Developing a Theoretical Framework of Continuance Mobile Payment Adoption Among Malaysian University Students

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ABSTRACT

Mobile payment is gaining popularity, particularly since the COVID-19 pandemic. Mobile payment is more convenient than cash for making payment. Although there are numerous benefits of mobile payment, the continuance intention to use mobile payment, especially among university students, is not well understood. A framework to understand the continuous use of mobile payment among university students in Malaysia does not exist. Thus, this paper develops the theoretical framework of continuance mobile pay adoption among university students in Malaysia. The theoretical framework is developed by integrating the Technology Continuance Theory framework with four extended variables: price, benefit, trust, habit, and operational constraints. The comprehensive and holistic framework developed from this paper provides a better understanding of the continuous usage of mobile payment among university students in Malaysia. This paper offers practical implications for service providers and policymakers on utilising the framework to develop strategies that promote continuous intention to use mobile payment among university students in Malaysia.

Keywords: *Mobile payment, Technology continuance theory (TCT), Intention to continue use, Malaysia*

INTRODUCTION

Mobile payment has surpassed cash payment in popularity since the COVID-19 pandemic outbreak in 2020. People would like to settle their payment through e-wallet or mobile payment, as this would reduce the risk of contracting COVID-19. Mobile payment is broadly defined as a service that provides users with the ability to initiate, authorise, and complete financial transactions in which money is transferred over a financial network or wireless communication technologies using mobile devices (Dahlberg et al., 2003; Liebana-Canabillas et al., 2014; Slade et al., 2015). Over the past few years, mobile payment has evolved into an integrated service innovation with multiple functions, making cash payment less popular as the sole means of payment for goods and services. Mobile payment is also more convenient in service compared to cash payment, as a person would not need to bring a hefty amount of cash to pay for goods and services. Mobile payment accelerates transactions and enhances the quality of life through ease of use, convenience, and practicality. This service ability can create customer value for those who use it (Nueesch et al., 2015).

There are multiple functions of using mobile payment services. Advertisers and marketers can reach their target customers more easily with the use of mobile payment services. A massive amount of big data collected from customers, including expense amounts, consumption patterns, and preferences, enables marketers to understand their target customers better and design policies to attract them. Customers can also benefit from innovative technology to make transactions faster and more reliable. Studies show that mobile payment is not only used in developed countries but also popular in developing countries, such as Malaysia (Kim et al., 2009; Lallmahamood, 2007). With handphones, a person can pay for the flight tickets, dine in restaurants, purchase things at the supermarket, and use the phone anywhere. Malaysia is the leader in Southeast Asia in terms of mobile wallet usage. According to The Mastercard Impact Study of 2020, Malaysia has a mobile wallet usage of 40 percent, higher than that of the Philippines (36 percent), Thailand (27 percent), and Singapore (26 percent). Mobile payment is rapidly growing and very promising, considering that the mobile payment usage was only eight percent in 2018 (Malaysian Payment Landscape, 2018). It has increased by 32 percent in just two years. Part of the reason is that Malaysia also has very high mobile phone access in Southeast Asia. The Department of Statistics Malaysia (2021) showed that

the percentage of households with access to mobile phones was 98.6% in 2020. The types of mobile payments in Malaysia include S Pay Global (previously known as Sarawak Pay), Boost Pay, Touch & Go, GrabPay, and BigPay. These mobile payment applications have garnered popularity amid the pandemic. For example, Malaysia Big Pay, an electronic wallet, saw a five-times growth in remittance transaction volume via its platform amid the COVID-19 pandemic (Business Wire, 2020).

Though there are numerous benefits of mobile payment services, the intention to continue using them, especially among students, is not well understood. Graduated university students are the youth who use mobile payment services. Additionally, there is a limit to research exploring the continuance intention to use mobile payment services in Malaysia. Understanding the continuance intention is important as it may affect users' behaviour in continuing to use mobile payments. Previous studies on mobile payment in Malaysia focused on the intention of customers to adopt payment (Xiang Feng et al., 2021; Leong et al., 2021) and barriers to non-adoption of mobile payment (Cham et al., 2022). Some limited studies discuss the continued use of mobile payment among Malaysian university students (Abdul-Halim et al., 2021; Lim et al., 2024; Amron et al., 2024). Hence, there is a limited understanding of mobile payment usage and the factors that influence the continued use of mobile payment among university students in Malaysia. The majority of studies on the continuance intention of mobile payment systems focus on developed countries, with very few studies on emerging economies, such as Malaysia (Humbani & Wiese, 2019). Ultimately, this study aims to establish a theoretical framework for the continuance intention of mobile payment systems with a focus on university students in Malaysia.

