Analysis of Factors Affecting Behavioral Intention and Use of Behavioral of Mobile Banking Using Unified Theory of Acceptance and Use of Technology 2 Model Approach

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ABSTRACT

The percentage of mobile banking users is currently lower than the number of active internet users with smartphones in Indonesia. The current study extends the Unified Theory of Acceptance and Use of Technology 2 by adding two important factors, perceived risk and observability. The purpose of this study is to investigate the factors influencing behavioural intention and use behaviour of Mobile banking by customers of Indonesian. Data was collected by conducting an online survey questionnaire completed by 360 respondents. The authors analysed the model through structural equation modelling LISREL. The results showed observability, performance expectation, hedonic motivation, facilitating conditions as positive and significant of behaviour intentions. The perceived risk, and price value indicated negative and significant in explaining behaviour intention. Behavioral intention and experience has positive and significant to use behavior mobile banking.

Keywords: Behavioral Intention, Mobile Banking, Observability, Perceived Risk, SEM, Unified Theory of Acceptance and Use of Technology 2

JEL Classifications: C31, G02, G21

1. INTRODUCTION

The use of digital technology especially the internet, has become a part of lifestyle in society, the growth of internet users in Indonesia in 2017 amounted to 143.26 million people, as much as 44.16% conducted internet activities using smartphones and 39.28% using a combination of smartphones and computers, as well as from the number of users who use the internet in the economic sector for new banking activities by 7.39% (APJII, 2017).

Mobile banking is a form of internet-based banking activity model through wireless devices and a service that enables bank customers to conduct banking transactions via smartphones, this mobile banking service can be used by using the menus available on the SIM (Subscriber Identity Module) Card, USSD (Unstructured Supplementary Service Data), or through applications that can be downloaded and installed by customers (OJK, 2015). The ease of use and the widespread availability of cellular communication has led to the phenomenal growth of financial transactions in rural and urban areas, especially in many developing countries in Asia (Misra and Bisht, 2013).

The emergence of new competitors, which is financial technology companies have an impact on banking industry transactions. The effect is a change in customer behavior from conventional activities such as visiting bank offices, switching to digital transaction activities. The percentage of internet users to access banking services is 7.39% and percentage of those conducting banking transactions on mobile banking has only reached 17.04% (APJII, 2017).

Based on data from one national private bank as of March 2019, from 4.2 million retail banking customers registered in the mobile banking application at 18.5% and those actively using...
mobile banking application just counted at 41.4% of registered customers or only 7.7% of total customers. The number of carried out transactions was 1.63 million transactions and the amount of money transacted was 1656 billion rupiah.

Previous research mentioned the significant influence of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) variable on behavioral intention to use mobile banking. Gharaibeh et al. (2018) concluded that effort expectancy, performance expectancy, social influence, trust and mass media had a significant positive effect on the adoption of mobile banking in Jordan. Baptista and Oliveira (2015) conducted a study on behavioral intention in mobile banking in Mozambique with the results that effort expectancy, hedonic motivation and experience had a significant impact. Bhatiasevi (2015) added that the perception factor of credibility, and perceived comfort had a significant positive effect on behavioral intention to use mobile banking in Thailand in addition to the factors of effort expectancy, performance expectancy, and social influence. Al-Jabri and Sohail (2012) explained that the relative profit, compatibility and observability factors showed a significant positive impact while risk perception had a negative impact on behavioral intention in mobile banking in Saudi Arabia. Blaise et al. (2016) concluded that performance, expectation efforts, social influence, and facility conditions, perceived trust and perceived risk have a significant influence on the use of m-commerce in North America.

This study is different from previous studies, this study accommodates UTAUT2 variables and risk perception variables and observability variables from the Diffusion of Innovation theory. This study also analyzes up to the most significant indicator variable on behavioral intention.

