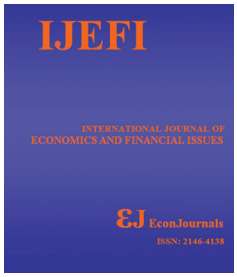

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Factor Affecting Mobile Adoption Companies in Malaysia

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ABSTRACT

Mobile banking refers to the use of smart phones or other mobile devices to perform tasks online banking from your home computer, such as monitoring the account balances, transfer of funds between accounts, pay bills and prepaid top-up. Mobile banking is a new strategy for the bank to enhance their latest technology in a new dynamic marketing environment. The low penetration of mobile banking in Malaysia, especially in terms of adoption patterns is becoming the research interest, especially when compared to the total number of cellular telephone subscriptions, which recorded the highest number of penetration rates in quarter three of 146.2% in 2013. Although the number of cellular telephone users is huge, yet the mobile banking penetration rate was just 12.7% last year against the total population. This implies that those who employ the mobile banking market is still the minority. Thus, more effort needs to be practiced to amend the number of users and penetration rate of mobile banking. Even if mobile banking is relatively new in Malaysia, it is very important for the banks to mitigate this issue and thus can draw more users. It is a fact that mobile banking is yet in its infancy and quite foreign to the people of Malaysia. The purpose of this study was to explore the affecting factors of intention to use of mobile banking in Malaysia. The issue of risk in term of security, privacy, financial, time and performance are the five important dimensions in risk factor that may affect the user's intention to adopt the mobile banking services. Therefore, this study attempts to further discuss on the elements of risk to have a better understanding of the adoption of the mobile banking. The findings of this study are very important for the banking services in Malaysia to have a better outcome and strategy to increase the penetration rate of mobile banking users.

Keywords: Mobile Banking, Decomposed Theory of Planned Behavior, Perceived Risk
JEL Classifications: M00

1. INTRODUCTION

Mobile technology is revolutionizing the way we live. The number of smartphone users globally has already topped one billion. Smartphone sales now exceed feature phone sales. Commercial enterprises must ensure they remain on the pulsation of the needs of the new mobile consumer in order to gain the most of the chance. Mobile banking is a new strategy for the bank to enhance their latest technology in a new dynamic marketing environment. Similar to internet banking, mobile banking offering customer's mobile access to the accounts they carry in the banks. According to Ensor and Wannemacher (2012) there is an advantage and opportunity to the bank client when using the mobile banking transaction such as funds transfer, checking of account balances at any time and can be done at everywhere. The study by Devlin (2006), customer have less time to spend on activities such as visiting a bank and thereafter want a higher degree of convenience and accessibility.

The rapid growth, adoption of the digital technology, particularly in smart phone users and other handheld gadgets become the principal way for the great unwashed to start out online. The recent statistic from the ITU World Telecommunication Report (2013) disclosed that there are nearly as many mobile-cellular subscriptions as people in the world, with more than half in the Asia-Pacific region (3.5 billion total subscriptions). While the mobile-cellular penetration rates stand at 96% globally, 128% in

developing countries, and 89% in developing nations. In Malaysia, the total penetration rate for the mobile banking user is still in the minority. A few researchers have been studies on the factors of diffusion in mobile banking adoption. One of the most popular studies is the aspect of trust. Trust is a prerequisite of social behavior, especially regarding important decisions. Granting to the trustees literature, trust/risk is two important determinants of intention behavior of people to carry out body processes that involve risk (Gefen, 2000).

1.1. Definition of Mobile Banking

Mobile banking refers to the use of smart phones or other mobile devices to perform tasks online banking from your computer, such as monitoring the account balances, transfer of funds between accounts, pay bills and find an ATM. Luo et al. (2010) defined mobile banking as an innovative method for accessing banking services via a channel whereby the customer interacts with a depository financial institution using a mobile device (e.g. Mobile phone or personal digital assistant). From an information system (IS) perspective, there is no question that mobile banking is one of the major technological innovations for financial institutions (Lin, 2011). Mobile banking can be regarded as a subset of e-banking or online-banking and refers to the shift of conducting financial transactions from wired networks to wireless networks (Clarke, I, 2008). Besides, mobile devices improve the tone of the service because clients can do transactions at their convenience wherever and whenever they desire it (Laukkanen, 2007).

