BEHAVIOURAL INTENTION TO ADOPT MOBILE WALLET AMONG MILLENNIAL GENRATION IN KLANG VALLEY

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DECLARATION

I hereby declare that:

(1) This Research Project is the end result of my own work and that due acknowledgement has been given in the references to all sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) The word count of this research report is 18,548.

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Date: 29 November 2019

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I chose mobile wallet as the research topic mainly because I am interested in the payment industry and would like to figure out the development of mobile wallet in Malaysia. As there are always have the headlines reported that the rapid development of mobile wallets in China and how it changed the behavioural of Chinese people in their daily basic which made me eager to find out the factors that affecting Malaysian to use mobile wallet. However, completing this research study would not have been possible without the help, support and patience of my supervisor Ms. Esther, who always give me valuable advice and guidance whenever I encountered troubles during the progress of my research. And also, I would like to thank Mr. Sia Bik Kai who have answered my questions and provide me the advices during the research process.

Next, I want to thank all the respondents who participated in answering the survey. Without their inputs, my research would not have completed. Lastly, not forgetting all friends who have been there to help me and shared their ideas, thoughts and viewpoints for my research project. Thank You All.

DEDICATION

To Ms. Chin Wai Yin, my final year project supervisor,

To my family and my fellow friends and course mate,

And

All the respondents.

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ABSTRACT

The mobile wallet is transforming the payment industry by enhancing payment efficiency, convenience and versatility that required to satisfy the today's complex marketplace. Hence, the interest in mobile wallet is growing by Malaysian with the aim to enhance a nation's competitiveness and achieve payment efficiency. This present research begins with the observation that widely used models of technology adoption, namely the Theory of Planned Behaviour, Technology Acceptance Model and Innovation Diffusion Theory which may provide a good theoretical foundation to understand mobile wallet adoption. In this study, the researcher develops a research framework to examine the factors that influencing millennial generation' behavioural intention to adopt the mobile wallet. There are seven independent variables were used in this research to examine the behavioural intention to adopt mobile wallet which are perceived usefulness, perceived ease of use, subjective norms, personal innovativeness, compatibility, perceived security and trust. To this end, the research has carried out the survey on 306 millennials in Klang Valley.

The proposed framework explaining 59 per cent of variation in the millennials' behavioural intention to adopt mobile wallet. Besides that, the researcher study found that four out of seven factors (i.e. perceived usefulness, perceived ease of use, compatibility and trust) are significant factors influencing behavioural intention to adopt the mobile wallet among millennial generation (with the exception of subjective norms, personal innovativeness and perceived security). The conclusions and implications suggested those organizations within this ecosystem to review their strategy in promoting mobile wallet use among the millennial generation and unlock the new business opportunity.

CHAPTER 1

INTRODUCTION

1.0 Introduction

This research study is aim to examine the factors that affecting behavioural intention to adopt the mobile wallet among the millennial generation in Klang Valley. This chapter will consist of several parts of introduction. Firstly, it begins with the background of the study. In this section, readers can get the preliminary information or basic idea before going through the details. Secondly, it will be followed by problem statement which provides the issues or reasons for this research project. Thereafter, the research questions and objectives are presented. Lastly, the significant of study also will be discussed.

1.1 Research Background

Nowadays, the smartphones are becoming important roles in our daily life. As the smartphones are not just limited use for social media, videos and taking selfies, but also becoming an ideal medium to perform the payment transaction as well (Varsha & Thulasiram, 2016). According to Xu (2017) stated that smartphones have the ability to store everything that normally be carried in your physical wallet as well as allows the users to perform the payment transactions speedy and conveniently. In additional, Chen (2008) points out the emerge of e-commerce supported to replace the conventional physical location of business with virtual locations. Hence, Chen further illustrates that

the several mobile payment methods such as NFC, mobile wallet and digital cash have been introduced to consumers with the help on process the payment transaction more convenience and confidence in virtual marketplace.

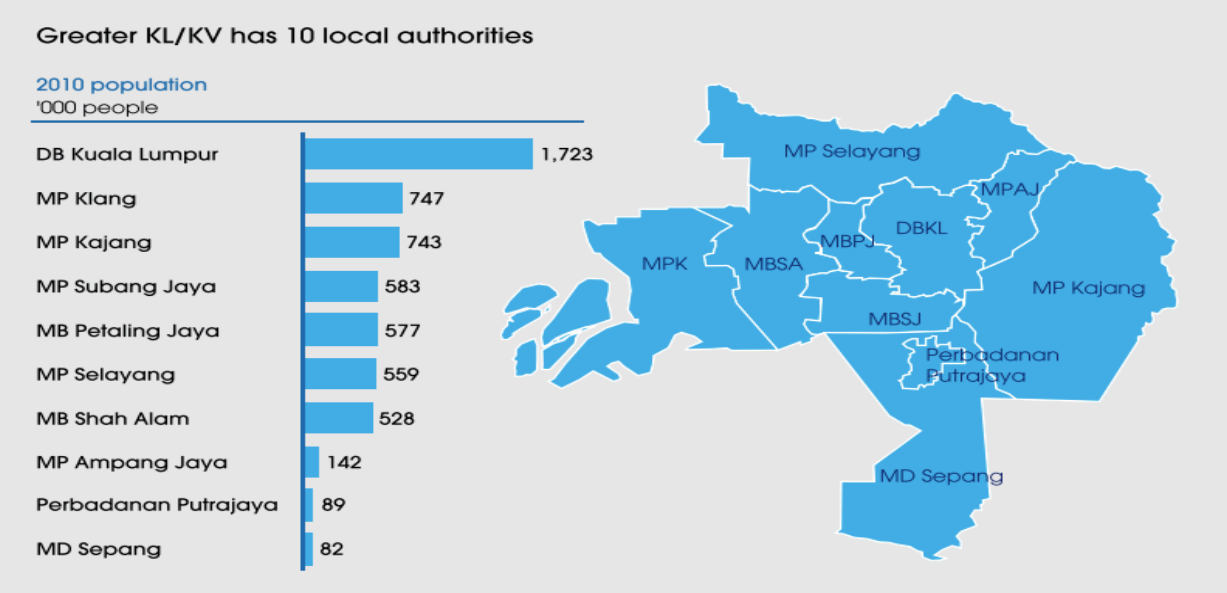
Based on the quarter report of Bank Negara Malaysia (BNM) stated that BNM has committed to transform Malaysia's payment system from cash and cheques to mobile payment (Lee & Khaw, 2018). Based on Malaysian Communications and Multimedia Commission (MCMC) (2017) report shown that in the end of 2017, there were 42.4 million mobile phone subscriptions (of which 75.9 per cent are smartphones users) for a population of 32.1 million in Malaysia. The percentage of smartphone users in Malaysia has risen from 68.7 per cent in 2016 to 75.9 per cent in 2017 (MCMC, 2017). Lee & Khaw (2018) point out that the high mobile phone adoption rate in Malaysia as a means of allowing transform from cash to cashless payment option with no extra infrastructure cost needed. In additional, the mobile wallet has the potential to enhance a nation's competitiveness in two aspects: (1) better cost savings and the overall efficiency are expected to gain up to 1 per cent of gross domestic product (GDP) yearly; (2) lesser risk of leakages to the shadow economy, especially through illegal activities such as money laundering, tax evasion and corruption (Lee & Khaw, 2018). Moreover, they further illustrate that by switching to cashless society, we do have created more opportunities for businesses as well as SMEs to further unlock and obtain the benefits of mobile wallet services.

The rapid pace of technology advancement has changed the entire payment industry in the transaction processes (Chen, 2008). The mobile wallet is transforming the payment industry by enhancing payment efficiency, convenience and versatility that required to satisfy the today's complex marketplace. In this study, we will focus on millennial generation perspective on adoption the mobile wallet. According to Keeling (2013) defined that millennial generation is those born in between 1982 and 2003. This generation would though themselves as unique, team-oriented, result-oriented, protected, educated and also possessed of rational minds (Keeling, 2013). Based on

Dennehy & Sammon (2015) highlighted that the mobile payment is more likely to be adopted by millennial generation, but slowly overall adoption will be increasing.

This study is selected Klang Valley as the sampling location. As Klang Valley is the pillar of the country that driving the Malaysia's economy significantly (PEMANDU, 2010). Klang Valley, also called as the greater Kuala Lumpur which covered by 10 municipalities, namely Kuala Lumpur, Putrajaya, Petaling Jaya, Shah Alam, Klang, Kajang, Subang Jaya, Selayang, Ampang Jaya and Sepang, see Figure 1. According to PEMANDU (2010), the population of Klang Valley in 2010 was approximately 6 million, and it contributed to the national gross nation income (GNI) about RM 263 billion. In other words, the one-fifth of the national population contributed 30 percent of the nation's GNI, which concluded that Klang Valley is the catalyst for the nation's economic growth. This is the main reason that this study is selected Klang Valley as sampling location as people in these areas relevantly having more purchasing power due to higher income.

Figure 1: The Boundaries of Klang Valley



Note. From Performance Management and Delivery Unit (PEMANDU). (2010). *A roadmap for Malaysia*. Retrieved August 10, 2019, from https://policy.asiapacificenergy.org/node/1271.

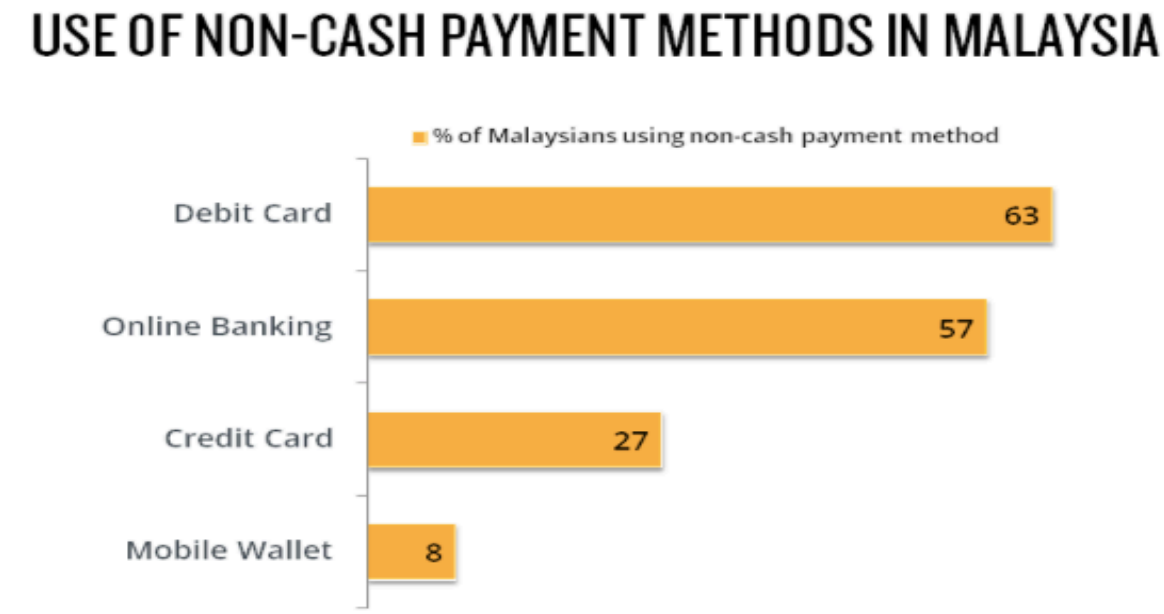
1.2 Problem Statement

Dennehy & Sammon (2015) said that the emerge of mobile wallet trends placed the challenge for merchant and consumer adoption issues. On the one hand, merchants are reluctant to invest on the mobile payment facilities at point-of-sale unless there is high demand by consumers; On the other hand, consumers unable to use mobile wallet to perform their payment unless merchants accept them (Dennehy & Sammon, 2015; Contini et al., 2011). This statement is supported by Sahut (2008) stated that the more people use mobile wallet, the greater number of merchants are preferred to offer this payment methods at their point-of-sale, and thus, the more useful mobile wallet will become. However, Machael (2017) and Xu (2017) comment most consumers do not think that they should change their habit at checkout despite mobile wallet payment are claimed to be more efficiency and convenient.

The current mobile wallet development in Malaysia still in its infancy as the current payment option still dominated by cash and bank card (The Nielsen Company, 2019; Lee & Khaw, 2018). Based on figure 2 shown that, the non-cash payment methods in Malaysia are dominated by debit card and online banking. Then, followed by credit card which accounted 27 per cent, and, there is only 8 per cent of Malaysians have been using the mobile wallets to pay for their expenses.

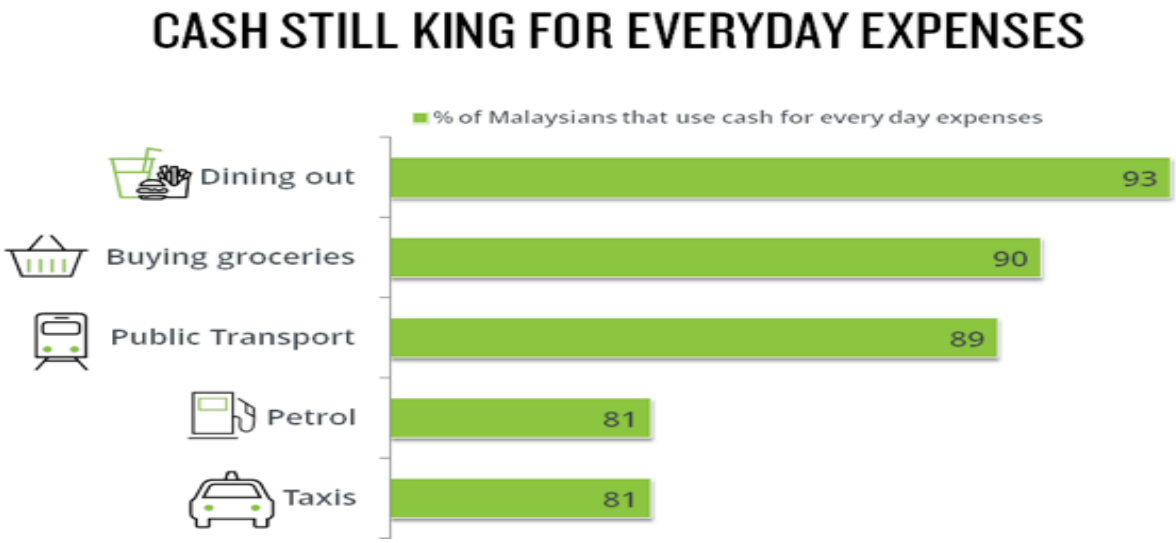
In fact, most of the Malaysians are still preferred to use cash to pay for their daily expenses, as shown in Figure 3. Although, there are several benefits of adopting the mobile wallet, however the adoption rate in Malaysia is still low. According to Xu (2017) claimed there is a gap between potential and realized value as most of the consumers did not realized the potential value by adopting the mobile wallets. Many consumers are satisfied with their current payment methods in cash or debit/credit card, and unwilling or slow to change their payment habits.

Figure 2: Malaysian Using Non-Cash Payment Method



Note. From The Nielsen Company (2019). *Cash or cashless? Malaysia's shifting payment landscape*. Retrieved April 11, 2019, from https://www.nielsen.com/my/en/insights/reports/2019/cash-or-cashless-malaysias-shifting-payment-landscape.html.

Figure 3: Malaysians that Use Cash for Every Day Expenses



Note. From The Nielsen Company (2019). *Cash or cashless? Malaysia's shifting payment landscape*. Retrieved April 11, 2019, from https://www.nielsen.com/my/en/insights/reports/2019/cash-or-cashless-malaysias-shifting-payment-landscape.html.

In order to attract mass adoption by consumers and merchants, there are several key requirements that should be considered such as influence adoption, interoperability, simplicity and usability, security, privacy, universality, cost, efficiency and convertibility (Dahlberg, Mallat, Ondrus & Zmijewska, 2008; Karnouskos & Fokus, 2004; Pousttchi, 2008). If these requirements unable to fulfil, the adoption rate of mobile wallet may explain why have not lived up as expected. Among these requirements, consumers are mainly concern on the security and privacy of the payment system which will influence their behavioural to use mobile wallet (Koenig-Lewis et al., 2015; Shin, 2009; Zhou, 2013). These studies claimed that consumers are feel uncomfortable with the idea of mobile payment due to fears of security breaches as well as identity theft. Moreover, there are some technical limitations associated with mobile wallet system (i.e., small screen and slow response of smartphone) are required to be improved (Zhou, 2013). Otherwise, the consumers may find that the mobile wallet is inconvenience to use as new form of payment instrument.

Another problem to consider is lack of interoperability among the mobile payment service providers (Lee & Khaw, 2018) due to different technologies and business models used by mobile payment providers which caused the mobile payment market in the highly competitive and complexity (Xu, 2017). Mobile wallet is growing popularity in Malaysia (Ramalingam, 2012). However, Malaysian are still little engaged with mobile wallet, which create barriers as above mentioned such as lack of knowledge, lack of confident and behavioural habit etc.