2. LITERATURE REVIEW

2.1. Mobile Banking

The banking business is experiencing changes related to the development of technology that has an impact on shifting relationships between banking customers and banks. With the existence of digital-based service options, banking customers do not really need to conduct banking transactions directly to bank branches, but customers can take advantage of ATM services, online chat, internet banking and mobile banking (Citigroup, 2016). The integration between internet technology and mobile networks creates opportunities and new technologies in banking business services, namely mobile banking which provides a service mechanism wherever and whenever for banking services as the use of smartphones and tablet PCs develops (Dash et al., 2014).

Tiwari et al. (2006) states that the mobile banking utility from the perspective of the bank is to:
1. Support intensive competition in the banking sector.
2. Adapting to specific target segment requirements.
3. Functioning as a distribution channel.
4. Increase the volume of sales of banking products.
5. Increase customer satisfaction.
6. As a company image product.

Mobile banking provides opportunities for banks to maintain their existing customer base, smart technology based on customer segmentation by offering innovative services that have added value.

2.2. UTAUT2

There are several research models developed to explain the factors that influence the interest and use of an information technology system including Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Table 1).

The UTAUT was developed comprehensively from the eight theoretical perspective models (Venkatesh et al., 2003). Extending theory to study the context of developing applications and services from technologies that target consumers, modifying some of the relationships that already exist in the UTAUT model concept and introducing new relationships, then added three new constructs namely hedonic motivation, price values and habits (Venkatesh et al., 2012). The main purpose of UTAUT2 is to complete the better construct so that it can explain the emerging technology can increase the use of technology for users. Venkatesh et al. (2012) stated that UTAUT2 created an important increase in the variables explained in the use of technology by 56% to 74%.

The constructor of the UTAUT2 Model consists of:
1. Performance Expectancy is the level of individual confidence that through the system usage can help him obtain performance gains in his activities (Venkatesh et al., 2003).
2. Effort Expectancy is defined as the ease of use of a system that can reduce effort and time effort in activities (Venkatesh et al., 2003).
3. Social Influence is the level of trust in the social environment that convinces individuals to use the new system (Venkatesh et al., 2003).

The following table shows the list of technology acceptance theories.

Table 1: List of technology acceptance theories

<table>
<thead>
<tr>
<th>Theory</th>
<th>Abbreviation</th>
<th>Initiator</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of reasoned action</td>
<td>TRA</td>
<td>Ajzen and Fishbein</td>
<td>1975</td>
</tr>
<tr>
<td>Innovation diffusion technology</td>
<td>IDT</td>
<td>Rogers</td>
<td>1983</td>
</tr>
<tr>
<td>Social cognitive theory</td>
<td>SCT</td>
<td>Bandura</td>
<td>1986</td>
</tr>
<tr>
<td>Theory of planned behavior</td>
<td>TPB</td>
<td>Davis et al.</td>
<td>1989</td>
</tr>
<tr>
<td>Model of PC utilization</td>
<td>MPUC</td>
<td>Thompson et al.</td>
<td>1991</td>
</tr>
<tr>
<td>Motivational model</td>
<td>MM</td>
<td>Davis et al.</td>
<td>1992</td>
</tr>
<tr>
<td>Technology acceptance model</td>
<td>TAM</td>
<td>Taylor and Todd</td>
<td>1995</td>
</tr>
<tr>
<td>Combined TAM and TPB</td>
<td>C-TAM-TPB</td>
<td>Taylor and Todd</td>
<td>1995</td>
</tr>
<tr>
<td>Unified theory of acceptance and use of tehnology</td>
<td>UTAUT</td>
<td>Venkatesh et al.</td>
<td>2003</td>
</tr>
<tr>
<td>Unified theory of acceptance and use of tehnology 2</td>
<td>UTAUT2</td>
<td>Venkatesh et al.</td>
<td>2012</td>
</tr>
</tbody>
</table>
4. Facilitating Conditions, namely a level of trust of an individual if the organization and existing technical infrastructure can support the use of a technological system (Venkatesh et al., 2003).
5. Hedonic Motivation is pleasure derived from the use of technology and determine its adoption and usage (Brown and Venkatesh, 2005).
6. Price is the perception of the gap between the benefit of using technology and the rates charged (Dodds et al., 1991).
7. Habit (Habit) is the extent to which a person tends to behave automatically due to previous learning (Limayem et al., 2007).