Customers today can access to their bank account or made their transaction without the need to access to a computer terminal, in-fact they can execute at any time while they are on the go, when they are moving around, waiting for their bus to work, or when they are awaiting for their societies to get through in a restaurant (Soram, 2009). Mobile banking is also can be done via Short message service (SMS). There are two methods of SMS banking services widely used today; they are the push and pull SMS messages. Push SMS message is the message that the depository financial institution sends out to a customer's mobile phone, without the client initiating a request for the data. A model of push message could be a withdrawal alert, which alarms the user when a withdrawal is produced from his explanation. Pull SMS message is a request originated by the client, using a mobile phone, for obtaining information or executing a transaction in the bank account. This is a full duplex communication system where a user sends a petition to the bank and the bank replies with the information sought by the user. An example of pull SMS message is an account balance inquiry made by a user. The other means to categorize the mobile SMS banking services, by the nature of the service, gives us two kinds of services, that is inquiry based and transaction based. Then a request for your bank statement is an inquiry based service and a request for your fund transfer to whatever other bill is a transaction based service. Transaction based services are also differentiated from inquiry based services in the sense that they need additional security across the canal from the mobile phone to the bank's data servers.

Mobile banking offers many benefits and advantages to not simply customers or users, but also to the financial establishment that offers the service (Goswami and Raghavendran, 2009). New introductions to banks when customers will shift from traditional counter service to new mobile store and customers will be free to manage the hustle their digital transactions with transactions made immediately, while the banks use mobile banking has the result of significantly reducing the monetary value and facilitate change in retail banking (Laukkanen, 2007). One advantage of banks going online is the potential savings in the monetary value of keeping a traditional branch network (Shih and Fang, 2004). Ever since mobile banking was introduced consumers have the power to perform banking services 24 h a day using their mobile telephones without having to travel to a traditional bank branches or to encounter a computer with a broadband link to a personal transaction. This contributes to the simplicity of use of mobile banking as the amount the organization each time they require to increase their intentions to use the scheme and their preferred (Mohd Daud et al., 2011).

1.2. Mobile Banking in Malaysia

Malaysia must move into value-added industries, high knowledge to maintain competitiveness and economic prosperity. The Malaysian Government is constantly concerned in promoting the developed economy by 2020. Malaysian firms are utilized, the challenges of change and the use of technology, as the state has endured decades of economic transformation brought about by trade, global competition and rapid growth (Le and Koh, 2002). Presently there are 13 banks in Malaysia currently provide the mobile banking facility to their customers (Financial Stability and Payment System Report, 2013). In Malaysia, although the number of broadband subscriptions is 67.1%, yet the mobile banking penetration rate was just 12.7% last year against the total population. This implies that those who employ the mobile banking market are still the minority.

The report by Ministry of Communication and Multimedia Malaysia (2013) on the number of cellular telephone subscriptions and penetration rate as indicated in Table 1.

The report exposed, the more effort need to be practiced to amend the number of users and penetration rate of mobile banking. Even if mobile banking is relatively new in Malaysia, it is very important for the banks to mitigate this issue and thus can draw more users. It is a fact that mobile banking is yet in its infancy and quite foreign to the people of Malaysia. Thus, there is the possibility that mobile banking is still not known to and used by the customer of the bank. There is a need, therefore, to see the degree of acceptance of mobile banking by the customer and to study the factors that influence the intention to apply it for financial transactions (Baba and Muhammad, 2012). The importance of security and privacy for the acceptance of online banking was noted in many study of banking (Sathye, 1999; Tan and Teo, 2000). To be more precise, lack of security and privacy were found to be significant obstacles to the adoption of online banking (Chen and Barnes, 2007; Sathye, 1999). Roboff G (1998) found that people have a poor understanding of the security risks of online banking although they aware of the risks. Moreover, they noted that even though consumer confidence in their banks strongly but their confidence in technology is weak (Howcroft et al., 2002). The statistics as