The target of this research study is focus on the consumers' point of view instead of the merchants' point of view on the adoption of mobile wallet. Although, there are various research studies on mobile wallet had been conducted, however, most research studies are conducted outside Malaysia context which are China, India, Indonesia, Singapore, United States, Ireland, and other European countries (Azizah, Handayani & Azzahro, 2018; Chatterjee & Bolar, 2019; Eappen, 2015; Koenig-Lewis et al., 2015; Kumar, Adlakaha & Mukherjee, 2018; Liébana-Cabanillas, et al., 2015; Seetharaman, Kumar,

Palaniappan & Weber, 2017; G. Sharma & Kulshreshtha, 2019; S. K. Sharma, Mangla, Luthra & Al-Salti, 2018; Shaw, 2014; Singh, Kumar & Gupta, 2018; Varsha & Thulasiram, 2016; Zhou, 2013). There are limited studies focus on Malaysian context in general and, especially, the millennial generation. In additional, Shaw (2014) points out factors that influencing consumers behavioural intention to use mobile wallet could be varied by nation and also age group due to differences in infrastructure, consumers behavioural, social norms and culture. Thus, this study is aimed to fulfil the gaps left by other studies by examine the factors that affecting millennials' behavioural intention to use the mobile wallet.

1.3 Research Questions

The research questions are established as per below to guide this research study and address the researching issue.

RQ1: What is the relationship between *perceived usefulness* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ2: What is the relationship between *perceived ease of use* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ3: What is the relationship between *subjective norms* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ4: What is the relationship between *personal innovativeness* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ5: What is the relationship between *compatibility* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ6: What is the relationship between *perceived security* and behavioural intention to adopt mobile wallet among the millennial generation?

RQ7: What is the relationship between *trust* and behavioural intention to adopt mobile wallet among the millennial generation?

1.4 Research Objectives

The objective of this research study is to examine the factors that influencing millennial generation' behavioural intention to adopt the mobile wallet. Specifically, this research study is anticipated to achieve the following objectives:

RO1: To examine the relationship between *perceived usefulness* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO2: To examine the relationship between *perceived ease of use* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO3: To examine the relationship between *subjective norms* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO4: To examine the relationship between *personal innovativeness* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO5: To examine the relationship between *compatibility* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO6: To examine the relationship between *perceived security* and the behavioural intention to adopt mobile wallet among the millennial generation.

RO7: To examine the relationship between *trust* and the behavioural intention to adopt mobile wallet among the millennial generation.

1.5 Significance of the Study

This year, fintech is projected to grow in Malaysia due to the rapid development of technologies that helped to transform the payment and financial services industry. The mobile phone subscriptions have increased significantly in recent years, hence this push the entire mobile telephony industry experienced exponential growth (MCMC, 2017). In line with recent developments, the introduction of mobile wallet plays an crucial role in transforming the entire payment industry. The mobile wallet is the future trend of

payment instruments in the marketplace, thus mobile payment service providers and merchants should need to understand the benefit of mobile wallet and their consumers intention to adopt the mobile wallet payment as well.

In this study, the researcher needs to find out the main factors that affecting millennial generation' behavioural intention to adopt mobile wallet. According to Dennehy & Sammon (2015) highlighted that the mobile payment or mobile wallet is more likely to be adopted by millennial generation compare to other generation group because this generation is considered as "newer generation of digital natives" and they are most probably quickly realized the benefit (and disadvantages) of mobile wallet yet has high purchasing power as well. Thus, the perspective of millennial generation has the greater influence to force those marketers, service providers, government bodies and merchants to review their strategies if the traditional marketing programmes and policies are not lived up as their expectation or might not be applicable to the millennial generation.

This research study provides the evidence of the issues and factors relevant to adoption of mobile wallet by the millennial generation. The findings of this study serve as supportive data to support those organizations within this ecosystem to review their strategy in promoting mobile wallet use among the millennial generation. By understanding the millennial generation' concerns and issues when using the mobile wallet, those parties namely merchants, mobile wallet provides and marketers as well can formulate their strategy in regards to marketing programs or investment activities on infrastructure and systems that will increase the adoption rate of mobile wallet by the millennial generation.

Furthermore, the results can be contributed to Central Bank of Malaysia (BNM) on formulation of the policy to successfully transform the current payment landscape from cash to cashless society in order to enhance a nation's competitiveness. This provides some understanding of adoption factors that affect the broader usage of mobile wallet,

so that the Bank can collaborate with the industry player in safeguarding the stability and reliability of Malaysia's payment systems, and at the same time promoting the greater market competition and payment efficiency.

1.6 Conclusion

This chapter summarizes adoption factors that influence the use of mobile wallet. The purpose of this chapter is to give a clear idea for whole research project. In next chapter, the researcher will illustrate variables theory and each relationship. To have a clearer understanding on these variables, there will also display a research framework and research hypotheses diagrams.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

In this chapter, the researcher presents the review of literature about the definition of mobile wallet and factors that affecting adoption of mobile wallet among the millennial generation in Klang Valley. The first part begins with a definition of mobile wallet, then follow by discussion about relevant theoretical framework in a visual way to summarize the relationship of variables. Subsequently, the determining factors are introduced to serve as a link or to relate them with the behavioural intention to adopt the mobile wallet. Lastly, the final research framework and hypothesis of this study will be developed.

2.1 Mobile Wallet

The mobile wallet described by Shin (2009) as the form of payment that allows consumers to perform payment transaction electronically via smartphones, hence displacing the cash to check-out at a merchant's point-of-sale. Another definition of mobile wallet defined by Varsha & Thulasiram (2016) as the online prepare account that used to store money and can be used when required by initial, authorize and confirm the transaction in the exchange for goods and services. Furthermore, Shaw (2014) stated that the mobile wallet not only record the payment data, but also can be

incorporated with the loyalty cards and coupons which would benefit the consumers if they choose to use at the point-of-sale.

The mobile wallet is applicable in broaden areas such as ticketing, online purchase, mobile commerce (ring-tones, mobile games, news…), electronic banking, peer to peer fund transfers, as well as purchase goods and services from service providers or retail shops (Dahlberg, Guo & Ondrus, 2015). According to Koenig-Lewis, Morgan, Palmer, & Zhao (2015) claimed that benefit of mobile wallet is enable the users to conduct the payments at anytime from anywhere.

Koenig-Lewis et al. (2015) further stated that those small and medium-sized retailers who offers the mobile payment facility at their point of sale can lower down their operational costs when compare with traditional payment methods such as cash and/or bank card. In additional, Chatterjee & Bolar (2019) highlighted that the use of mobile wallet enables those organizations to gain access to customer transaction, so that they can have a better understanding on their consumers' preferences and offer them tailored services and/or packages. Hence, there are several studies supported that mobile wallet is the future trends of the payment method for both online and offline marketplace (Dennehy & Sammon, 2015; Liébana-Cabanillas, Ramos de Luna & Montoro-Ríos, 2015; Schierz, Schilke & Wirtz, 2010).

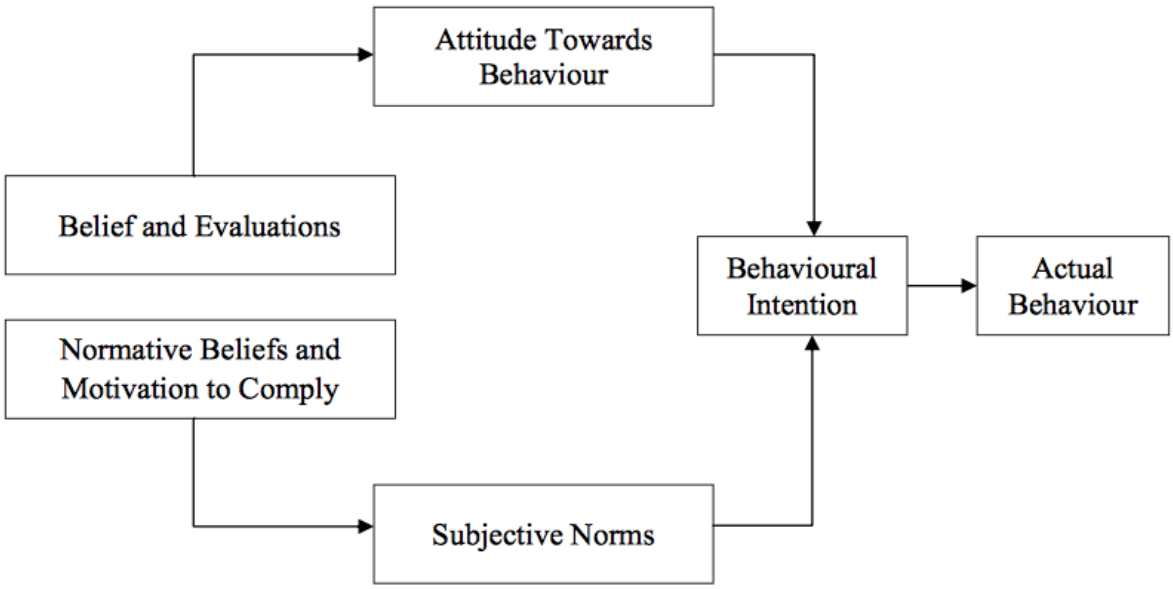
2.2 Review of Relevant Theoretical Models

2.2.1 Theory of Reasoned Action (TRA)

TRA model was formulated by Fishbein and Ajzen (1975), as a model utilized to observe how beliefs and attitudes associate with individual intention to involve in a particular activity or launching a new technology. TRA model asserted that individual's behavioural intention is influenced by attitude towards behaviour and social impact. In

additional, TRA is adopted to explain that a person feeling toward the participate in a given circumstance will affect his/her behaviour (Ajzen & Fishbein, 1980). Furthermore, this model suggested there are two variables namely attitude and subjective norms will influence a person behavioural intention (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). According to Hidayanto, Hidayat, Sandhyaduhita & Handayani (2015) stated that the TRA model was found to be validated track record in anticipating and describing "virtually all human behaviour".

Figure 4: Theory of Reasoned Action (TRA)

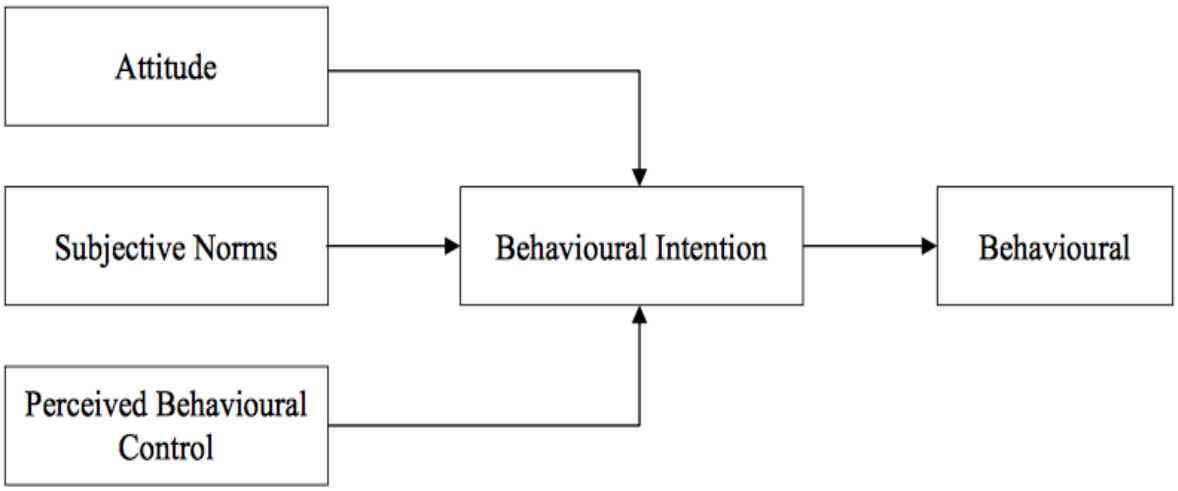


Note. From Fishbein, M. and Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Addison-Wesley, Reading, MA.

2.2.2 Theory of Planned Behaviour (TPB)

TPB model is an expansion development of the TRA model by Ajzen (1991). It proposes an additional variable which is perceived behavioural control as third predictor the behavioural intention. Based on study by Ajzen (1991), he introduced TPB model to cater the circumstance when a person does not have possess volitional control over the will of his/her behavioural. Hence, this is the differences between TPB model and TRA model. Basically, the TPB model describes an individual's behaviour intention is determined attitude of the person, social influence or subjective norms and perceived behavioural control (Ajzen, 2002; Madden, Ellen, & Ajzen, 1992).

Figure 5: Theory of Planned Behaviour (TPB)



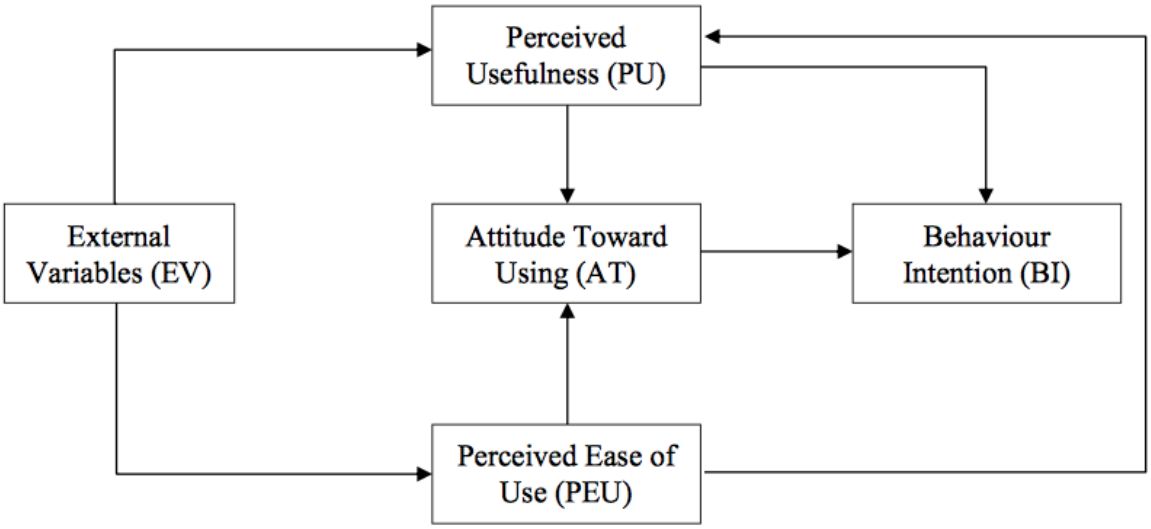
Note. From Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

2.2.3 Technology Acceptance Model (TAM)

TAM model is developed by Davis (1989) to examine the determinants of user acceptance toward a wide range of technologies or information system. Based on the study by Davis (1989), he asserted that there are two main variables (namely perceived usefulness and perceived ease of use) are found to have influence on users' decision to use the technology. In additional, Davis, Bagozzi & Warshaw (1989) agreed that perceived usefulness and perceived ease-of-use that decide the attitude towards the use of an innovation, and subsequently decide its wanted use, then finally become the actual use. Based on the study by Davis et al. (1989), they summarize the TAM is a model theorizes the relationship among belief, attitude, intention and behavioural and eventually anticipate the user acceptance on specific technology.

Even with the promising predictive power of TAM, Matemba and Li (2018) have criticized the TAM for several arguments: firstly, the outcome of TAM depends on the person self-declared input, which is too subjective and rely on his/her current emotional state; secondly, TAM expects the person must be always rational and able to form intentions to use the specific technology; and thirdly, this model disregards the culture and habit as primary factors that navigate the person for the adoption of technology. With aforementioned weaknesses, TAM model needed to modify by integrating others variables such as trust, security, compatibility etc. into this model to improve the model predictive power on behavioural adoption of mobile wallet (Chen, 2008; Eappen, 2015; Matemba & Li, 2018).

Figure 6: Technology Acceptance Model (TAM)



Note. From Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319.

