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DETERMINING INTENTION TO USE SMARTPHONE BANKING APPLICATION AMONG MILLENNIAL COHORT IN MALAYSIA

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ABSTRACT

The numbers of smartphone banking applications have risen over the years. Gaining popularity of smartphone banking apps resulted in many millennials switching from internet banking to mobile banking apps. The purpose of this study is to determine the factors that influence millennials' behavioral intention to use smartphone banking applications. The research framework is developed base on the technology acceptance model (TAM). A total of 310 questionnaires were distributed to the users of smartphone banking apps in Klang Valley area of Malaysia. The partial least squares structural equation modeling (PLS-SEM) technique is employed to process and analyze the data. The two-step approach involves in analyzing the data. Firstly, measurement model assessment which is associated with indicator loadings. Secondly, the structural model which is associated with path coefficient measures. The findings from this study reveal that perceived usefulness, perceived ease of use, perceived trust and perceived security have a positive and significant influence on behavioral intention where perceived security has a stronger influence on trust and perceived ease of use on perceived usefulness. The findings from this study will benefit the banking apps service provider to ensure the best mechanism to be implemented to gain customers' attention.

Contribution/Originality: This study is one of the very few studies which have investigated perceived security and perceived trust as variables to support the technology acceptance model (TAM) in the Malaysian context.

1. INTRODUCTION

In recent decades, the banking sector has been providing distinct opportunities to its consumers through mobile banking because of the rapid advancement of technology especially 'mobile device' (Tam & Oliveira, 2017; Tran & Corner, 2016; Zhang, Lu, & Kizildag, 2018). Mobile banking is prescribed as a channel where the customer interacts directly with a bank via mobile devices, such as a smartphone (Tran & Corner, 2016). Products and services are offered through mobile banking channels by financial institutions to serve their consumers who are using portable devices such as smartphones. Due to the increasing number of mobile banking services, numbers of people are shifting from getting services at the physical bank to smartphone banking services (Srivastava, 2013). The services provided by the smartphone banking application let their users to access financial and non-financial services such as balance inquiry, account management, bill payment, PIN change, cheque-book request (Shaikh & Karjaluoto, 2015) and prepaid reload for mobile phone can be done using mobile banking application.

The use of smartphone applications has been studied in the various context of apps such as mobile payment (Teo, Tan, Ooi, Hew, & Yew, 2015) mobile banking applications (Baptista & Oliveira, 2016). With the proliferation of smartphone technologies and the internet, the number of mobile banking apps has increased in Malaysia. The main reason to increase the demand for mobile banking apps is convenience (Shim, 2019). It is reported by the central bank that internet banking subscribers were 31.8 million and mobile banking subscribers end of the month of December 2019 were 17,229,900 respectively (Bank Negara Malaysia, 2019) and mobile banking transaction increased from 13.6 million in 2011 to 2.2 billion in 2018 approximately (Muller, 2020).

Less attention has been paid to study millennials generation in terms of behavioral intention to use smartphone applications for banking. Although the number of mobile banking subscribers in Malaysia has increased rapidly, the perception of millennials' behavioral intention to use mobile banking remains inadequate because actual subscribers of mobile banking may not be active users. It is crucial to study millennials generation as they grow up in the era of technology and regarded to be technologically savvy.

The present study uses the extended Technology Acceptance Model developed by Davis (1989) to fill the gaps which are derived from the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1975). Perceived usefulness (PU), perceived ease of use (PEU), behavioral intention to use (BI) and actual use (AU) are the variables of TAM which predicts the use of information system. Therefore, TAM model has extended in this study to investigate the further factors. However, the objectives of the study, literature review and development of the proposed model, methodology, and suggestions for further study along with conclusion will be highlighted in the following sections.

The main objective of this paper is to investigate factors that influence millennials' intention to use mobile banking applications as a payment method. To meet the special objective of this study four variables such as perceived usefulness (PU), perceived ease of use (PEU security (SEC) and trust (TR) are chosen to see effects on behavioral intention (BI). The remaining paper exhibits five sections include literature review, research methodology, results and findings and limitation and future research directions.

