assume that perceived usefulness and attitude toward using have a causal relationship with the behavioural intention or individual purpose to show the behavior of e-banking users. From the result of hypothesis test conducted in the analysis of sub-structure-2, there is a significant and simultaneous relationship between perceived usefulness and attitude toward using with behavioural intention at 0.249 and 0.229 respectively. Malhotra and Galletta (1999) found adoption of new

information technology such as e-commerce applications and m-commerce is determined by user's attitude. Therefore, to optimise the positive feelings of e-banking users in South Tangerang city in using e-banking (effect of evaluation or evaluative effect), the banks must increase the benefits of using e-banking. Banks may increase the variety of their e-banking services. However, they must also be able to socialise these services and educate the people who have not used e-banking services.

The final variable of TAM used in this study is actual use variable which is the real use of e-banking service by banking customer, or in other words, it is an adoption toward e-banking service. In this TAM, it is described that behavioural intention has a direct causal relationship with actual use. And from the result of analysis of sub-structure-3, it is found that there is a significant and simultaneous relationship of behavioural intention variable towards actual use variable with path coefficient value of 0.320. Therefore, to optimize the use of e-banking by South Tangerang e-banking users (frequency of usage and frequency of usage time), the banks should make efforts to increase the frequency of using the service. When a user feels that his goal of using e-banking is achieved, the frequency of e-banking usage will also increase.

CONCLUSION

Based on the results, 51% of e-banking users in South Tangerang city have been using e-banking for six months to 1.5 years

where the frequency of use of e-banking services per-week is not less than 10 times. In terms of the maximum amount of nominal transactions, 31% have made the largest transactions amounting to IDR 1,501,000 – IDR 5,000,000. As most of e-banking users work, they conduct their banking activities outside during the day (from 08.01 a.m. to 03.00 p.m.). Personal transaction is most used by e-banking users between accounts within the same bank, and the furthest destination of e-banking user in South Tangerang city is interprovincial transactions.

All respondents used personal services, such as balance information service.

Based on the analysis, it is found the adoption of e-banking services in South Tangerang city is influenced by all TAM (Technology Acceptance Model) variables, such as perceived usefulness, perceived ease of use, economic sacrifice, and attitude toward using, behaviour intention, and actual use.

Behavioural intention had the largest path coefficient value, namely 0.320 which means that this variable has the greatest influence on actual use or adoption of e-banking service in South Tangerang city.

Behavioural Intention has two indicators communicating the technology to others and the use of e-banking in every user action. About 60% of e-banking users are happy and have no difficulty in explaining e-banking services to others, and they also use e-banking either in jobs or personal activities. Strategies to maximise the use of e-banking services in South Tangerang city are based on Behavioural Intention variable which is focused on education to users and non-users of e-banking to increase user knowledge of e-banking services and invite non-users to use e-banking services. The definition of consumer education is the value of education both in economic understanding about money and in moral understanding about social and environmental responsibility (Samuel & Foedjiawati, 2005, p. 3). Socialisation is a process of planting or transferring habits or values and rules from one generation to another in a group or society. Some sociologists use socialisation as a role theory because the process of socialisation imparts rules. In this case, the rules are information about e-banking and the stages that should be taken in using e-banking. From the indicators on Behavioural Intention variables, it can be concluded that someone who has been familiar with e-banking will not hesitate to tell others about e-banking services. This will increase the adoption of e-banking services. This can be seen from the causal relationship between Behavioural Intention against Actual Use.

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