2.3. Diffusion of Innovation (DOI)
DOI theory contributes by examining innovation and the success of technology dissemination through more appropriate indicators of consumer behavior, and trying to explain how, why, and at what level the new technology idea spreads and a process when an innovation is communicated from time to time in social systems (Rogers, 2003).

There are five attributes, namely:
1. Relative Advantage: relative advantages that result in increased efficiency, economic benefits and increased status.
2. Complexity: How relatively difficult an innovation can be understood and used.
3. Compatibility: Important features of innovation as adjustments to the lifestyle of users that can drive increased adoption quickly.
4. Observability: Describes the extent to which an innovation is seen by members of the social system, and its benefits can be easily observed and communicated
5. Triability: The extent to which an innovation can be tested before the commitment of potential users to adopt the innovation is made.

2.4. Risk Perception
Risk perception is an attribute that refers to the level of risk in using an innovation (Ram and Sheth, 1989). Risk should be considered as one of the biggest concerns in the adoption and use of mobile banking services (Chen, 2013). Despite the success of mobile phones, researchers believe that mobile banking customers experience many types of risks (Agu et al., 2016). Banks need to take serious and urgent steps to respond complaints and provide special guarantees in reducing risk perceived by customers (Al-Jabri and Sohail, 2012).

2.5. Experience
Experience is how much or how often someone uses certain technology. Previous experience is a determinant of behavior, there is a significant difference between experienced users and users who are not experienced in the influence of behavioral factors (Ajzen and Fishbein, 1975). Venkatesh et al. (2012) defines experience as an opportunity to use a technology product and is generally formed from individual operational activities along with the passage of time using that technology product. Increased experience and routine behavior leading to the habit of using technology products can be a support in maintaining and increasing the actual use of technology products (Albashrawi, 2017). Agarwal and Prasad (1999) explain the existence of a strong relationship between previous individual experiences with similar technology and individual behavior to use the technology.

3. METHODOLOGY
This study uses non-probability techniques by sampling according to the purpose (purposive sampling). The sample selection is based on certain characteristics that are already known before, which are banking customers who have opportunity to use mobile banking and are domiciled in Indonesia.

Primary data in this study were obtained from distributing questionnaires by online using Google forms. The questionnaire was designed into two parts, the first part section about general data and profile of respondents including gender, age, level of education, location, length of time using mobile banking, and the number of mobile banking applications used. In the second part questions about the variables to be analyzed. The scale used is the Likert scale approach with a Likert scale ranging from 1 to 5.

Model used is a combination of UTAUT2 with observability characteristics from DOI theory, as well as perceived risk. The combination of these models are based on the assumption that acceptance of technological concepts which is complex phenomenon and requires more than one model (Shen et al., 2010) and will be able to strengthen the significance and predictions of the results obtained (Oliveira et al., 2016). Figure 1 explains the SEM-LISREL research model.

Structural model:
\[ \eta_1 = \gamma_{11} + \gamma_{12} + \gamma_{13} + \gamma_{14} + \gamma_{15} + \gamma_{16} + \gamma_{17} + \gamma_{18} + \gamma_{19} + \gamma_{20} + \gamma_{21} \]
\[ \eta_2 = \gamma_{21} + \gamma_{22} + \gamma_{23} + \gamma_{24} + \gamma_{25} + \gamma_{26} + \gamma_{27} + \gamma_{28} + \gamma_{29} \]

