Predicting the intention to adopt mobile payment during the COVID-19 pandemic: Applying the Theory of Planned Behavior

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ABSTRACT

This study investigates the factor affecting the behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah during the COVID-19 pandemic by applying the Theory of Planned Behavior (TPB). The study uses stepwise multiple linear regression to test the factors affecting the behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah. Through convenience sampling techniques, the primary data source was collected through online questionnaires. In addition, the data of this study was collected by survey form with 110 valid respondents who had experience using mobile payment services at least once during the outbreak of COVID-19 pandemic. The findings revealed that only the Perceived Behavioral Control (PBC) dimension significantly and positively affected the behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah during the COVID-19 pandemic.

Keywords: *Theory of Planned Behavior, Mobile Payment, COVID-19, Malaysia*

INTRODUCTION

The COVID-19 pandemic creates a devastating impact around the world and Malaysia is no exception. To encounter the pandemic, Malaysia's early action is to impose the Movement Control Order (MCO) to ensure the spread of the viruses can be contained or at least controllable from spreading into different regions and states. Apart from MCO the government also imposes social distancing due to the ability of the COVID-19 viruses to spread easily. According to the World Health Organization (WHO), one of the main COVID-19 transmission mechanisms is through coins and banknotes between the seller and buyer (Ooi & Tan, 2021). Besides the pandemic which makes people hesitate to choose cash payment, the traditional payment methods

are slowly ousted by society as a new modern and digital payment method is forced to change the customer's spending and payment habits. Based on the online global payment industry report in 2020, around 50% of international customers are now using modern and digital payment methods during the COVID-19 pandemic (GlobeNewswire, 2020).

Due to the COVID-19 pandemic, business no longer can rely on the traditional way of doing business as most business requires social distancing, and some business even must completely stop their operation such as aircraft due to travel band in certain countries. To sustain the business operation, a firm has no other choice but to become more innovative with the products and services that they offer. One of the best ways of sustaining business during this time is to promote the product online conveniently and provide mobile payment services to their customers (Hoa, Hien, & Lien., 2019). To encourage mobile payment, enterprises are offered several benefits on mobile payment methods such as free delivery, cashback, and rewards (Immanuel & Dewi, 2020). Banks and financial institutions have also begun to indulge in adopting mobile payment services. According to Chong, Soon, & Choo (2019), the innovation payment industry has impacted the financial institutions and banking industry to adopt mobile payment methods for their customers.

Mobile payment has emerged as a new payment method where mobile users only require installing mobile payment platforms or applications on their smartphones to complete the payment transaction such as purchasing goods and services via online platforms (Liu, Ben, & Zhang, 2019). The mobile payment methods help transfer funds via an internet connection from the payer to the payee. It allows the customers to use their mobile devices to make payments anytime and anywhere with the help of wireless technologies such as Wi-Fi, 4G Long Term Evolution (LTE), or 5G LTE. Mobile payment is also a virtual channel in current business and financial areas, creating more opportunities for them to observe efficiency and provide convenience and better customer experiences. The adoption of mobile payment methods aims to make the customers more convenient, easy to use, efficient, and minimize transaction costs. Some of the benefits of mobile payment include purchasing groceries online through an app, paying utility bills, depositing and transferring funds, etc.

The COVID-19 pandemic has further enhanced Malaysian adoption using the mobile payment to prevent themselves from contacting the viruses. For example, the customers are more likely to make their purchases online through apps such as Food Panda, Grab Food, Shopee, etc. during this period. Furthermore, Malaysian were enforced to stay at home and through their campaign “stay at home”. As a result, Malaysia's online food delivery and gaming demand escalated very quickly. Besides, the study also shows that lots of Malaysians pay for their monthly commitment such as home loans, hire purchases, and health insurance using mobile payment methods. (Rahman, Ismail, & Bahri, 2020). The increase in smartphone market penetration in Malaysia will continue to grow the adoption of mobile payment in these past few years and will continue to do so (Azman, Yi, & Bakri, 2020). Based on the Malaysian Communication and Multimedia Commission (MCMC), the

penetration rate of smartphone devices rose to 75.9% in 2017 from 68.7% (2016). Thus, the smartphone penetration rate increase will eventually reach up to 97.4% in 2025 (Dawi, 2019).