Table 1: Mobile Banking Penetration Rate, 2013

Internet Banking and Mobile Banking Subscribers (end of period)								
Internet Banking					Mobile Banking			
million	Number of subscribers			Penetration to population (%)	million	Number of subscribers	Penetration rate (%)	
	Total	Individual	Corporate				To population	To mobile subscribers
2005	2.6	2.5	0.1	9.8	2005	127.6	0.5	0.7
2006	3.2	3.2	0.0	12.0	2006	246.7	0.9	1.3
2007	4.6	4.5	0.1	16.9	2007	367.6	1.4	1.6
2008	6.2	6.1	0.1	22.5	2008	574.6	2.1	2.1
2009	8.1	8.0	0.2	28.9	2009	675.0	2.4	2.2
2010	9.8	9.6	0.2	34.4	2010	898.5	3.1	2.6
2011	11.9	11.6	0.2	41.0	2011	1,560.3	5.4	4.3
2012	13.7	13.4	0.2	46.3	2012	2,446.2	8.3	5.9
2013	15.6	15.3	0.3	52.2	2013	3,793.0	12.7	8.8
Mar-08	5.0	4.9	0.1	18.0	Mar-08	397.5	1.4	1.6
Jun-08	5.4	5.3	0.1	19.4	Jun-08	423.5	1.5	1.7
Sep-08	5.8	5.7	0.1	21.1	Sep-08	536.2	1.9	2.0
Dec-08	6.2	6.1	0.1	22.5	Dec-08	574.6	2.1	2.1
Mar-09	6.7	6.5	0.1	23.8	Mar-09	627.4	2.2	2.2
Jun-09	7.2	7.0	0.1	25.6	Jun-09	566.1	2.0	2.0
Sep-09	7.5	7.3	0.2	26.7	Sep-09	621.4	2.2	2.1
Dec-09	8.1	8.0	0.2	28.9	Dec-09	675.0	2.4	2.2
Mar-10	8.3	8.1	0.2	29.0	Mar-10	751.2	2.6	2.4
Jun-10	8.9	8.7	0.2	31.1	Jun-10	823.5	2.9	2.6
Sep-10	9.4	9.2	0.2	33.0	Sep-10	834.6	2.9	2.6
Dec-10	9.8	9.6	0.2	34.4	Dec-10	898.5	3.1	2.6
Mar-11	10.2	10.0	0.2	35.3	Mar-11	998.2	3.4	2.9
Jun-11	10.9	10.7	0.2	37.6	Jun-11	1,131.0	3.9	3.2
Sep-11	11.3	11.1	0.2	39.1	Sep-11	1,261.5	4.3	3.5
Dec-11	11.9	11.6	0.2	41.0	Dec-11	1,560.3	5.4	4.3
Mar-12	12.4	12.2	0.2	42.1	Mar-12	1,731.2	5.9	4.7
Jun-12	12.6	12.3	0.2	42.6	Jun-12	1,889.1	6.4	4.8
Sep-12	13.1	12.8	0.3	44.4	Sep-12	2,129.8	7.2	5.3
Dec-12	13.7	13.4	0.2	46.3	Dec-12	2,446.2	8.3	5.9
Mar-13	14.0	13.8	0.3	46.9	Mar-13	2,898.1	9.7	6.8
Jun-13	14.6	14.3	0.3	48.8	Jun-13	3,245.6	10.8	7.6
Sep-13	15.1	14.8	0.3	50.5	Sep-13	3,520.1	11.8	8.1
Dec-13	15.6	15.3	0.3	52.2	Dec-13	3,793.0	12.7	8.8

Source: Financial Stability and Payment System Report, Bank Negara Malaysia, 2013

per Tables 1 and 2 are evidence of mobile banking indicates that utilization and acceptance among consumers in Malaysia remains unclear. To provide a deeper understanding of the perceived risks of adopting online banking, we carried out a more in-depth study of the characteristics of the perceived risks. We divide perceived risk into five categories: performance, financial, time, security and privacy risks, as theorized by Jacoby and Kaplan (1972), in order to clarify which risk facets are more important in this field.

1.3. Problem Statement

Mobile banking services are still in their infancy stage, leaving a great deal for development. There is a need, therefore, to understand the customer acceptance of mobile banking and identify factors influencing their intention to use mobile banking (Luarn and Lin, 2005). A wide range of mobile services such as mobile phone instant messaging, mobile search and mobile music has become very popular among users. This service is mainly related to the application of the communications, information and entertainment. However, mobile service mobile banking transactions have been applied by a small number of users (Zhou, 2011). Even if mobile banking is relatively new in Malaysia compared with Internet banking, it is very important for banks

Table 2: Number of Cellular Telephone Subscription and Penetration Rate, 2013

Year	Qtr	Postpaid ('000)	Prepaid ('000)	Total ('000)	Penetration rate per 100 inhabitants
2012		7,375	33,950	41,325	142.5
2013	1	7,471	34,974	42,445	143.3
	2	7,534	35,070	42,604	143.4
	3	7,595	36.006	43.601	146.2
	4	7,645	35,311	42,956	143.6