2. LITERATURE REVIEW

2.1. Extended Technology Acceptance Model

In many technology-related contexts, the validity of TAM had identified as a stingy model in various studies (Davis 1989; Davis., Bagozzi, & Warshaw, 1989) cited in Barry and Jan (2018). TAM's stinginess in many literature reviews defined as a key limitation (Venkatesh & Davis, 2000; Vijayasarathy, 2004). It is in fact the theory of information services that model how users adopt and use a technology (Dauda & Lee, 2015). Several researchers have extended the TAM model and applied it to many different technology-related studies consist of e-learning (Al-Maroof & Al-Emran, 2018; Cheung & Vogel, 2013) m-commerce (Barry & Jan, 2018) and short message service (Muk & Chung, 2015) because the variable of TAM may not capture the key factors to determine consumers' intention to use information system (Ha & Stoel, 2009). To study the usage intention of new technology, TAM is considered as well-recognized extensions in academic research (Aydin & Burnaz, 2016). It is further advised to include a few additional variables to strengthen the TAM model (Jaradat, 2013). One of the extended variable "security" found to have antecedents of intention to use a particular information system (Barry & Jan, 2018). Based on the above statements, this study includes security (Barry & Jan, 2018) and trust (Singh & Srivastava, 2018) as extended variables to examine the behavioral intention to use smartphone mobile banking apps. The other two variables are perceived usefulness and perceived ease of use.

2.2. Behavioural Intention

Intention describes as individual goal to achieve something (Zhao & Othman 2010). The behavioral intention however described as a person's subjective probability that he intends to attain within a period (Ajzen 1988). It

refs to the way a person who will act in the future (Fishbein & Ajzen, 1975). The behavioral intention has been widely studied and considered as the best predictor of behavior (Fishbein & Ajzen, 1975) in consumer behavior research (Im, Hong, & Kang, 2011; Martins, Oliveira, & Popovič, 2014). An extended study has been utilized TAM model to investigate behavioral intention to use technology particularly in the area of m-banking, internet banking, m-commerce and services (Arenas Gaitán, Peral Peral, & Ramón Jerónimo, 2015; Baptista & Oliveira, 2016; Barry & Jan, 2018; Gupta, Dogra, & George, 2018).

2.3. Perceived Usefulness

Perceived usefulness describes as a degree to which an individual believes that using a information system will lengthen their productivity (Davis 1989). In TAM model, perceived usefulness hypothesizes to predict the direct relationship with behavioral intention to use information system (Park, Rhoads, Hou, & Lee, 2014). Perceived usefulness often referred as a degree to which a person believes that using a given system would strengthen their job performance. Perceived usefulness is a strongest TAM element that has a significant and positive impact on behavioral intention (Davis. et al., 1989). A study conducted by Al-Maroof and Al-Emran (2018) found perceived usefulness to have significant and positive relationship with behavioral intention to use technology such as Google classroom. Prior study of Baker-Eveleth and Stone (2015) found that, the usefulness of using electronic textbook enhance consumers continuance intention to use. Abbas and Hamdy (2015) found a positive relationship between perceived usefulness and continuance intention to use cellular services. Li and Liu (2014) studied information systems in the context of online travel services; found that perceived usefulness has a significant positive relationship with intention to use IS. Lin and Wang (2012) found perceived usefulness to have a major impact on behavioral intention to use the e-learning system. According to Venkatesh., Morris , Davis , and Davis (2003) extended TAM model, perceived usefulness found to have significant and strongest factors to predict intention to use a particular information system. Mun and Hwang (2003) found a positive and significant relationship associated with perceived usefulness and behavioral intention. With that above-mentioned literature, the following hypothesis is proposed:

H1: perceived usefulness will have a positive influence on behavioral intention to use smartphone banking applications.