Calculation model for X:
\[ PE_1 = \lambda_{PE_1} + \delta_1 \]
\[ PE_4 = \lambda_{PE_4} + \delta_4 \]
\[ EE_4 = \lambda_{EE_4} + \delta_4 \]
\[ SI_4 = \lambda_{SI_4} + \delta_4 \]
\[ FC_4 = \lambda_{FC_4} + \delta_4 \]
\[ HM_4 = \lambda_{HM_4} + \delta_4 \]
\[ PV_4 = \lambda_{PV_4} + \delta_4 \]
\[ OB_4 = \lambda_{OB_4} + \delta_4 \]
\[ PR_4 = \lambda_{PR_4} + \delta_4 \]

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EX\_1 = \lambda_{EX\_1} \xi + \delta_{EX\_1}, \ EX\_2 = \lambda_{EX\_2} \xi + \delta_{EX\_2}, \ EX\_3 = \lambda_{EX\_3} \xi + \delta_{EX\_3}

Calculation model for Y:
BI\_1 = \lambda_{BI\_1} \eta + \epsilon_{BI\_1}, \ BI\_2 = \lambda_{BI\_2} \eta + \epsilon_{BI\_2}, \ BI\_3 = \lambda_{BI\_3} \eta + \epsilon_{BI\_3},

UB\_1 = \lambda_{UB\_1} \eta + \epsilon_{UB\_1}, \ UB\_2 = \lambda_{UB\_2} \eta + \epsilon_{UB\_2}, \ UB\_3 = \lambda_{UB\_3} \eta + \epsilon_{UB\_3}, \ UB\_4 = \lambda_{UB\_4} \eta + \epsilon_{UB\_4}, \ UB\_5 = \lambda_{UB\_5} \eta + \epsilon_{UB\_5}

Explanation of the operational variables used in this study are as follows:
1. Performance expectancy (Venkatesh et al., 2012)
   a. Using mobile banking has the benefit of completing the payment process (PE1).
   b. Using mobile banking will complete the payment process quickly (PE2).
   c. Using car banking simplifies, helps, or supports work (PE3).
   d. Using mobile banking will improve performance (PE4).

2. Effort expectancy (Venkatesh et al., 2012)
   a. Learning how to use mobile banking is easy (EE1).
   b. Interact with mobile banking clearly so that it can be understood (EE2).
   c. Easy to become skilled in using mobile banking (EE3).
   d. Mobile banking is easy to use (EE4).

3. Social influence (Venkatesh et al., 2012)
   a. An important person for me thinks that I should use mobile banking services (SI1).
   b. People who influence my behavior think that I had to use mobile banking services (SI2).
   c. The use of mobile banking services is a status symbol in the environment (SI3).

4. Facilitating condition (Venkatesh et al., 2012)
   a. Have the knowledge needed to use mobile banking services (FC1).
   b. Have the knowledge needed to use mobile banking (FC2).
   c. Mobile banking is compatible with other technologies used (FC3).
   d. Can get help from others when having difficulties using mobile banking (FC4).

5. Hedonic motivation (Venkatesh et al., 2012)
   a. Using mobile banking is fun (HM1).
   b. Using mobile banking services is entertaining (HM2).
   c. Using mobile banking services is very convenient (HM3).

6. Price value (Venkatesh et al., 2012)
   a. The cost of using mobile banking is cheap (PV1).
   b. The cost of using mobile banking is reasonable (PV2).
   c. The cost of using mobile banking, according to the benefits obtained (PV3).

7. Observability (Al-Jabri and Sohail, 2012)
   a. Mobile banking can be accessed anywhere or anytime in the territory of Indonesia (OB1).
   b. Mobile banking does not have a queue (OB2).
   c. Mobile banking can immediately see the effect of the transaction (OB3).
   d. Friends around me discuss the use of mobile banking (OB4).

   a. The emergence of misuse of important personal or financial information when using mobile banking (PR1).
   b. Mobile banking is likely to be an error, thereby creating problems with the transaction (PR2).
   c. Using mobile banking for bill payments, the potential for fraud (PR3).
   d. Mistakes when using mobile banking can cause financial losses (PR4).
9. Experience (Venkatesh et al., 2012 and Albashrawi (2017))
   a. Have a lot of experience in using mobile banking (EX1).
   b. Has long used mobile banking (EX2).
   c. When using mobile banking, attention is focused on my online banking activities (EX3).