2.2.4 Innovation Diffusion Theory (IDT)

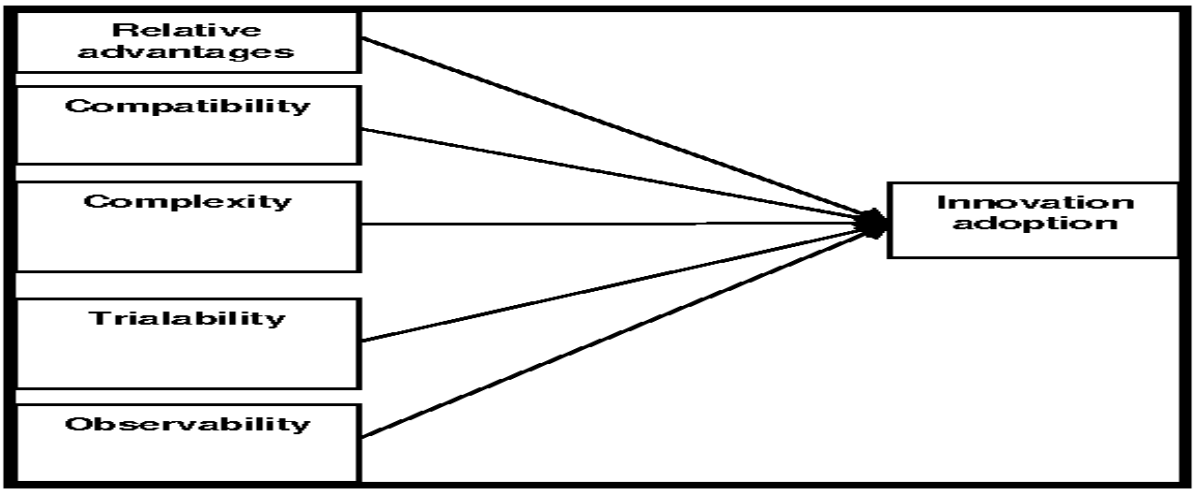
Another classic theory related to technology acceptance is the IDT model developed by Rogers (1983, 1995). Rogers (1995) defined the term of innovation as "an idea, practice or object that is perceived as new by an individual or another unit of adoption", and the term of diffusion was decoded as "the process by which an innovation is communicated through certain channels over time among the members of a social system". Basically, the IDT is to explain how, why and at what pace the new ideas and technology spread through cultures. According to Seetharaman et al. (2017) stated that time is involved in diffusion in several ways. Innovativeness of an individual or other unit of adoption is one of the ways that time is involved in diffusion (Seetharaman et al., 2017).

The study by Rogers (1995) advocated there are five adopter categories, which are Innovators (2.50%), early adopters (13.60%), early majority (34.00%), late majority

(34.00%) and late adopters or laggards (16.00%). In additional, the IDT model has five significant innovation characteristics, namely relative advantage, compatibility, complexity, trialability and observability, were found to explain 49 per cent to 87 per cent of the variance in the rate of its new idea or technology adoption. The IDT has been validated by many research studies, and especially in mobile payment and/or mobile wallet topic (Chatterjee & Bolar, 2019; Chen, 2008; Hidayanto et al., 2015; Seetharaman el al., 2017).

There are similarities between IDT and TAM in terms of their principal constructs (Chatterjee & Bolar, 2019). The relation advantage in IDT was similar with the perceived usefulness in TAM, whereas the complexity in IDT was similar to perceived ease of use in TAM (Chatterjee & Bolar, 2019). Both IDT and TAM shared the same limitation which is unable to explain situations where the person is not in fully volitional control.

Figure 7: Innovation Diffusion Theory (IDT)



Note. From Rogers, M. E. (1995). *Diffusion of innovations* (4th ed.). New York: The Free Press.

2.3 Dependent Variable

2.3.1 Behavioural Intention

In the study by Ramos, Ferreira, Freitas, & Rodrigues (2018), they defined the behavioural intention reveals the discreet probability of the consumer to adopt or use specific technology in a period of time. In additional, Matemba and Li (2018) highlighted that motivational factors could affect behavioural intention to use an innovative. For individuals who have access to greater resources or predicting low barriers, they are more likely possess higher level of mobile wallet intention (Matemba & Li, 2018). Basically, intentions show the levels of willingness of the person to execute their plans by paying endeavour to perform the behaviour.

There are several classic theories as above discussed are commonly applied for investigating on the topic of users' behaviour intention to use mobile wallet, and also several factors that affecting users' intention to use mobile wallet for purchase transactions (Liébana-Cabanillas et al. (2015); Schierz et al. (2010); Shaw (2014); N. Singh et al. (2019). Those classic theories such as TPB (Ajzen, 1991), TAM (Davis, 1989) and IDT (Rogers, 1983, 1995).

The TRA and TPB models, both explain that a person's behavioural intention to use a specific technology is decided by the person's attitude and subjective norms, which can be triggered by normative beliefs and behavioural of a person (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980; Ajzen, 1991). Moreover, an individual's intention to use technology is central concept in TAM, this model has consistently explained about 40 per cent of the variance on the topic of technology and mobile wallet (Chatterjee & Bolar, 2019; David, 1989). In TAM, David (1989) proposed perceived usefulness and perceived ease of use are two main factors determinants of use intentions. In additional, Rogers (1983, 1995) introduced IDT model, this model proposed several factors, namely compatibility, complexity, observability, trialability and relative advantage,

which are considered to be determinants for the behavioural intention to adopt an information system. Hence, behavioural intention is a dependent variable in this study.

2.4 Independent Variables

2.4.1 Perceived Usefulness

Perceived usefulness defined by Davis (1989) as "the degree to which a person believes that using a particular system would enhance his or her job performance" and it is their perception toward the outcome of the experience (Davis et al., 1989). There are plenty of studies have generally supported that perceived usefulness as one of the predictors in TAM that has positively associated with behavioural intention to adopt mobile wallet (Eappen, 2015; A. Kumar et al., 2018; Liébana-Cabanillas et al., 2015; Lu et al., 2011; Schierz et al., 2010; Seetharaman et al., 2017; Shaw, 2014; Shin, 2009).

In the online context, Liébana-Cabanillas et al. (2015) defined perceived usefulness as the extent to which a person believes that online shopping can receive latest promotion plan and useful news, then subsequently allow his/her easily to do the comparison on several promotions and perform the quicker checkout. In this study, perceived usefulness referring to the practical benefits an individual obtains from adopting mobile wallet for payment transactions. It is expected that consumers view on adoption of mobile wallet will help them to perform their payment transactions faster and better (Eappen, 2015).

The slow diffusion of mobile wallet is due to the failure in delivering a solid benefit to potential users (Schierz et al., 2010). The potential users are more likely to adopt the innovation if only they realized those innovations deliver a solid advantage compared to the current methods (Rogers, 1995). In terms of TAM model, the perceived usefulness well reflected the above statement. Davis (1989) suggests that perceived

usefulness is a crucial factor to predict the consumers' behavioural intention to adopt the mobile wallet.

2.4.2 Perceived Ease of Use

According to Davis (1989) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort". Eappen (2015) claimed that despite the technology is useful, users may not be motivated to use the technology if they perceive the technology is complex and require considerable efforts input. In additional, Liébana-Cabanillas et al. (2015) illustrate that the payment system must be designed in the way that fully adaptable to the users' capabilities and skills; otherwise users will likely to avoid from using it (Abrazhevich, 2001). Based on the study by Davis et al. (1989), he claimed that users perceive a technology to be more useful when it is easy to interact with.

Many researchers confirmed perceived ease of use as a crucial determinant on influencing behaviour intention to use the technology (Chen, 2008; Dahlberg, Mallat, & Oorni, n.d.; Lu et al., 2011; Seetharaman et al., 2017; G. Sharma & Kulshreshtha, 2019; Shaw, 2014; Shin, 2009; Unnikrishnan & Jagannathan, 2018). Davis (1989) reported that the information system or technology with a higher level of perceived ease of use is more likely to be accepted by most users.

In term of the payment system, Karnouskos & Fokus (2004) wrote that the payment system should be designed in easy and user-friendly way for users to conduct the payment transaction. This implies that the users must not be persistently disturbed to ask for fill information such as personal data and payment details, as the payment should be conducted automatically and free of effort (Hidayanto et al., 2015). This statement is absolutely true for mobile wallet services. In the study by Schierz et al. (2010), mobile wallet service providers are required to deliver clear benefits to users in

terms of perceived ease of use in order to displace the well-established payment solutions such as cash and credit card etc.

Moreover, the important features related to mobile wallet ease of use include, for instance, store of personal and bank details, record payment data, incorporated with loyalty cards, visible symbols and function icons, few and easy transaction process steps, user-friendly interface as well as help functions (Shaw, 2014; Varsha & Thulasiram, 2016). Therefore, the researcher will incorporate perceived ease of use into this research study to examine the user acceptance on mobile wallet. As noted by Venkatesh, Morris, Davis, & Davis (2003), particularly for non-users, the impression of perceived ease of use is undeniably more significant than the actual characteristics which underlie this construct.

2.4.3 Subjective Norms

Subjective norm is used to measure the social context or social influence. According to Venkatesh et al. (2003) stated subjective norms as "the degree to which an individual perceives that people who are important to him/her think he/she should use a specific system or take some action". On the other hand, Singh et al. (2019) defined subjective norms as the direct and indirect impact of others on the person's beliefs, perception and attitudes which eventually influencing their behaviour intention. Karahanna, Straub, & Chervany (1999) asserted that normative belief stimulates the subjective norms in the sense that the person ascribes to what relevant of others (salient referents) expect him to do with regard to adopting the information technology and also his motivation to conform with those beliefs. In additional, Bhattacherjee (2000) pointed out that subjective norms can be divided into two categories: (1) external influence by expert reviews and opinion of social media; (2) interpersonal influence by families, friends and relatives.

Many researchers incorporated subjective norms into their research models and proven subjective norms has positively associated with user's behavioural intention to adopt mobile payment (Hidayanto et al., 2015; Koenig-Lewis et al., 2015; Liébana-Cabanillas et al., 2015; Schierz et al., 2010) and mobile wallet (Megadewandanu et al., 2016; Shin, 2009; G. Singh et al., 2018; N. Singh et al., 2019). N. Singh et al. (2019) stated that the user with high social impact will disregard of expanded hazard on his adoption of behavioural intention. Furthermore, individuals usually act in a specific way to satisfy the desires of their friends, relatives and communities (Jiang et al., 2016; Liébana-Cabanillas, Marinkovic, Ramos de Luna, & Kalinic, 2018).

As previously mentioned, the current mobile wallet development in Malaysia is still in an infancy stage. In the current development, majority of users may lack of useful information about the clear benefits on the adoption of mobile wallet (Liébana-Cabanillas et al., 2015; Schierz et al., 2010). Therefore, the users will seek for the opinions of third parties such as family and friends before adopt the particular mobile wallet (Schepers & Wetzels, 2007). However, the users will reluctant to adopt the new technology when they perceive the perception of others are not in favour (Chong, Darmawan, Ooi, & Lin, 2010).

According to Webster & Trevino (1995) summarised that the subjective norms or social influence must not fail to consider when comes to evaluations of the acceptance of technological innovations: if the social context is not agreeable to utilize mobile wallet, the likelihood of adoption of mobile wallet by potential users will be low. In real life, most of people have inclination to collect more information about the technology from others, which in return would influence his/her intention to use the technology or take some actions (Tan, Lee, Lin, & Ooi, 2017). As above discussed, this makes us believe that subjective norm is expected to have positively influence on the users' behavioural intention to adopt mobile wallet.

2.4.4 Personal Innovativeness

According to Agarwal and Prasad (1998) defined that personal innovativeness in the field of information technology as "the degree to which an individual is responsive to new ideas and adopts innovative decisions freely and earlier than others". The study by Agarwal and Prasad was the first research study to include personal innovative as one of the predictor variables to examine its relationship in the technology acceptance models. In additional, Rogers (1995) explained the term "innovative" in his innovation diffusion theory, those individuals who are proactive seeking for information about new idea or to be a pioneer in using new technologies earlier than others are tend have high level of personal innovativeness, they are also called early adopters.

Furthermore, Sair and Danish (2018) hold that the term of "personal innovativeness" should be well understood and accepted universally in such a way that consumers regardless of any countries are expected to have similar of willingness to accept new innovative thing, for instance, novelty looking for is not weaken by consumers' cultural differences. In the study by N. Singh et al. (2019), the researchers observed that individuals with higher level of innovativeness are able to cope with greater uncertainty and more likely to accept the new technologies, such as mobile wallet application. This statement is also supported by Seetharaman et al. (2017) that individuals with high level of personal innovativeness are expected to generate more positive perceptions compared to individuals with low level of personal innovativeness.

Many past studies adopted personal innovativeness as determinants to test its impact on the consumers' behavioural intention to use e-commerce (Sair & Danish, 2018), mobile banking (Ramos et al., 2018), mobile payment (Liébana-Cabanillas et al., 2018) and mobile wallet (Liébana-Cabanillas et al., 2015; Seetharaman et al., 2017; G. Singh et al., 2018; N. Singh et al., 2019). In previous chapter, the researcher mentioned that the mobile wallet is an innovative payment technology and likely to be transformed the Malaysia's payment system from cash to cashless society in near future. Consequently,

individuals possess the greater personal innovativeness can be more technically competent and would consider the mobile wallet less troublesome than others, which suggesting the behavioural intention to use mobile wallet is influenced by personal innovativeness.

2.4.5 Compatibility

Based on Rogers (1995), compatibility is explained as "the degree to which an innovation is perceived consistent with the values, needs and past experiences of potential users". Rogers went further illustrated that an innovation is well fits with the individual's daily life or habit, which as a result will yield higher rate of adoption. Moreover, Liébana-Cabanillas et al. (2018) stated that compatibility is considered as another important predictors for the new technology development process, as the greater compatibility realized by the users can help to reduce potential uncertainty and increase adoption on new ideas or a specific innovation technology like mobile wallet.

Tornatzky and Klein (1982) mentioned that user support could be a crucial innovation characteristic that stimulating to technology acceptance, especially on those innovations are really new. In the context of mobile wallet, Lu et al. (2011) observed the lifestyles of individuals will strongly affect by their decision toward adoption of the technology. One of the examples given by Lu et al., mobile wallet is considered an extension of internet payment services, individuals who frequently perform internet payment transaction may found to have less resistance to accepting the mobile version payment method.

Many empirical evidences supported compatibility has positively impact on user's behavioural intention to adopt information technologies in general (Aslam, Ham, & Arif, 2017; Chen, 2008; Liébana-Cabanillas et al., 2015, 2018; Lu et al., 2011) and mobile wallet in particular (Chatterjee & Bolar, 2019). As previous mentioned that the

development of mobile wallet is still new in Malaysia, hence compatibility is necessary to unlock the initial model (Schierz et al., 2010). In this sense, it can be assumed that compatibility can be one of the factors to improve its anticipative power on behavioural intention to use the mobile wallet.

2.4.6 Perceived Security

The definition of perceived security has been defined by several researchers. According to S. K. Sharma et al. (2018) defined perceived security as the opinion of users towards payment systems or financial institution that he/she believe that the web is secure to perform payment transaction and transmit sensitive information while maintain confidentially. In additional, Matemba & Li (2018) explained perceived security as "a user's feeling that his/her personal data will not be viewed, stored and controlled by unauthorized users when performing payment transaction". Moreover, Ramos et al. (2018) described perceived security is the perception of the users towards the payment service provider will meet safety requirement such as authentication, encryption and integrity. Basically, the perceived security stands for the opinion of security against with the risk related to mobile payment transaction, notably on the risk of privacy violation as a consequence lead to financial losses (Aslam et al., 2017).

Schierz et al. (2010) claimed the transformation on payment system generally also come with risks. Liébana-Cabanillas et al. (2015) is also agreed that the major concerns in mobile wallet payment systems are risk assessment and safety. Furthermore, Matemba & Li, (2018) wrote that in the context of mobile payment system, many users concerning their online activities can be hijacked by unauthorized users, the consequences not only to theft of sensitive personal information, but also lead to financial losses. Hence, it is necessary to establish infrastructure that supporting the payment systems that can resistant to attacks over the internet in order to safeguard the

security of consumers' transaction and build trust, which in return enhancing behavioural intention towards adoption of mobile wallet (Hidayanto et al., 2015).

According to Seetharaman et al. (2017) asserted the important functionality of mobile wallet is around payment systems. Based on the study by Francis, Hancke, Mayes, & Markantonakis (2010), the researchers summarized the electronic payment systems into four subcategories, namely payment authentication, payment integrity, payment authorization and payment confidentiality: payment authentication implies that demanding proof of identity for payer and payee; payment integrity refers to unauthorized parties are prevented from altering the payment record, payment authorization refers to the transaction ensuring prevention of unauthorized withdrawals if without getting permission from account holders; payment confidentiality stands for unauthorized users are blocked to view the transaction records.

Matemba & Li, (2018) pointed out security of payment system suggests technical features must protect the privacy matters in a more effective way. Not only that, the mobile wallet service providers should be constantly improved so that the security holes such as data leakages and double spending of currency can be prevented (Hidayanto et al., 2015). With this respect, it is important to have tools that safeguarding the payment transaction against unwanted behavioural, so that consumers will feel safe and encouraging them to use mobile wallet for payment transaction (Liébana-Cabanillas et al., 2018). Similar to previous research studies (A. Kumar et al., 2018; Lu et al., 2011; Shin, 2009), perceived security is found as important inhibitors influencing the behavioural intention to adopt the mobile wallet.

2.4.7 Trust

According to Zhou (2013) defined trust as "the willingness to be loyal to a service provider based on positive expectation toward the service provider's future behaviour".

In another study performed by A. Kumar et al. (2018) illustrates the concept of trusting beliefs, which can be classified into four distinctive elements: (1) competence – refers to the individual's belief that the other party has the ability or knowledge to fulfil its duties; (2) benevolence – means the belief that the other party is taking care of their best interest, and not just its own advantage; (3) integrity – the belief that the other party is able to keep its promises without lying to customers, make good faith agreements and also act ethically at all times; (4) predictability – the belief that the other party always behaving consistent over time and can be predicted in certain circumstances.

