THE MALAYSIAN MILLENIA'S INTENTION TO USE MOBILE PAYMENT SYSTEMS– EXTENDING THE MOBILE TECHNOLOGY ACCEPTANCE MODEL

CHONG PUI SEE

MASTER OF BUSINESS ADMINISTRATION
(CORPORATE MANAGEMENT)

FACULTY OF BUSINESS AND FINANCE
UNIVERSITI TUNKU ABDUL RAHMAN

JANUARY 2023

THE MALAYSIAN MILLENIA'S INTENTION TO USE MOBILE PAYMENT SYSTEMS– EXTENDING THE MOBILE TECHNOLOGY ACCEPTANCE MODEL

By

CHONG PUI SEE

A thesis submitted to
Faculty of Business and Finance,
Universiti Tunku Abdul Rahman,
in partial fulfilment of the requirements for the degree of
Master of Business Administration
(Corporate Management)
January 2023

ABSTRACT

THE MALAYSIAN MILLENIA'S INTENTION TO USE MOBILE PAYMENT SYSTEMS– EXTENDING THE MOBILE TECHNOLOGY ACCEPTANCE MODEL

CHONG PUI SEE

Mobile commerce is becoming an important tool for shopping among residents in developed and developing countries. Advances in mobile payment (m-payment) systems benefit sellers and users in terms of instant payment service using mobile devices. However, the adoption of m-payment is not flourishing in Malaysia. Malaysians are hesitant to use the m-payment system proactively, even though they may have realized the benefits of e-commerce. In order to address this issue, this project examines the key behavioral variables - the usefulness of m-payment systems; ease-of-use of m-payment systems; perceived trust; and perceived mobility – in influencing customers' intentional behavior. Millennial is targeted in this project because the groups represent a large and lucrative potential market for m-payment merchants due to their technological knowledge, busy schedules, and higher purchasing power.

The current conceptual model is based on the MTAM framework, enriched by adding two more variables: perceived trust and perceived mobility. The questionnaire was distributed by snowball sampling method, and variable items were measured by 5 points Likert scale. 384 answered questionnaires were

collected. The results show that the usefulness and ease-of-use of m-payment system and perceived trust are positively significant with respondents' intentional behavior and appropriate implications are suggested to academics and managerial decision-makers. Plausible explanations on the non-significant effect created by perceived mobility, research limitations, and suggestion for future research are presented.

ACKOWLEDGEMENTS

I would like to thank my dear supervisor, Dr. Chong Yee Lee, for her valuable academic guidance and support throughout the research project. I have great gratitude and respect for the knowledge and experience she shared and contributed to the completion of this research.

Thank you

APPROVAL SHEET

This thesis/ dissertation entitled **'The Malaysian Millennia's Intention to Use Mobile Payment Systems- Extending the Mobile Technology Acceptance Model'** was prepared by CHONG PUI SEE and submitted as partial fulfilment of the requirements for the degree of Master of Business Administration (Corporate Management) at Universiti Tunku Abdul Rahman.

Approved by:

Chong Yee Lee

_____

(Dr. CHONG YEE LEE)
Date: 14/ 12/ 2022
Supervisor
Department of Marketing
Faculty of Business and Finance
Universiti Tunku Abdul Rahman

FACULTY OF BUSINESS AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

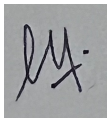
Date: 27/2/2023

SUBMISSION OF THESIS

It is hereby certified that CHONG PUI SEE (ID No: 22ABM02649) has completed this thesis entitled 'The Malaysian Millennia's Intention to Use Mobile Payment Systems- Extending the Mobile Technology Acceptance Model' under the supervision of Dr. CHONG YEE LEE from the Department of Marketing.

I understand that the University will upload softcopy of my thesis in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

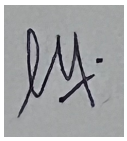
Yours truly,



(Chong Pui See)

DECLARATION

I CHONG PUI SEE hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.



(CHONG PUI SEE)

27/2/2023

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

Analysis of Variance	ANOVA
Dependent Variable	DV
Electronic Learning	E-Learning
Electronic Shopping	E-Shopping
Independent Variable	IV
Intention to use Mobile Payment Systems	Int
Mobile Payment	M-Payment
M-payment's Ease of Use	MPEOU
M-payment's Usefulness	MPU
Mobile Technology Acceptance Model	MTAM
Mobile Usefulness	MU
Near-field Communication	NFC
Perceived Ease of Use	PEOU
Perceived Mobility	PM
Perceived Trust	PT
Perceived Usefulness	PU
Technology Acceptance Model	TAM
Theory of Reasoned Action	TRA
Usefulness of the Mobile Payment Systems	MPU
Unified Theory of Acceptance and Use of Technology	UTAUT
Variance Inflation Factor	VIF
Virtual Reality	VR

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

In this topic, mobile payment (m-payment) and the target market: millennia reside in Malaysia are introduced. In justifying the need to test the relationship between specific independent variables (IV) and the Millennia's intention to use M-Payment, the issues and problems that lead to lower intentional behavior are discussed. Based on the presented statement of problems, research questions, and research objectives are established. Then, the uniqueness of current conceptual framework and outcome in the literature about m-payment and value-added information to policy makers and academics are presented.

1.1 Research Background

M-payment systems enable consumers to purchase goods and services, as well as pay bills through a specific mobile app that is installed on user's smart devices like mobile phones. The e-trading or e-monetary transaction can be activated when the smart device is connected to the internet. M-payment includes the services of mobile commerce, mobile wallet, and mobile banking (Geva, 2012; Liebana-Cabanillas, 2012) and is governed by local financial regulations. In order to use the m-payment systems, users need to register and open an e-account that will be monitored by the m-payment service provider. For each e-transaction, the buyers or users transfer their money from their bank account, debit or credit cards fund, or e-wallet into the m-payment e-account (Bank Negara Malaysia, n.d.).

Conventionally, e-monetary transactions in local and international markets have been facilitated by banks. A specific wiring cable fee is charged by banks for every e-monetary transaction. If the transacted amount is small, it becomes costly to senders or receivers and time-consuming as the sender needs to activate the e-transfer at a bank physically (Gia & Pham, 2016). Conversely, e-payment changes the ways of implementing monetary transaction – from physical to virtual mode which enhances the user's quality of life (Nizam et al., 2019; Ting et al., 2016). Hence, m-payment systems become a popular payment tool in developing countries (Kim, Tao, & Shin, 2009).

M-payment allows consumers to make various types of micropayments (Gia & Pham, 2016) like purchasing a small volume of services and products such as groceries, books, transportation tickets, hotel booking, and paying electrical and water bills (Karim et al., 2020; Ondrus & Pigneur, 2006). In reducing scam incidents and increasing the security of e-monetary transaction, an m-payment scheme is guarded by a personal password (Karim et al., 2020). M-payment usually uses biometric authentication, and one-time passwords (OTP) to complete the transactions. OTP is a special security code given by banks for online transactions. It adds an extra layer of authentication compared to static passwords because OTPs are single-use, and each transaction has a different OTP code (DPS, 2021).

The Malaysian government fosters the use of fintech since 2011 by modernizing the financial system of Malaysia into a highly valued environment which aims to transform Malaysia to become a fully matured country by 2020. Financial

technology or fintech is an emerging technologies designed to is created to automate the delivery of financial services (Kagan, 2023). According to Bank Negara Malaysia, m-payments are essential to achieve the goal of creating a cashless environment for Malaysia by 2020. However, the adoption of fintech in m-payments in Malaysia remains low especially compared to China, South Korea, and India (Merchant Savvy, 2022) or just a handful of issuers, roughly 40 have recently obtained permission to become legitimate m-payment system issuers (Alam et al., 2021).

Nowadays, Malaysian banks encourage bank consumers to use the e-banking system which can be assessed using online platforms and mobile applications for bill payments, and monetary transfers into a domestic and international account, and facilitate consumers to buy goods and services from e-commerce or m-commerce providers (Islam et al., 2020). For the government, the record of e-transactions is beneficial as the detail is more transparent which reduces corruption or money laundering scandals (FITS Study, 2013).

In solving the low intention to use the m-payment system in Malaysia, this project examines the key variables that have been influencing customers' intentional behavior. A number of studies have examined the user's m-payment system adoption behavior from a technology perspective in other nations. Nevertheless, studies on variables affecting Malaysian customers' intention to adopt m-payment systems are still limited (Yeow et al., 2017). The intentional usage of m-payments is critical for e-commerce and m-commerce businesses especially small businesses to speed up the trading of their products or services

and reach a wider target market (Au & Kauffman, 2008; Mallat, 2007; Ondrus & Pigneur, 2006).

The oldest age group of millennia was born at the dawn of the internet and the youngest at the dawn of smartphone era, known as the first true digital natives. Millennia are also called technological savvy generation and born in the information age. Therefore, using m-payment is not much of a problem for millennia. In Malaysia, millennial make up 50% of the working population and are the largest demographic group in Malaysian at 33.2% (Kemp, 2022). If the m-payment services providers and the government know the behavioral factors or variables that have been influencing the Malaysian millennia's adoption behavior, tactical solutions can be planned in materializing the m-payment system usage in the future. This project aims to fill in the knowledge gap.

1.2 Problem Statement

Given the widespread usage of mobile devices and the internet, m-payment systems are proven to be popular payment methods for individual consumers as well as a practical tool for government agencies and commercial enterprises to speed up payment (Ondrus & Pigneur, 2006). The adoption of m-payment applications is crucial for e-commerce organizations to enlarge their e-market share (Au & Kauffman, 2008; Mallat, 2007; Ondrus & Pigneur, 2006). As the country's population grows, Statista (2021) anticipates that Malaysia will have more than 31 million smartphone users by 2025. Although the m-payment systems usage in Malaysia is increasing, the usage still lags behind compared to the usage of traditional payment methods.

M-payment acceptance in Malaysia is relatively low as compared to China or Singapore (Chuah et al., 2019). According to Hajazi et al., (2021), only 7% of e-commerce transactions are completed using m-payment systems in Malaysia. In understand the possible behavioral variables that have been influencing the respondent's intentional behaviour, a preliminary study was carried out by the current researcher.

The preliminary study result shows that 60% of 20 interviewed millennia respondents did not perceive the usefulness of m-payment systems in expediting the transactions process. The usefulness of m-payment systems has been extensively studied in the literature. In 2016, only 5.6% of the studied respondents (Malaysian millennials) denoted that the systems make payment transactions less effective such as low speed, as well as less flexibility (Mun et al., 2017). Probably, the speed and coverage of the internet from 2015 to 2017 were low. In a later study dated 2021, Hajazi et al. (2021) asserted that usefulness of the m-payment system can motivate potential users to use the system (Malaysian millennials). Therefore, the m-payment system's usefulness (MPU) is tested in the main study of this project for confirmation of the Malaysian millennia's behavior and to find out the plausible reason that can explain such behavior.

Eighty percent of the preliminary study's millennia respondents found that most of the m-payment systems are not easy to use. Such response is in line with the literature's findings; the ease-of-use of m-payment services was a significant

variable that drives the respondent's intention in adopting the studied m-payment service (Flavian et al., 2006; Mun et al., 2017; Rana et al., 2013). Hence, this study examined how the m-payment system's ease-of-use (MPEOU) affects the Malaysian millennia's intention to use m-payment systems. In solving the problems related to MPU and MPEOU, this project use the Mobile Technology Acceptance Model (MTAM) to develop the current study's conceptual research model.