10. Behavioral intention (Venkatesh et al., 2012)
    a. Want to know more about mobile banking (BI1).
    b. Intend to continue to use mobile banking in the future (BI2).
    c. Planning to conduct transactions on mobile banking (EX3).

11. Use behavior (Venkatesh et al., 2012)
    a. Mobile banking users (UB1).
    b. Use mobile banking to check accounts (UB2).
    c. use mobile banking to transfer money (UB3).
    d. use mobile banking for payment transactions (UB4).
    e. use mobile banking for investment transactions (Mutual Funds, Bonds) (UB5).

3.1. Hypothesis
To answer the problem in this study, the authors propose a research hypothesis:
1. $H_1$: Observability has a significant positive effect on behavioral intention
2. $H_2$: Performance Expectancy has a significant positive effect on behavioral intention.
3. $H_3$: Effort Expectancy has a significant positive effect on behavioral intention.
4. $H_4$: Social Influence has a significant positive effect on behavioral intention.
5. $H_5$: Facilitating Condition has a significant positive effect on behavioral intention.
6. $H_6$: Hedonic Motivation has a significant positive effect on behavioral intention.
7. $H_7$: Price Value has a significant positive effect on behavioral intention.
8. $H_8$: Perceived Risk has a significant negative effect on behavioral intention.
9. $H_9$: Behavioral intention has a significant positive effect on use behavior.
10. $H_{10}$: Experience has a significant positive effect on use behavior.

Data processing that carried out was descriptive analysis, analysis by SEM-LISREL method and priority determination stage. The application software used was LISREL 8.80. The stage of determining priority indicators for behavioral intention was done using quadrant charts as in the Importance Performance Analysis technique (Martilla and James, 1977). The X-axis determines the average range of respondents’ perceptions on the questionnaire indicator, while the Y-axis determines the loading factor of the indicator.

4. RESULT AND DISCUSSION
The results of the distribution of questionnaires produced 360 questionnaires that met the completeness to be processed. The number of male respondents was 52% and female respondents were 48%. This study grouped ages according to generations based on research by Bencsik and Machova (2016). Respondents are dominated by the range of age between 25 years and 31 years (30.6%), ages between 32 years and 38 years (25.8%), ages 18 years and 24 years (20.3%), ages between 39 years and 47 years (16.9%), and over the age of 48 years (6.4%). The education level of the largest respondents was undergraduate/bachelor graduates (S1), totaling 63.1%, while the smallest percentage was Doctoral graduates (S3) of 1.9%. Most of the respondents residing in Java with a percentage of 73.1% and followed by respondents on the island of Sumatra 15.3%, the smallest percentage of respondents was in the Maluku/Papua region (1.9%). Respondents who have used mobile banking services for 6 to 12 months is 42.8%, while respondents who have not used mobile banking services are 11.7%.

Based on Table 2, all model conformity indices have a measure of the suitability of the measurement model with a good match category, which exceeds the minimum suitability of the model. Validity is related to whether a variable measure what should be measured (Wijanto, 2015). A variable has good validity for the construct of its latent variable, if the value of t factor loading (loading factor) is greater than the critical value ($\geq 1.96$) or for practicality ($\geq 2$) (Ridgon and Ferguson, 1991). Hair et al. (2010) suggest a standardized loading factor (SLF) value $\geq 0.5$ indicates that convergent validity has either been achieved or more is expected to be SLF $\geq 0.7$.

Reliability is the consistency of a measurement. There are two ways in measuring reliability, the first is construct reliability (CR), which is a deciding indicator that shows whether or not convergent validity is good, the second is variance extracted (VE), which is a reflection of the total number of constructs in the observed variable explained by latent variables. Hair et al. (1998) states that a construct has a good reliability value if the value of CR $\geq 0.70$ and the value of VE $\geq 0.50$.