In the mobile wallet context, the lack of trust will discourage potential adopters from using the mobile wallet because this type payment method is more vulnerable and uncertain than those traditional payment methods like cash and credit card etc (Lu et al., 2011). Thus, Seetharaman et al. (2017) argued that the mobile wallet service providers need to develop a good system to meet the expectations of their potential users is a necessary determinant of success. Not only that, the service providers need to collaborate with statutory bodies like Central Bank (Bank Negara Malaysia) in safeguarding the stability and reliability of Malaysia's payment system (Lee & Khaw, 2018), which indirectly makes them trustworthy (Chatterjee & Bolar, 2019).

According to Eappen (2015) defined trust as the degree of which an innovative technology is dependable and reliable. Eappen further illustrates that it means the feeling of guarantee provided to the users that their transaction via mobile wallet will be performed in relation to their expectations, and also payment records obtained will not be disclosed to any unauthorized parties with any vested interests. Not only that, Hidayanto et al. (2015) pointed out customer trust in mobile wallet is also expecting their account balance will be not stolen, and all parties involved will take care of users' best interest regardless of the system design whether perfect or not. The perception of users in favour toward the mobile wallet is high when they perceive their information will be handled in a dependable, credible and in ethical manner, therefore, the higher

intention to adopt the mobile wallet is expected, and also users are more likely to share their information with mobile wallet service providers (Saprikis, Markos, Zarmpou, & Vlachopoulou, 2018).

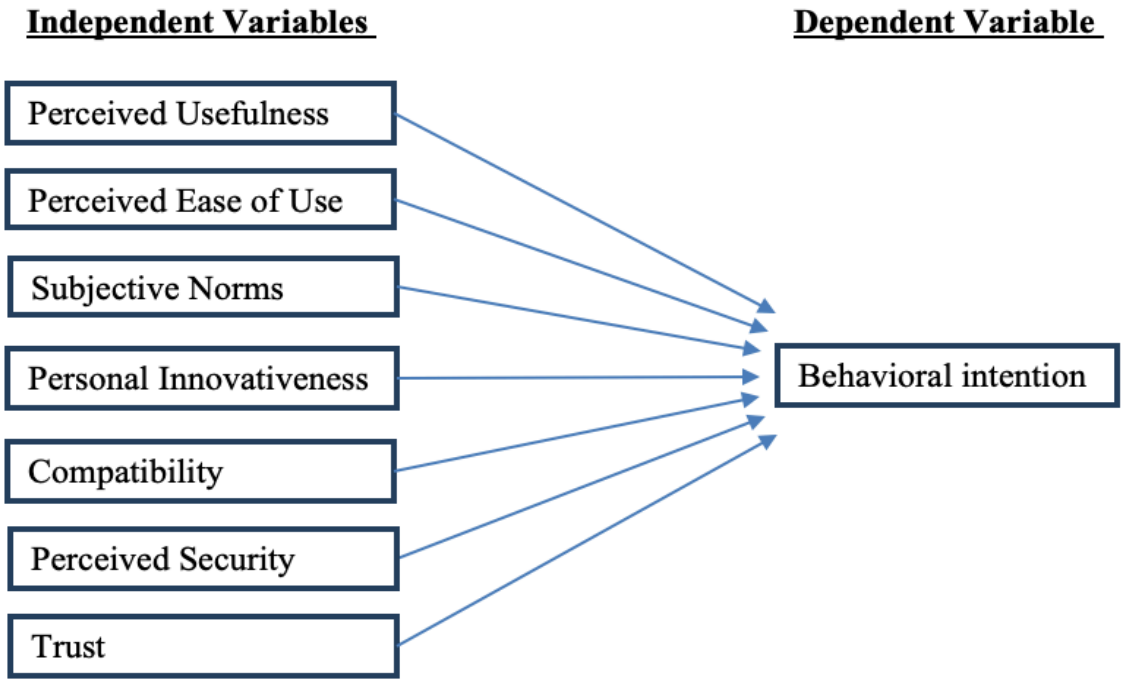
In the study by Azizah et al. (2018), the researchers reported trust is crucial factor in influencing individuals to share their personal information. Ramos et al. (2018) found that trust in service providers can reduces fears and worries in perform the mobile transaction. Matemba and Li (2018) highlighted that the good quality of services that consumers have experienced in mobile wallet transaction, there is high possibility that they will continuously to conduct another payment transaction in the near future. Thus, Matemba and Li further stated that this will build good and stable relationship between the consumers and mobile wallet service providers, which in directly may expand the service provider's network thru word-of-mouth.

There are many studies agreed that mobile wallet vendors should help consumers to overcome uncertainty by building trust in mobile wallet and trust in mobile wallet service providers which eventually can increase the acceptance of using mobile wallet (Azizah et al., 2018; Chatterjee & Bolar, 2019; Eappen, 2015; Hidayanto et al., 2015; A. Kumar et al., 2018; Lu et al., 2011; Matemba & Li, 2018; Ramos et al., 2018; Saprikis et al., 2018; Seetharaman et al., 2017; S. K. Sharma et al., 2018; Shaw, 2014; Zhou, 2013). In overall, consumers are concerned about the safety of their personal information and payment transactions which trust plays a key role in influencing consumers to adopt the mobile wallet (Shin, 2009). Hence, it is reasonable to predict trust has positive relationship with behavioural intention to adopt mobile wallet.

2.5 Proposed Research Framework

The proposed research framework for this research study shown in Figure 8. TPB, TAM and IDT model are utilized in this research study to develop the research framework. In addition, there are three variables which are personal innovativeness, perceived security and trust are added into this research framework.

Figure 8: Proposed Research Framework



Note. Developed for this study.

2.6 Hypothesis Development

Based on the discussion in literature review, therefore the hypothesis of this study can be formulated as following:

H_1: There is a significant positive relationship between *perceived usefulness* and millennials' behavioural intention to adopt mobile wallet.

H_2: There is a significant positive relationship between *perceived ease of use* and millennials' behavioural intention to adopt mobile wallet.

H_3: There is a significant positive relationship between *subjective norms* and millennials' behavioural intention to adopt mobile wallet.

H_4: There is a significant positive relationship between *personal innovativeness* and millennials' behavioural intention to adopt mobile wallet.

H_5: There is a significant positive relationship between *compatibility* and millennials' behavioural intention to adopt mobile wallet.

H_6: There is a significant positive relationship between *perceived security* and millennials' behavioural intention to adopt mobile wallet.

H_7: There is a significant positive relationship between *trust* and millennials' behavioural intention to adopt mobile wallet.

2.7 Conclusion

The literature review of several independent variables and dependent variable have been discussed under this chapter. Based on the literature review, the researcher has developed the research framework to test its relationship among independent and dependent variables. In next chapter, the research methodology will be discussed.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This chapter is comprised of several parts of research methodology. Firstly, the research design was first to be discussed and the followed by data collection methods. The researcher illustrated the target population, sample size, sampling procedures, sampling location, sampling technique and sampling element of this study in the data collection methods section. Next, pilot test and research instrument are discussed under this chapter. In last part of this chapter, the researcher discussed about the measurement of construct and data analysis methods. Hence, the aim of this chapter is to let readers understand better about how and where this research is being conducted.

3.1 Research Design

Cooper & Schindler (2008) stated that research design served as master plan that displayed the techniques and methods for collecting and analysing the required data. Another definition of research design defined by Sekaran (2003) is structure to determine on data collection, data analysis and interpret data and looking for solutions to address the problems. Hence, the researcher conducted this research study in the visualized way to tell readers about how this research is being conducted. By doing

this, it is important that the data collection processes are in appropriate matter in order to avoid any error occurred.

3.1.1 Quantitative Research

The researcher is used quantitative approach for this research study by collected a greater number of respondents' perceptions through the questionnaire. According to Zikmund (2003), quantitative approach utilizes mathematical based methods to render findings by focus on gathering and examine numerical which means that the measurement is objective, quantitative and statistically valid. Moreover, Malhorta & Peterson (2006) asserted that a course of action can be proposed according to conclusive result of quantitative research.

3.1.2 Descriptive Research

Descriptive research is used in this research because the researcher could survey a representative sample to examine those factors that influencing behavioural intention to use mobile wallet among millennial generation in Klang Valley. Descriptive research is applied by most of the research papers as this is most useful to explain the characteristics of population (Zikmund, 2003) and also the accessible circumstances instead of interpreting and making judgements (Creswell, 1994). The primary goal of descriptive research is adopted for validation of the established hypotheses and report the present circumstance.

3.2 Data Collection Method

3.2.1 Primary Data

The data collection for this research study is based on primary data. The questionnaire is used to conduct this research as primary data. In other word, those collected data as primary data for this research study (Zikmund, 2003). Usually, the first-hand collected data, so called primary data is found to be more objective, authentic and reliable. As primary data is the principal source of collection method for this research to solve the specific research problem as described in chapter 1. The data collected via questionnaire from a group of people enables the researcher to conclude the population characteristics. There are several techniques to gather primary data which are via questionnaire, focus group, observation and interviews. In this research study, survey questionnaire is the most suitable method to be used to generate the primary data. The data collection is used self-administered survey technique. A total of 300 questionnaires are distributed to the targeted respondents.

In order to complete the survey in an easy and cost-effective way, the researcher is used online survey questionnaire which generated in Google Form and sent to the targeted respondents to fill and return it automatically after they have answered. In additional, the traditional hand-in-hand survey questionnaire is also being carried out for data collection through distributed to respondents face to face. Both methods are effective way to collect data from a large sample of millennial generation in Klang Valley within a short period of time.

3.3 Sampling Design

As noted by Zikmund (2003), sampling is a step that utilizes a subset of population to represent and describe the whole population. Zikmund further illustrates that it enables the researcher to anticipate some unknown populations characteristics.

3.3.1 Target Population

Target population is a gathering of individuals that needed to make the correct inferences. The fitting target population must be defined in the start of the sampling process. In this research study, the target respondents are millennial generation who born between 1982 and 2003 in Klang Valley, Malaysia.

There are two main reasons that the researcher selected millennial generation as target population in this research. Firstly, according to Farag, Schwanen Dijst and Faber (2007) stated that the millennial consumers' perceptive toward internet and online shopping have more positive attitude as compared to other generations such as baby boomer. The millennial generation is more familiar with internet and latest technology; thus, they are not easily giving up if counter any difficulties while using mobile wallet. Secondly, the millennial generation is the heavy users of mobile devices for their daily routine and activities. With the above points, the researcher selected this group of people can help to narrow down the scope of this research and more accurately on analysing the consumers' behavioural intention towards mobile wallet.

3.3.2 Sampling Frame and Sampling Location

Sampling frame provides the references from where the samples can be drawn (Zikmund, 2003). In this research study, the sampling frame is not relevant due to non-probability sampling techniques are applied for further understanding.

The survey questionnaires are randomly circulated to the potential respondents in Klang Valley where the population is more dense and accessible. The boundaries of Klang Valley are defined in Chapter 1, see Figure 1. The questionnaires will be distributed in two forms: online questionnaires will be distributed via Google Doc; traditional hand-in-hand questionnaires will be distributed via face to face.

3.3.3 Sampling Element

The target respondents are those people who born between 1982 and 2003 in Klang Valley, Malaysia as the sampling element of this research study. The target respondents are selected randomly regardless of gender, education level and income level to participate in this research study.

3.3.4 Sampling Techniques

Sampling technique is applied to select target sample from the population (Cooper & Schindler, 2008). There are two types of sampling techniques which are probability sampling and non-probability sampling (Zikmund, 2003). In this research study, the researcher applied non-probability sampling technique due to no sampling frame. Zikmund further defined that non-probability sampling is referring to the selection of respondents to participate in this research are not given the equal chance.

According to Zikmund (2003), there are several modes of non-probability sampling which are convenience sampling, snowball sampling, quota sampling and judgmental sampling. In this research study, convenience sampling is used as this allowed the researcher to easily collect a greater number of answered questionnaires in a faster and cost effectively way.

3.3.5 Sampling Size

Sekaran and Bougie (2010) stated that "the research objective, extent of precision desired (the confident interval), amount of variability in population, acceptable risk in making prediction of level of precision (confidence level), cost and time constraints and population's size will affect the decision on sample size." Furthermore, Roscoe (1975) mentioned that the appropriate sample size for research study should be exceeded than 30 and lower than 500. The bigger sample size, the lower the sampling errors are expected to generalize the population of study (Malhotra & Peterson, 2006).

Hence, the targeted sample size in this research is 300 respondents. In regard to prevent the failure of achieving targeted sample size due to missing data or outliers, there are 350 sets of questionnaires are distributed to the target respondents. As a result, there were 306 respondents' response to the survey through the convenience sampling.

3.4 Research Instrument

To achieve the research objective, the self-administered questionnaire is the most appropriate instrument and applied in this research study. Self-administered questionnaire is the process to collect data from the target respondents that can comprehend and fill the survey questions easily without needed the additional training (Hair, Money, Samouel & Page, 2006).

3.4.1 Questionnaires Design

The questionnaire is designed in closed-ended questions given the options for respondents to choose and answer. With this design, it enables to simplify the process for interpreting the sample from greater numbers of respondents as the returned questionnaires were constant. In additional, it is easier and less time-consuming for respondents to answer and complete the questionnaire as they only required to indicate their degree of agreement according to each survey questions. By doing this, it enhances the likelihood for respondents to participant in this research study. The questionnaire will be adopted a simple English and avoid unambiguous word in the design of questionnaire (Zikmund, 2003) as it is an appropriate to communicate and provide a better understanding for respondents to input the accurate answer.

The full set of questionnaire consists of cover letter, demographic profile, factor influence, behavioural intention, and the closing of the questionnaire. The layout of the questionnaire is started from cover letter which is used to explain the purpose of the survey. In additional, the researcher thanks the respondents for their participation for spending time in completing the questionnaire. Lastly, the researcher's contact details such as name and email address will be stated in the cover page for respondents to further clarification on their queries if any. This questionnaire is consisting of three

parts which is Section A (demographic profile), Section B (factors adoption) and Section C (behavioural intention to adopt mobile wallet).

In Section A, the respondents are required to give some basic demographic profile such as gender, race, age, monthly income and etc. However, there is certain demographic question like age is asked in a closed-ended basic which required the respondents to select from the drop down of year of birth. This enabled researcher to identify whether the respondents are the targeted sample. This demographic profile, especially age is important for this research as the research is focused on millennial generation on the adoption on mobile wallet. This section helped to identify the respondents' profile.

Section B is carried out all the independent variables questions which require the respondents to answer in order to identify the factors influencing levels. In this part, there is a series of statements with regard to different factors influences and the respondents are required to indicate their extent of agreement toward each question. The respondents are required to score on five-point Likert scale: 1 for "strongly disagree", 2 for "disagree", 3 for "neutral", 4 for "agree" and 5 for "strongly agree". Under each factor influence, there are several questions are being asked in order to compute an average and obtain the accuracy of the measure of the respondents' influencing level.

In section C, the questionnaire is to test the respondents' behavioural intention to adopt mobile wallet. It is similar with section B, there is a series of statements and required the respondents to indicate their degree of agreement with each statement. And also, the measurement of agreeableness of the respondents is through five-point Likert scale. This section is important as the researcher not only can identify the level of behavioural intention to adopt mobile wallet, but also identify the relationship between factors influences and behavioural intention to adopt mobile wallet. With these data, the researcher is able to understand which independence variables has no relationship with

the dependence variable and vice versa. At the end of questionnaire, the researcher once again thanks the respondents for their time to complete the questionnaire.

3.4.2 Pilot Test

Pilot test, or called as pre-testing is important to be carried out to ensure do not have any ambiguous questions being asked in the questionnaire through the respondents' feedback (Zikmund, 2003). According to Cooper & Schindler (2008) stated that the pilot study is conducted to notice the weakness in design of the questionnaire. They further illustrate that the function of pilot test is to improve the questionnaire to make sure the respondents can answer the questions at ease and also do some adjustment before distribute to target respondents.

According to Lackey and Wingate (1998) proposed 10 percent of the total sample size is sufficiently for pilot testing. Thus, 30 sets of questionnaires will be distributed to UTAR students for pilot testing to ensure no major problems for respondents in understanding the questions and able to answer it well. The researcher selected UTAR students as the target respondents for pilot test is due to the characteristic of this group of people is similar with the actual target respondents, hence the researcher will be able to get more reliability and validity results. However, those minor feedback from respondents such as typing error and grammar mistake is amended accordingly as well to enhance the quality and appropriateness of the questionnaire.

3.5 Constructs Measurement

3.5.1 Origin of constructs

The sources used in this research study were adopted from several studies (Chatterjee & Bolar, 2019; Eappen, 2015; Liébana-Cabanillas et al., 2015; Schierz et al., 2010; Shaw, 2014; N. Singh et al., 2019). All the questions asked for each variable are summarized in below Table 1.