Unlike physical payment, trust in the m-payment system among different groups of users can be different because the security feature of each m-payment system is different. Eighty percent of the preliminary study respondents questioned whether their e-payment which is activated via the m-payment systems can be securely and legitimately transferred. The riskiness perception is supported by a few m-payment systems studies. In Bagla and Sancheti's (2018) study, the studied risks include illegal acts like theft, account takeover, fraudulent transactions, and security breaches (Marria, 2018). These uncertain risks may affect users' trust in m-payment systems. Thus, the perceived trust (PT) variable is examined in the main study as a predictor.

The preliminary study's respondents also voiced the mobility of the m-payment systems. More than 50% of 20 millennia respondents doubt whether m-payment systems can be used in making payment while travelling because not all areas in Malaysia have strong internet coverage. On the other hand, a high number of Malaysian is using smartphones. As of January 2022, about 29.55 million Malaysian residents use the internet facility (Kemp, 2022) an increase of 1.3%

as compared to 2021 (Kemp, 2022). Such contradicting statement drives the current researcher to examine how perceived mobility (PM) affects the use of m-payments among the Malaysian millennia in the main study.

This project enriches the m-payment literature by extending the MTAM's theoretical framework by adding two predictor variables: perceived trust (PT) and perceived mobility (PM).

1.3 Research Questions

The following questions are derived based on the problems discussed above:

i. How do the mobile payment system's usefulness and ease of use relate to the Malaysian millennia's m-payment systems intentional usage?
ii. How do the perceived trust and perceived mobility relate to the Malaysian millennia's intention to use m-payment systems?

1.4 Research Objectives

Generally, this project aims to examine the behavioral factors that influence the millennia's intention to use m-payment systems. Specifically,

i. To examine the how the m-payment system's usefulness and ease of use variables affect the Malaysian millennia's m-payment systems intentional usage.
ii. To examine how the perceived trust and perceived mobility affect the Malaysian millennia's m-payment systems intentional usage.

1.5 Significance of the Study

1.5.1 To Managerial Decision Makers

Bank Negara Malaysia, which supervises and monitors the country's financial sector in Malaysia, has provided e-money licenses to six banks and 45 non-banks (Bank Negara Malaysia, 2020). The RM30 eTunai Rakyat program aims to promote the use of the m-payment by debiting RM30 into eligible Malaysians' m-payment system account (Tariq, 2020). E-wallet issuers are simultaneously promoting the use of the m-payment system by offering alluring discounts like cashback, coupons, and rebates (Chawla & Joshi, 2019). However, only 8% of Malaysians use the m-payment system as their primary mode of payment (Nielsen Malaysia, 2019). The m-payment system is still in its infancy stage, according to PricewaterhouseCoopers Malaysia (PwC, 2018).

Each group of target consumers has its own needs and wants. It is crucial that m-payment system issuers identify their targets and understand their behavior intelligently. The Malaysian millennia is technological savvy compared to the boomer generation and they have a bundle of bills payment that needs to be cleared, including asset installments, utility bills, rentals, house or car maintenance, and household expenses. Therefore, it is well-advised to focus on the millennia market if the government intends to generate a cashless society in the hope of reducing crime rates like robbery and money laundering. Given that millennia are technologically savvy, it is not difficult to encourage them to adopt the m-payment systems if their negative perceptions pertaining to the MPU, MPEOU, PT, and PM reduce.

Useful indications can be provided from the current study results. The current project's results assist the relevant policymakers in devising strategies that can meet the millennia's expectations and encourage the Malaysian millennia to use m-payment systems.

1.5.2 To Academics

As behavioral studies relate to the millennia's m-payment systems usage intention have not been extensively examined in Malaysian, this project aims to fill the literature gap and enrich the MTAM model by extending two additional variables: PT and PM which are rarely tested in mobile technology study context.

The majority of the past studies apply the TAM model to reveal the users' m-payment usage intention. This study diff from most past studies because a specific technology adoption theory, the MTAM model is used as the studied subject matter relates to mobile technology. According to Ooi and Tan (2016), the predictors of the MTAM model are more suitable for studying the adoption of mobile technologies.

On top of that, the current conceptual framework also extends the MTAM theoretical framework with two additional predictors, perceived trust, and perceived mobility. The result of the current study therefore can provide useful indications to future researchers in applying the current conceptual model or enriching the current conceptual model with other variables that could explain the context of their study better.

1.6 Chapter Layout

Chapter 1 briefs the scope of the project by discussing relevant past studies' information. In addition to formulating research questions and research objectives, questions are also identified. The uniqueness of this project is extensively covered in the subsection on research significance. To clarify how the MTAM theoretical framework can support the current researcher to construct the conceptual framework and the hypotheses of this project, as well as how to enrich the MTAM, the literature was properly researched and analyzed in Chapter 2. In order to collect and analyze valid and accurate data, chapter 3 aims to describe the methodology used in this research and to discuss the reasons for using particular methodologies. The study's findings are presented and interpreted in Chapter 4 and the recommendations and limitations of this project are presented in Chapter 5.

CHAPTER 2

LITERATURE REVIEW

This chapter presents and discusses the development of the basic theoretical framework and past studies' research models that adopted the MTAM framework. The current author aims to identify and fill literature gaps by developing a conceptual framework and the current project's hypotheses.

2.1. Overview the Technology Acceptance Model Theoretical Framework

Many behavioral studies related to the adoption of new technology applied the Technology Acceptance Model (TAM) theoretical framework introduced by Davis (1989). The TAM was developed based on the theoretical framework of the Theory of Reasoned Action (TRA) (Yousafzai et al., 2010). Theoretically, both TAM and TRA explain that consumers are motivated to use relatively new technology if the usage intention exists, and the intentional behavior is determined by their attitude toward the studied technology.

The attitudes are determined by two primary predictor constructs: perceived usefulness (PU) and perceived ease-of-use (PEOU) (Yousafzai et al., 2010). The PU reflects the degree to which a technology is anticipated to boost a potential user's performance, while the PEOU shows the amount of necessary effort that needs to be contributed in order to use the studied technology (Davis, 1989). TAM was developed to become TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008).

Various technology adoption research has used TAM, including online services (Liao, Chen, & Yen, 2007), mobile phones (Ervasti & Helaakoski, 2010), mobile ticketing (Mallat, Rossi, Tuunainen, & örni, 2009), social networking technology (Lorenzo, Alarcón, & Gómez, 2011), healthcare information systems (Pai & Huang, 2011), and m-payments (Liébana- Cabanillas, 2012; Luna, 2012). Despite numerous updates on TAM (Lee, Hu, & Yeh, 2003; Liébana-Cabanillas, 2012), the TAM is still regarded as the most significant model of technology acceptance behavior (Davis, 1989; Davis et al., 1989). It has been incorporated in numerous studies on m-payments (Nysveen et al., 2005; Mao et al., 2005; Chen, 2008; Shin, 2009; Yang et al., 2012).

However, scholars argued that TAM is more applicable and suitable if the studied technology is used in an organizational setting and the researcher wishes to examine whether the office workers will accept the studied technology after the workers have been equipped with the necessary technical skill and knowledge (Tsai & LaRose, 2015; Venkatesh, Thong, & Xu, 2012). TAM explains that potential users a have high motivational usage intention if they perceive the technology usage is easy and practical.

Nevertheless, studies related to mobile technology show the TAM predictors: PU and PEOU are generating conflicting results on the respondent's attitude. According to Ooi and Tan (2016), it is possible that respondents act differently towards the PU and PEOU influence, and subsequently can affect the intentional behavior directly, due to respondent demographics and the influence of external variables. As a result, implementing TAM requires extreme caution. When using

the TAM in developing the current conceptual model, the researchers must be aware of the nature of the dynamic IT environments (Benbasat et al., 2007; Phan, & Daim, 2011). Consequently, a modified TAM, namely Mobile Technology Acceptance Model (MTAM) is proposed by Ooi and Tan (2016),

2.2 Overview the Mobile Technology Acceptance Model (MTAM) Theoretical Framework

In order to precisely address the requirements of the mobile environment for information communication technology (ICT) research, MTAM was developed. Ooi and Tan (2016) propose MTAM after extensive review (Lew et al., 2020) and rename the model's predictors as mobile usefulness (MU) and mobile ease-of-use (MEOU) (see Figure 2.1), which share almost similar definition as the TAM's PU and PEOU but the MU and MEOU are carefully defined to better reflect the mobile environment of the study context (Lew et al., 2020).

Meanwhile, academics criticized the MTAM framework because the MU and MEOU cannot be viewed as the only variables that can encourage consumers to use mobile technology. The framework should also take into account additional external factors, that are technological and non-technology related (Lee et al., 2020).

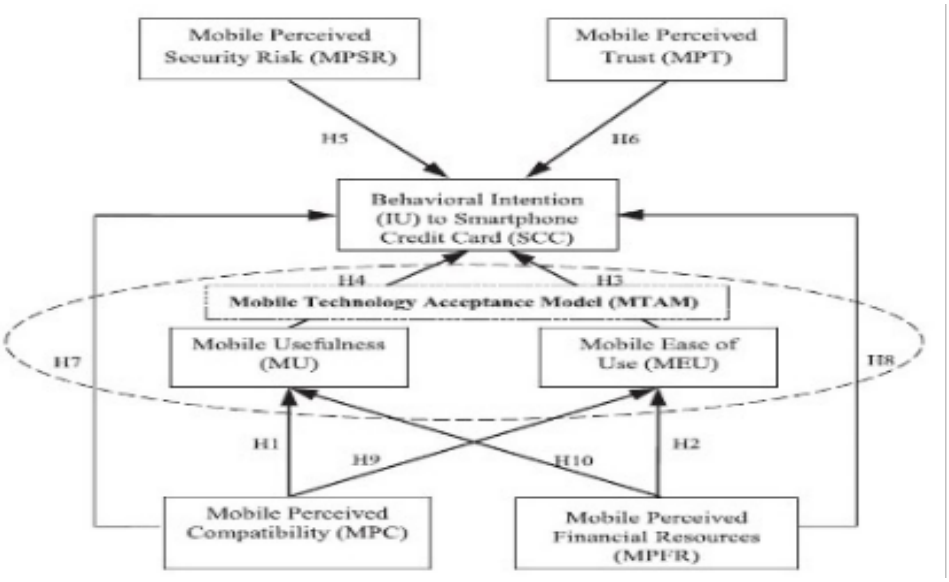


Figure 2.1: The Theoretical Framework of the Mobile Acceptance Technology Model

Source: Ooi and Tan (2016)

2.3 Past MTAM Studies

The application of the MTAM framework in mobile technology studies is still limited (see Table 2.1). MTAM is adopted in mobile technology studies related to wearable payment (Lee et al., 2020); and smartphone credit cards (Ooi & Tan, 2016). In enriching the MTAM framework, the following additional predictor variables have been tested – (1) perceived aesthetics and technology readiness (Lee et al., 2020); and (2) mobile perceived trust, mobile perceived compatibility, mobile perceived financial resources, and mobile perceived security risk (Ooi & Tan, 2016) (See Table 2.1).