The penetration rate refers to the total subscriptions divided by the total population and multiplied by 100. A penetration rate is over 100% can occur because of multiple subscriptions

to check this uses factors influencing customers' intent to receive and take measures necessary to address this issue and thus attract many banking customers to use this system. It is a fact that mobile banking is still in its infancy and quite alien to the people of Malaysia. Therefore, there is the possibility that mobile banking is still not known to and used by the customer of the bank. There is a need, therefore, to understand the level of adoption of mobile banking by the customer and to study the factors that influence the intention to use it for financial transactions (Baba and Muhammad, 2012). These statistics are evidence of mobile banking indicates

that usage and acceptance among consumers remains unclear. Security and privacy are two important dimensions in risk factor that may affect the user's intention to adopt the e-transaction based. Encryption technology is the most common in all bank site for secure privacy information, coupled with the combination of different unique identifiers, for example, the password, the name of the mother, a date that cannot be forgotten or a few minutes of inactivity the user logon account will be logoff automatically (Poon, 2008a).

2. LITERATURE REVIEW

There are few studies by previous researchers on mobile banking adoption in Malaysia. Mohd Daud et al. (2011) their study in determining critical success factors of mobile banking in Malaysia, using the extended Technology Acceptance Model (TAM). Their survey of 300 banking users resulted the perceived usefulness, perceived credibility and awareness about mobile banking have significant effect on users attitude and influence the intention toward mobile banking. Baba and Muhammad (2012) adopts TAM to investigate the factors of individuals intention to use mobile banking among the bank customer in Labuan and Kota Kinabalu. Determinants are perceived usefulness, perceived ease of use, perceived credibility and perceived self-efficacy. Hanudin et al. (2008) examines the factors that determine intention to use mobile banking among Bank Islam Malaysia Berhad customers and using the extended TAM and the result of their study revealed that perceived usefulness and perceived ease of use are strong determinants of behavioral intention to adopt mobile banking. Masrek et al., (2012) examined the aspect of trust factor as a critical issue identified in intention to use mobile banking. There are three element of trust built in their study i.e. the retail bank that provide the mobile banking services, the mobile telecommunication provider that provide mobile banking services and the mobile gadget that is used as a medium for engaging in mobile banking. Poon (2008) explore the determinants of users adoption momentum of e-banking in Malaysia. The result of their study indicates that all elements of 10 identified factors i.e., convenience of usage, accessibility, features availability, bank management and image, security, privacy, design, content, speed and fees and charges are significant with respect to the user adoption of e-banking services. Privacy and security are the major roots of dissatisfaction, which have momentously impacted user satisfaction. The above mentioned studies assist us to understand the mobile banking in Malaysia. However, all of the above did not explain on the issue of risk in mobile banking services. Thus, this study would like to extend the risk factor as a gap in intention to use of mobile banking service.

2.1. Perceived Risk

Perceived risk in this study generally defined as a perception of the risks inherent in the use of open internet infrastructure for the exchange of personal information, and it often operates as a multi-dimensional construct (Chen, 2013). Previous studies have incorporated risk is seen as the main antecedent behavior intention towards the purchase of e-commerce (Featherman and Pavlou, 2002). According to Jarvenpaa et al. (1999) trust belief has been found to help in explaining how consumers can overcome perceived risk and engage in online transactions. In respect of consumer attitudes to online banking and mobile, the perceived risk is the most important factor that encouraged or discouraged the use of online banking (Laforet and Li, 2005a). Security and privacy are two important dimensions in risk factor that may affect the user's intention to adopt the e-transaction based. Encryption technology is the most common in all bank site for secure privacy information, coupled with the combination of different unique identifiers, for example, the password, the name of the mother, a date that cannot be forgotten or a few minutes of inactivity the user logon account will be logoff automatically (Poon, 2008a). The study by conduct by Sathye (1999) showed that the main factors affecting the absorption of internet banking users in Australia is the security concerns and lack of awareness of internet banking and it benefits. Consumer attitudes about whether mobile banking or mobile payment technology is secure enough correlation by using this technology. Consumers have shown reluctance to complete online transactions (Hoffman et al., 2002), primarily due to risk concerns (Jarvenpaa et al., 1999). Therefore, perceived risk is seen as the main barrier of consumer acceptance of e-services in an environment of e-commerce (Featherman and Pavlou, 2002). Lee (2009) found that all five risk aspects: security, finance, time, social and performance risks, appear as negative factors in the intention to adopt online banking. A study conducted by Wu and Wang (2005) carried out on mobile commerce, where more than three-fifths (60%) of the respondents had experience of online transactions, indicate that the perceived risks that have a positive influence behavior intended to use the product.