2.4. Perceived Ease of Use

The TAM model signifies perceived ease of use as one of the major factors that have a positive impact on technology use (Davis. et al., 1989). The term perceived ease of use (PEU) means a degree to which using a system will be effortless (Davis 1989) Consumers, however, tend to use the technology if the given system is not only useful but also easy to use. Jackson, Chow, and Leitch (1997) posited that perceived ease of use significantly and positively predicts behavioral intention to use (BI) an information system.

A research by Venkatesh., Speier, and Morris (2002) shows the positive and significant relationship between perceived ease of use and behavioral intention to use technology. Barry and Jan (2018) studied m-commerce using TAM, the result shows a positive and significant relationship between perceived usefulness and behavioral intention to use but a negative relationship between PEU and BI. Karim, Haque, Ulfy, Hossain, and Anis (2020) found from their study related to e-wallet apps that, PEU and BI are positively and significantly related. Additionally, correlation between PEU and BI found to be significant in the study. Four longitudinal TAM fields expanded by Venkatesh and Davis (2000) show that perceived ease of use positively influences perceived usefulness and behavioral intention to use. A study conducted by Al-Maroof and Al-Emran (2018) on undergraduate students reveals the use of technology is easy and user-friendly. Thus, PEU has a positive impact on perceived usefulness and behavioral intention. Thus, the following hypotheses are formed:

H2a: perceived ease of use will have a positive influence on behavioural intention to use smartphone banking applications.

H2b: perceived ease of use will have a positive influence on the perceived usefulness of smartphone banking applications.

2.5. Perceived Security

Security is a major concern when financial transactions are performed via electronic channels. This could therefore be one of the major obstacles to mobile banking adoption, because personal or financial records could be exposed and used for fraudulent practices. Kalakota and Whinston (1997) described security as a threat which involves an event related to data theft, destruction, modification of data, fraud case, breaching and abuse. Customers may not trust the provider of the information system and will deny any transaction via e-payment unless the privacy and security features are involved (Gitau & Nzuki, 2014). The study of Karim et al. (2020) found security as an important factor to determine the behavioral intention among young adults to use tech-related products such as e-wallet apps. Customers would be more willing to trust the new service if their activity related to the transaction are adequately protected (Singh & Srivastava, 2018). Trust is strengthened by the security features provided by mobile banking services. Trust, therefore, plays a crucial role in the adoption of mobile banking, helping consumers to address the concerns about security/privacy threats and fraudulent smartphone activities (Afshan & Sharif, 2016). Based on the above literature, the author proposed the following hypotheses:

H3a: Perceived security will have a positive influence on behavioural intention to use smartphone banking applications.

H3b: Perceived security will have a positive influence on trust to use smartphone banking applications.

2.6. Perceived Trust

Trust is the degree which describes service holders' belief on service provider regarding to ensure the transaction security (Komiak & Benbasat, 2004). Trust is a significant predictor of adoption of mobile payment and mobile shopping (Chong, 2013; Wang & Lin, 2017) and influence purchase intention (Xie, Batra, & Peng, 2015) and repeat purchase (Chiu, Huang, & Yen, 2010). Although trust has been widely researched in the field of information technology, it is yet to be researched in the field of smartphone banking apps. Trust is seen as one of the key barriers that keep people from adopting internet banking technology (Nor, 2007). Akhlaq and Ahmed (2013) found that lack of trust has a negative impact on intention to use Internet banking. As electronic transactions include confidential details and the transfer of valuable funds through the Internet, trust will be favorably affected by increased privacy and security expectations among internet banking customers, resulting in greater intention of using internet banking. Therefore, the following hypothesis is formulated:

H4: Perceived trust will have a positive influence on behavioral intention to use smartphone banking applications.
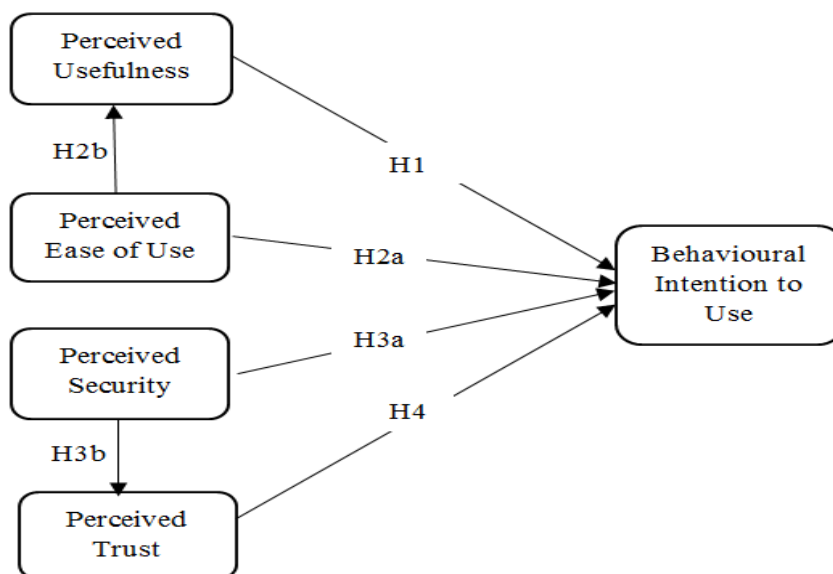

Figure-1. Proposed Hypothesized Model

3. RESEARCH METHODOLOGY

3.1. Construct Measurement

The research model comprises of five constructs, including perceived usefulness, perceived ease of use, perceived security, perceived trust and behavioral intention to use. All the measuring elements are adapted from previous research and further adjusted to ensure that all the elements are valid, hence represent the constructs. In this study, the survey questionnaire is developed based on TAM theory and items were adapted primarily from Barry and Jan (2018) and Al-Sharafi, Arshah, Abo-Shanab, and Elayah (2016). Five-point likert scale (i.e. 1= strongly disagree to 5= strongly agree) are used to measure all the measurement items to express the level of agreement among the respondents. Each item of the questionnaire is designed using the English language only. The last section of the questionnaire was asked the background information of the respondents such as, gender, age, ethnic group, monthly income and which bank application using mostly.

3.2. Data Collection

A total of 310 questionnaires are collected from the Klang Valley area in Malaysia and those only 262 are selected for the data analysis. Data for this study are collected by utilizing the month of January and February 2020. Data is collected via an online survey and face-to-face distribution. The target respondents were those who have been using smartphone banking applications for long and used at least for a while.

4. ANALYSIS AND RESULT

4.1. Demographic Profile

Table-1. Demographic profile.

Measure	Items	Frequency	Percentage
Gender	Male	113	43.13
	Female	149	56.87
Age	21-24	45	17.18
	25-30	153	58.4
	31-39	64	24.42
Ethnic Group	Malay	125	47.71
	Chinese	88	33.59
	Indian	33	12.6
	Other	16	6.1
Monthly Income	Below RM 1000	61	23.28
	RM 1000- RM 2999	138	52.67
	RM 3000- RM 4999	46	17.56
	RM 5000 and above	17	6.49
Which Banking Apps do you use most?	CIMB Clicks (CIMB Bank)	52	19.85
	Maybank2u (May Bank)	67	25.57
	RHB now (RHB Bank)	38	14.5
	Am Online (Am Bank)	44	16.8
	Hong Leong Connect	19	7.25
	Bank Islam Go (Bank Islam)	23	8.78
	Others	19	7.25

After removing 48 missing data, a total of 262 data are analysed using PLS-SEM version 3.0. For descriptive statistics, frequencies and percentage of each characteristic are calculated. Valid data represents 84.5% of the total 310 distributed questionnaire. Female respondents represent 56.87% while male 43.13% of the total sample population. Most of the respondents (58.4 %) are in the age group between 25 and 30. Most respondents (47.71%) are Malaysian and the remaining (52.29%) are non-Malaysian. The majority of the respondents' (52.67%) monthly income is between RM1000- RM2999; followed by below RM1000 (23.28%) and RM3000-RM4999 (17.56%). Respondents then are asked about the banking application they use most. Majority responded maybank2u (25.57%)

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among all other banking applications in Malaysia; followed by CIMB Clicks (19.85%), Am Online (16.8%), RHB now (14.5%). Detailed demographic data of respondents are presented in Table 1.