The current project outlines the MPU and MPEOU in more depth so that possible factors are considered in response to previous research. Moreover, consumers' PT and PM of mobile technology are critical in determining the acceptance success rate as different generations groups of respondents have different

perceptions of trust and mobility. Therefore, there is a need for additional studies concerning the impact of PT and PM on the m-payment systems usage intention among millennia. In summary, PT and PM function as predictors that are tested with MTAM predictors to enrich the MTAM framework in this project.

Table 2.1: Previous research using the MTAM framework

Authors (Year)	Research Area & Variables	Results
Lee et al. (2020)	Wearable Payment DV: Behavioral Intention to use wearable payment IV1: MU IV2: MEOU IV3: Perceived aesthetics IV4: Technology readiness	• IV1, IV3, and IV4 have positive relationship to DV. • Both IV3 and IV4 have positive relationship to IV1 and IV2
Ooi & Tan (2016)	Smartphone Credit Card DV: Intention to use smartphone credit cards IV1: MU IV2: MEOU IV3: Mobile perceived trust IV4: Mobile perceived compatibility IV5: Mobile perceived financial resources IV6: Mobile perceived security risk	• IV1, IV3, and IV4 have positive relationship to DV • IV2, IV5, and IV6 are no significant relationship with DV • IV4 is significantly related with IV1 and IV2 • IV5 is significantly related with IV1, but not significant relationship with IV2

2.4 Relevant Past Studies Related to Perceived Trust and Perceived Mobility

2.4.1 Perceived Trust

There are numerous definitions have been given to trust. Perceived trust is a complex concept in the fields of marketing and social psychology (Doney & Cannon, 1997). Geffen et al. (2003) describe trust as an emotion reflected in the other party's confidence and sense of security and indicate that consumers avoid online purchases due to security concerns. Leonard (2016) considers users' confidence in using a mobile device to complete online transactions as perceived

trust. Zhou (2013) argues that PT reflects the respondents' willingness to become loyal to the usage of studied object due to positive behavior performed by the service provider. Liébana-Cabanillas et al. (2018) describes PT as an emotional reaction that prompts someone to trust other person if the respondents are satisfied with the person's behavior.

The definition of trust is adapted to different study contexts. For example, PT was examined in the contexts of e-commerce (Kim et al., 2011; Corbitt et al., 2003; Kim et al., 2008), and m-payments (Denaputri & Usman, 2019; Teo et al., 2015; Matemba et al., 2017). In e-commerce, PT refers to the confidence that customers have developed towards online retailers after carefully weighing the merchants' qualities (Pavlou, 2003). In m-payment studies, PT relates to the respondents' expectation; whether their e-transactions is performing accurately (Kim et al., 2010; Mallat, 2007). Typically, m-payments consumers' usage decision depends on the level of trustworthiness and reliability they believe the providers have. As a result, the current author cited the above definition of trust in this study.

Furthermore, technology adoption studies found that PT is a tool that improves system security perceptions and customer relationships; and increase studied object's credibility (Liébana-Cabanillas et al., 2018). For illustration, in research conducted by Denaputri & Usman (2019); Teo et al. (2015); Matemba et al. (2017); Phonthanukitithaworn et al. (2016); Cao et al. (2018); PT is significantly related to m-payment systems' usage intention. Contrarily, some study results

show that PT and usage intention has no significant relationship in m-payment study context (Chandra et al.'s 2018; Sajid & Haddara, 2016).

In general, the significant relationship between PT and consumers' ICT usage intention is inconsistent in mobile technology studies when the study context and groups of respondents differ. As a result, there is a need to examine the relationship between PT and intentional usage behavior in m-payment systems context among Malaysian millennia.

2.4.2 Perceived Mobility

According to Clarke (2001); Dahlberg et al. (2008); Kim et al. (2010), mobility refers to the ability to access studied services anywhere, at any time, and through a range of mobile devices like a mobile phone, smartphone, or laptop. Mobility improves customers' perceptions of the studied mobile services' PEOU, convenience, and timeliness (Seppala & Alamaki, 2003). In addition, mobility enables users to access time-sensitive information and services anywhere, anytime using wireless networks and mobile devices (Kim et al. 2010). Therefore, PM is a crucial predictor in the following study contexts: mobile learning (Huang et al., 2007; Rafique et al., 2018), mobile commerce (Marikovic & Kalinic, 2017), and m-payment services (Yen & Wu, 2016; Zmijewska et al., 2004; Chandra et al., 2018; Daştan & Gürler, 2016).

Jiang (2009) argues that PM and intention to adopt mobile internet is positively related. In Mallat et al.'s (2008) study, PM and person's intentional decision to adopt a mobile-ticketing service are significantly related. In a m-payment system

studies, inconsistent results are presented. PM has a strong effect on m-payment services usage intention (Chandra et al., 2018; Dastan & Gurler, 2016; Lu et al., 2016; Schierz et al., 2010; Yen & Wu, 2016); and continuance usage decisions among South Korean users (Kim et al., 2010). However, in Liebana-Cabanillas et al. (2015) and Ramos-de-Luna et al.'s (2015) studies, PM is not significantly related to m-payment usage intention.

In general, some past studies support the significant relationship between PM and m-payment usage intention, while some of the researchers show no significant relationship. The findings appear to be fairly inconclusive. As a result, there is a need to examine the relationship between PM and m-payment usage intention among Malaysian millennia. Basically, past researchers agree that M-payment provides beneficial mobility services such as enabling users to pay anytime, anywhere without being limited by time and place (Zhou, 2011). Therefore, examining PM as a predictor in influencing the intentional usage of m-payment is valuable in enriching the MTAM model framework.

2.5 Hypotheses Development

2.5.1 Usefulness of Mobile Payment System (MPU) and M-payment Systems Intentional Usage (H1)

The usefulness of an m-payment system greatly affects the likelihood that a consumer will use the technology (Davis, 1989). Past TAM study results in support that perceived usefulness are significantly associated with intentional behavior (Garg & Garg, 2013; Chen, 2017; Fauzi. 2019). A TAM study's result in Malaysia also shows that PU is one of the main motivational factors that drive the intentional usage of wearable technology (Chuah et al., 2016).

The MTAM model explains that mobile technology is considered useful if the technology can be used to achieve the target consumer's goals (Davis, 1989; Ooi & Tan, 2016). Similarly, many past studies support that PU relates to m-payment systems (Abrahão et al., 2016; Kim et al., 2010; Pal et al., 2015; Slade, Dwivedi, Piercy, & Williams, 2015) and NFC-based m-payments (Pham & Ho, 2015) usage intentional. Mobile technology intentional usage studies in developing countries show the positive relationship between MPU and intention to use NFC m-payments (Tan et al., 2014) and smartphone credit cards (Ooi & Tan, 2016).

Interestingly, some past studies have found that despite the benefits offered by NFC mobile payments, mobile usefulness was non-significant for behavioral intentions in France and Malaysia (Dutot, 2015; Balachandran & Tan, 2015). Possibly, the studies' respondents were related to people with high and low information communication technology (ICT) knowledge. As this project targets the millennia which is born in the IT era, current researcher therefore projects that:

> H1: The usefulness of mobile payment systems is positively related to the m-payment systems intentional usage.

2.5.2 Mobile Payment System's Ease-of-Use (MPEOU) and M-payment Systems Intentional Usage (H2)

The ease-of-use of a mobile system represents the perceived complexity of learning to use a technology system and has been defined in the TAM and UTAUT (Davis, 1989; Ooi & Tan, 2016; Venkatesh et al., 2003). Empirical

studies show that a system's PEOU is a strong indicator of m-payment system intentional usage (Kim et al., 2010; Pal, Vanijja, & Papasratorn, 2015; Abrahão et al., 2016). Consumers are more likely to use a system when they perceive that the system is simple to use (Ooi & Tan, 2016).

In Malaysia, the PEOU variable is significantly related to the contactless m-payment and m-payment usage intention in some past studies (Ooi & Tan, 2016; Tan et al., 2014; Teo et al., 2015; Ting et al., 2016). Also, the variable relates to m-payment intention usage behavior in another study conducted in France (Dutot, 2015). These studies underscore the importance of user-friendly interfaces, smooth system operation, and powerful features that increase user acceptance.

However, Ooi and Tan's (2016) study results indicate that smartphone credit cards usage intention is not significantly influenced by the system's ease-of-use. Lee et al. (2020) also showed that MEOU and wearable payment usage intention is not significantly related. The results from Ooi and Tan (2016) and Lee et al. (2020) contrast with previous research on NFC mobile devices, which found that users accept new innovations if the system is easy to use (Balachandran & Tan, 2015; Dutot, 2015; Leong et al., 2013; Tan et al., 2014).

In summary, a technology system could be easy to use among tech-savvy people, and not among users who have less exposure to ICT tools. If the study's respondents compose people with different levels of ICT knowledge, the relationship between m-payments system usage intention and PEOU may likely

be non-significant (Dastan & Gurler, 2016). As this project targets technological savvy users, current researcher anticipates that:

> H2: The mobile payment system's ease-of-use is positively related to the m-payment systems intentional usage.

2.5.3 Perceived Trust (PT) and M-payment Systems Intentional Usage (H3)

Perceived trust refers to a feeling that motivates someone to trust another person or company based on the satisfactory performance performed by the person or company. In m-payment systems context, PT is also known as mobile perceived trust. It refers to the level of trust that a consumer has developed when an m-payment system can process e-transactions up to their expectations (Kim et al., 2010; Mallat, 2007).

Trust has been used as a tool for improving customer relationships, promoting trustworthiness, and enhancing the perceived security of a technology system (Liébana-Cabanillas et al., 2018). Yang and Lin (2014) argue that building trust in an online tool is more challenging for merchants and customers than in an offline tool due to the lack of face-to-face interaction between the two parties during online transactions. Therefore, it is important for m-payment suppliers to develop ways that can increase users' perceived trust.

Developing users' PT in an m-payment system is subject to changes in external factors relate to operational and environmental uncertainties. However, if users have developed a strong trust in an m-payment system, the threat of external

factors reduces (Mallat, 2007). According to Mallat (2007), m-payment services are perceived as less risky if users trust the provider as reliable. Teo et al.'s (2015) also supported the positive relationship between PT and m-payment usage intentions when they feel the system is secured against mobile fraud. Therefore, current researcher develops the below hypothesis.

> The perceived trust is positively related to m-payment systems intentional usage.

2.5.4 Perceived Mobility (PM) and M-payment Systems Intentional Usage (H4)

Mobility is one of the key characteristics that distinguish m-payment systems from conventional payment systems. Mobility is frequently used in the m-payment literature to denote a person's ability to perform payments regardless of location or time. This means people use m-payment systems to complete their transaction tasks when they are working, at home, or traveling (Daştan & Gurler, 2016).

However, mobility of an m-payment system is feasible only if the mobile device can access the internet service. According to Krueger (2001), paid roaming can solve the internet access issue or users can use paid roaming service to access the internet service provided by another internet provider if the subscribed internet service is not available. Collaboration between internet service providers is important in ensuring a wider internet coverage area (Buhan et al., 2002). As PM is an important behavioral variable that drives the m-payment system usage intention, the following hypothesis is proposed:

The perceived mobility is positively related to m-payment systems intentional usage.