Table 1: Questions Asked for Each Factor Influence

Factors Adopt Mobile Wallet	**Questions Asked**	**Sources**
Perceived Usefulness	1. The mobile wallet is useful mode of payment.	Eappen (2015); Liébana-Cabanillas et al. (2015); Schierz et al. (2010)
	2. Using mobile wallet makes the handling of payments easier.	
	3. Mobile wallet allows quick use of mobile applications (e.g., ticket purchases, and use of mobile coupons, etc.).	
	4. I believe that the mobile wallet improves my decisions as a consumer (e.g., flexibility, speed, etc.).	
Perceived Ease of Use	1. It is easy to become skilful at using the mobile wallet.	Chatterjee & Bolar, (2019); Eappen (2015); Liébana-Cabanillas et al. (2015); Schierz et al. (2010)
	2. Interactions with the mobile wallet are clear and understandable.	
	3. It is easy to follow all the steps to use the mobile wallet.	
	4. It is easy to interact with the mobile wallet.	

Subjective Norms	1. People who are important to me would recommend using the mobile wallet.	Liébana-Cabanillas et al. (2015); Schierz et al. (2010)
	2. People who are important to me view the mobile wallet as beneficial.	
	3. People who are important to me think it is a good idea to use mobile wallet.	
Personal Innovativeness in Information Technology	1. If I heard about a new information technology, I will try it.	Liébana-Cabanillas et al. (2015)
	2. I am usually the first among my friends/family to explore new information technologies.	
	3. I like to experiment with new information technologies.	
Compatibility	1. Using mobile wallet fits well with my lifestyle.	Chatterjee & Bolar, (2019); Liébana-Cabanillas et al. (2015); Schierz et al. (2010)
	2. Using mobile wallet fits well with the way I like to purchase products and services.	
	3. I would prefer to use the mobile wallet over other kinds of payment methods (e.g. credit or debit card, cash).	
Perceived security	1. The risk of an unauthorized party intervening in the payment process is low.	Liébana-Cabanillas et al. (2015); Schierz et al. (2010)
	2. The risk of abuse of user's information (e.g. names of business partners, payment amount) is low when using the mobile wallet.	
	3. The risk of abuse of billing information (e.g. credit card number, bank account data) is low when using mobile wallet.	
Trust	1. Mobile wallet has adequate features to protect my security.	

	2. Mobile wallet keeps my financial information secure.	Eappen (2015); Shaw (2014)
	3. Mobile wallet has adequate features to protect my privacy.	
	4. Mobile wallet keeps my personal data safe.	
	5. Overall, mobile wallet is trustworthy.	

Note. Developed for this study.

Table 2: Questions Asked for Behaviour Intention

Dependent Variable	**Questions Asked**	**Sources**
Behavioural intention	1. I am likely to use mobile wallet in the near future.	Liébana-Cabanillas et al. (2015); Schierz et al. (2010); Shaw (2014); N. Singh et al. (2019)
	2. I am willing to use a mobile wallet in the near future.	
	3. I intend to use mobile wallet when the opportunity arises.	
	4. I plan to use the mobile wallet frequently in my daily routine activities.	

Note. Developed for this study.

3.5.2 Primary Scale of Measurement

In this research study, the researcher collected all the information from respondents via questionnaire in aiming to solve the research question and meet the objective. There are several measurement scales such as nominal, ordinal, interval and ratio scale is used in order to measure the questionnaire.

3.5.2.1 Nominal Scale

Nominal scale is the simplest type of measurement scale which means those numbers and letters was assigned to the objects serve as “tags” or “labels” for identification or classification purpose only (Zikmund, 2003). The requirement of using nominal scale is if the alpha numerical data is not in order form. In other words, nominal scale does not imply any ordering among the responses as the numbers have no value. For instance, the information of demographic profile such as gender and races are used nominal scale to measure.

3.5.2.2 Ordinal Scale

Ordinal scale is a non-numerical scale because the objects is arranged according to their magnitudes in an ordered relationship (Zikmund, 2003), however the differences between the each one is unknown. Ordinal scale is the second level of measurement which reports the ranking and ordering of the data. For instance, ordinal scale is used in the monthly income and education level.

3.5.2.3 Interval Scale

Interval scale is a numeric scale which means that not only arrange objects according to their magnitudes but also distinguishes the order arrangement in unit with equal intervals (Zikmund, 2003). In other words, this scale has a beginning point and a terminating point and it is divided equally spaced into units or intervals (R. Kumar, 2011). Interval scale is best used for opinion measurement given that there is no "true zero". For instance, the Likert scale rank from 1 for "strongly disagree", 2 for "disagree", 3 for "neutral", 4 for "agree" and 5 for "strongly agree" are applied in Section B and C to analyse the degree of agree or disagree on both independent and dependent variables.

3.5.2.4 Ratio Scale

The highest level of measurement is ratio scale. According to R. Kumar (2011)**,** ratio scale has all the properties of above mentioned scales and it also has a starting point fixed at zero. This is an absolute scale which means the differences between the intervals is always calculated or measured from a zero point. The measurement of age and monthly income in the questionnaire are under ratio scale. For instance, a person who is 40 years old is twice the age of the person who is 20 years old; a person who earning MYR 75,000 per year has earn three times the salary of a person earning MYR 25,000.

3.6 Data Processing

Data processing is those data being collected and converting into valuable information or information into data. There are several steps of data processing included questionnaire checking, data editing, data coding, data transcription and data cleaning in order to ensure the data is presented in the clean and systematic way for easy to understand and to be used for further analysis purposes.

3.6.1 Questionnaire Checking

According to Malhotra and Peterson (2006), the first step of data processing is questionnaire checking. This step is to check the completeness of the returned questionnaire from the respondents. Any problems or errors found on the returned questionnaire such as incomplete or misplaced can be detected and allowed the researcher to make an appropriate changes or correction before use to conduct a real survey.

3.6.2 Data Editing

The second step is data editing which means the data is ready for coding and transfer to data storage (Zikmund, 2003). In this step, it is included the questionnaire screening process to ensure the consistency, completeness and reliability of the data. The incomplete answers or missing values were rejected in data editing process.

3.6.3 Data Coding

After the data editing, the data coding is carried out to classify each item in questionnaire as the code or number to represent the likely response to each question (Malhotra & Peterson, 2006). For instance, the gender profile in section A, "Male" is assigned as 1 and "Female" is assigned as 2. The coding process helped the researchers to ease the process of data entry and less time-consuming.

3.6.4 Data Transcription

After the data being coded, the following step is transferred the coded data from questionnaire directly into computer software which is Statistical Project of Social Science (SPSS), and then executed the eventual cross tabulation. After that, the results is generated through SPSS software for analysis.

3.6.5 Data Cleaning

The final step in data processing is data cleaning. According to Malhotra and Peterson (2006), data cleaning is to ensure no missing value or responses in all the entry data. Consistency checking is used to identify whether the data is reasonable incompatible or have extreme value. The SPSS software is used to identify out of range value.

3.7 Data Analysis

Data analysis is the process of analysing and evaluating the data to form some finding or conclusion. There are several analyses are carried out such as descriptive analysis,

factor analysis, reliability test and inferential analysis to examine the factors that influencing millennial generation' intention to adopt the mobile wallet.

3.7.1 Descriptive Analysis

According to Zikmund (2003), descriptive analysis is the process of conversion of raw data into a form of information that will have better guiding the researcher in understanding and interpreting of the raw data. The purpose of descriptive analysis is to identify and summarize the characteristics of the data.

The frequency distribution is the best tool to summarize the demographic of the sample. The measurement scale applied in frequency distribution is nominal and ordinal scale. With this analysis, the researcher is easily observed how frequently each response occurs. After that, all the data is presented in the tabulation form.

3.7.1.1 Normality Test

The normality test is applied to assess the degree of which distribution data corresponds to the normal distribution (Hair et al., 2006). Hair et al. (2006) stated that there are two numerical indicators, namely Skewness and Kurtosis are used to test for normality. According to Mayers (2013) claimed that the acceptable range value of skewness and kurtosis for big samples (i.e., >100) is at absolute z-value below 3.29 ($Z < |3.29|$), which corresponds with an alpha level 0.05, and conclude the distribution of sample is normal.

3.7.2 Factor Analysis

Factor analysis is used to examine the number of variables whether are correlated with each another. The analysis allowed numerous inter-correlated variables to be condensed into fewer dimensions, or called factors. According to Kaiser and Rice (1974) suggest that Kaiser-Meyer-Olkin (KMO) measurement above 0.6 is acceptable.

3.7.3 Reliability Test

The data collected required to pass the reliability test. The purpose of this reliability test is to test the consistency and stability in measuring the inter-correlation of the data (Zikmund, 2003). The range of Cronbach's alpha reliability coefficient is fall between "0" to "1". According to rules of thumb, the value of Cronbach's alpha above 0.8 is considered excellent, over 0.7 is acceptable, less than 0.6 is questionable, less than 0.5 is weak and unacceptable (Sekaran, 2003). The higher the value of Cronbach's alpha, the test results are more reliable.

3.7.4 Inferential Analysis

In additional, the inferential analysis is used to investigate the research question, the research framework as well as various hypotheses and form the conclusion that draw from a population. In this research study, SPSS is used as the tool to conduct the Multiple Regression Analysis.

3.7.4.1 Multiple Regression Analysis

Multiple regression is used to determine whether there is positive or negation relationship between the variables and to anticipate the value of dependence variable (Y) based on the value of independence variables (X). In this research study, the dependent variable is millennial generation' behavioural intention to adopt mobile wallet. The multiple linear regression is used to prove whether the independence variables have significant relationship with the dependent variable.

The multiple regression model in this research study are shown as below:

$$Y= a + b_1X_1 + b_2X_2 + b_3X_3 + ... + b_kX_k + e$$

Equation:

$$BI = a + b_1(PU) + b_2(PEOU) + b_3(SN) + b_4(PI) + b_5(C) + b_6(PS) + b_7(T) + e$$

Whereby,

BI = Behavioural Intention
PU = Perceived Usefulness
PEOU = Perceived Ease of Use
SN = Subjective Norms
PI = Personal Innovativeness
C = Compatibility
PS = Perceived Security
T = Trust

3.8 Conclusion

This chapter has discussed several methods to be used to carry out this research study. After the completely collected the data from returned questioned by respondents, then those collected data are analysed through SPSS software. In the next chapter is focused on interpretation of the research result.

CHAPTER 4

RESEARCH RESULTS

4.0 Introduction

This chapter reports the research results of mobile wallet survey which was conducted on the millennial generation in the Klang Valley, Malaysia. The data collected for this research study is used Statistical Package for Social Science (SPSS) for analysis and interpret the data in order to provide an overall image of the research result. There are several analyses are carried out such as descriptive analysis, factor analysis, reliability analysis and inferential analysis.

4.1 Response Rate

A total of 350 questionnaires were distributed either by social media through Online Google Doc or by hand to the targeted respondents located in Klang Valley area. There are 306 out of 350 responses were received, as shows in Table 3. The response rate is 87.43 per cent, hence, this is sufficient to fulfil the sample size requirement for this research study.

Table 3: Response Rate of Questionnaires

Distributed Questionnaires	350
Completed Questionnaires	306
Total Response Rate (%)	87.43%

Note. Developed for this study.

4.2 Descriptive Analysis

4.2.1 Respondents' Demographic Profile

This sector provides the respondents' demographic profile which consists of gender, ethnic group, age, marital status, education level, employment status and monthly income. In additional, there is one general question is being asked in questionnaire which was designed to obtain the current adoption rate of mobile wallet.

4.2.1.1 Gender

Based on Table 4 indicates the majority of the respondents are male which accounted 160 out of 306 respondents (52.30 per cent), whereas the remaining 146 respondents (47.70 per cent) are female.

Table 4: Frequency Table of Respondents Based on Gender

Demographic Profile	Categories	Frequency	Percentage (%)
Gender	Male	160	52.3
	Female	146	47.7
	Total	306	100.0

Note. Developed for this study.

4.2.1.2 Ethnic Group

Table 5 presents the respondents' demographic profile of ethnic group who have participated in this research study. Based on the findings, there are more than half of the respondents (58.80 per cent) are Chinese, and about one-third of the respondents (35.30 per cent) are Malay, then follow by Indian (5.90 per cent) which is the lowest among ethnic group.

Table 5: Frequency Table of Respondents Based on Ethnic Group

Demographic Profile	Categories	Frequency	Percentage (%)
Ethnic Group	Malay	108	35.3
	Chinese	180	58.8
	Indian	18	5.9
	Total	306	100.0

Note. Developed for this study.

4.2.1.3 Age Group

In term of age distribution shows in Table 6, there are nearly half of the respondents (48.30 per cent) were aged between 22 to 27 years old. The rest of the minority respondents were aged between 16 to 21 years old and 28 to 37 years old, with 25.20 per cent and 26.50 per cent respectively.

Table 6: Frequency Table of Respondents Based on Age Group

Demographic Profile	Categories	Frequency	Percentage (%)
Age Group	16 - 21	77	25.2
	22 - 27	148	48.3
	28 - 37	81	26.5
	Total	306	100.0

Note. Developed for this study.

4.2.1.4 Marital Status

Table 7 indicates the marital status, the majority of the respondents (75.50 per cent) are single, follow by married (23.50 per cent) and divorced only 1 per cent out of 306 respondents.

Table 7: Frequency Table of Respondents Based on Marital Status

Demographic Profile	Categories	Frequency	Percentage (%)
Marital Status	Single	231	75.5
	Married	72	23.5
	Divorced	3	1.0
	Total	306	100.0

Note. Developed for this study.

4.2.1.5 Education Level

It is observed that about two-third of the respondents (65.40 per cent) have completed bachelor's degree and above. This implies that around one-third of the respondents (34.60 per cent) holding diploma and below, as shows in Table 8.

Table 8: Frequency Table of Respondents Based on Education Level

Demographic Profile	Categories	Frequency	Percentage (%)
Education Level	Diploma and below	106	34.6
	Bachelor Degree	157	51.3
	Master/PhD Degree	43	14.1
	Total	306	100.0

Note. Developed for this study.

4.2.1.6 Employment Status

Based on Table 9 reveals that more than half of the respondents (53.30 per cent) are working under private sector, then follow by student (28.80 per cent). In additional, 8.50 per cent of the respondents are either employer or self-employed and 6.90 per cent are government servants. Lastly, 2.6 per cent of the respondents were categorised under others, which consists of housewives and unemployed persons.

Table 9: Frequency Table of Respondents Based on Employment Status

Demographic Profile	Categories	Frequency	Percentage (%)
Employment Status	Employee - Private Sector	163	53.3
	Employee - Government Sector	21	6.9
	Employer/Self-employed	26	8.5
	Student	88	28.8
	Others	8	2.6
	Total	306	100.0

Note. Developed for this study.

4.2.1.7 Monthly Income

Table 10 shows that the majority of the respondents earn monthly income between RM 3,000 and RM 4,999, which is consists of 31.70 per cent, then follow by 29.70 per cent of the respondents are earn less than RM 1,099. Meanwhile, 17.60 per cent of the respondents earn monthly income between RM 5,000 and RM 6,999 and there are 12.70 per cent of the respondents with monthly income RM 1,100 and RM 2,999. The remaining 8.20 per cent of the respondents are earn RM 7,000 and above.

Table 10: Frequency Table of Respondents Based on Monthly Income

Demographic Profile	Categories	Frequency	Percentage (%)
Monthly Income	Less than RM1,099	91	29.7
	RM1,100 - RM2,999	39	12.7
	RM3,000 - RM4,999	97	31.7
	RM5,000 - RM6,999	54	17.6
	RM7,000 and above	25	8.2
	Total	306	100.0

Note. Developed for this study.

4.2.1.8 Mobile Wallet Adoption

Majority of the respondents (75.80 per cent) have reported that they have used the mobile wallet before. Based on Table 11, it can be observed that the minority of the respondents that never use mobile wallet before is about 24.20 per cent out of 306 respondents.

Table 11: Frequency Table of Respondents Based on Mobile Wallet Adoption

General Information	Categories	Frequency	Percentage (%)
Have you used mobile wallet before	Yes	232	75.8
	No	74	24.2
	Total	306	100.0

Note. Developed for this study.

4.2.2 Central Tendencies Measurement of Construct

Referring to Table 12, perceived usefulness has the highest mean of 4.14, followed by behavioural intention with the mean of 4.01, then perceived ease of use with the mean of 3.93. Moreover, personal innovativeness has the mean of 3.69, compatibility with the mean of 3.66, subjective norms with the mean of 3.62, trust with the mean of 3.41 and lastly perceived security with the lowest mean of 3.11. In overall, the results of mean shown that all constructs scored higher than 3.0.

In additional, it is important to use below Table 12 to examine the data whether is considered normal distribution. According to Mayers (2013) claimed that the acceptable range value of skewness and kurtosis is at absolute z-value below 3.29 ($Z < |3.29|$). Hence, all the constructs are found within the range value of skewness and kurtosis, which means the data in this research is normal distributed.