Based on Table 3, shows the validity and reliability of the model variables. Invalid indicators are FC4 and UB5 and were eliminated when calculating CR and VE. The results of the reliability evaluation of all latent variables are reliable criteria.

Figure 2 also shows the coefficient of determination between variables of the analyzed model. The coefficient of determination for the structural equation of behavioral intention toward

<table>
<thead>
<tr>
<th>Table 2: Model suitability index</th>
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<tbody>
<tr>
<td>Indicator GOF</td>
</tr>
<tr>
<td>SRMR</td>
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<td>RMSEA</td>
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<td>NNI</td>
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<td>NFI</td>
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<tr>
<td>CF</td>
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<tr>
<td>RFI</td>
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<tr>
<td>IFI</td>
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<tr>
<td>Normed Chi-square</td>
</tr>
</tbody>
</table>
performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, observability, and perceive risk variables is 0.92. Whereas in the variable use behavior the coefficient of determination is 0.86 for the behavioral intention and experience variables.

Structural equations

\[
\text{Intent} = 0.48 \times \text{Observ} + 0.33 \times \text{Perform} + 0.021 \times \text{Effort} + 0.022 \times \text{Social} + 0.12 \times \text{Facility} + 0.25 \times \text{Hedon} - 0.15 \times \text{Price} - 0.079 \times \text{Risk} \\
\]

\[
\begin{array}{llll}
\text{Errorvar.} = & 0.083, & R^2 = 0.92 \\
& (0.022) & & 3.70 \\
\end{array}
\]

Use = 0.66 \times \text{Intent} + 0.30 \times \text{Exper}, \text{Errorvar.} = 0.14, R^2 = 0.86

\[
\begin{array}{llll}
(0.084) & (0.077) & (0.023) \\
7.86 & 3.88 & 5.82 \\
\end{array}
\]

4.1. Hypothesis Testing Results

Hypothesis testing in this study was conducted by evaluating the path coefficient and the calculated value for each path of the model. Testing of each path of the two latent variables will produce a value of tcount, if the tcount >1.96 can be concluded that the influence of the variable is significant.

Based on Table 4 explains that from 10 existing hypotheses, there are 2 hypotheses that were rejected because they were insignificant (H3 and H4), and 1 hypothesis that was rejected due to a significant negative effect (H7).

4.2. Priority Determination

Based on the research, there are three latent variables that influence behavioral intention variables, namely observability, performance expectancy and hedonic motivation. To find out the relationship between the loading factor value and the average value of each indicator of the most influential variable, a simple mapping approach is used, such as the Importance Performance Analysis technique (Figure 3).
There are two indicators that are in quadrant I, namely HM3 (using mobile banking services is very convenient) and OB1 (can access mobile banking anywhere or anytime in the territory of Indonesia) which are priorities to be improved. In quadrant II there are five indicators that must be maintained services namely PE1 (using mobile banking support to complete important work), PE3 (using mobile banking beneficial in daily life), PE4 (using mobile banking completes the payment process quickly), OB2 (not facing queue
when using mobile banking) and OB3 (can immediately see the effects of transactions on mobile banking).

5. CONCLUSION

The conclusions of this study are as follows:

1. Behavioral intention is significantly positive influenced by the variables of observability, performance expectancy, hedonic motivation and facilitating conditions. The price value and perceive risk factors have a significant negative effect.
2. Latent variables social influence and effort expectancy do not affect behavioral intention.
3. Use behavior of mobile banking users is significantly positively influenced by behavioral intention and experience.

Based on this research, managerial implications are obtained, which the development of differentiation in HM3 indicators that makes the appearance of mobile banking more accommodating of user and application interactions (user interface/UI) and able to accommodate the experience of users who have used mobile banking applications (user experience/UX). The designed UI/UX has appropriate and simple design features but still focuses on banking transaction activities and user experience, and controls the application of multimedia. The second indicator, OB1, can be developed by increasing the ability to access mobile banking applications that can accommodate bandwidth availability. Collaboration with communication service providers can be an alternative solution.

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