2.1.1. Perceived privacy

Perceived privacy refers to a level of inconsistency between the customer and the judgment and actual behavior, as well as the failure of technology to deliver the results expected and subsequent losses (Koenig-Lewis et al., 2010). Lee (2009) is defined as the potential losses due to fraud or hackers that affect user security online banks. Phishing is the new criminal skills that phishers try to fraudently obtaining sensitive information, such as usernames, passwords and credit card information, by masquerading as a trust-worthy entity in an electronic communications (Reavley, 2005). Although related to internet transactions for some time, can increase risk of transactions through mobile devices (Gerrard and Cunningham, 2003). For mobile banking, the perceived risk is more important, because the threat of privacy concerns and security (Luarn and Lin, 2005). Therefore, the mobile banking users are worry on the risk since more points in the telecommunication process can be found between mobile phones as compared with the fixed devices (Corradi et al., 2006). According to Poon (2008a), some of the users are worried if their accounts being hack and can access through their personal account details by way of stolen PIN codes.

2.1.2. Perceived security

Perceived security defined as the individual perception when log in to the system. Security appears to be a significant factor associated with mistrust in the internet banking service. Breach of security may cause various problems, including details of the operating system or prevent unauthorized access to the information, and the customer do not trust the security infrastructure on the internet.

Security is a very important factor for customers to use mobile banking services. According to Polasik and Wisniewski (2009) perceived security shown a strong predictor influence by the internet banking users in Poland. Perceived security seen has been found to have a significant effect on computer banking adoption (Lee et al., 2003). Perceived security was found to be having a significant effect on computer banking adoption. A significant and positive impact on security and privacy risks seen in views has been proved by Chen (2008). Their study confirms that security and privacy are important and positive impact on the risk. A study by (Poon, 2008b) on e-banking services in Malaysia has also confirmed that security and privacy are positive and significant impact on consumers' acceptance of the technology.

2.1.3. Financial risk

It is defined as the potential financial losses as a result of misuse of the error or the bank account transactions. According to Kuisma et al. (2007) many customers are afraid to lose money while performing a transaction or transfer money through the internet. Online banking transaction presents less guarantee given in the traditional environment through official proceedings and receipts. Therefore, users often have difficulty to request compensation when the error of the transaction occurs.

2.1.4. Time risk

It may refer to lost time and inconvenience caused by the delay in receiving payment or the difficulty of navigation (finding appropriate services and hyperlinks). Two main causes of dissatisfying online experience which can be regarded as the risk of time/facilities including structured or misleading websites and pages that are too slow to download (Forsythe and Shi, 2003). It may also relate to the length of time involved in waiting website or learn how to operate the online banking website.

2.1.5. Performance risk

This refers to the losses incurred by the lack of or damage to other websites, online banking. Customers will often feel that a breakdown of the system server or disconnections because these situations can cause unexpected losses (Kuisma et al., 2007). These may relate to the ability of the consumer to undertake the transaction, or to effect the transaction within what is considered a reasonable time. In the meantime, the effectiveness of the mobile service, including download speed, and the time it takes to move from one part of other mobile service may also have some effect. Thus, the risk that the new service will not meet the requirements of the consumer.

3. DECOMPOSED THEORY OF PLANNED BEHAVIOR (DTPB)

The DTPB model is adapted from Taylor and Todd (1995), using such constructs as relative advantage, complexity, compatibility from the diffusion of innovation theory Rogers (1983) and perceived behavioral control. The DTPB model has advantages over other models that it identify the specific features of the belief is likely to affect the use of information technology. In particular, the model found to have better prediction power when compared to traditional TPB model and model acceptance of technology (Ndubisi, 2004). The model, DTPB is using the constructs from the innovation literature (for example, a relative advantage, and compatibility). It also explored (for example, the social influence) subjective norms and behavioral control seen more fully by decomposing them into more specific dimension. It provides a comprehensive way to understand how individual attitudes, subjective norms and control behavior seen can influence his intention to use the Internet banking services (Tan and Teo, 2000).