2.6 Proposed Conceptual Framework

This study examined the direct effect created by four independent variables (IVs): MPU, MEOU, PT, and PM on millennia' m-payment systems intentional usage in Malaysia (see figure 2.2).

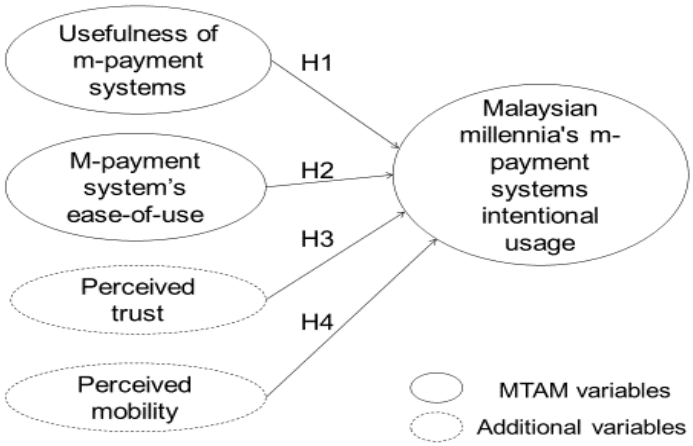


Figure 2.2: Current Conceptual Model

Source: Develop for current study

CHAPTER 3

RESEARCH METHOD

The research methodology for this project related to research and sampling design, development of the questionnaire, data collection and analysis methods, and ethical consideration are presented in the following sub-topics.

3.1 Research Design

This project uses a quantitative approach that involves the collection of numerical data using a questionnaire survey for statistical analysis (Taylor, 2000) in order to test current hypotheses. Table 3.1 shows that several past TAM and MTAM studies related to the adoption of studied technology employed a quantitative approach to gathering their data (Bertrand & Bouchard, 2008; Celik & Yilmaz, 2011; Al-Adwan et al., 2013; Phan & Daim, 2011; Rafique et al., 2020) because the measuring items of the model's original constructs: PU and PEOU variables have been well established and tested many times in literature. Most past studies results support the TAM's proportions; therefore, qualitative data is not required to verify the measuring items.

Table 3.1: The Source of Data for Past Studies that used Technology Acceptance Model

Author(s) and Year	Research Area	Source of Data	Objectives(s)
Bertrand & Bouchard (2008)	Virtual Reality (VR)	Quantitative	To determine the relationship between TAM variables and VR usage in clinical setting
Celik & Yilmaz (2011)	E- shopping	Quantitative	To explain consumer acceptance of e-shopping

Al-Adwan, Al-Adwan, & Smedley (2013)	E-learning	Quantitative	To examine the relationship between TAM variables and students' acceptance of e-learning
Phan & Daim (2011)	Mobile Services	Quantitative	To examine the relationship between TAM variables and acceptance of mobile services.
Rafique et al. (2020)	Mobile library applications	Quantitative	To examine the relationship between TAM variables and acceptance of mobile library applications.

3.2 Sampling Design

3.2.1 Targeted Population

The target population of this research is millennia (born between 1980 and 1999) and currently reside in Malaysia. The millennia population is composing 33.2% of the country's total population (Kemp, 2022), and compared to earlier generations, millennia is extremely responsive to using new technology (Muda et al., 2016). Besides that, the millennium is the largest internet user group in Malaysia (Com Score, 2009).

3.2.2 Sample Size

The sample size for this study is 384 respondents, in accordance with Morgan's Table of Sample Size (1970) (see Table 3.2), given that the approximated total population of Malaysian millennia is 11.8 million (Department of Statistics Malaysia, 2020).

Table 3.2: Morgan's Table of Sample Size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

3.2.3 Sampling Method

One of the best sampling methods that give each respondent an equal chance of being chosen is probability sampling. However, since no public agency has a sampling frame that shows the database of the Malaysian millennia's biodata, probability sampling cannot be used in this project. This project uses a non-probability sampling method, namely snowball sampling.

The use of snowball sampling method allows current researcher to reach hidden populations. The first responded batch of respondents is encouraged to distribute the questionnaire to their family, and social networking that matched the criteria of the target population. The same process repeats for the second, third, and so on responses batched by respondents. The procedures continue until 384 completed questionnaires are collected.

3.3 Development of Questionnaire and Data Collection Method

A structured questionnaire is used to collect quantitative data. The questionnaires were distributed using the smart application, Google Surveys. A questionnaire in Google Forms is used as it is more user-friendly. As long as the respondents have a smart device and internet connection, the respondents can respond to the survey whenever and wherever they like. Additionally, adopting an electronic questionnaire can lower the likelihood of Covid-19 transmission and make it easier for the answered respondents to forward the questionnaire to their family members or social networks. The item statements of the first drafted questionnaire are prepared by modifying selected past study item statements. See Table 3.3 to view the modified measuring items.

3.3.1 Pre-Test

It is critical that the respondents understand what was measured by each item statement that was adapted from past studies or shown in the first drafted questionnaire. Pre-test is used to increase construct validity of the study's examined variables. An academic expert was engaged in pre-test. The main responsibility of the academic expert is to make sure the item statements that were prepared by the present researcher is representing the measurement detail accurately. The academic expert rectified the drafted item statements if the item statements used to measure the same variable is overlapping or has overlapped with another variable's item. Table 3.3 showed the suggestions given by the academic expert.

Table 3.3 Amendment on adopted variable's items as suggested by the academic expert

Variable	First drafted measuring items	Suggestion for improvement
Usefulness of m-payment system	1. Using mobile payment systems is advantageous. 2. Using mobile payment systems may increase my effectiveness in my daily life. 3. Using mobile payment systems may save my time in paying. 4. Using mobile payment systems enables me to pay quicker. 5. Using mobile payment system may improve my paying efficiency.	*Suggestion for improvement: It is suggested to use this source: Daştan (2016) because the item statement examined in this article is more understandable and measurable compared to suggested item statement. The following statements are suggested.* 1. Using mobile payment systems would improve my performance in making payments. 2. Using mobile payment systems increases my effectiveness in making payments, i.e., assisting me to achieve a decided/ desired goal such as completing a payment transaction at a specific or faster time frame. 3. Completing monetary transactions using a mobile payment system is time-saving. 4. Using mobile payment systems enables me to complete the monetary transaction at a faster pace compared to the use of traditional payment systems.
M-payment system's ease-of-use	1. I think using mobile payment system is easy. 2. I think learning to use mobile payment system is easy. 3. I think it is easy to find what I am looking for through mobile payment system. 4. I think becoming skilful at using mobile payment system is easy.	*Suggestion for improvement: It is suggested to use this source: Daştan (2016) because the item statement examined in this article is more understandable and measurable compared to suggested item statement. The following statements are suggested.* 1. Overall, I find mobile payment systems easy to use. 2. Learning to use mobile payment systems would be easy for me. 3. The mobile payment system is flexible for me to operate while making payments. 4. It is easy to become skillful at using a mobile payment system in making payments.
Perceived trust	1. I trust that mobile payment system provider will not disclose my privacy information of its users.	*Suggestion for improvement: The measuring items from the articles can be maintained but need modifications to suit this research. The following statements are suggested.* 1. I trust the mobile payment system apps provider will not disclose the private information of its users.

	2. I trust that funds stored in mobile payment systems is safe. 3. I trust that mobile payment systems are trustworthy.	2. I trust that funds transfer in making payments using mobile payment systems is safe. 3. I trust that the mobile payment systems providers will update the app's technology.
Perceived mobility	1. I believe I can be use the mobile payment system anytime. 2. I believe I can be use the mobile payment system anywhere. 3. I believe I can still use the mobile payment system while travelling.	*Suggestion for improvement: The measuring items from the articles can be maintained but need modifications to suit this research. The following statements are suggested.* 1. I believe I can use the mobile payment system in making payments anytime. 2. I believe I can use the mobile payment system in making payments anywhere. 3. I believe I can still use the mobile payment system in making payments while traveling.
M-payment systems intentional usage	1. I pay for purchases with a mobile payment system now. 2. I will think about using mobile payment systems. 3. I intend to use mobile payment systems in the near future. 4. In 5 years, I intend to use mobile payment system to pay for my purchases.	*Suggestion for improvement: Remove the first statement as it is more accurate for respondents that have used mobile payment systems. The following statements are suggested.* 1. I will think about using mobile payment systems. 2. I intend to use mobile payment systems in the near future. 3. In 5 years, I intend to use a mobile payment system to pay for my purchases.

3.3.2 Pilot Study

A pilot study is carried out using social media after the current author has completed the pre-test and the second drafted questionnaire has been prepared according to the expert's advice. A total of 20 respondents were engaged. The main responsibility of the pilot study respondents is to determine whether the wording and jargon shown in the questionnaire item statements need to be further amended so that they can be more certain of what is meant to be measured by each item statement.

A short discussion was held with representatives of the respondents through the zoom platform to discuss the need to modify the wording and jargon of the pre-test questionnaire. Essentially, each respondent representative provided a consistent response to each item statement and claimed to understand it. Hence, representatives respondent were asked to answer the questionnaire so that the current researcher can compute the reliability coefficient or Cronbach alpha score for each variable. As the Cronbach alpha coefficient scores of each variable are higher than the threshold value of 0.6 (see Table 3.4), the current author has distributed the finalized questionnaire to the main study respondents.

Table 3.4 Cronbach's Coefficient Scores for Pilot Test Variables

Variables	Cronbach's Alpha	Reliability
Usefulness of m-payment systems (IV1)	0.774	Good reliability
Mobile m-payment systems' ease-of-use (IV2)	0.708	Good reliability
Perceived trust (IV3)	0.787	Good reliability
Perceived mobility (IV4)	0.768	Good reliability

3.3.3 Questionnaire Design for Main Study

The finalized questionnaire (after completing the pre-test and pilot study) consists of two sections: sections A and B. The respondents' demographic information, including age, gender, ethnicity, average monthly salary, and current location are shown in section A. The present research variables are measured by specific item statements and are shown in Section B. This questionnaire uses 5 points Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) because it is simple for respondents to answer. Table 3.5 shows the item statements for each studied variable in this project. The master copy of the finalized questionnaire is shown at appendix 1.

Table 3.5 Measuring Items of Current Research's Variables

Variables	Item's coding	Measuring Items
Usefulness of m-payment system	MPU1	Using mobile payment systems would improve my performance in making payments.
	MPU2	Using mobile payment systems increases my effectiveness in making payments, i.e., assisting me to achieve a decided/ desired goal such as completing a payment transaction at a specific or faster time frame.
	MPU3	Completing monetary transactions using a mobile payment system is time-saving.
	MPU4	Using mobile payment systems enables me to complete the monetary transaction at a faster pace compared to the use of traditional payment systems.
M-payment system's ease-of-use	MPEU1	Overall, I find mobile payment systems easy to use.
	MPEU2	Learning to use mobile payment systems would be easy for me.
	MPEU3	The mobile payment system is flexible for me to operate while making payments.
	MPEU4	It is easy to become skillful at using mobile payment systems in making payments.
Perceived trust	PT1	I trust the mobile payment system apps provider will not disclose the private information of its users.
	PT2	I trust that fund transfer in making payments using mobile payment systems is safe.
	PT3	I trust that the mobile payment systems providers will update the app's technology that is beneficial to users.
Perceived mobility	PM1	I believe I can use the mobile payment system to make payments anytime.
	PM2	I believe I can use the mobile payment system to make payments anywhere.
	PM3	I believe I can still use the mobile payment system in making payments while traveling.
M-payment intentional usage	Int1	I will think about using mobile payment systems.
	Int2	I intend to use mobile payment systems in the near future.
	Int3	In 5 years, I intend to use a mobile payment system to pay for my purchases.