In the past decade, empirical studies investigating factors affecting the consumers' behavior to adopt mobile payment methods have been conducted in different countries with different sorts of settings and target participation. In particular, the application of the Theory of Planned Behavior (TPB) is largely used to investigate the impact of mobile payment adoption. Mobile payment has contributed to Information Technology (IT) productivity in Malaysia. This new modern payment method should cater to the customers' attitude to accept and use mobile payment in their daily lives. However, how TPB reacts to the attention to adopting mobile payment during COVID-19, especially among students receive less attention. Thus, this research emphasizes filling those gaps by investigating how TPB can be used to predict the intention to adopt mobile payment specifically during the COVID-19 pandemic.

The organization of this paper is as follows. The next section presents a literature review, and sections 3 and 4 present methodology and results, respectively. Finally, section 5 presents the conclusion discovered from this study.

LITERATURE REVIEW

TPB was originally enhanced from the Theory of Reasoned Action (TRA). TRA came from social psychology, where the researchers used it to understand how an attitude and subjective norm affects behavioral intention. Adding perceived behavioral control into the TRA evolved this theory into TPB. In addition, TPB incorporates the dimension of perceived behavioral control into the constructs of the attitude and subjective norm (Sharma & Mishra, 2014). This theory was created in response to TRA limitations, in which people's behaviors have incomplete volitional control. The perceived behavioral control in TPB is defined as a customer's perception of the ease or difficulty of doing an action. This view is usually based on previous experiences and information from others (Ajzen, 1991). The empirical evidence posited that TPB is the process of adding an extra variable namely perceived behavioral control of customer’s behavioral intention when accepting an innovation (Immanuel & Dewi, 2020; Castro, Atkinson, & Ezell, 2010).

TPB has been frequently used to predict how customers will reach innovation based on the variables such as attitude, subjective norm, and perceived behavioral control. The theoretical concept can be used in mobile payment services, where it is suited to examine the customer's interest in using mobile payment services during the COVID-19 pandemic. The researchers require to understand the factors affecting the customers' behavioral intention to adopt IT since IT has a wide range of applications (Rosli et al., 2020). Mugo et al. (2017) posited that they will evaluate the factors affecting their consequences before embracing the new technologies. Thus, based on

the above argument the study posited that TPB can be used to predict the intention to adopt mobile payment.

Hypothesis Development

The research model shown in this study, as illustrated in figure 1, is based on the TPB. The intention to adopt mobile payment among students at University Malaysia Sabah during the COVID-19 pandemic preceded the process before the actual adoption of mobile payment. It is hypothesized that attitude has a direct relationship with behavioral intention, and a direct connection between subjective norms and behavioral control is also proposed here.

To investigate the relationship between the independent variables (attitude, subjective norm, and perceived behavior control) and the dependent variable (Intention to adopt mobile payment) the study developed three hypotheses. The directionality stated in each hypothesis is derived from previous studies conducted based on TPB. As a result, this research aims to determine whether there is a direct positive relationship between attitude, subjective norm, and perceived behavioral control towards the intention to adopt mobile payment. The research model used in this study is examined based on the following figure:

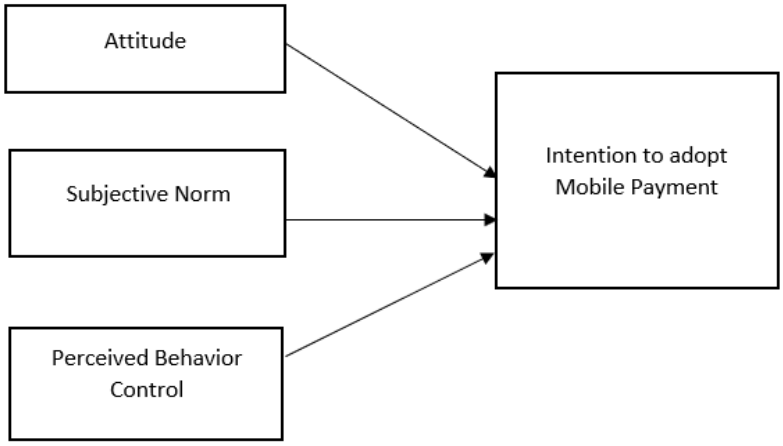

Fig 1 The diagram of the conceptual framework

Attitude

Attitude is the basic influence on other people's behavior (Azman, Yi & Bakri, 2020). On the other hand, Ajzen (1980) posited to define attitude as someone’s reaction to an object, people, or organization. In other words, attitude is the interpersonal emotion that shows whether it is favorable or unfavorable based on the person’s judgment. Bugembe (2010) points out that most of the main factors that affect the adoption of mobile payment behavioral intention are customer