4.2. Measurement Model

Convergent and discriminant validity tests were performed to assess the measurement model. To test convergent validity, each construct of composite reliability and Cronbach'α values should be higher than 0.7 (Chin, 1998). Current study shows the composite reliability (CR) values ranging from 0.965 to 0.982 and Cronbach'α values from 0.952 to 0.977. Guideline for loadings are to be higher than 0.5 as conferred by Hair, Black, Babin , Anderson , and Tatham (2006). Although loading of more than 0.7 reflects more variance. Figure 2 shows the loadings for each indicator are way higher than 0.7, ranging from 0.920 to 0.977 indicates good loading. The AVE value equal to or above 0.50 implies that on the average, the construct clarified more than half the variance of its indicators. By comparison, an AVE of less than 0.50 suggests that there is still more error in the items than the average variance described by the constructs. The rule of thumb, therefore, is that an AVE value greater than or equal to 0.50 is appropriate (Hair, Ringle, & Sarstedt, 2013). AVE for current study ranging from 0.874 to 0.946. The test result of the current study may therefore infer the strong reliability of all the items.

Discriminant validity concerns the uniqueness of a construct, whether the phenomenon captured by a construct is special and not reflected in the model by the other constructs (Hair et al., 2013). Discriminant validity can indeed be evaluated by comparing cross loads among constructs, using the Fornel-Larcker criterion and the Heterotrait-Monotrait (HTMT) correlation ratio. Discriminant validity of a construct can also be measured by comparing the square root of the AVE values with the latent variable correlations (Fornell & Larcker, 1981). Table 2 shows the strong discriminant validity as it shows that each factor's square AVE is greater than all its correlations with the other factors.

Table-2. Convergent validity and reliability

Variables	AVE	CR	α	BI	PEU	PS	PT	PU
BI	0.914	0.982	0.976	0.956				
PEU	0.881	0.967	0.955	0.579	0.939			
PS	0.874	0.965	0.952	0.635	0.406	0.935		
PT	0.946	0.981	0.971	0.647	0.537	0.65	0.972	
PU	0.898	0.982	0.977	0.589	0.693	0.444	0.487	0.948

4.3. Structural Model

Using the bootstrap re-sampling technique (5000 re-sample) the path-coefficient was then tested to investigate the significance of hypotheses. The t-value> 1.96 is significant at p<0.05 and t-value> 2.58 is significant at p< 0.01 (Hair, Sarstedt, Ringle, & Gudergan, 2017).