3.3.4 Distribution of Main Study Questionnaire

In reaching the millennia respondents, the project's questionnaires are disseminated on social media platforms: WhatsApp, WeChat, Facebook, and Instagram which are composed of vast millennia followers through a distribution link feature. Instagram was the main social media platform used by the current researcher to distribute the questionnaire. This is because the Instagram account of the current researcher has the highest count of followers compared to other social media platforms.

To persuade followers to answer the questionnaire, the main study respondents were well informed of the project's objective, the importance of getting their feedback, and the guarantee of privacy and confidentiality of their personal data. Such information is shown on the questionnaire's cover page. If the participants need clarification, the current researcher has provided the contact details for corresponding purposes. The questionnaire also shows the description of m-payment systems in Section B.

> Mobile payment (also referred to as mobile wallet) is an alternative payment method to traditional payment systems that use cash, cheque, or credit card. The e-monetary transaction is performed via wireless or mobile devices and operates under financial regulations.

The questionnaire was first distributed to the author's family, and friends as first batch respondents and the respondents were asked to forward the questionnaire to their family and social networks to reach other millennia respondents.

3.4 Data Analysis Methods

3.4.1 Descriptive Analysis

The descriptive result is a used to describe the distribution of the respondent's demographic data such as age, gender, and geographical area using frequency counts (Loeb, Dynarski, McFarland, Morris, Reardon, and Reber, 2017) and explain the relationships between categorical data (Baha, 2016). If the demographic data is biased toward a specific demographic categories like female versus male respondents, the present researchers need to provide a logical explanation when the descriptive data is not evenly distributed.

3.4.2 Inferential Analysis

Inferential statistics analyses compose of a variety of analytical techniques to aim to draw conclusions about the relationship between the studied variable among the population from data collected from a sample. In confirming the current project hypotheses, multiple linear regression analysis is used (Glen, 2021). Prior to the testing of current hypotheses, a number of statistical tests were carried out in ensuring the collected data is valid and reliable.

The reliability of the data was evaluated using Cronbach's alpha scores. The reliability coefficient reflects the consistency of respondents' responses. Outliers of data occur if respondents provide unusual feedback, and such inconsistent behavior will lower the variable's reliability coefficient value. A higher Cronbach's alpha score implies that respondents have generally provided higher consistent responses to all items used to measure specific variables, as shown in

Table 3.6, which also provides the range of these scores and the corresponding reliability indicators.

Table 3.6: Rule of Thumb for Cronbach's Coefficient Alpha

Coefficient Alpha Range (a)	Reliability
0.80 to 0.95	Very good reliability
0.70 to 0.80	Good reliability
0.60 to 0.70	Fair reliability
Below 0.60	Poor reliability

Sources: Zikmund et al. (2013)

After the reliability status of the variable data is confirmed and accepted, the variable data is analyzed using a QQ plot to determine whether the data follow a normal distribution flow. Pearson's correlation coefficient is calculated to determine whether DV and IV were consistently correlated. A positive correlation coefficient value indicates a positive correlation between variables, and a negative correlation coefficient value indicates a negative correlation. Table 3.7 will show the interpretation of the range of the correlation coefficient between the variables.

Table 3.7: Interpretation of the range of Correlations Coefficient analysis

Positive	Negative	Interpretation
+1.00	-1.00	Perfect
+0.80 to +0.99	-0.80 to -0.99	Very Strong
+0.60 to +0.79	-0.60 to -0.79	Strong
+0.40 to +0.59	-0.40 to -0.59	Moderate
+0.20 to +0.39	-0.20 to -0.39	Weak
+0.01 to +0.19	-0.01 to -0.19	Very Weak

Sources: Salkind (2009)

However, if the independent variables are highly correlated, multicollinearity problems will arise, and this should be avoided. The project evaluated the

multicollinearity effect by referring to the variable inflation index (VIF) coefficient of each variable. A VIF coefficient below the threshold value of 10 indicates that there is not a substantial correlation between the IVs. The VIF coefficient was presented in the multiple linear regression tables.

Lastly, multiple linear regression analysis was carried out to examine the relationship between the DV and IVs. When evaluating the distribution of the data points around the linear regression line, R squared is a useful evaluation statistic. It takes into account the DV's percentage of variance. R-squared measures the percentage of the DV's variance that each IV can explain for. In other words, it shows how well the data fit the regression model.

Under the regression result, the t-test analysis was run to test which IV is significantly related to the DV. If the t-test precisions score of each examined IV and DV is below the threshold significance level of 0.05, the hypothetical relationship therefore can be confirmed as supported, and vice-versa, a hypothesis is not supported when the -test precision scores are more than the threshold value of 0.05. The project's multiple linear regression equation is shown below:

$$Y = \sigma + \beta_{1a}X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4$$

Where,

Y : Intention to use m-payment systems

X_1: Usefulness of m-payment systems

X_2: M-payment system's ease-of-use

X_3: Perceived trust

X_4: Perceived mobility

σ : Intercept point

β_{1a}, β_{1b}, β_2, β_3&β_4: Coefficient of each independent variable

3.5 Ethical Consideration

Before the distribution of the finalized questionnaire, the current researcher submitted an application for an ethical clearance form with the finalized questionnaire to the university's ethical clearance committee members for approval. Approval from the committee members was received after they were satisfied with the prior preparation like the pre-test and pilot study that has been carried out and there is no indication that the main study's respondents will be forced to participate in the survey. The collected data will be used purely for academic research purposes. Therefore, the current researcher promised that the respondent's database will never be shared with other researchers or organizations or any e-platforms. Their identities and responses will remain confidential and private after the completion of the project.

The respondents were approached using the rule of informed consent. After obtaining consent from the respondents who voluntarily participate in this research, the questionnaires were delivered to the respondents. The respondents are informed about this study's so that they are aware of the ramifications of their participation. The personal data protection statement as depicted in Appendix 1 shows the current researcher's ethical intention and the respondents were asked to endorse the statement in signifying their voluntary involvement in this study.

CHAPTER 4

RESULT AND DISCUSSION

4.0 Introduction

The descriptive and inferential results are presented and explained in this chapter.

4.1 Descriptive Result

4.1.1 Survey Responses

A total of 384 questionnaire responses were obtained, as each respondent contributed their demographic information along with their responses to every measuring item, no data was discarded or voided.

4.1.2 Respondent Demographic Profile

The distribution of demographic data of the 384 respondents is shown in Table 4.1. Data collected from male and female respondents were found to be evenly distributed and less biased (53.6% male and 46.4% female). 71.1% of the respondents have a monthly salary of less than RM4000, while 74.5% of the respondents are in West Malaysia.

One of the biases on the demographic profile is about the age data, in which 47.9% of respondents are between 23 and 27. This could be one of the drawbacks of the chosen sampling method, snowball sampling. Although the snowball sampling method assists researchers in reaching respondents that are difficult to be detected, the identity of the respondents recommended by the previous group

of respondents are very likely similar to the recommender's demographic and social background. Additionally, the first batch of group respondents was selected from the researcher's social circle, which will lead to bias in the age group and ethnicity. Chinese respondents accounted for the highest percentage of total respondents during the sampling process at 66.7%.

Table 4.1: Distribution of Demographic Profile Data

	Frequency count	Percentage	Cumulative percentage
Age			
23-27	184	47.9	47.9
28-32	73	19.0	66.9
33-37	66	17.2	84.1
38-42	61	15.9	100.0
Gender			
Male	206	53.6	53.6
Female	178	46.4	100.0
Ethnicity			
Malay	68	17.7	17.7
Chinese	256	66.7	84.4
Indian	54	14.1	98.4
Others	6	1.6	100.0
Monthly Salary			
<RM2000	83	21.6	21.6
RM2001-3000	88	22.9	44.5
RM3001-4000	102	26.6	71.1
RM4001-5000	54	14.1	85.2
>RM5000	57	14.8	100.0
Current Location			
West Malaysia	286	74.5	74.5
East Malaysia	98	25.5	100.0

4.2 Inferential Result

4.2.1 Reliability Result

The reliability of all tested variables is above the threshold value of 0.7, as shown in Table 4.2, and the result indicates that the respondents have measured all the

items used to measure a specific variable in a consistent pattern (Nunnally & Bernstein, 1994).

Table 4.2: Reliability Test Result

Variables	Cronbach's Alpha	No of items
IV1: Usefulness of Mobile Payment Systems	0.912	4
IV2: Mobile Payment System's Ease of Use	0.898	4
IV3: Perceived Trust	0.884	3
IV4: Perceived Mobility	0.917	3
DV: M-payment intentional usage	0.825	3

4.2.2 Normality of Data Distribution

The Q-Q plots were used to test the normality distribution of the collected data for each variable. If the variable data is not normally distributed, then the use of linear regression in measuring the relationship between the IVs and DV becomes disputable. Figure 4.1 illustrates the Q-Q plot for each variable data. The plot demonstrates a linear relationship between the observed and expected values for each variable or it shows that the variable data is normally distributed can be analyzed and tested using linear regression analysis.