Table 12: Descriptive Statistics

Constructs	N	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
	Stats	Stats	Stats	Stats	Stats	Stats	Std. Error	Stats	Std. Error
Perceived Usefulness	306	1.50	5.00	4.14	0.670	-0.609	0.139	0.486	0.278
Perceived Ease of Use	306	1.00	5.00	3.93	0.748	-0.589	0.139	1.045	0.278
Subjective Norms	306	1.00	5.00	3.62	0.869	-0.242	0.139	-0.324	0.278
Personal Innovativeness	306	1.00	5.00	3.69	0.909	-0.423	0.139	-0.260	0.278
Compatibility	306	1.00	5.00	3.66	0.892	-0.260	0.139	-0.357	0.278
Perceived Security	306	1.00	5.00	3.11	1.036	-0.052	0.139	-0.545	0.278
Trust	306	1.00	5.00	3.41	0.824	-0.129	0.139	-0.122	0.278
Behavioural Intention	306	1.00	5.00	4.01	0.792	-0.748	0.139	0.910	0.278

Note. Developed for this study.

4.3 Factor Analysis

The factor analysis, which applied principal component analysis method with varimax rotation to examine the number of variables whether are correlated with each another and grouping numerous inter-correlated variables into fewer dimensions, or called factors. The principal component analysis was performed to assess the underlying constructs for 31 items of positive affect scale, however, there are two items were subsequently deleted from the constructs. In additional, the reliability test is carried out as well to determine the reliability of the variables.

Based on Table 13 shows that KMO value was 0.929 which is greater than the recommended value of 0.6 (Kaiser & Rice, 1974) and Bartlett's Test of Sphericity value was achieved statistical significance, which p-value was 0.000 (less than 0.05), therefore supporting the factorability of the correlation matrix.

Table 13: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.929
Bartlett's Test of Sphericity	Approx. Chi-Square	7353.700
	df	406
	Sig.	.000

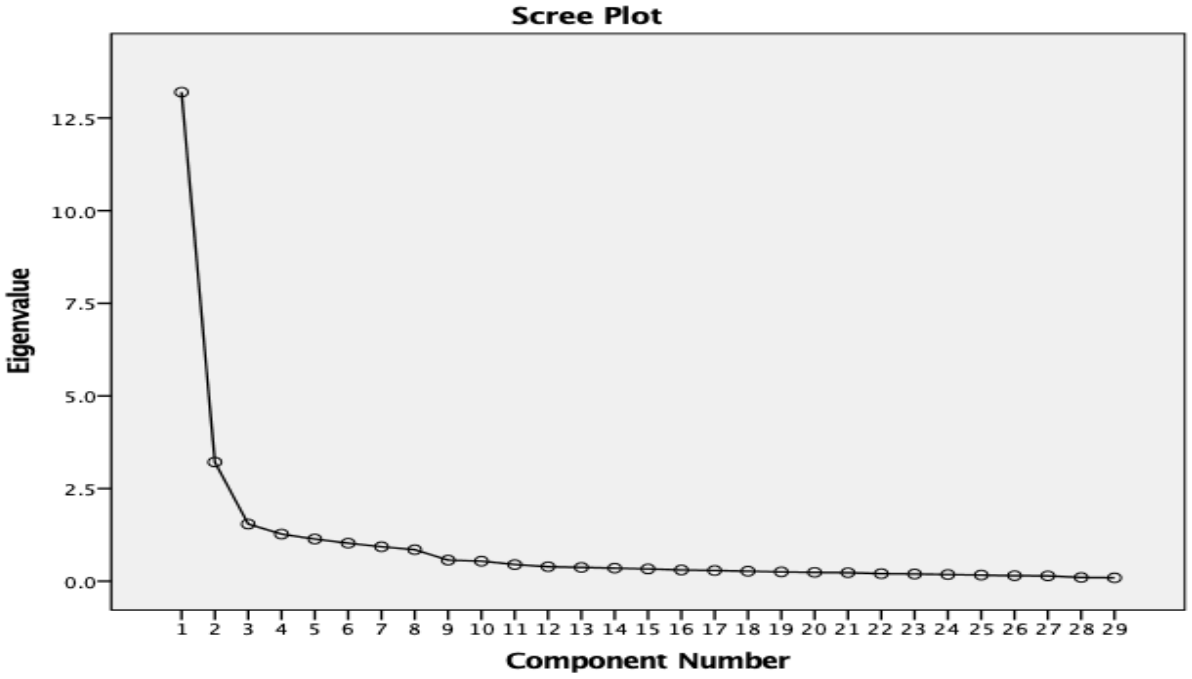
Note. Developed for this study.

In the use of principal component method, the researcher required to make decisions on how many components (or called factors) to retain for this research study (Kanyongo, 2006). According to Kaiser rule, this is the easiest and most commonly used method, this method applies to retain the components with eigenvalues greater than 1.0 procedure for further study (Kaiser, 1974). However, Cliff (1988) argued that Kaiser's rule to retain components based on number of eigenvalues greater than one was inappropriate and misapplication of a common formula for determining the number of components to be extracted. In additional, Kanyongo (2006) claimed that the Kaiser's

rule only provides a rough estimation on determine the number of components that can be used to represent the data which sometimes may lead to extract fewer components than should have been extracted.

On the other hand, Kanyongo (2006) suggests that scree test has been found to be reasonably effective in determining the correct number of components to retain, especially with large sample sizes (more than 250) and with strong components. The scree test is suggested by Catell (1966), to examine the break or the "elbow" of the graph where the eigenvalues seem to level off is noticed and components to the left of this point should be retained and considered as significant. An inspection of the scree plot found a clear break after the eighth component. By using Catell's scree test, the researcher decided to retain eight components for exploration study.

Figure 9: Scree Plot



Note. Developed for this study.

Principal component analysis presented the presence of six factors with eigenvalues above 1 and two factors with eigen values 0.930 and 0.851 respectively, hence in total explained 79.913 per cent of the variance (see Table 14). Specifically, the first factor ("trust") explains the greatest proportion of variance (45.510 per cent), followed by the second factor ("behavioural intention") (11.084 per cent), then the third factor ("perceived usefulness") (5.321 per cent), the fourth factor ("perceived ease of use") (4.386 per cent), the fifth factor ("perceived security") (3.926 per cent), the sixth factor ("personal innovativeness") (3.543 per cent), the seventh factor ("subjective norms") (3.207 per cent), and lastly the eighth factor ("compatibility") (2.935 per cent).

To aid in interpretation of these eight factors, varimax rotation was performed, as shown in Table 14. This is the representation showing that 29 items were grouped into eight factors and the correlation between the factors and items. According to Hair et al. (2006), the factor loading greater than 0.40 is identified as significant. It is noticeable that all items with absolute factor loading greater than 0.5 were extracted and respectively named to construct the dimension of trust, behavioural intention, perceived usefulness, perceived ease of use, perceived security, personal innovativeness, subjective norms and compatibility.

Table 14: Results of Principal Component Analysis

Rotated Component Matrix								
Survey Questionnaire Items	Factor							
	T	BI	PU	PEOU	PS	PI	SN	C
T1: Mobile wallet has adequate features to protect my security	0.783							
T2: Mobile wallet keeps my financial information secure	0.780							
T3: Mobile wallet has adequate features to protect my privacy	0.827							
T4: Mobile wallet keeps my personal data safe	0.843							
T5: Overall, mobile wallet is trustworthy	0.715							
BI1: I am likely to use mobile wallet in the near future		0.750						
BI2: I am willing to use a mobile wallet in the near future		0.820						
BI3: I intend to use mobile wallet when the opportunity arises		0.820						
BI4: I plan to use the mobile wallet frequently in my daily routine activities		0.650						
PU1: The mobile wallet is useful mode of payment			0.822					
PU2: Using mobile wallet makes the handling of payments easier			0.804					
PU3: Mobile wallet allows quick use of mobile applications (e.g., ticket purchases, and use of mobile coupons, etc.)			0.672					
PU4: I believe that the mobile wallet improves my decisions as a consumer (e.g., flexibility, speed, etc.)			0.513					
PEOU1: It is easy to become skilful at using the mobile wallet				0.592				
PEOU2: Interactions with the mobile wallet are clear and understandable				0.744				
PEOU3: It is easy to follow all the steps to use the mobile wallet				0.788				
PEOU4: It is easy to interact with the mobile wallet				0.702				

PS1: The risk of an unauthorised party intervening in the payment process is low					0.848			
PS2: The risk of abuse of user's information (e.g. names of business partners, payment amount) is low when using the mobile wallet					0.836			
PS3: The risk of abuse of billing information (e.g. credit card number, bank account data) is low when using mobile wallet					0.779			
PI1: If I heard about a new information technology, I will try it						0.686		
PI2: I am usually the first among my friends/family to explore new information technologies						0.822		
PI3: I like to experiment with new information technologies						0.802		
SN1: People who are important to me would recommend using the mobile wallet							0.737	
SN2: People who are important to me view the mobile wallet as beneficial							0.811	
SN3: People who are important to me think it is a good idea to use mobile wallet							0.741	
C1: Using mobile wallet fits well with my lifestyle								0.686
C2: Using mobile wallet fits well with the way I like to purchase products and services								0.725
C3: I would prefer to use the mobile wallet over other kinds payment methods (e.g. credit or debit card, cash)								0.548
Eigenvalues	13.198	3.214	1.543	1.272	1.139	1.027	0.930	0.851
% of Variance	45.510	11.084	5.321	4.386	3.926	3.543	3.207	2.935
Cumulative %	45.510	56.594	61.916	66.302	70.228	73.771	76.978	79.913
Cronbach's Alpha	0.937	0.922	0.848	0.891	0.896	0.840	0.880	0.873

Note. Developed for this study.

4.4 Reliability Test

As previous chapter mentioned that the constructs are required to pass the reliability test. According to Zikmund (2003), he illustrates the purpose of this reliability test is to test the consistency and stability in measuring the inter-correlation of the data. Zikmund claimed that according to rules of thumbs, the value of Cronbach's alpha value must greater than 0.6 in order to consider acceptable and reliable. The higher the value of Cronbach's alpha, the more reliable of the test results.

Referring to Table 15, the reliability test was applied to observe 29 items used to measure the constructs in the questionnaire. Based on the results of Cronbach's alpha, the reliable of all dependent and independent variables are at excellent level which is above 0.8. Hence, it can be concluded that the dependent variable and independent variables have passed the reliability test and provides a valid representation of the sample by satisfy both adequacy and reliability.

Table 15: Reliability Test

Constructs		N of items	Cronbach's Alpha
Dependent Variable	Behavioural Intention (BI)	4	0.922
Independent Variables	Perceived Usefulness (PI)	4	0.848
	Perceived Ease of Use (PEOU)	4	0.891
	Subjective Norms (SN)	3	0.880
	Personal Innovativeness (PI)	3	0.840
	Compatibility (C)	3	0.873
	Perceived Security (PS)	3	0.896
	Trust (T)	5	0.937

Note. Developed for this study.

4.5 Inferential Analysis

4.5.1 Multiple Regression

The multiple regression is conducted to examine the relationship between seven independent variables and dependent variable. Based on Table 16, the r-square value is 0.599, which means 59.9 per cent of the variation in the millennials' behavioural intention to adopt mobile wallet in Klang Valley can be explained by perceived usefulness (PU), perceived ease of use (PEOU), subjective norms (SN), personal innovativeness (PI), compatibility (C), perceived security (PS) and trust (T). In additional, the adjusted r-square value is 0.589. The adjusted r-square value is 48.5 per cent. Furthermore, the Durbin-Watson statistic is 1.915, which is almost 2. Hence, the researcher can assume that there is no auto-correlation detected in this multiple regression data.

The high percentage implies that the model is relatively good in predicting mobile wallet adoption among millennials. According to the Rules of thumb, the figure greater than 50% is considered a good model.

Table 16: Model Summary[b] for Multiple Linear Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.774[a]	0.599	0.589	0.50751	1.915

a. Predictors: (Constant), T, PU, PI, PS, SN, PEOU, C

b. Dependent Variable: BI

Note. Developed for this study.

Table 17 shows that the p-value of ANOVA is 0.000, which is less than alpha 0.05. This means that at least one of the seven independent variables can be used to model the millennials' behavioural intention on mobile wallet.

Table 17: ANOVA[a] for Multiple Linear Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114.455	7	16.351	63.481	0.000[b]
	Residual	76.755	298	0.258		
	Total	191.210	305			

a. Dependent Variable: BI

b. Predictors: (Constant), T, PU, PI, PS, SN, PEOU, C

Note. Developed for this study.

Furthermore, it is required to perform collinearity diagnostics to examine whether there are problems with multicollinearity. According to Chatterjee, Hadi and Price (2000), the common cut-off points for determining the presence of multicollinearity are the Variance Inflation Factor (VIF) values are all fall between the ranges 0 to 10 and the tolerance value must be greater than 0.2. Based on the results as shown in Table 18, there was no multicollinearity problem happened because the tolerance value for all the independent variables in the model were more than 0.20, ranging from 0.392 to 0.577 and the VIF values were less than 10, ranging from 1.734 to 2.551.

The test of normality is being carried out by inspected the histogram, normally P-P plots of regression and scatterplot, as shown in Appendix C. Based on the histogram, it is clearly showing that the histogram is all bell-shaped. Besides that, the normal P-P plots indicated that mostly all the data fall on the linear regression line (along the 0 point). From the scatterplot, there is no clear relationship between the residuals and the predicted values, which means the residuals fall within a generally random pattern. This finding indicated that homoscedasticity in the multivariate independent variable group that each value of the predictors is constant. Furthermore, the error terms for any pair of observations should be uncorrelated.

Table 18: Coefficients[a] for Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.276	0.195		1.415	0.158		
	PU	0.344	0.062	0.292	5.525	0.000	0.484	2.068
	PEOU	0.229	0.060	0.216	3.805	0.000	0.417	2.398
	SN	-0.017	0.047	-0.019	-0.365	0.715	0.509	1.964
	PI	0.061	0.043	0.070	1.429	0.154	0.560	1.786
	C	0.227	0.052	0.255	4.353	0.000	0.392	2.551
	PS	-0.020	0.037	-0.027	-0.549	0.584	0.577	1.734
	T	0.141	0.054	0.147	2.633	0.009	0.432	2.314

a. Dependent Variable: BI

Note. Developed for this study.

Based on the multiple regression equation, the statistical results as below:

BI = 0.276 + 0.344 (PU) + 0.229 (PEOU) – 0.017 (SN) + 0.061 (PI) + 0.227 (C) – 0.020 (PS) + 0.141 (T)

Whereby,

BI = Behavioural Intention

PU = Perceived Usefulness

PEOU = Perceived Ease of Use

SN = Subjective Norms

PI = Personal Innovativeness

C = Compatibility

PS = Perceived Security

T = Trust

From the results, it shows increase of 0.344 (PU), 0.229 (PEOU), 0.061 (PI), 0.227 (C) and 0.141 (T) and decrease of 0.017 (SN) and 0.020 (PS) in order for every unit increase in BI. According to the standardized coefficients (Beta) as shown in Table 18, the largest beta coefficient is 0.292. This means that perceived usefulness is the strongest predictor of behavioural intention to adopt mobile wallet, then followed by

compatibility (β = 0.255). The third strongest predictor is perceived ease of use (β = 0.216), and the fourth predictor is trust (β = 0.009). This conclusion is made at the significant level, α = 0.01 (1%) or confidence level (99%).

4.6 Hypotheses Testing

The objective of this research study is to find the millennials' behavioural intention to adopt mobile wallet, and to apply several models such as TPB, TAM and IDT in order to understand how these factors affect the behavioural intention. There are several hypotheses were developed for this research study as mentioned in Chapter Two. The hypothesis testing is based on the results of multiple regression analysis via the use of SPSS.

First Hypothesis

H_1: There is a significant positive relationship between *perceived usefulness* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for perceived usefulness is 0.000, which is less than 0.01. Therefore, H_1 is supported which proves that perceived usefulness has a significant positive impact on millennials' behavioural intention to adopt mobile wallet.

Second Hypothesis

H_2: There is a significant positive relationship between *perceived ease of use* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for perceived ease of use is 0.000, which is less than 0.01. Therefore, H_2 is supported which proves that perceived ease of use has a

significant positive impact on millennials' behavioural intention to adopt mobile wallet.

Third Hypothesis

H_3: There is a significant positive relationship between *subjective norms* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for subjective norms is 0.715. This value is more than 0.01. Therefore, H_3 is rejected. So, there is no significant relationship between subjective norms and millennials' behavioural intention to adopt mobile wallet.

Fourth Hypothesis

H_4: There is a significant positive relationship between *personal innovativeness* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for personal innovativeness is 0.154. This value is more than 0.01. Therefore, H_4 is rejected. So, there is no significant relationship between personal innovativeness and millennials' behavioural intention to adopt mobile wallet.