Figure 2 and Table 3 describes the path coefficient (β), t-statistics and p-value of each hypothesis. According to the findings in Table 3, all proposed hypotheses were supported which indicates direct relationship. H1 (β= 0.210, t= 2.530) indicates the path between perceived usefulness of smartphone banking application (PU) and behavioural intention to use (BI); describing a significant positive relationship in between. H2a (β= 0.174, t= 2.064) shows the path between perceived ease of use and behavioural intention which shows the significant positive relationship between PEU and BI to use smartphone banking applications. H2b (β= 0.693, t= 15.141) describes that perceived ease of use (PEU) has positive and significant effects on perceived usefulness (PU). H3a (β= 0.308, t= 3.579) ascertains the direct, positive and significant relationship between PS and BI. H3b (β= 0.693, t= 15.141) indicates the relationship between perceived security (PS) of smartphone banking applications and perceived trust (PT) were positive and significant thus, supported for the current study. Lastly, H4 (β= 0.251, t= 2.907) alludes that there was a significant positive association between perceived trust (PT) and behavioural intention to use smartphone banking apps.
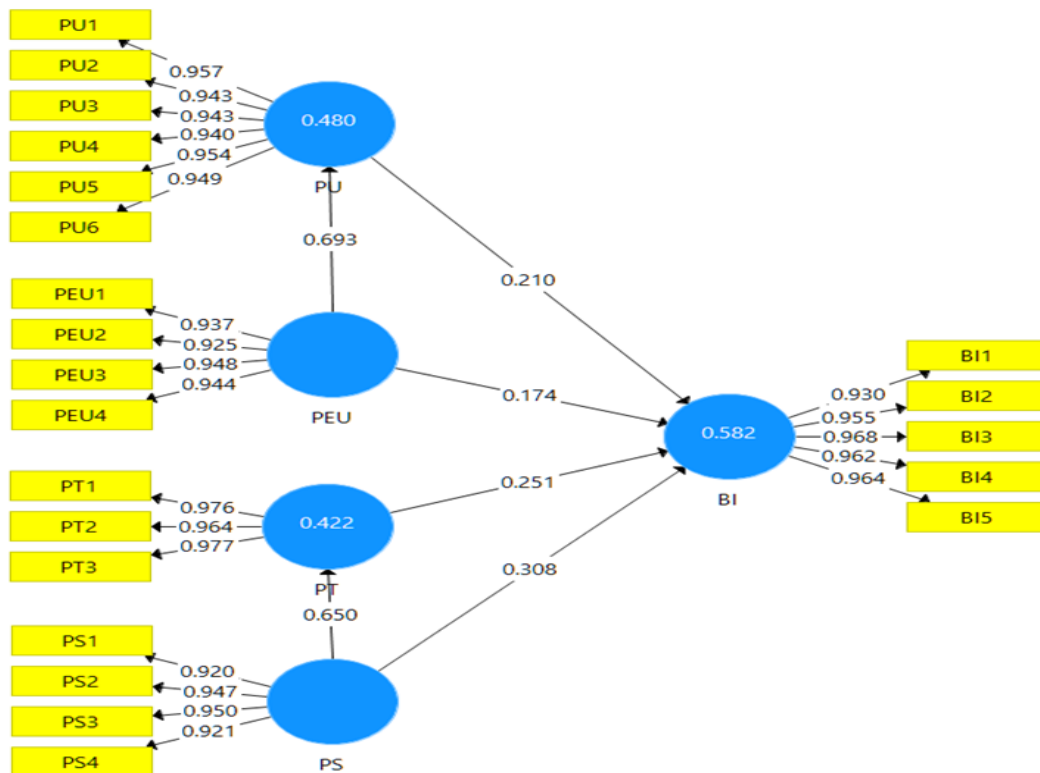
Figure-2. The PLS-SEM test results.

In PLS analysis, prediction power of a specific construct and to determine the standard path coefficient for each relationship between exogenous and endogenous variable is evaluated using the endogenous variables' R-squared (R^2) values. The values of R^2 in PLS are interpreted similarly to those obtained from multiple regression analysis. R^2 values of 0.75, 0.50 and 0.25, which define substantial, moderate and weak levels to predict the accuracy, according to Hair, Hult, Ringle, and Sarstedt (2014). The degree of R^2 (determination coefficient) was evaluated subsequently. Perceived ease of use accounted for 48% of variance in explaining perceived usefulness. Meanwhile, perceived security accounted for 42.2% of the variance in perceived trust. Lastly, perceived usefulness, perceived ease of use, perceived trust and perceived security accounted for 58.2% of the variances in describing behavioural intention.