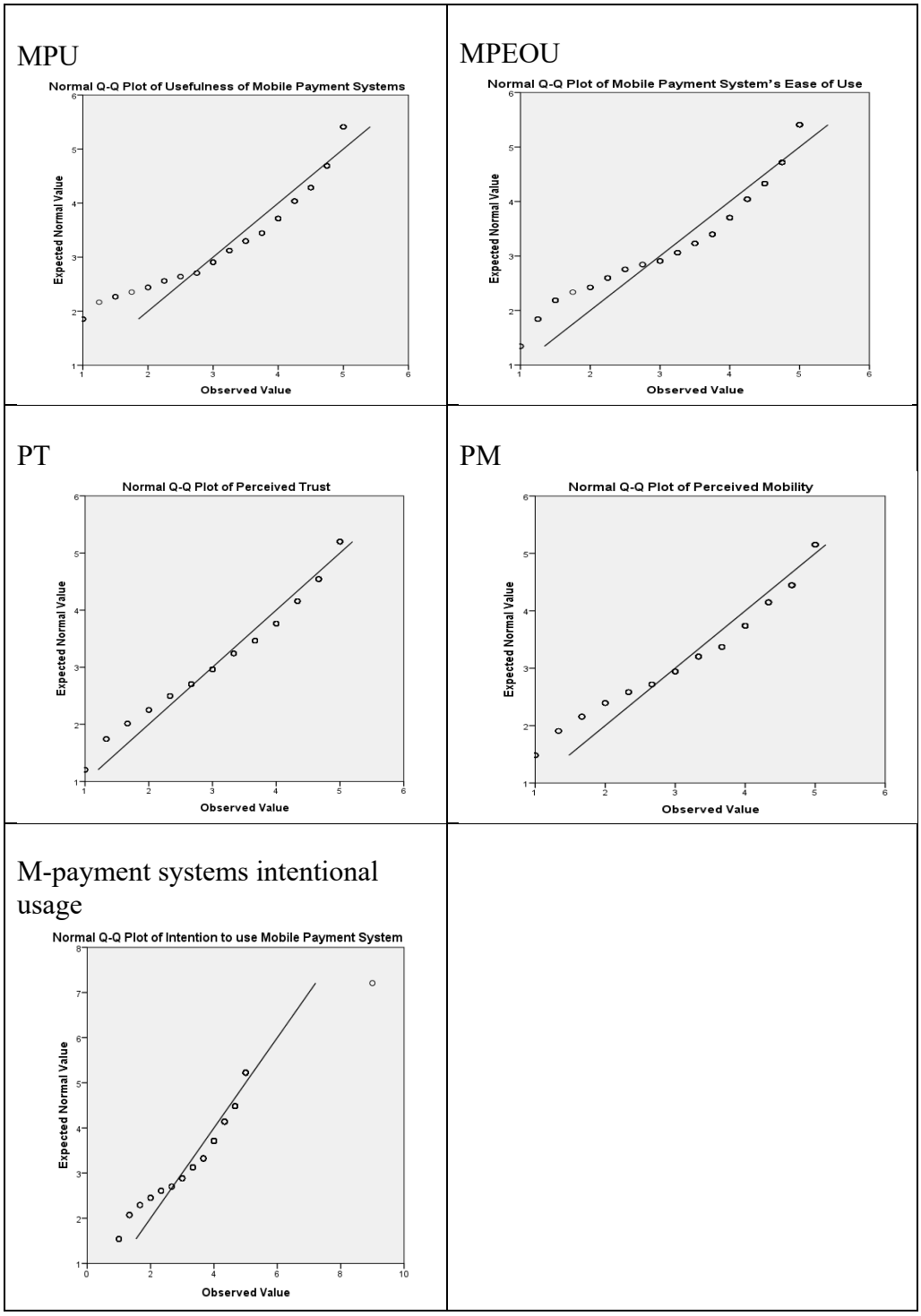


Figure 4.1 Normally Data Distribution of Each Variable

4.2.3 Correlation Result

Table 4.3 shows that the correlation coefficient value between each IV and the DV.

Table 4.3: Pearson's Correlation Coefficients Scores

	Usefulness of m-payment systems	M-payment system's ease of use	Perceived trust	Perceived mobility	Intention to use m-payment system
• Usefulness of m-payment systems					
Pearson Correlation	1	.896**	.733**	.820**	.829**
Sig. (2-tailed)		.000	.000	.000	.000
N	384	384	384	384	384
• M-payment system's ease of use					
Pearson Correlation	.896**	1	.759**	.814**	.834**
Sig. (2-tailed)	.000		.000	.000	.000
N	384	384	384	384	384
• Perceived trust					
Pearson Correlation	.733**	.759**	1	.787**	.721**
Sig. (2-tailed)	.000	.000		.000	.000
N	384	384	384	384	384
• Perceived mobility					
Pearson Correlation	.820**	.814**	.787**	1	.763**
Sig. (2-tailed)	.000	.000	.000		.000
N	384	384	384	384	384
• M-payment system intentional usage					
Pearson Correlation	.829**	.834**	.721**	.763**	1
Sig. (2-tailed)	.000	.000	.000	.000	
N	384	384	384	384	384

4.2.4 Multicollinearity and Multiple Linear Regression Results

The regression analysis was carried out using a stepwise method in which multiple rounds of analyses will be run based on the significance level of each IV. This process is repeated until all significant IVs are analyzed and incorporated into the regression model, while the non-significant variable will be omitted. Perceived mobility (IV4) and m-payment systems intentional usage

(DV) have no significant relationship, therefore is omitted from the regression analysis (see Table 4.4).

Table 4.4: Excluded Variable

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
Model 1							
• Usefulness of m-payment systems	.412[b]	6.859	.000	.332	.197	5.076	.197
• Perceived trust	.207[b]	4.912	.000	.244	.424	2.358	.424
• Perceived mobility	.249[b]	5.315	.000	.263	.338	2.961	.338
Model 2							
• Perceived trust	.161[c]	3.936	.000	.198	.410	2.439	.174
• Perceived mobility	.158[c]	3.267	.001	.165	.296	3.381	.173
Model 3							
• Perceived mobility	.096[d]	1.814	.071	.093	.244	4.096	.169

n.b. *Perceived mobility and m-payment systems intentional usage have no significant relationship.*

Table 4.5 illustrates that 74.0% of the variation in the DV (Intention to use m-payment systems) can be explained by three IVs (m-payment systems usefulness, m-payment systems ease-of-use, and perceived trust). The balance of 26.0% of the variation is explained by other variables that are not tested in this analysis.

Table 4.5: Model Summary

Model Summary[d]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834[a]	.696	.695	.61102
2	.854[b]	.729	.728	.57722
3	.860[c]	.740	.738	.56654

a. Predictors: (Constant), M-payment system's ease-of-use

b. Predictors: (Constant), M-payment system's ease-of-use, Usefulness of m-payment systems

c. Predictors: (Constant), M-payment system's ease-of-use, Usefulness of m-payment systems , Perceived trust

d. Dependent Variable: M-payment system intentional usage

The result of regression ANOVA is presented in Table 4.6. The precision level of the final model or model 3 is less than 0.05 and this shows that at least one of the significant IVs – m-payment system's ease-of-use or usefulness of m-payment systems or perceived trust can significantly explain the variation in DV-Intention to use m-payment system.

Table 4.6: ANOVA analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	326.174	1	326.174	873.652	.000[b]
	Residual	142.618	382	.373		
	Total	468.791	383			
2	Regression	341.850	2	170.925	513.009	.000[c]
	Residual	126.942	381	.333		
	Total	468.791	383			
3	Regression	346.822	3	115.607	360.179	.000[d]
	Residual	121.969	380	.321		
	Total	468.791	383			

a. Dependent Variable: M-payment system intentional usage

b. Predictors: (Constant), M-payment system's ease-of-use

c. Predictors: (Constant), M-payment system's ease-of-use, usefulness of mobile payment systems

d. Predictors: (Constant), M-payment system's ease-of-use, usefulness of m-payment systems, perceived trust

A variance inflation factor (VIF) test was performed, and the results are presented at the regression coefficient table (see Table 4.7). This is to ensure that the IVs are not highly correlated with each other as multicollinearity problem will make it challenging to distinguish the independent contributions of individual IVs from the multiple regression equation. According to the VIF findings presented in Table 4.7, multicollinearity is not an issue in this project as the VIF result of each significant variable is less than the threshold value of 10.

Table 4.7: Regression Coefficient Result for the Significant Variable

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
Model 1							
(Constant)	.472	.122		3.875	.000		
• MPEOU	.896	.030	.834	29.558	.000	1.000	1.000
Model 2							
(Constant)	.219	.121		1.816	.070		
• MPEOU	.500	.065	.465	7.742	.000	.197	5.076
• MPU	.454	.066	.412	6.859	.000	.197	5.076
Model 3							
(Constant)	.166	.119		1.386	.166		
• MPEOU	.410	.067	.381	6.089	.000	.174	5.733
• MOU	.407	.066	.369	6.153	.000	.190	5.250
• PT	.162	.041	.161	3.936	.000	.410	2.439

A regression t-test is used to ascertain the direct impact of each significant IV on the change in DV. Table 4.7 indicates that the m-payment system's ease-of-use has a relatively higher effect on DV, which symbolize as the most significant factor that influencing the millennia's behavior, followed by usefulness of m-

payment systems, and perceived trust. The multiple linear regression equation of this research is shown as below:

$$Int = 0.166 + 0.410\ (MPEOU) + 0.407\ (MPU) + 0.162\ (PT)$$

Where,

Int	: M-payment systems intentional usage
MPEOU	: M-payment system's ease-of-use
MPU	: Usefulness of m-payment systems
PT	: Perceived trust

Finally, the normal P-P plot is plotted. As shown in Figure 4.2, the significant IVs are linearly correlated with DV in a P-P plot, further confirming the linear relationship between the variables.

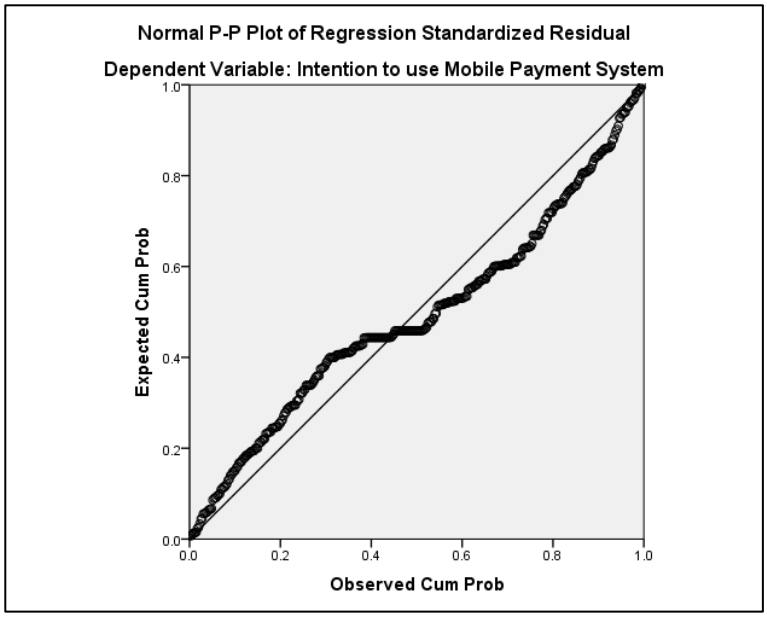


Figure 4.2: The Normal P-P Plot of Regression Standardized Residual for Malaysian Millennia's M-payment Systems Intentional Usage

4.3 Current Developed Research Model

Based on the findings above, a research conceptual framework for this study can be finalized, as shown in Figure 4.3.

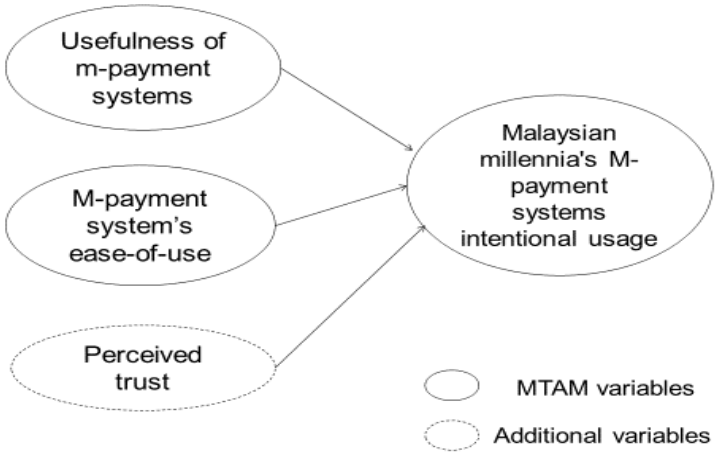


Figure 4.3: Current Developed Research Model

Source: Developed for current project

4.4 Summary of the Results

Based on the results, the current hypotheses are confirmed. There are three hypotheses are supported and one hypothesis is not supported, as shown in Table 4.8.