LITERATURE REVIEW ON CONTINUANCE INTENTION

Continuance intention is defined as a user's intention to continue using the technology (Bhattacherjee, 2001). Numerous studies have investigated the initial adoption of technology; however, there is a lack of research on continuance intention (Liebana-Cabanillas et al., 2019; Raman & Aashish, 2021; Zhu et al., 2017). When it comes to mobile payment, the majority of the researchers focus on the willingness to adopt or initial adoption of mobile payment, but very few have examined the continuance intention,

namely, Raman and Aashish (2021) in India, Zhu et al.(2017) in China, Liebana-Cabanillas et al. (2019), as well as Humbani and Wise (2019) in South Africa.

In Malaysia, some studies have explored the continuance intention (Halim et al., 2021). Most studies focus on consumer acceptance towards the Mobile Payment System (MPS) (Liebana-Cabanillas et al., 2014; Jin et al., 2019) and intention to adopt MPS (Liebana-Cabanillas et al., 2014; Jin et al., 2019). Understanding the principle of continuance intention in a developing country like Malaysia is therefore very pertinent, as we are not only looking at the initial adoption but also assessing the value of long-term continuous usage and evaluating future behaviours, such as loyalty (Lin, 2011).

THEORETICAL BACKGROUND

Though mobile payment is commonly regarded as a new way of payment, few studies have explored the factors that affect the continued use of mobile payment. There is extensive research on applying the Technology Acceptance Model (TAM) in the context of mobile payment or electronic wallets. The Technology Acceptance Model (TAM) was developed by Davis (1989). The model is designed based on the Theory of Reasoned Action (TRA) and represents the antecedents of technology use (Yousafzai et al., 2010). The TAM hypothesises that a person's acceptance of a technology is determined by the intention to use it. The attitude towards the use of technology determines the intention. Two beliefs influence attitudes towards using technology, as pointed out by Yousafzai et al. (2010). The two beliefs are perceived usefulness and perceived ease of use. Nonetheless, intention to use is not suitable for this study as it focuses on continued use of the mobile payment system in Malaysia. One of the most prevalent frameworks to examine the continuance of technology is the Technology Continuance Theory (TCT).

TCT was introduced by Liao et al. (2009), which is an improved theory that describes the use of information system continuity. It is made up of the integration of three theories, namely, the Technology Adoption Model (TAM), Expectation Confirmation Model (ECM), and Cognitive Model (COG). While ECM explains the variables that impact user retention and

loyalty rather than initial acceptance, TAM investigates initial acceptance. Nevertheless, in terms of application and explanatory power, TCT outperforms the TAM, ECM, and COG models by a significant margin (Liao et al., 2009). Furthermore, TCT suggests that long-term usage rather than initial acceptance determines service success.

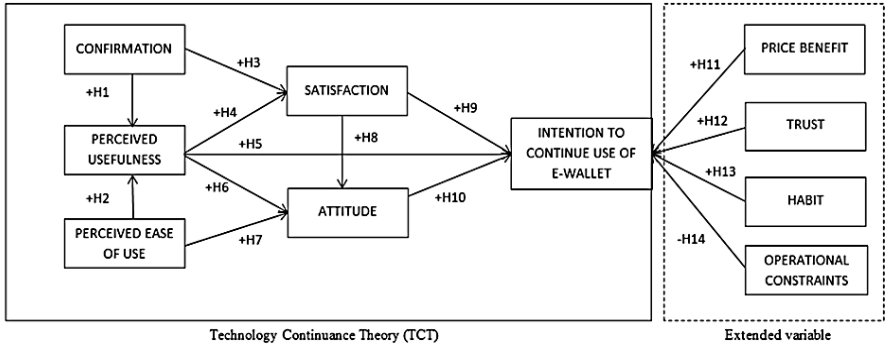
To sum up, TCT has six variables, including PEU, PU, confirmation, attitudes, satisfaction, and intention to continue to use, and incorporates the two main aspects of satisfaction and attitude within a single continuity model (Liao et al., 2009), aiming at obtaining the well-established PEU and PU variables as a reference to the first level. It is a three-level model with the goal of retaining an information system continuity as the final dependent variable (Liao et al., 2009). The model of continued use of the information system was explored based on the Expectation-Confirmation Theory (ECT), commonly used in the marketing field to track the effects of customers' satisfaction on their intention to continue using application technology (Jia et al., 2017). The continuation of information systems at the individual level is also critical for the survival of various e-commerce companies, from businesses to consumers, such as internet service providers (ISPs), online vendors, banks, agents, travel agencies, etc. (Bhattacherjee, 2001). The continuous use of e-wallets is characterised by two post indicators, namely, PU and satisfaction.