attitudes. Oney, Guven, & Rizvi, (2017) are also in line with this point of view and further posited that attitude can influence behavioral intention, cognitive, and overall purpose.

Lai, (2018) clarified that the person could determine the nature of the attitude toward the adoption of Information Technology (IT). If the person knows the needs and desires of Information Technology (IT), they will use it to accept their objective and satisfaction (Ramos-de-Luna, Montoro-Ríos, & Liébana-Cabanillas, 2015). Additionally, Sánchez & Huerosb (2010) stated that technology must incorporate self-confidence, testing, and maturity to alter the customer's attitudes. In addition to the claims made by many scholars, many previous studies have empirically found that attitude has a positive relationship with the intention to adopt mobile payments or electronic payments (Jena, 2022; Norng, 2022; Verma et al., 2020). Thus, based on the above argument and empirically supported we hypothesize that:

H1: Attitude has a positive and significant relationship with behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah

Subjective Norm

Subjective norm has two dependent elements: compliance incentives and normative beliefs (Ajzen, 1980 & 1991). Normative beliefs are people's personal beliefs about how they want to behave or not perform the behavior, and the desire to meet is the motivation to actualize other people's ideas. In other words, subjective norm refers to the individuals who can choose to obey or deny the beliefs and behavior of other people (Wei, 2017; Fishbein & Ajzen, 2005; Neighbor et al., 2007). Several researchers agreed that subjective norms brought two influences on online payment methods: external and interpersonal factors (Bhattacherjee, 2000; Ramos-de-Luna, Montoro-Ríos, & Liébana-Cabanillas, 2015). The external factors include professional evaluation, while interpersonal factors are influenced by friends, family members, or social environments. TPB emphasizes the effect of social factors such as subjective norms on the customer's behavioral intention to adopt mobile payment services (Ventakesh & Bala, 2008; Cao, 2016). In addition to the scientists' assertion, it has also been empirically proven that subjective norm has a positive relationship with behavioral intention (Jena, 2022; Norng, 2022; Verma et al., 2020; Lada et al., 2009). Thus, based on the above argument and past empirical evidence, we hypothesize that:

H2: Subjective norms have a positive and significant relationship with behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah

Perceived Behavioral Control

Wang et al. (2009) posited that attitude and belief are predictors of behavioral control in people. Stroborn et al. (2004) explained that perceived behavioral control is the individual's belief in their ability to perform the behavior. In addition, Tan & Teo, (2000) posited that perceived

behavioral control refers to a person's perceptions about the difficulty of achieving a behavior of interest. For example, people who think they can control their mobile payments will be more likely to adopt this payment method. Perceived behavioral control varies depending on the situation and action taken, resulting in people having different perspectives on behavior (Chuen, 2016). The dimension of perceived behavioral control is influenced by two components: self-efficacy and facilitating control (Taylor & Todd, 2000). Bandura (1977) states that self-efficacy is a considerable structure in predicting the behavioral intention to use the innovation. The definition of facilitating control is the efficiency in which resources are readily available to carry out or participate in the behavior (Triandis, 1979). This framework was then incorporated into the theory, transitioning from TRA to TPB. The aspects of cashless payment transactions are considered consumers' perceptions of behavioral control over the ability to use the systems and facilities in mobile payment methods (Ja-Chul, G., Sang-Chul, L., & Yung-Ho, S., 2009). Meanwhile, Polancic, Hericko, & Rozman (2010) claims that perceived behavioral control indicates the degree of control over behavior, not the result. Besides posited by scholars, it has also been empirically discovered that perceived behavioral control is strongly positively related to the intention to pay by mobile payment (Sun et al., 2022). Thus, based on the above argument on perceived behavioral control, we hypothesize that:

H3: Perceived Behavioral Control has a positive and significant relationship with behavioral intention to adopt mobile payment among student's in Universiti Malaysia Sabah

RESEARCH METHODOLOGY

Sampling

Sample and procedure

The research study adopts quantitative research analysis through online surveys by using questionnaires. The online questionnaire was sent through mobile devices such as WhatsApp and Facebook. The research received a total of 110 valid responses and this data was used to do the analysis. The findings in this research study will summarize and examine the relationship of each independent variable, such as attitude, subjective norm, and perceived behavioral control. The dependent variable is the behavioral intention to adopt mobile payment during the COVID-19 pandemic. Statistical Package for Social Science (SPSS) software version 28 was applied and used to interpret this research study to produce the results. This section will explain the method to analyze the data and interpret the outcome of the analysis.

Measures

Based on the online Google survey, all variables will be measured using sentences, including attitude, subjective norm, perceived behavioral control, and behavioral intentions. The

online questionnaire will consist of three questions for each variable. A Likert measurement scale will be used to measure the variable such as points 1 to 5. Point 1 is defined as strongly disagree, and point 2 disagrees, point 3 is neutral, point 4 is agreed, and point 5 is strongly agree.

FINDINGS

Reliability and Validity

Validity and reliability analysis will be used to measure the consistency of the questionnaire according to KMO and Cronbach's Alpha values. Based on table 1, we will test the validity and reliability of the independent and dependent variables from the online survey form. The validity analysis was performed using the Keizer Meyer Oklin Measure of Sampling Adequacy (KMO). When the KMO value is greater than 0.5, this means that the factors can be used in the research study (Ayudya & Wibowo, 2018; Liébana- Cabanillas, García-Maroto, & Muñoz-Leiva, 2020). In this study, the KMO test of the variables is 0.727 (considered as Middling), which is larger than 0.5. Thus, following this criterion, we concluded that the variables are reliable and can be used in this research study.

Table 1 The validity test with KMO value

KMO and Bartlett's Test		
Keizer Meyer Oklin Measure of Sampling Adequacy (KMO)		0.727
Barlett's Test for Sphericity	Approx. Chi-square	389.737
	df	66
	Sig.	<0.001

Besides the reliability test, we also look at Cronbach's Alpha value. Based on the finding, all the Cronbach's Alpha for the variables is greater than 0.6, achieving and passing the acceptance level of the reliability in nature (Ursachi, Horodnic, & Zait, 2015; Ayudya & Wibowo, 2018). Cronbach's Alpha for this reliability analysis is 0.710, 0.815, 0.644, and 0.695, respectively. Cronbach's Alpha of the subjective norm is 0.815, considered the most excellent internal consistency score in this research study. Thus, following Cronbach's Alpha criteria, we also concluded that the variables tested in this study were considered valid.

Table 2 The reliability test with Cronbach's Alpha values.

Construct	**Number of items**	**Cronbach's Alpha**	**Internal Consistency**
Attitude	3	0.710	Good
Subjective Norm	3	0.815	Very Good
Perceived Behavior Control	3	0.644	Fair
Behavior Intention	3	0.695	Fair
Total Variables	12	0.789	Good

Based on the table, we use stepwise multiple linear regression analysis to determine which TPB dimension predominantly affects the Behavioral intention to adopt mobile payment during COVID-19. The hypothesis testing was analyzed using SPSS version 28; thus, three research hypotheses were verified.

Table 3 Test of Collinearity

Variable	**Tolerance**	**VIF**
Attitude	0.916	1.091
Subjective Norm	0.884	1.131
PBC	1.000	1.000

Table 4 Regression Result

Model	**Beta Coefficient**	**T-value**	**P-value**	**Hypothesis**
ATT	0.142	1.447	0.151	Not Supported
SN	0.137	1.370	0.174	Not Supported
PBC	0.206	2.188	0.031	Supported