Table 4.8: The Summary of the Confirmation of Current Hypotheses

	Details of Hypothesis	Remark
H1	The usefulness of mobile payment systems is positively related to the m-payment systems intentional usage.	Supported
H2	The mobile payment system's ease of use is positively related to m-payment systems intentional usage.	Supported
H3	The perceived trust is positively related to m-payment systems intentional usage.	Supported
H4	The perceived mobility is positively related to m-payment systems intentional usage.	Not Supported

CHAPTER 5

CONCLUSION AND IMPLICATION

5.1 Accomplishment of Research Objective and Discussions of Main Results

To understand the effect of behavioral variables on Malaysian millennia's m-payment systems intentional usage, this project has established two specific objectives. The first objective consists of two hypotheses (H1 and H2) that are related to the respective MTAM predictors- MPU and MPEOU. The results show that both H1 and H2 are supported.

The support of H1 shows that Malaysian millennial unanimously agreed that their willingness to use the m-payment systems will increase when the m-payment systems are improving their performance, effectiveness, and efficiency in making payments, and enable them to complete the monetary transaction at a faster pace, their willingness to use the m-payment systems will increase. This result is consistent with the past studies conducted by Lee et al. (2020); Lew et al (2020); Ooi and Tan (2016); Tan et al. (2014); and Yeow et al (2017); which emphasized that when users perceived they can gain more benefits from the used of studied technology, the users' technology usage intention increases.

The support of H2 is consistent with Leong et al (2013); and Lew et al (2020) findings that MEOU is positively related to respondents' behavioral intention. It indicates that Malaysian millennial consensually agreed that their m-payment systems intentional usage will increase when m-payment systems are easy to

use, easy to learn, and easy to become skillful at using the m-payment system in making payments.

The second objective aims to examine how the m-payment system's perceived mobility and perceived trust affect the Malaysian millennia's m-payment systems intentional usage and it is composed of two hypotheses (H3 and H4). The result shows that H3 is supported while H4 is not supported.

The support of H3 implies that the Malaysian millennial is more likely to use m-payment systems if they trust that the m-payment system app provider will not disclose their private information, trust that the m-payment system is safe, and trust that the apps provider will update the app's technology that is beneficial to them. The result is supported by studies carried out by Dastan and Gurler (2016); Ooi and Tan (2016); and Teo et al (2015).

However, the findings show that H4 is not supported, implying that perceived mobility is not significantly related to behavioral intention. The non-support of H4 indicates that there is no consensus among respondents on the impact of PM on their m-payment systems intentional usage. The result is consistent with the past studies by Liebana-Cabanillas et al (2015) and Kim et al (2015). Kim et al (2015) highlighted that mobility is not particularly attractive to some users when conducting transactions.

In order to acquire a deeper understanding of the non-supported hypothesis (H4), post-main survey interviews were conducted. Some of the interviewees

responded that mobility would not increase their likelihood of using an m-payment system because they do not believe they can use it anytime and anywhere. This is due to the fact that internet coverage in Malaysia still insufficient, many rural areas in Malaysia is still lack internet connectivity. On the contrary, some interviewees believe that they can complete all the transactional through m-payment systems when they are at work, at home, or while traveling as free Wi-Fi is provided by many commercial outlets like restaurants. Such inconsistent behavior leads to one unsupported hypothesis.

5.2 Implications

5.2.1 Implications to Policy Makers

In response to the support of H1, H2, and H3, the following improvement strategies are proposed. The support of H1 indicates that the m-payment system application providers should be concerned about improving the usefulness of the applications. One of the ways to improve usefulness is through periodic surveys. Continuously collect data related to customers' needs, wants, and levels of satisfaction in order to provide more beneficial usages while meeting customer satisfaction especially when the external factors related to economic, social, and technological factors change. Another method for enhancing usability is to invite more merchants (either similar or supply chain business partners) for business collaboration which aims at providing more contactless terminals and limiting the problems of internet connection issue. For instance, Apple Pay has partnered with over 220,000 merchants, including petrol stations, restaurants, and vending machines in the United States. Moreover, merchants and retailers should

advertise the benefits of their m-payment systems aggressively in their mobile marketing campaigns.

The support of H2 implies that m-payment system application providers should focus on improving the applications based on the user's suggestions, such as mobile usability interface so that users can easily operate the transaction applications with minimal effort. Additionally, the m-payment apps should be easy to be navigated or user-friendly so that the searching and transaction process can be simplified and easily understood. Also, speedy response of customer services like online help desks, toll-free hotlines, and email are ways to increase the level of the MPEOU.

Another significant IV: perceived trust which is shown by the support of H3 suggests that adopting a cutting-edge technology infrastructure is one of the ways to increase user trust. This involves the implementation of login security systems, wireless encryption, and other solid security measures which aim to avoid scamming or hacking of e-account. A strict security policy should also be applied to ensure safe transactions. Retailers should strive to verify the user's identity prior to approving the requested transaction amount and guarantee the security of the user's private information. In this way, users may be more inclined to use the m-payment app and increase their trust in the m-payment system.

Lastly, there is insufficient evidence to support the effectiveness of perceived mobility variables having a significant effect on DV. Therefore, it is

inappropriate for the current author to recommend that policymakers withdraw implemented strategies and policies designed to enhance users' perception of the app's mobility.

5.2.2 Implications to Academics

As Malaysian government has been envisioning the country moving towards a more digitally connected economy, more research on m-payment systems should be conducted. More Malaysians are switching from cash to contactless payments due to a variety of financial incentives from the government. However, the behavioral variables affecting the Malaysian millennial's m-payment systems intentional usage has not been fully examined in previous studies. Also, most m-payment studies apply TAM to examine users' m-payment systems intentional usage, but studies applying MTAM are still limited. Therefore, this project fills the literature gap.

Additionally, the current author has enriched the MTAM by extending two additional variables, perceived trust and perceived mobility which are rarely tested in mobile technology study context. Although the hypothesis of the perceived mobility variable is not supported, this does not imply that users did not take this into account when deciding whether to use the applications. Future researchers will need to undertake the preliminary research more extensively to look for other factors that may affect respondents' perceptions of the mobility of research products. Hence, policymakers can better understand the implications of the significant results.

5.3 Limitations of Research

One of the limitations is that the current author was compelled by the Covid-19 pandemic to distribute the online questionnaire. It can be challenging to keep track of respondents' attention when they are answering online questionnaires. It is possible that the respondents answered the online questionnaire without carefully reading the item statement.

The second limitation is caused by snowball sampling method. Snowball sampling was applied to minimize sample error, however the current author found it challenging to monitor the distribution of demographic profile of prospective respondents suggested by previous respondents. The prospective respondents were referred to the current authors by friends, family, and social networks. Since many introducers are Chinese, it stands to reason that potential millennia respondents are also predominantly Chinese. Consequently, there is a bias against the particular demographic profiles of respondents. Imbalances in the racial distribution may limit the generalizability of results across populations.

The non-support of H4 (perceived mobility) is a limitation. In the context of mobile technology research, past studies have tested perceived mobility variables, and past studies have produced inconsistent results. However, this does not imply that the perceived mobility variable is not applicable to the Malaysian millennia. More research on millennia behavior is required to study how millennial perceive the mobility of measuring items so that future scholars can better grasp millennia’s behavior.

5.4 Recommendation for Future Research

Future researchers are advised to physically distribute the questionnaire and facilitate the respondents to answer the question instantly. Future researchers are also encouraged to collect data using additional channels like online communication platforms like Google Meet if the physical or face-to-face distribution strategy cannot be effectively executed. Also, the researchers need to be provided immediate response if further explanation is required.

Additionally, it is advised that future researchers employ snowball sampling more sparingly. The researchers must ensure that the first batch of respondents' demographic background is not biased towards specific traits such as race.

Lastly, enriching the MTAM by testing the currently studied variables and other pertinent variables to enrich the literature is also one of the recommendations for future researchers. To do this, a preliminary study should be conducted to determine the variables to be investigated and the measuring items of the variables.

Reference

Agardi, I., & Alt, M. A. (2022). Do digital natives use mobile payment differently than digital immigrants? A comparative study between generation X and Z. *Electronic Commerce Research*.

Aji, H. M., Berakon, I., & Md Husin, M. (2020). Covid-19 and e-wallet usage intention: A multigroup analysis between Indonesia and Malaysia. *Cogent Business & Management*, *7*(1), 1804181.

Alam, M. M., Awawdeh, A. E., & Muhamad, A. I. (2021). Using e-wallet for Business Process Development: Challenges and prospects in Malaysia. *Business Process Management Journal*, *27*(4), 1142–1162.

Altounjy, R., Alaeddin, O., Hussain, H. I. & Kot, S., (2020). Moving from Bricks to Clicks: Merchants' Acceptance of the Mobile Payment in Malaysia. *International Journal of eBusiness and eGovernment Studies, 12*(2), 136-150.

Cao, X., Yu, L., Liu, Z., Gong, M., & Adeel, L. (2018). Understanding mobile payment users' continuance intention: a trust transfer perspective. *Internet Res, 28*(2), 456–476.

Chandra, Y. U., Kristin, D. M., Suhartono, J., Sutarto, F. S., & Sung, M. (2018). Analysis of determinant factors of user acceptance of mobile payment system in Indonesia (A case study of go-pay mobile payment). *International Conference on Information Management and Technology (ICIMTech)*.

Corbitt, B. J., Thanasankit, T., & Yi, H. (2003). Trust and e-commerce: A study of consumer perceptions. *Electronic Commerce Research and Applications*, *2*(3), 203–215.

Daştan, İ., & Gürler, C. (2016). Factors affecting the adoption of mobile payment systems: An empirical analysis. *EMAJ: Emerging Markets Journal*, *6*(1), 17–24.

DBS. (2021). *What is OTP Number?* Retrieved from https://www.dbs.com/digibank/in/articles/pay/what-is-otp

Denaputri, A., & Usman, O. (2019). Effect of perceived trust, perceived security, perceived usefulness and perceived ease-of-use on customers' intention to use mobile payment. *SSRN Electronic Journal*.

Gia, S. L., & Pham, T. T. (2016). A study of factors affecting the intention to use mobile payment services in Vietnam. *Economics World*, *4*(6).

Glen, S. (2021). *Inferential statistics: Definition, uses*. Statistics How To. Retrieved from https://www.statisticshowto.com/probability-and-statistics/statistics-definitions/inferential-statistics/

Hajazi, M. U. A., Chan, S. S., Ya'kob, S. A., Siali, F., & Latip, H. A. (2021). Usage intention of QR mobile payment system among millennials in

Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *11*(1).

Islam, T., Rehman, S. U., Abid, M. S., & Ahmer, Z. (2020). How Perceptions About Ease-of-Use and Risk Explain Intention to Use Mobile Payment Services in Pakistan? The Mediating Role of Perceived Trust. *Pakistan Journal of Commerce and Social Sciences*, *14*(1), 34–48.

Kagan, J. (2023). *Financial Technology (Fintech): Its uses and impact on our lives*. Investopedia. Retrieved from https://www.investopedia.com/terms/f/fintech.asp

Kar, A. K. (2021). What affects usage satisfaction in mobile payments? modelling user generated content to develop the "Digital Service Usage Satisfaction Model". *Information Systems Frontiers, 23,* 1341-136.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, *26*(3), 310–322.

Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems*, *44*(2), 544–564.

Kim, M.-J., Chung, N., & Lee, C.-K. (2011). The effect of Perceived Trust on Electronic Commerce: Shopping Online for Tourism Products and services in South Korea. *Tourism Management*, *32*(2), 256–265.

Kim, Y., Park, Y.-J., Choi, J., & Yeon, J. (2015). An empirical study on the adoption of "Fintech" service: Focused on mobile payment services. *Advanced Science and Technology Letters*.

Kemp, S. (2022). *Digital 2022: Malaysia - DataReportal – global digital insights*. DataReportal. Retrieved from https://datareportal.com/reports/digital-2022-malaysia

Kenpro. (2016). *Sample size determination using Krejcie and Morgan Table*. Kenya Projects Organization. Retrieved from http://www.kenpro.org/sample-size-determination-using-krejcie-and-morgan-table/

KnowledgeHut. (2020). *How to interpret R-squared in regression analysis?* Retrieved from https://www.knowledgehut.com/blog/data-science/interpret-r-squared-and-goodness-fit-regression-analysis

Lee, V. H., Hew, J. J., Leong, L. Y., Tan, G. W. H., & Ooi, K. B. (2020). Wearable payment: A deep learning-based dual-stage SEM-Ann Analysis. *Expert Systems with Applications*, *157*, 113477.

Leong, L.-Y., Hew, T.-S., Tan, G. W.-H., & Ooi, K.-B. (2013). Predicting the determinants of the NFC-enabled mobile credit card acceptance: A neural networks approach. *Expert Systems with Applications, 40*(14), 5604–5620.

Lew, S., Tan, G. W. H., Loh, X. M., Hew, J. J., & Ooi, K. B. (2020). The disruptive mobile wallet in the hospitality industry: An Extended Mobile Technology Acceptance Model. *Technology in Society*, *63*, 101430.

Liebana-Cabanillas, F., Ramos de Luna, I., & Montoro-Rios, F. (2017). Intention to use new mobile payment systems: A Comparative Analysis of SMS and NFC payments. *Economic Research-Ekonomska Istrazivanja*, *30*(1), 892-910.

Liébana-Cabanillas, F., Ramos de Luna, I., & Montoro-Ríos, F. J. (2015). User behaviour in QR mobile payment system: the QR Payment Acceptance Model. *Technology Analysis & Strategic Management, 27*(9), 1031–1049.

Lim, S. H., Kim, D. J., Hur, Y., & Park, K. (2018). An empirical study of the impacts of perceived security and knowledge on continuous intention to use mobile fintech payment services. *International Journal of Human–Computer Interaction*, *35*(10), 886–898.

Liu, Y., Wang, M., Huang, D. *et al.* (2019). The impact of mobility, risk, and cost on the users' intention to adopt mobile payments. *Inf Syst E-Bus Manage* **17**, 319–342.

Lu, J., Wei, J., Yu, C., & Liu, C. (2016). How do post-usage factors and espoused cultural values impact mobile payment continuation? *Behaviour & Information Technology, 36*(2), 140–164.

Marinkovic, V., & Kalinic, Z. (2017). Antecedents of customer satisfaction in mobile commerce. *Online Information Review, 41*(2), 138–154.

Matemba, E. D., & Li, G. (2018). Consumers' willingness to adopt and use WeChat Wallet: An empirical study in South Africa. *Technology in Society*, *53*, 55–68.

Mun, Y. P., Khalid, H., & Nadarajah, D. (2017). Millennials' perception on Mobile Payment Services in Malaysia. *Procedia Computer Science*, *124*, 397–404.

Merchant Savvy. (2022). *50+ global mobile payment stats, Data & Trends (2022).* Retrieved from https://www.merchantsavvy.co.uk/mobile-payment-stats-trends/

Ooi, K.-B., & Tan, G. W.-H. (2016). Mobile Technology Acceptance Model: An investigation using mobile users to explore smartphone credit card. *Expert Systems with Applications*, *59*, 33–46.

Phan, K., & Daim, T. (2011). Exploring technology acceptance for mobile services**.** *Journal of Industrial Engineering and Management, 4*(2), 339-360.

Rafique, H., Anwer, F., Shamim, A., Minaei-Bidgoli, B., Qureshi, M. A., & Shamshirband, S. (2018). Factors affecting acceptance of mobile library applications: Structural equation model. *Libri*, *68*(2), 99–112.

Ramos-de-Luna, I., Montoro-Ríos, F., & Liébana-Cabanillas, F. (2015). Determinants of the intention to use NFC technology as a payment system: An acceptance model approach. *Information Systems and e-Business Management*, *14*(2), 293–314.

Rawat, A. S. (n.d.). An overview of *descriptive analysis.* Analytics Steps. Retrieved from https://www.analyticssteps.com/blogs/overview-descriptive-analysis

Raynor. (2021). *Malaysia: Mobile payment users 2025*. Statista. Retrieved from https://www.statista.com/statistics/1271325/mobile-wallet-user-forecast-in-malaysia/

Sajid, O., & Haddara, M. (2016). NFC Mobile payments: Are we ready for them? *SAI Computing Conference (SAI)*.

Tan, J. (2021). *MasterCard: Malaysia has highest mobile wallet usage in Southeast Asia*. RinggitPlus. Retrieved from https://ringgitplus.com/en/blog/e-wallet/mastercard-malaysia-has-highest-mobile-wallet-usage-in-southeast-asia.html

Teo, A. C., Tan, G. W. H., Ooi, K. B., & Lin, B. (2015). Why consumers adopt mobile payment? A partial least squares structural equation modelling (PLS-SEM) approach. *International Journal of Mobile Communications, 13*(5), 478.

Ting, H., Yacob, Y., Liew, L., & Lau, W. M. (2016). Intention to use mobile payment system: A case of developing market by ethnicity. *Procedia - Social and Behavioral Sciences*, *224*, 368–375.

Tsai, S. H. Y. & LaRose, R. (2015). Broadband Internet adoption and utilization in the inner city: A comparison of competing theories. *Computer in Human Behavior, 51*. 344-355.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly, 36*(1), 157-178.

Yen, Y.-S., & Wu, F.-S. (2016). Predicting the adoption of mobile financial services: The impacts of perceived mobility and personal habit. *Computers in Human Behavior*, *65*, 31–42.

Yeow, M. P., Khalid, H., & Nadarajah, D. (2017). Millennials' perception on Mobile Payment Services in Malaysia. *Procedia Computer Science*, *124*, 397–404.

Zmijewska, A., Lawrence, E., & Steele, R. (2004). Towards Understanding of Factors Influencing User Acceptance of Mobile Payment Systems. *International Conference.*

Appendix 1: Master Copy of the Finalized Questionnaire

UNIVERSITI TUNKU ABDUL RAHMAN (UTAR)
FACULTY OF BUSINESS AND FINANCE
Master in Business Administration (Corporate Management)

The Malaysian Millennia's Intention to use Mobile Payment Systems – Extending the Mobile Technology Acceptance Model

Survey Questionnaire

Dear Respondents,

I am currently studying at University Tunku Abdul Rahman (UTAR), Faculty of Business and Finance, under the Master in Business Administration (Corporate Management) program. This study is undertaken to fulfill my final year project (FYP) of the program.

The main objective of the study is to investigate the factors that influence Malaysian millennia's intention to use mobile payment systems. I sincerely hope that you are willing to spare a few minutes to complete this questionnaire. Your responses are utterly important for me in completing my study. Your participation is on a voluntary basis.

The information gathered and acquired through this questionnaire will be used solely for academic purposes. I firmly assure you that all information provided to this study will be kept PRIVATE AND CONFIDENTIAL. I truly appreciate your cooperation in completing this questionnaire. Thank you for your precious time and participation in this study.

Yours sincerely,

Name: Chong Pui See

Student ID: 2202649

Contact details: puisee0304@1utar.my

PERSONAL DATA PROTECTION STATEMENT

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-

- For assessment of any application to UTAR
- For processing any benefits and services
- For communication purposes
- For advertorial and news
- For general administration and record purposes
- For enhancing the value of education
- For educational and related purposes consequential to UTAR
- For the purpose of our corporate governance
- For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan

2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.
3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.
4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.
2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
3. You may access and update your personal data by writing to us at puisee0304@1utar.my

Acknowledgment of Notice

[ ] I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.
[ ] I disagree, my personal data will not be processed.

……
Name:
Date:

Section A: Demographic Profile

The following questions refer to the respondent's demographic profile. Please tick the option that can best describe your demographic profile.

Age:	☐	23-27
	☐	28-32
	☐	33-37
	☐	38-42
Gender:	☐	Male
	☐	Female
Ethnicity:	☐	Chinese
	☐	Malay
	☐	Indian
	☐	Other
Average Monthly Salary:	☐	Less than RM 2,000
	☐	RM 2,001 – RM 3,000
	☐	RM 3,001 – RM 4,000
	☐	RM 4,001 – RM 5,000
	☐	RM 5,001 and above
Current Location:	☐	West Malaysia
	☐	East Malaysia

Section B: Independent Variable

Instructions: Below are the statements concerning behavioural factors that influencing Malaysian millennial's intention to use mobile payment. Kindly show your (dis)agreement with each statement based on the 5 points scale [1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.]

Mobile payment (also referred to as mobile money, mobile money transfer, and mobile wallet) is an alternative payment method to traditional payment systems that use cash, cheque, or credit card. The e-monetary transaction is performed via the use of a wireless or mobile device and operates under financial regulations.

		1	2	3	4	5
No.	Statements	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Mobile Payment System Usefulness (IV1)						
MPU1	Using mobile payment systems would improve my performance in making payments.					
MPU2	Using mobile payment systems increase my effectiveness in making payments, i.e., assisting me to achieve a decided/ desired goal such as completing a payment transaction at a specific or faster time frame.					
MPU3	Completing monetary transactions using a mobile payment system is time-saving.					
MPU4	Using mobile payment systems enables me to complete the monetary transaction at a faster pace compared to the use of traditional payment systems.					
Mobile Payment System Ease-of-Use (IV2)-						
MPEOU 1	Overall, I find mobile payment systems easy to use.					
MPEOU 2	Learning to use mobile payment systems would be easy for me.					
MPEOU 3	The mobile payment system is flexible for me to operate while making payments.					
MPEOU 4	It is easy to become skillful at using mobile payment systems in making payments.					
Perceived Trust (IV3)						

PT1	I trust the mobile payment system apps provider will not disclose the private information of its users.					
PT2	I trust that fund transfer in making payment using mobile payment systems is safe.					
PT3	I trust that mobile payment systems providers will update the app's technology that is beneficial to users.					

Perceived Mobility (PM)

PM1	I believe I can use the mobile payment system in making payments anytime.					
PM2	I believe I can use the mobile payment system in making payments anywhere.					
PM3	I believe I can still use the mobile payment system in making payment while traveling.					

M-payment systems intentional usage (Int)

Int1	I will think about using mobile payment systems.					
Int2	I intend to use mobile payment systems in the near future.					
Int3	In 5 years, I intend to use a mobile payment system to pay for my purchases.					

Thank you very much for your willingness to participate in answering the questionnaire