RESEARCH MODEL

In this paper, we develop the research model based on the Technology Continuance Theory. The theory comprises six variables, namely, Perceived Ease of Use (PEU), Perceived Usefulness (PU), confirmation, attitudes, satisfaction, and intention to continue using. Perceived Ease of Use (PEU) is conceptualised as the degree to which an individual believes that the use of information technology, such as mobile payment systems, will reduce effort and make work easier (Davis, 1989; Moshelpour et al., 2018). Moslehpour et al. (2018) also mentioned that perceived ease of use is a critical element of technology, as society tends to prefer something simple. Meanwhile, Perceived Usefulness (PU) is defined as the post-adoption subjective views of the user that technology improves the way he/she completes the transaction (Bhattacherjee, 2001; Liébana-Cabanillas et al., 2017). In addition, we extend the theory by incorporating four

variables, namely, price benefit, trust, habit, and operational constraints. The explanation of the integration of four variables is provided in the discussion section.

Figure 1
Theoretical Framework of Continuance Mobile Pay Adoption among Malaysian University Students



Source: Adapted from Abdul-Halim et al. (2021)

METHODOLOGY

This study employs the literature refinement method to develop the theoretical framework of the continuance mobile pay adoption among Malaysian university students. The theory of technology continuance and the extended e-wallet continuance usage model proposed by Abdul-Halim et al. (2021) have been integrated to construct the theoretical framework. The theoretical framework comprises two parts. The first part encompasses the variables from the Technology Continuance Model, while the second part includes the extended variables from the Mobile Payment continuance usage model. A seven-point Likert scale can measure the intention to continue using mobile payment. All constructs in the study can be measured using a 5-point Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

Variables in Technology Continuance Theory: Confirmation, Satisfaction, Perceived Usefulness, Perceived Ease of Use, and Attitude Extended Variables in Mobile Payment Continuance Usage Model: Price Benefit, Trust, Habit, and Operational Constraints. The operation definitions and hypotheses of the variables are shown in the discussion section.

DISCUSSIONS

Perceived Usefulness (PU)

The study by Hamid et al. (2016) demonstrates that perceived usefulness significantly influences continuance intention. If mobile payment or technology leads to increased productivity and time efficiency, it will lead to continuance intention. This is supported by a study by Phuong et al. (2020) on e-wallet customers in Vietnam. An e-wallet that is useful to the customer tends to have better continuance intention.

Hypothesis: Perceived usefulness influences continuance intention.

Perceived Ease of Use (PEU)

Shang and Wu (2017) explained in their study that perceived ease of use significantly influenced continuance intention. When the level of perceived ease of use is high, users are likely to use the technology again. Notwithstanding, users avoid using it again if the level is low. Moreover, Phuong et al. (2020) also supported that perceived ease of use positively influenced continuance intention. They state that if users find the mobile application easy to use, they tend to continue using it.

Hypothesis: Perceived ease of use influences continuance intention.

Price Benefit

Price benefit is a crucial component in determining the usage of mobile payment or e-wallet. The price of using it is directly related to the cost of using it. Mobile payment users must minimise the cost. If the cost of using mobile payment is high, the likelihood of the user continuing to use it will be low. This is due to the user finding a low-cost alternative to replace the mobile payment. Therefore, many electronic payment systems offer discounts to attract users to use the mobile payment (Malay Mail, 2020). A user who has a price benefit is more likely to use mobile payment (Abdul-Halim et al., 2021).

Two items measured the price benefit. The items are formulated and adapted from Ventakesh et al. (2012).

Measurement items of Price Benefit

Item 1 of Price Benefit: I use mobile payment apps for the following benefits: e-wallet apps offer discounts and cash back.
Item 2 of Price Benefit: I use mobile payment apps for the following benefits: I save money when I pay through mobile payment apps.

Hypothesis: Price benefit has a positive impact on intention to continue use of mobile payment.

Trust

Trust in the application of mobile payment activities is a significant component that affects the continued use of mobile payments (Abdul-Halim et al., 2021). The privacy of the users must always be protected to gain trust in mobile payment applications (Goad et al., 2020). Privacy-related risks and protection of customers must be well addressed in mobile payments, as it involves personal information being saved on devices (Sharma & Sharma, 2019). In brief, continued usage of mobile payments depends on users' trust in the mobile payment.

Three items can measure trust. The items are formulated and adapted from Pal et al. (2020).

Measurement items of Trust

Item 1 of Trust: I am continuing to use mobile payment apps because they meet my interests.
Item 2 of Trust: I am continuing to use mobile payment apps because they meet my needs.
Item 3 of Trust: I am continuing to use mobile payment apps because they have features as promised by the providers.

Hypothesis: Trust has a positive impact on intention to continue using mobile payment.