Many studies have focused on behavioral intention or intend to use behavioral intentions and interpreted in relation to the context of the study. TPB and TAM was developed as an extension of Ajzen and Fishbein and theory of reasoned action (TRA). TRA is understood as a general structure designed to explain almost all human behavior and based on the importance of an individual's beliefs for prediction of behavior (Fishbein and Ajzen, 1975). Taylor and Todd (1995) revealed that the decomposed model of the TPB has better explanatory power than the pure TPB and TRA models. So, the argument of our empirical study is that mobile banking is a technological innovation and thus the decomposed TPB model gives a more satisfactory explanation of adoption intention. The attitude is defined as the positive or negative individual feeling (the effects of evaluative) about doing the target behavior (Fishbein and Ajzen, 1975). Research shows attitude towards electronic banking and real behavior is also influenced by factors such as customer satisfaction/dissatisfaction with current banking services, reference group, namely the influence of family and others and this computer attitudes would affect the behavior towards banking online (Laforet and Li, 2005b). Subjective norm describes the social pressure that may affect an individual's intention to perform. Subjective norm describes the social pressures that may affect an individual's intent to perform (Ajzen and Fishbein, 1980). Subjective norm defined as the degree of individual's perception of the extent to which the social environment. The antecedents can be their family, friends, colleagues, authority figures or media. Perceived behavioral control in this study refers to the respondents perception regarding accessing and opportunity needed towards using mobile banking. The importance of actual behavioral control is a clear: resources and opportunities that are available to a person must be a little set the potential achievement of the behavior. Psychological significance larger than the actual control, however, the perception of control behavioral control and impact to the intentions and actions (Ajzen, 1991).

The framework as per Figure 2 developed based on the review of the literature. This study uses the DTPB model includes another antecedent factor which is perceived risk as a new construct. The study by Gupta and Xu (2010) suggested that, whenever risk involved it will slow down the adoption of technology due to security concern. As mentioned by Bauer et al. (2005) consumers ' perceived risk is highly influence the willingness of users to adopt mobile marketing innovation since using of mobile marketing service is also involved in providing personal information, privacy, security, and others. This study described widespread research model that hypothesized in this study and will empirically investigate. The study will also explain in details the relationship within variables and

Figure 1: Decomposed theory of planned behavior (Taylor and Todd, 1995)

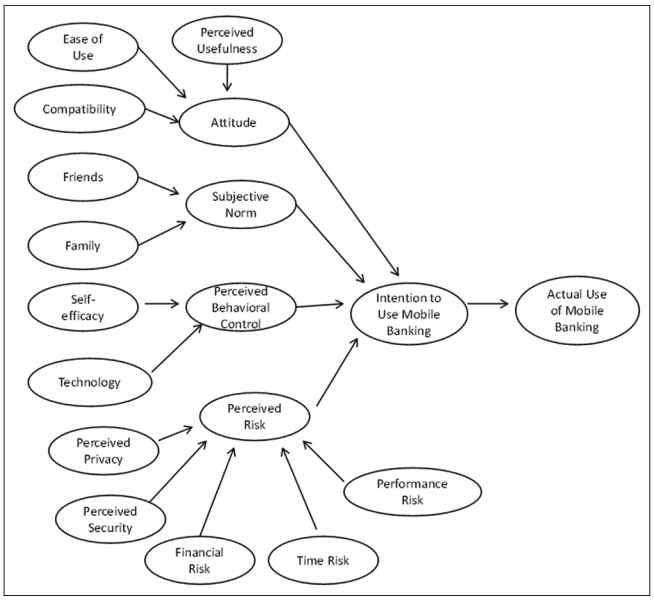

Figure 2: Theoretical framework

supported by the underpinning theory. The theoretical framework formulated based on study of the DTPB by Taylor and Todd (1995), the research problem as well as after review of past research. This study focused on descriptive and causal research (hypothesis testing), since the objective of this study is to examine the factors that influence the intention to use and actual use of behavior. Therefore the following hypotheses are predicted:

3.1. Hypotheses Development

3.1.1. Hypotheses about DTPB

Based on the theoretical model developed in Figure 2, we formulated the following research hypotheses. As DTPB are used as the base models, we need to test the following DTPB hypotheses in the context of mobile banking adoption. The hypotheses are proposed based on DTPB as discussed in Section 3 while the hypotheses 5, 6, 7, 8, 9 and 10 based on DTPB as per Figure 2.