5. DISCUSSION AND IMPLICATION

This study revealed the effects of perceived usefulness, perceived ease of use, perceived trust and perceived security on behavioural intention to use smartphone banking applications. Firstly, perceived usefulness found to have a significant influence on behavioural intention (H1 was supported). In this study, respondents admitted that smartphone banking application is very useful such as it saves time, convenient and transactions are effortless. Gu, Lee, and Suh (2009) studied behavioural intention to use mobile banking and found perceived usefulness as the most important construct and the key determinant of behavioural intention to use technology. Secondly, easy to use smartphone banking apps influences perceived usefulness and behavioural intention to use (H2a and H2b were supported). Consumers perceived that the more it is easy to use the smartphone banking application the more likely to be useful thus consumer intend to behave on a given technology. The result was following a prior study of Karim et al. (2020) which revealed that perceived ease of use did have an impact on perceived usefulness and consumers' behavioural intention. Next, perceived security found to be significant with behavioural intention to use and perceived trust (H3a and H3b). Consumers expect bank to ensure the security system to be strengthened, particularly over wireless networks, where they expect protection of transactions and privacy Singh and Srivastava (2018). Lastly, perceived trust found to be significant with behavioural intention to use smartphone banking

application (H4 was supported). Although the study of (Singh & Srivastava, 2018) found an insignificant relationship between perceived trust and behavioural intention to use mobile banking in developing countries like India, the current study shows the significant relationship with behavioural intention to use smartphone banking applications among millennials in Malaysia.

Table-3. Hypothesized model.

Hypotheses	Relationship	β	t-stats	p-Value	Decision
H1	PU→BI	0.210	2.530	0.012	Supported
H2a	PEU→BI	0.174	2.064	0.040	Supported
H2b	PEU→PU	0.693	15.141	***	Supported
H3a	PS→BI	0.308	3.579	***	Supported
H3b	PS→PT	0.650	14.311	***	Supported
H4	PT→BI	0.251	2.907	0.004	Supported

Note: $*p<0.05$; $**p<0.01$; $***p<0.001$.

From a theoretical standpoint, this study contributes to the technology acceptance model by supporting perceived security and perceived trust among Millennials in the Malaysian context. The study also supports the conceptual TAM framework and provides the evidence for the relationships between perceived usefulness, perceived ease of use, perceived trust, perceived security and behavioral intention to use smartphone banking applications from the Malaysian context. This analysis provides researchers with a foundation to further develop and adopt the use of technology. This study helps bank service providers concentrate on initial trust-building to promote and speed up the use of smartphone banking applications. Mobile banking service providers must implement technical mechanisms, such as security certificates from third parties, to improve trust. Banks can also provide services to customers during and after banking transactions through the application. Banks can also promote customers to use mobile banking application by implementing adequate security mechanisms and prompt customer support through which they can create trust. To attract new customers to these facilities, increasing awareness needs to rise and technical support must be expended. To increase consumer trust in the use of mobile banking applications, banks can maximize mobile banking awareness by posting online demos or offering guidance about how to use them in the mainstream media.

6. CONCLUSION AND LIMITATION

There are some limitations in this study. Firstly, the conducted study was mainly covered the Klang Valley area of Malaysia thus, the study should cover throughout the Malaysia. Secondly, demographic factors such as gender, age and income level were not measured as a construct to support the theoretical model. Thirdly, this study did not employ other independent variables that might predict the use of smartphone banking applications accurately. Another drawback of this analysis is the use of a convenience sample, which may not be an appropriate way to represent the entire population. The findings must therefore be viewed with caution, in particularly when generalizing. The banking sector is going through a process in which there are dramatic technical advances are involved such as transaction through digital platforms. Millennials are tech-savvy and born in the era of technology. They are the generations holding vast knowledge in the area of online and internet thus; using several applications in their smartphones are nothing new for them to deal with. Service provider of smartphone banking application must ensure the given technologies for banking services are useful and secured for its clients. Customers are the essence of every service industries and banks are also client-centric in the service sector and are constantly improving their operations by building trust and security features to ensure better customers behavioral intention to use banking technologies such as mobile banking application.

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