Prior main analysis, we also run a diagnostic analysis to test for the potential multicollinearity by using VIF. Based on table 3, the results demonstrate no VIF value greater than 4. According to hair et al. (2010), a VIF value greater than 4 indicates higher multicollinearity. Thus, following this criterion, the study showed that no VIF value was greater than 4. The results in table 3 indicate

that the risk of multicollinearity does not exist within the variable. The main analysis of the study is presented in table 4. Based on table 4, the hypothesis test analysis for attitude toward behavioral intention has no significant effect. The p-value is larger than 0.05 (0.151), and the p-value is smaller than 1.96 (1.447). Therefore, the first hypothesis (H1) testing is not supported. Similarly, the SN is also not supported where the p-value is larger than 0.05 (0.174), and the t-value is smaller than 1.96 (1.370). On the other hand, the PBC effect on BI supported the hypothesis that the p-value is smaller than 0.05 (0.031), and the t-value is larger than 1.96 (2.188). From this result, the study concluded that, among the three dimensions of TPB, only PBC positively and significantly influences the behavioral intention to adopt mobile payment among the students in Universiti Malaysia Sabah.

The significant effect between PBC and behavioral intention to adopt mobile payment among students in Universiti Malaysia Sabah indicates was in line with some previous studies (Ariffin and Lim, 2020). The studies imply that significant factors, namely PBC, should be instilled and adapted in marketing strategies especially during the COVID-19 pandemic. This probably could help meet the needs and wants, especially among institutes of higher learning students. In contrast, the insignificant effect of attitude and subjective norm related to mobile payment is consistent with a previous study (Sun et al., 2020). One of the main explanations and reasons for the insignificant impact of attitude and subjective norm in the context of mobile payment is that consumers focus more on usability than functionality in mobile payment (Sun et al., 2020). Although the usability of mobile payment can be transferred by attitude, subjective norm, and perceived behavioral control, the usability of mobile payment makes consumers feel that they can control mobile payment well, because perceived behavioral control influences not only satisfaction but also consumer intention (Sun et al., 2020). This could be one of the many reasons why mobile payment-related outcomes do not have a significant impact on attitude and subjective norm.

CONCLUSION

Given the limited attention paid to student mobile payment behavior, particularly during the COVID-19 pandemic, notwithstanding its rapid adoption especially among institutes of higher learning education students, this study minimizes the gap by examining it in this context. Using stepwise multiple regression, the study's discovery is in some ways unique compared to many other important discoveries that have found strong predictability of all TPB dimensions on behavioral intention. Our discovery may be unique because the perceived behavioral control of mobile payment makes users feel that they can control mobile payment intention very well, especially during COVID-19 pandemic. When COVID-19 viruses can spread easily, attitude and subjective norm may become less significant factors in influencing their intention to adopt mobile payment relative to perceived behavioral control. In conclusion, perceived behavioral control is the only factor to be found positive and significant in affecting the intention to adopt mobile payment among students in Universiti Malaysia Sabah. However, the two dimensions in TPB,

attitude and subjective, were insignificant. Therefore, it can be concluded that hypotheses one and two were not supported; meanwhile, hypothesis three is supported.

A banking and Financial Technology (FinTech) institution should build a partnership with a government organization to organize programs related to the awareness and benefit of mobile payment during the pandemic. The campaign is crucial to encourage more students from institutes of higher learning to use mobile payment in the hope that it could change their attitudes towards accepting the use of mobile payment, especially during the COVID-19 pandemic. The finding contributes by identifying the interest of the younger generation, especially among institutes of higher learning in adopting mobile payment. The study hopes to provide valuable information, especially in increasing the interest of consumers to use mobile payment during this COVID-19 pandemic.

The study conducted is not without its limits. First and foremost, the sample was only collected among students in Universiti Malaysia Sabah. Thus, the result may not be extrapolated to different Universiti with a different set of settings. Additionally, the study only tests one Theory, namely TPB, which is relatively limited in understanding the overall behavioral intention to adopt mobile payment, especially during the COVID-19 pandemic. For future research, the study encourages a combination of theory, such as adding the Theory Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). Both these theories can be used to reexamine the students from higher learning institution and determines the similarity and differences, which could contribute to broadening the scope of understanding the intention to adopt mobile payment during the COVID-19.

ETHICS STATEMENTS

Not available.

AUTHOR STATEMENTS

Connie Voo Min jun wrote the introduction, literature review, data collection, methodology, finding and conclusion and Mohd Ashari Bakri rerun the regression and improve the overall contents including introduction, literature review, methodology, finding and conclusion.

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DECLARATION OF INTERESTS

Not available.

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