Fifth Hypothesis

H_5: There is a significant positive relationship between *compatibility* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for compatibility is 0.000, which is less than 0.01. Therefore, H_5 is supported which proves that compatibility has a significant positive impact on millennials' behavioural intention to adopt mobile wallet.

Sixth Hypothesis

H_6: There is a significant positive relationship between *perceived security* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for perceived security is 0.584. This value is more than 0.01. Therefore, H_6 is rejected. So, there is no significant relationship between perceived security and millennials' behavioural intention to adopt mobile wallet.

Seventh Hypothesis

H_7: There is a significant positive relationship between *trust* and millennials' behavioural intention to adopt mobile wallet.

Based on Table 18, the p-value for trust is 0.009, which is less than 0.01. Therefore, H_7 is supported which proves that trust has a significant positive impact on millennials' behavioural intention to adopt mobile wallet.

4.7 Conclusion

This chapter reported the results which are according to the research questions and hypotheses proposed in Chapter 2. There are seven hypotheses were tested and four were supported through the study. Based on the results of hypotheses tests, the researcher found that perceived usefulness, perceived ease of use, compatibility and trust were significant factors for the adoption of mobile wallet among millennials. The next chapter will have further discussed on the findings, implication and limitation of this study and recommendations for future research.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.0 Introduction

This chapter begins with the discussion of major findings that are related to the research objectives of this study. After that, based on these major findings, this chapter identifies some potential implications that can be useful to central bank, mobile wallet service providers and merchants. Besides that, this chapter also discusses the limitations of the study and recommendations for future studies. In the last part of this chapter, a conclusion remark is presented.

5.1 Discussion of Major Findings

The objective of this research study is to examine the factors that influencing millennial generation' behavioural intention to adopt the mobile wallet. In this section, the researcher will discuss the results of the hypotheses to respond to the research objective of this study. Based on the findings, the summary of hypotheses tests is presented in Table 19. The results show that four out of seven factors (i.e. perceived usefulness, perceived ease of use, compatibility and trust) are significant factors influencing behavioural intention to adopt the mobile wallet among millennial generation (with the exception of subjective norms, personal innovativeness and perceived security).

Table 19: Summary of Hypotheses Tests

Hypothesis	Beta (β)	Description	Result
H_1: Perceived Usefulness → Behavioural Intention	0.292	p = 0.000 (p < 0.01)	Supported
H_2: Perceived Ease of Use → Behavioural Intention	0.216	p = 0.000 (p < 0.01)	Supported
H_3: Subjective Norms → Behavioural Intention	-0.019	p = 0.715 (p > 0.01)	Not Supported
H_4: Personal Innovativeness → Behavioural Intention	0.070	p = 0.154 (p > 0.01)	Not Supported
H_5: Compatibility → Behavioural Intention	0.255	p = 0.000 (p < 0.01)	Supported
H_6: Perceived Security → Behavioural Intention	-0.027	p = 0.584 (p > 0.01)	Not Supported
H_7: Trust → Behavioural Intention	0.147	p = 0.009 (p < 0.01)	Supported

Note. Developed for this study.

5.1.1 Relationship between Perceived Usefulness and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that perceived usefulness had a significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = 0.292$, $p < 0.01$). In additional, perceived usefulness has the highest impact on millennials' behavioural intention to adopt mobile wallet among others independent variables.

The finding of this study was also consistent with the prior studies in the context of mobile wallet (Eappen, 2015; Seetharaman et al., 2017; Shaw, 2014; N. Singh et al., 2019). According to Shaw (2014) indicates that an individual use particular system because of the promise to deliver a desired outcome. In the case of mobile wallet, it promises a faster payment transaction than traditional method such as cash or bank card, due to smartphones are more readily at hand than physical wallets tucked in pockets or purses (Shaw, 2014). Furthermore, Eappen (2015) agreed that the usefulness of mobile

wallet offers the convenience of receiving e-coupons and digital receipts. For this reason, usefulness clearly presented the advantages of mobile wallet to users which is fundamental to improve behavioural intention to use.

5.1.2 Relationship between Perceived Ease of Use and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that perceived ease of use had a significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = 0.216$, $p < 0.01$). In additional, perceived ease of use has third highest impact on millennials' behavioural intention to adopt mobile wallet among others independent variables.

The finding is congruent with the study conducted by Eappen (2015), who stated that the higher users' perceptions of ease of use the mobile wallet, the more useful they find the mobile wallet for payment transactions. In this sense, Hidayanto et al. (2015) agreed that lack of effort that a user required to accept the mobile wallet will significantly influence its adoption. N. Singh et al. (2019) confirmed the finding that perceived ease of use has significant influence on intention to use a mobile wallet, as user is concerned about the extent of easiness or difficulty to adopt the mobile wallet, because it requires certain level of skill and information to perform the payment transaction via mobile wallet.

5.1.3 Relationship between Subjective Norms and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that subjective norms had no significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = -0.019$, $p > 0.01$).

The finding from this study is in line with the study by Hidayanto et al. (2015) in his context of mobile payment. Hidayanto et al. (2015) pointed out that current users may already have experience with mobile payment. Hence, the social influences are diminishing from time to time with the increasing experience of the use of the system. On the other hand, Aydin and Burnaz (2016) claimed that the low impact of social influence on behavioural intention to use, which can be attributed to the low number of mobile wallet users as the mobile wallet is considered at the beginning of its life cycle.

5.1.4 Relationship between Personal Innovativeness and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that personal innovativeness had no significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = 0.070$, $p > 0.01$).

Personal innovativeness, which was predicted to be a significant factor, had no effect on the behavioural beliefs which is consistent with previous study (Hidayanto et al., 2015). The finding of this study has proven that users with higher level of personal innovativeness has no direct influence the behavioural intention to adopt the mobile wallet. This implies that users do not view the mobile wallet as innovative product as compared to other technologies.

5.1.5 Relationship between Compatibility and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that compatibility had a significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = 0.255$, $p < 0.01$). In additional, compatibility has second highest impact on millennials' behavioural intention to adopt mobile wallet among others independent variables.

The finding from this study provides strong evidence that compatibility is a significant predictor in influencing millennials' behavioural intention to adopt mobile wallet, which is in line with past studies (Aydin & Burnaz, 2016; Lu et al., 2011). Aydin and Burnaz (2016) indicates that consumers perceive an application that is compatible with their lifestyle and values, they are more willing to accept and adopt it. In additional, Schierz et al. (2010) found that compatibility has the greatest impact on the intention to use, in his study on the mobile payment services context. With this regard, the consideration in adopting mobile wallet, the users must find them to be reconcilable with their existing lifestyle and behavioural patterns.

5.1.6 Relationship between Perceived Security and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that perceived security had no significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = -0.027$, $p > 0.01$).

This result is consistent with the result of research on mobile payment conducted by Aslam et al. (2017). However, this contrasts with the finding of Unnikrishnan and Jagannathan (2018), who found that perceived security strongly associated with behavioural intention in their study. This result may be related to the fact that in current Malaysia context that security on mobile wallet no longer be a source of competitive advantage, but it is a basic requirement instead, in marketing sense called as "competitive parity". For instance, the mobile wallet service providers have to meet the basic security requirement such as provide safeguarding in payment process in order to prevent unauthorized party to intervene the transaction (Aslam et al., 2017). Besides that, the consumers have low concern on security which indicated that users are overcoming this barrier slowly. However, it cannot be concluded that perceived security is not important at all. More precisely, in consumers' perspective, security

concerns are less important than their concerns related to the usefulness and ease of use of the mobile wallet (Aydin & Burnaz, 2016).

5.1.7 Relationship between Trust and Behavioural Intention

Based on the statistical results as summarised in Table 19, it has revealed that trust had a significant positive influence on millennials' behavioural intention to adopt mobile wallet ($\beta = 0.147$, $p < 0.01$). In additional, trust has the least impact on millennials' behavioural intention to adopt mobile wallet among others independent variables.

The result of this study is congruent with the previous empirical studies, which reported that the more the user's trust in the mobile wallet, the higher the behavioural intention to use the mobile wallet (Azizah et al., 2018; Hidayanto et al., 2015; Kumar et al., 2018; Matemba & Li, 2018; Unnikrishnan & Jagannathan, 2018). As noted by Azizah (2018), mobile wallet enables the payment performed without face-to-face interactions with cashier by through the system which created great uncertainty and risk, hence the trust plays an important factor influencing behavioural intention to use. In fact, the users would stop using the mobile wallet if they hear about issues concerning security or privacy breaches in the system. In additional, Eappen (2015) also agreed with this finding, he stated that trust is a measure of the user's confidence that their data is safe and secure, their personal privacy is well protected and their payment transaction is credited correctly to the merchants or the assigned parties from the approved account. In this respect, customers' perspective on mobile wallet need to be trustworthy in order to increase the behavioural intention to use the mobile wallet.

5.2 Implication of Study

In this research study utilized TPB, TAM and IDT model to develop a foundation to examine the factors that influencing millennial generation' behavioural intention to adopt the mobile wallet and has implication effects on both theoretical and managerial perceptions.

5.2.1 Theoretical Implications

In this research study, there is one of the major contributions from the theoretical point of view is the creation of theoretically based model, which incorporates several factors that influence behavioural intention to adopt mobile wallet. By using multiple regression equation in this research study, it provides multiple fit indices to develop whether the model was properly specified. As a result, the model reveals a good fit with the collected data, the relative relationships between independent variables and dependent variable have been identified in this research study. There are seven independent variables in the proposed research framework, however, there are only four independent variables (i.e., perceived usefulness, perceived ease of use, compatibility and trust) which proven to have significant positive relationship influence on behavioural intention to adopt mobile wallet.

5.2.2 Managerial Implications

The technology advancement has rapidly evolving the payment industry by transforming from cash-based transactions to electronic payments. Based on the report of Bank Negara Malaysia, the potential benefit of migration from cash based to mobile payment can enjoy greater cost saving and efficiency gains estimated to be up to 1% of nation's Gross Domestic Product (GDP) (Lee & Khaw, 2018). In previous chapter, the

researcher highlighted that there is only 8% of Malaysians have been using the mobile wallets to pay for their expenses. The low adoption rate of mobile wallet in Malaysia is due to lack of awareness about its usage by both consumers and merchants. This can be explained through the theory of "chicken and egg" development process: On one hand, merchants do not wish to invest on new mobile payment facilities unless there is high demand from consumers; On the other hand, consumers may defer adopt mobile wallet payment until they are sure that merchants will gradually accept such electronic transaction (Koenig-Lewis et al., 2015). Hence, this provides tremendous opportunity to mobile wallet service providers and merchants to unlock and obtain the benefit of switch to mobile wallet payment.

In terms of managerial implications, this research study has demonstrated several significant factors that are positively related to behavioural intention to adopt mobile wallet. These are: perceived usefulness, perceived ease of use, compatibility and trust. The findings from this study serve as supportive data for many stakeholders that are part of the ecosystem (namely, merchants, consumers, mobile wallet service providers and financial institutions) to determine their strategy to increase the adoption rate of mobile wallet. Thus, all stakeholders should pay special attention to these four factors.

Firstly, the perceived usefulness was found to be the most significant factor influencing the behavioural intention to adopt mobile wallet. The low awareness of the benefits of mobile wallet in the context of Malaysia that may conclude why the adoption rate not lived up to the expectations. To improve usefulness, mobile wallet service providers should collaborate with many banks as well as other financial institutions to offers users easy to exchange, withdraw or transfer their funds to other payment systems at any time (Hidayanto et al., 2015). The finding suggested that customers may require to educate on how to conduct mobile wallet payment for online shopping, bill payments, fund transfer to relatives and friends without the need of carrying the physical wallet. In this sense, the mobile wallet service provides need to run awareness programmes that

introduces various advantages of using mobile wallet and this will boost the customers' confidence towards the higher usage of mobile wallet in Malaysia.

Secondly, another factor that influencing the behavioural intention to adopt mobile wallet is perceived ease of use. Consumers nowadays are concerning the payment characteristics, to provide an ease of use mobile wallet, mobile wallet service provide must provide a convenient way for account registration with minimal steps, yet still without compromise the security (Hidayanto et al., 2015) Furthermore, the mobile wallet application must design in a user-friendly interface, fast and reliable which allowed the users easy to use and navigate. For instance, paying with mobile wallet must be simple as the current transaction of paying with debit or credit cards.

Thirdly, compatibility in this study was found to be second highest significant factor influencing behavioural intention to adopt mobile wallet. In consumers' perspective, they would love to adopt the mobile wallet if only that is fit well with their lifestyle and values. According Machael (2017) stated that most consumers do not think that they should change their habits at checkout by using cash and bank card, despite mobile payments are claimed to be more secure and convenient. This implies that consumers might need more incentives to change their behavioural to adopt mobile wallet for payment on a daily basic. Hence, mobile wallet service providers need to collaborate with merchants in promoting the use of mobile wallet in checkout. By doing this, there are schemes like loyalty points, cash back and other promotion schemes that can offer to consumers with the aim of further increase the adoption of mobile wallet by a greater number of customers.

The fourth factor influencing behavioural intention to adopt mobile wallet is trust. Since the mobile wallet development in Malaysia is still in an infancy stage, there could be emerging issues related to trust and risk in the future when the overall usage and volume transaction increased from time to time. Mobile wallet service providers must guarantee data security and privacy of customer are well protected by having clear rules

and prompt response to address any complaint or violation. More precisely, mobile wallet service providers need to put top priority on building trust in users by minimizing errors in mobile wallet transactions such as unable to pair, invalid Merchant Identification Number (MIN), wrong public keys, decryption unsuccessful, invalid element data, and other possible errors (S. K. Sharma et al., 2018). Hence, it is important for mobile wallet developers to strengthen trust among users by preventing the aforementioned technical errors to occur in the launched mobile wallet in Malaysia. In this regard, government agencies need to pay closer attention in developing regulations that is align with recent mobile wallet development, which ensure higher security and privacy protection, while minimum risk in mobile wallet transaction. As trust plays important role in behavioural acceptance on mobile wallet.

In a nutshell, the transformation from cash-based transaction to mobile wallet transaction has the potential to boost the economic conditions and Malaysia will obtain the benefits of cashless society with increased mobile wallet payment usage. Hence, Bank Negara Malaysia needs to collaborate with the industry players that are part of this ecosystem in safeguarding the stability and reliability of Malaysia's payment systems, while offering greater market competition and payment efficiency.

5.3 Research Limitations and Future Research

There are some limitations have been identified in this study and taken into consideration to improve future research study. First and foremost, this study was conducted in Klang Valley area, the greater Kuala Lumpur, and the findings might not be generalizable to entire populations in Malaysia. As different states in Malaysia consist of different income level, education background, race and infrastructure of payment systems. The evidence of variation in mobile wallet adoption rates between different states suggests that larger sample size needs to be undertaken in different states of Malaysia and within different target population segments to examine wider

cross section of the general population in more details to represent the whole country. Future research in a large and varied sample could produce different findings.

Secondly, the self-administered questionnaire survey is used for this research study which may suffer from response bias, although this is most cost-effective way and generally reliable research method. Therefore, the future research can be conducted in a longitudinal approach to have better assessment of behavioural evolution of users over time. Future research may also can consider to compare and evaluate the pre- and post- adoption behaviour of a user and its impact on actual attitude toward the use of mobile wallet services.

Moreover, given the complexity of user behavioural, the future research can focus on other factors such as promotional benefits, social image, gender, age and individual differences (i.e., behavioural control, openness to divulging information) to examine the relationship with behavioural intention to adopt mobile wallet. Besides that, future studies can be undertaken to compare and evaluate the consumers' perception toward different types of mobile wallet service providers.

Lastly, this research study focuses on one particular mobile payment which is mobile wallet. Thus, it would be interesting to compare the results from this study with other mobile payment systems such as NFC mobile payment, QR or even face biometric authentication technologies. Future research on several other mobile payment systems provide a greater external validity that capture both a categorization and use profile for each mobile payment system which probably being postulated to displace the use of cash and bank cards.

5.4 Conclusion

In conclusion, the purpose of this study is to examine the factors that influencing millennial generation' behavioural intention to adopt the mobile wallet in Klang Valley. The empirical findings have shown that four significant factors (namely, perceived usefulness, perceived ease of use, compatibility and trust) are positively influenced the behavioural intention to adopt mobile wallet. Apart from this, perceived usefulness proven to be the dominant factor, followed by compatibility, thereafter perceived ease of use and trust are significantly affected the behavioural intention to adopt mobile wallet. Last but not least, there are some limitations and recommendations for future research is being discussed for future researchers. Finally, the findings from this research study have addressed the research questions and achieved the research objectives.