H1: Perceived usefulness significantly affects the intention to use mobile banking.

H2: Attitude significantly affects the intention to use online banking.

H3: Subjective norm significantly affects the intention to use mobile banking.

H4: Perceived behavior control significantly affects the intention to use mobile banking.

3.1.2. Hypotheses regarding perceived risk

Perceived risk in this study generally defined as a perception of the risks inherent in the use of open internet infrastructure for the exchange of personal information, and it often operates as a multi-dimensional construct (Chen, 2013). Therefore the following hypotheses are proposed:

H5: Perceived risk significantly affects the intention to use mobile banking.

3.1.3. Hypotheses regarding perceived security

Perceived security defined as the individual perception when log in to the system. Security appears to be a significant factor associated with mistrust in the online banking service. Breach of security may cause various problems, including details of the operating system or prevent unauthorized access to the information, and the customer do not trust the security infrastructure on the internet. Security is a very important factor for customers to use mobile banking services. Thus, it hypothesized that:

H6: Perceived security significantly affects the perceived risk toward using the mobile banking.

3.1.4. Hypotheses regarding perceived privacy

Perceived privacy refers to a level of inconsistency between the customer and the judgment and actual behavior, as well as the failure of technology to deliver the results expected and subsequent losses (Koenig-Lewis et al., 2010). The following hypotheses are thus posited:

H7: Perceived privacy significantly affects the perceived risk toward using the mobile banking.

3.1.5. Hypotheses regarding financial risk

Financial risk refers to the potential for financial loss caused by errors or misuse of bank account transactions. Many users resist using online banking because they are afraid of losing anything (Kuisma et al., 2007). We therefore hypothesize:

H8: Financial risk significantly affects the perceived risk toward using the mobile banking.

3.1.6 Hypotheses regarding time risk

Current research also suggests that some users are very time oriented and worry about potential risks 'waste of time' spent performing, learn how to use and problem solving new e-services.

These time-conscious consumers likely to adopt an e-service that they consider to have high switching, setup and maintenance costs (Featherman and Pavlou, 2002). Therefore, we test the following hypotheses:

H9: Time risk significantly affects the perceived risk toward using the mobile banking.

3.1.7. Hypotheses regarding performance risk

The performance risk refers to losses incurred by deficiency or malfunction of online banking websites. Performance risk is concerned with how these products will do compared with expectations. User evaluation of the risks of performance is based on the knowledge and cognitive ability in the domain specific products (Littler and Melanthiou, 2006). Online banking information asymmetry and lack of personal contact is preventing the user correctly evaluate the features of products, reduce confidence (Ba, 2001). We hypothesize that:

H10: Performance Risk significantly affects the perceived risk toward using the mobile banking.

This study attempts to determine the level the factors that influence the intention to use and actual use of behavior of mobile banking usage. The unit of analysis for this study will be a full time student in local universities. The unit of analysis chosen is because to get an accurate data by getting a larger sample of mobile banking customer. This study treats each response by the student as an individual data source. Self-administered questionnaire will be used to collect data on each of the study variables.

4. CONCLUSION

This study examined the relative role of risk of mobile banking in Malaysia is still in infancy stage. Thus, it is a needed to identify the factors of lower adoption. The purpose of this study is to examine the effect of risk on mobile banking user adoption. The service providers need to improve the risk factor to ensure the maximum usage of mobile banking service. The study indicates that the categories of risk, which are the perceived privacy, perceived security, financial risk, time risk and performance risk are critical in establishing consumer trust leading towards mobile banking adoption.

The paper aims to investigate the factors that affect the adoption of mobile banking in Malaysia. This study will provide an explanations and understanding on the customer acceptance in mobile banking study in a several ways. In term of theoretical contribution, this study will improves the existing literature as the findings and the proposed framework will serve as a practical guideline for researchers to enhance their future research. In addition, this study will contribute to create knowledge in the literature to the ability to predict the intention of adoption and behavior within the framework of various sampling. From the practical perspective, the results of this study will also be directed to the practitioner in recognizing the various drivers and the challenges likely to acceptance of mobile marketing services. Implications for management, accuracy in determining the acceptance and consumers' interests is very important. The result of this research, which expected to contribute to a better outcome and strategy to increase the penetration rate of mobile banking users in Malaysia.

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