Habit

Habit is a crucial factor affecting the continued use of technology repeatedly as decision-making considerations, which is also related to the usefulness or functionality of applications (Chávez Herting et al., 2020). People must remain in the context over a fairly long period of time to evolve the e-wallet and make it a tradition or practice. In short, people who have used e-wallets for some time will understand the habit and the ease of using such systems for their transactions (Karjaluoto et al., 2019).

Users will continue to use the mobile payment system if they develop the habit of using it (Chavez Herting et al., 2020). This is because they are accustomed to using mobile payment in their daily lives. Ultimately, mobile payment service providers must understand the users' habits of using the systems for transactions (Karjaluoto et al., 2019). The practice or habit of using payment will lead to continuous use of the mobile payment system (Pal et al., 2020).

Four items can measure habit. The items are formulated and adapted from Pal et al. (2020).

Measurement items of Trust

Item 1 of Habit: I continue to use mobile payment apps because this has become a habit for me (Pal et al., 2020).
Item 2 of Habit: I continue to use mobile payment apps because I am used to using them.
Item 3 of Habit: I continue to use mobile payment apps because I automatically use them.
Item 4 of Habit: I continue to use mobile payment apps because they are natural to me.

Hypothesis: Habit has a positive impact on intention to continue using mobile payment.

Operational Constraints

Operational constraints are another variable that discourages users from using the mobile payment system. Operational constraints occur when users find it challenging to use the mobile payment. The constraints of mobile payment include inaccessibility, experience obstacles and problems, such as restricted mobile data plans and external mobile service barriers, including security concerns, online support tutorials, irrelevant pop-ups, and lack of customisation options (Ma et al., 2016). Apart from that, the limited scale of mobile applications, including limited displays and tiny multifunction keypads, may be burdensome and pose a challenge to users (Zhou, 2011). Users who face these obstacles will eventually stop accepting innovation (Podsakoff et al., 2003). In essence, it is expected that users who face operational constraints may stop using the mobile payment system.

Four items measure operational constraints. The items are formulated and adapted from Song (2011).

Measurement items of Trust

Item 1 of Operational Constraints: Sometimes, I am unable to use mobile payment because the mobile payment app's display and screen make it difficult to use (Song, 2011).
Item 2 of Operational Constraints: Sometimes, I am unable to use mobile payment because mobile payment apps often freeze or malfunction.
Item 3 of Operational Constraints: Sometimes, I am unable to use mobile payment because the buttons and options on the mobile payment apps are difficult to find.
Item 4 of Operational Constraints: Sometimes, I am unable to use mobile payment because the features provided by the mobile payment apps are not sufficient for my needs.

Hypothesis: Operational constraints adversely affect the intention to continue using mobile payment.

Intention to Continue to Use Mobile Payment

Four items measure the intention to continue using mobile payment. The items are formulated and adapted from Alraimi et al. (2015).

Measurement items of Trust

Item 1 of Intention to Continue Using Mobile Payment: I intend to continue using e-wallets in the future (Alraimi et al., 2015).
Item 2 of Intention to Continue Using Mobile Payment: I will continue using mobile payment in the future.
Item 3 of Intention to Continue Using Mobile Payment: I will strongly recommend mobile payment to others to use it.
Item 4 of Intention to Continue Using Mobile Payment: I will continue to use mobile payment as regularly as I do now.

There are two limitations of this paper. The first limitation is that this paper only focuses on developing a theoretical framework for the continuous intention to use mobile payment among university students in Malaysia. This paper does not focus on empirical work on constant intention to use mobile payment. Moreover, this paper only focuses on the scope of university students. This paper does not focus on the overall Malaysian market, nor comparisons of continuous intention to use mobile payment across different groups of society in Malaysia.

CONCLUSION

This paper discusses the theoretical framework for the continuous intention to use mobile payment among university students in Malaysia. The theoretical framework is developed by integrating the TCT framework with four extended variables: price, benefit, trust, habit, and operational constraints. The comprehensive and holistic framework developed in this paper intends to provide a better understanding of the continuous use of mobile payment among university students in Malaysia. University students in Malaysia are the most popular users of mobile payment applications. Ergo, it is crucial to capture the continuous use of mobile payment applications among them.

On top of that, the theoretical framework developed in this paper can be useful for future research on the continuous use of mobile payment applications to attract and retain users. Future researchers can use the framework as a basis for analysing the determinants of continuous mobile payment usage using empirical data. It is suitable for both cross-sectional studies and longitudinal research to confirm the hypotheses constructed based on the theoretical framework developed in this paper.

CONTRIBUTION OF AUTHORS

There are two authors in this paper. Both authors contribute to the writing and discussion of the paper.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest with any party.

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