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Appendix A: Survey Questionnaire

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF ACCOUNTANCY AND MANAGEMENT

MASTER OF BUSINESS ADMINISTRATION

Behavioral Intention to Adopt Mobile Wallet Among the Millennial Generation in Klang Valley

I am currently pursuing Master of Business Administration (MBA) at Universiti Tunku Abdul Rahman (UTAR). As part of the fulfilment of my MBA Final Year Project, I am required to conduct this research and I appreciate your co-operation in order to complete the survey. The purpose of this study is to examine the factors that influence millennial generation's behavioural intention to adopt the mobile wallet. It is because the mobile wallet is the future trend of payment system in marketplace. Thus, this study serves as reference to support those organizations that are part of the ecosystem to determine their strategy in promoting mobile wallet payment.

This questionnaire consists of three parts. In Section A, the respondents are asked to provide some basic demographic information; Section B deals with independent variables questions; Lastly, the Section C is to test the respondents' behavioural intention to adopt mobile wallet.

I would be grateful if you can take out your valuable time to fill the questionnaire. Your answers are extremely valuable and will certainly make an important contribution to this study. All the information collected is for research purposes and will be kept completely confidential. Please proceed to fill the questionnaire if you are born in between 1982 and 2003. Thank you.

Yours Sincerely,

Louis Lim Tze Yuan (louis93@live.com.my)

Section A: Demographic Profile

The following personal information is necessary for validation of the questionnaire (**must be born between 1982 and 2003)*. All responses will be kept confidential. Your cooperation in providing this information will be greatly appreciated.

Please fill in the blank and tick the appropriate boxes.

1) **Gender**
   - o Male
   - o Female

2) **Ethnicity / Race**
   - o Malay
   - o Chinese
   - o Indian
   - o Others, please specify _____

3) **Age Group (Years Old)**
   - o 16 – 18
   - o 19 – 21
   - o 22 – 24
   - o 25 – 27
   - o 28 – 30
   - o 31 – 33
   - o 34 – 37

4) **Current Marital Status**
   - o Single
   - o Married
   - o Divorced
   - o Widowed
   - o Others, please specify _____

5) Education Level

- o No formal Education
- o Primary
- o Secondary
- o Pre-university / STPM / A-level
- o Certificate / Diploma
- o Degree
- o Master / PhD
- o Professional Qualifications
- o Others, please specify _____

6) Current Employment Status

- o Employee – Private Sector
- o Employee – Government Sector
- o Employer
- o Self-Employed
- o House-husband / House-wife
- o Student
- o Unemployed
- o Others, please specify _____

7) Monthly Income (Ringgit Malaysia)

- o Less than 1,099
- o 1,100 – 2,999
- o 3,000 – 4,999
- o 5,000 – 6,999
- o 7,000 – 8,999
- o 9,000 – 10,999
- o 11,000 and above

8) Have you used mobile wallet before?

- o Yes
- o No

Section B: Factors Influencing Behavioural Intention to Adopt Mobile Wallet

In this section, kindly indicate your level of agreement (based on five-point Likert scale) that you would choose to describe the extent of the following statement.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Perceived Usefulness					
1. The mobile wallet is useful mode of payment.	1	2	3	4	5
2. Using mobile wallet makes the handling of payments easier.	1	2	3	4	5
3. Mobile wallet allows quick use of mobile applications (e.g., ticket purchases, and use of mobile coupons, etc.).	1	2	3	4	5
4. I believe that the mobile wallet improves my decisions as a consumer (e.g., flexibility, speed, etc.).	1	2	3	4	5

Perceived Ease of Use					
1. It is easy to become skilful at using the mobile wallet.	1	2	3	4	5
2. Interactions with the mobile wallet are clear and understandable.	1	2	3	4	5
3. It is easy to follow all the steps to use the mobile wallet.	1	2	3	4	5
4. It is easy to interact with the mobile wallet.	1	2	3	4	5

Subjective Norms					
1. People who are important to me would recommend using the mobile wallet.	1	2	3	4	5
2. People who are important to me view the mobile wallet as beneficial.	1	2	3	4	5
3. People who are important to me think it is a good idea to use mobile wallet.	1	2	3	4	5

Personal Innovativeness in Information Technology					
1. If I heard about a new information technology, I will try it.	1	2	3	4	5
2. I am usually the first among my friends/family to explore new information technologies.	1	2	3	4	5
3. I like to experiment with new information technologies.	1	2	3	4	5

Compatibility					
1. Using mobile wallet fits well with my lifestyle.	1	2	3	4	5
2. Using mobile wallet fits well with the way I like to purchase products and services.	1	2	3	4	5
3. I would prefer to use the mobile wallet over other kinds of payment methods (e.g. credit or debit card, cash).	1	2	3	4	5

Perceived Security					
1. The risk of an unauthorized party intervening in the payment process is low.	1	2	3	4	5
2. The risk of abuse of user's information (e.g. names of business partners, payment amount) is low when using the mobile wallet.	1	2	3	4	5
3. The risk of abuse of billing information (e.g. credit card number, bank account data) is low when using mobile wallet.	1	2	3	4	5

Trust					
1. Mobile wallet has adequate features to protect my security.	1	2	3	4	5
2. Mobile wallet keeps my financial information secure.	1	2	3	4	5
3. Mobile wallet has adequate features to protect my privacy.	1	2	3	4	5
4. Mobile wallet keeps my personal data safe.	1	2	3	4	5
5. Overall, mobile wallet is trustworthy.	1	2	3	4	5

Section C: Behavioural Intention to Adopt Mobile Wallet

In this section, kindly indicate your level of agreement (based on five-point Likert scale) that you would choose to describe the extent of the following statement.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Behavioural Intention					
1. I am likely to use mobile wallet in the near future.	1	2	3	4	5
2. I am willing to use a mobile wallet in the near future.	1	2	3	4	5
3. I intend to use mobile wallet when the opportunity arises.	1	2	3	4	5
4. I plan to use the mobile wallet frequently in my daily routine activities.	1	2	3	4	5

You have completed this questionnaire.

Thank you.

Thank you for your participation!

Appendix B: Ethical Approval Letter

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/143/2019

14 August 2019

Ms Chin Wai Yin
Department of International Business
Faculty of Accountancy and Management
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang, Selangor

Dear Ms Chin,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

Research Title	Behavioural Intention to Adopt Mobile Wallet Among Millennial Generation in Klang Valley
Investigator(s)	Ms Chin Wai Yin Louis Lim Tze Yuan (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	Klang Valley
No of Participants	300 participants (Age: 16 - 37)
Research Costs	Self-funded
Approval Validity	14 August 2019 - 13 August 2020

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research;

(2) Confidentiality of participants' personal data must be maintained; and

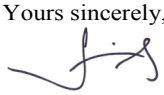
(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,



Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Accountancy and Management
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Appendix C: Output of SPSS

Descriptive Analysis

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	160	52.3	52.3	52.3
	Female	146	47.7	47.7	100.0
	Total	306	100.0	100.0	

Ethnic Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malay	108	35.3	35.3	35.3
	Chinese	180	58.8	58.8	94.1
	Indian	18	5.9	5.9	100.0
	Total	306	100.0	100.0	

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16 - 21	77	25.2	25.2	25.2
	22 - 27	148	48.4	48.4	73.5
	28 - 37	81	26.5	26.5	100.0
	Total	306	100.0	100.0	

Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	231	75.5	75.5	75.5
	Married	72	23.5	23.5	99.0
	Divorced	3	1.0	1.0	100.0
	Total	306	100.0	100.0	

Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma and below	106	34.6	34.6	34.6
	Bachelor Degree	157	51.3	51.3	85.9
	Master/PhD Degree	43	14.1	14.1	100.0
	Total	306	100.0	100.0	

Employment Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employee - Private Sector	163	53.3	53.3	53.3
	Employee - Government Sector	21	6.9	6.9	60.1
	Employer/Self-employed	26	8.5	8.5	68.6
	Student	88	28.8	28.8	97.4
	Others	8	2.6	2.6	100.0
	Total	306	100.0	100.0	

Monthly Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than RM1,099	91	29.7	29.7	29.7
	RM1,100 - RM2,999	39	12.7	12.7	42.5
	RM3,000 - RM4,999	97	31.7	31.7	74.2
	RM5,000 - RM6,999	54	17.6	17.6	91.8
	RM7,000 and above	25	8.2	8.2	100.0
	Total	306	100.0	100.0	

Have you used mobile wallet before

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	232	75.8	75.8	75.8
	No	74	24.2	24.2	100.0
	Total	306	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Perceived Usefulness	306	1.50	5.00	4.1364	.67019	-.609	.139	.486	.278
Perceived Ease of Use	306	1.00	5.00	3.9314	.74808	-.589	.139	1.045	.278
Subjective Norms	306	1.00	5.00	3.6187	.86874	-.242	.139	-.324	.278
Personal Innovativeness	306	1.00	5.00	3.6874	.90894	-.423	.139	-.260	.278
Compatibility	306	1.00	5.00	3.6580	.89153	-.260	.139	-.357	.278
Perceived Security	306	1.00	5.00	3.1111	1.03632	-.052	.139	-.545	.278
Trust	306	1.00	5.00	3.4065	.82404	-.129	.139	-.122	.278
Behavioural Intention	306	1.00	5.00	4.0114	.79178	-.748	.139	.910	.278
Valid N (listwise)	306								

Factor Analysis

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.198	45.510	45.510	13.198	45.510	45.510	4.192	14.454	14.454
2	3.214	11.084	56.594	3.214	11.084	56.594	3.583	12.355	26.809
3	1.543	5.321	61.916	1.543	5.321	61.916	2.854	9.843	36.652
4	1.272	4.386	66.302	1.272	4.386	66.302	2.774	9.565	46.217
5	1.139	3.926	70.228	1.139	3.926	70.228	2.578	8.889	55.106
6	1.027	3.543	73.771	1.027	3.543	73.771	2.500	8.620	63.726
7	.930	3.207	76.978	.930	3.207	76.978	2.482	8.560	72.286
8	.851	2.935	79.913	.851	2.935	79.913	2.212	7.627	79.913
9	.569	1.962	81.875						
10	.542	1.868	83.743						
11	.450	1.552	85.295						
12	.392	1.352	86.647						
13	.372	1.284	87.930						
14	.353	1.216	89.146						
15	.332	1.144	90.291						
16	.304	1.049	91.340						
17	.289	.997	92.337						
18	.270	.931	93.268						
19	.251	.866	94.134						
20	.239	.823	94.957						
21	.232	.799	95.756						
22	.203	.702	96.457						
23	.194	.670	97.128						
24	.181	.624	97.751						
25	.166	.571	98.322						
26	.150	.516	98.838						
27	.143	.495	99.333						
28	.101	.348	99.681						
29	.093	.319	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component							
	1	2	3	4	5	6	7	8
T4	.843							
T3	.827							
T1	.783							
T2	.780							
T5	.715							
BI3		.820						
BI2		.820						
BI1		.750						
BI4		.650						.412
PU1			.822					
PU2			.804					
PU3		.356	.672					
PU4		.362	.513				.372	
PEOU3				.788				
PEOU2			.331	.744				
PEOU4				.702				
PEOU1		.464		.592		.314		
PS1					.848			
PS2	.319				.836			
PS3	.360				.779			
PI2						.822		
PI3						.802		
PI1						.686		.390
SN2	.307						.811	
SN3							.741	
SN1							.737	
C2								.725
C1								.686
C3								.548

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Reliability Test: Perceived Usefulness (PI)

Reliability Statistics

Cronbach's Alpha	N of Items
.848	4

Reliability Test: Perceived Ease of Use (PEOU)

Reliability Statistics

Cronbach's Alpha	N of Items
.891	4

Reliability Test: Subjective Norms (SN)

Reliability Statistics

Cronbach's Alpha	N of Items
.880	3

Reliability Test: Personal Innovativeness (PI)

Reliability Statistics

Cronbach's Alpha	N of Items
.840	3

Reliability Test: Compatibility (C)

Reliability Statistics

Cronbach's Alpha	N of Items
.873	3

Reliability Test: Perceived Security (PS)

Reliability Statistics

Cronbach's Alpha	N of Items
.896	3

Reliability Test: Trust (T)

Reliability Statistics

Cronbach's Alpha	N of Items
.937	5

Reliability Test: Behavioural Intention (BI) to Adopt Mobile Wallet

Reliability Statistics

Cronbach's Alpha	N of Items
.922	4

Multiple Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.774[a]	.599	.589	.50751	1.915

a. Predictors: (Constant), T, PU, PI, PS, SN, PEOU, C
b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114.455	7	16.351	63.481	.000[b]
	Residual	76.755	298	.258		
	Total	191.210	305			

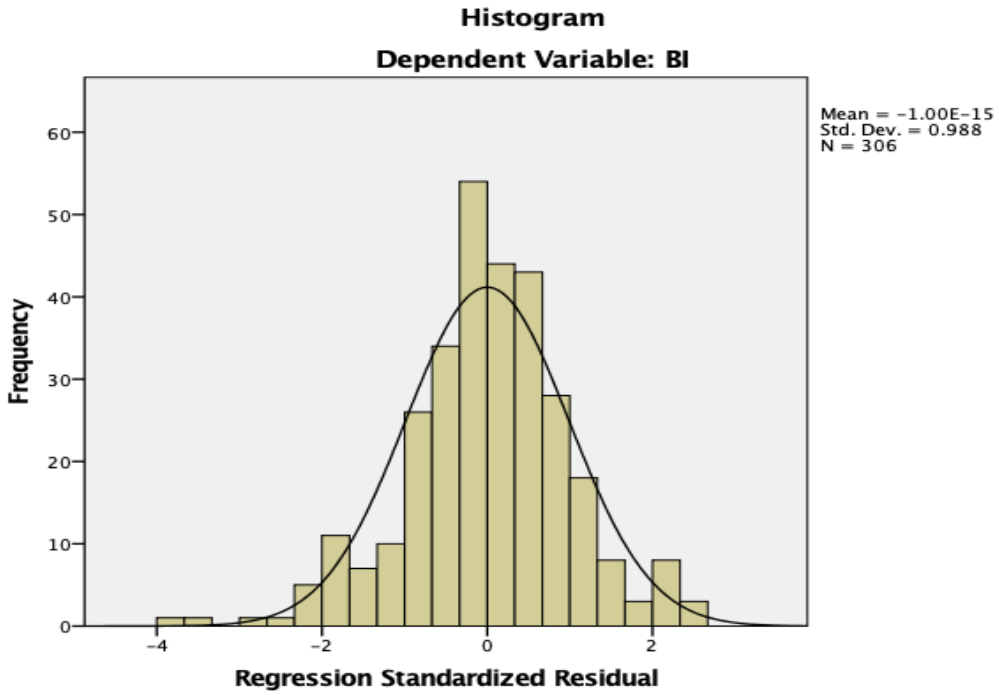
a. Dependent Variable: BI
b. Predictors: (Constant), T, PU, PI, PS, SN, PEOU, C

Coefficients[a]

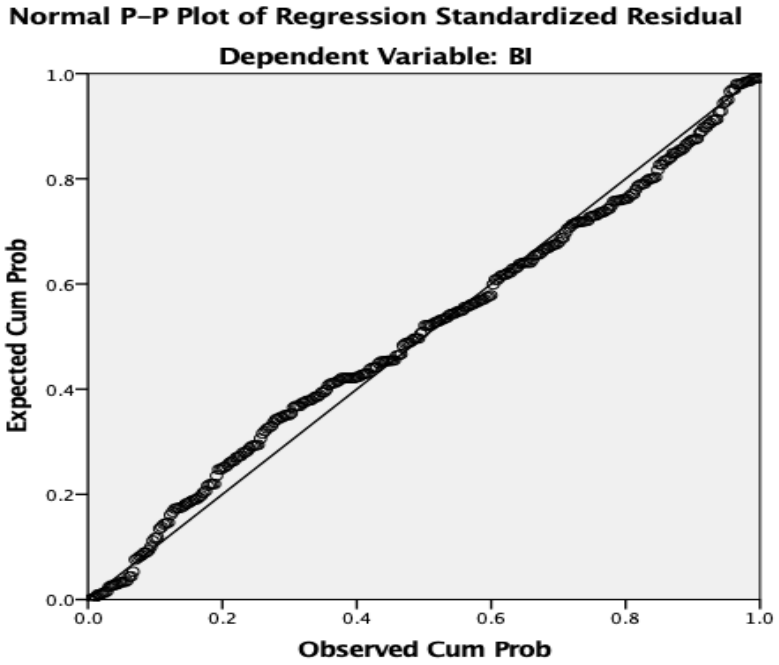
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.276	.195		1.415	.158		
	PU	.344	.062	.292	5.525	.000	.484	2.068
	PEOU	.229	.060	.216	3.805	.000	.417	2.398
	SN	-.017	.047	-.019	-.365	.715	.509	1.964
	PI	.061	.043	.070	1.429	.154	.560	1.786
	C	.227	.052	.255	4.353	.000	.392	2.551
	PS	-.020	.037	-.027	-.549	.584	.577	1.734
	T	.141	.054	.147	2.633	.009	.432	2.314

a. Dependent Variable: BI

Test of Normality: Histogram



Test of Normality: Normal P-P Plot



Test of Normality: Scatterplot