



An Investigation of Determinants for Trust of Mobile Payment Consumers

A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Nguyen Anh Tuan

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List of Acronyms and Glossary

Adoption	Adoption is defined as the general term used in the study of innovations to signify both the decision -making process of choosing an innovation, the implementation process for the innovation and the use of that innovation on an ongoing basis
Continuance Intention	Continuance intention is the determination of the user to continue the utilisation of an innovation in the future
Usage/Use	Usage/Use is the utilisation of an innovation after the implementation of the innovation up until the time the innovation is abandoned by the user
e-commerce	Electronic commerce
e-payment	Electronic payment
m-commerce	Mobile commerce
m-payment	Mobile payment
B2C	Business-to-customer
B2B	Business-to-business
TAM/TAM2	Technology acceptance model
UTAUT/UTAUT2	Unified theory of acceptance and use of technology
DOI	Diffusion of innovation theory
TRA	Theory of reasoned action

TPB	Theory of planned behaviour
PE	Performance expectancy
EE	Effort expectancy
SI	Social influence
PV	Price value
FC	Facilitating conditions
HM	Hedonic motivation
HB	Habit
PT	M-payment provider trust
IBT	Institution-based trust
ST	Seller trust
PD	Power distance
CO	Collectivism
MA	Masculinity
UA	Uncertainty avoidance
LO	Long term orientation
CT	Consumer trust
IN	Intention to continue using m-payment
IS	Information Systems
ISCM	Information Systems Continuance Model

SEM

Structural Equation Modelling

PLS

Partial Least Squares

Abstract

This study investigates the determinants for consumer trust (CT) and the effect of CT on mobile payment (m-payment) continuance intention. This study addresses the limitations of previous studies which are a lack of research on the antecedents for CT in m-payment adoption in general and in developing countries in particular, a lack of differentiated trust types, and a lack of investigation on the moderating impact of culture in m-payment adoption. Based on a comprehensive review of related literature, the researcher proposed a model including three important groups of factors: acceptance trust factors, cultural factors and trust types. The data was collected in Vietnam—which is a developing country with the fastest growth rate of m-payment globally in 2019—to test the model. A survey of 454 m-payment consumers was conducted. The outcome validated the model with a R^2 score of 0.842, which outperforms previous models about the antecedents of CT in m-payment found in the literature. This study makes academic and practical contributions. In theory, this study provides a better fit model to the literature of trust's determinants in m-payment adoption as well as technology adoption. In practice, it provides suggestions for practitioners to increase levels of CT, which may lead to a higher level of m-payment adoption rates. In addition, the outcome contributes to the literature on m-payment adoption, technology adoption, trust in m-payment adoption in general and in developing countries in particular.

Chapter 1: Introduction

This study aimed to investigate the determinants of consumer trust (CT) and its effect on mobile payment (m-payment) continuance intention. M-payment is a state-of-the-art payment method in the modern world. It has been adopted widely across the globe, especially during the COVID-19 pandemic. Trust is one of the key drivers of m-payment adoption, whereas a lack of trust is recognised as one of the main barriers to m-payment adoption. Investigating trust's determinants may help researchers and practitioners better understand the concept of trust in m-payment adoption. This may lead to the development of appropriate methods to increase the level of trust in m-payment consumers, which may lead to an increase in the usage of m-payment.

This chapter aims to present an overview of this study. First, the research background and motivation of this study are discussed. Based on this, the research objectives, the research questions and the research method are presented in the following sections. Finally, the thesis structure is presented for the benefit of the reader.

1.1. Research background and motivation

The importance of trust in enhancing the adoption of m-payment has been increasingly recognised (Gao & Waechter, 2017; Patil, Rana, Dwivedi, & Abu-Hamour, 2018; Xin, Techatassanasoontorn, & Tan, 2015; Yan & Pan, 2014). This is in direct contrast to the lack of research on the antecedents of trust in m-

payment (Nguyen, Dick, & Pham, 2020; Patil et al., 2018; Shuhaiber, 2016). As a result, a better understanding of the determinants of CT in m-payment adoption was necessary and significant. Based on analysing data collected in Vietnam which is a developing country that had the fastest m-payment growth rate worldwide in 2019 (PwC, 2019), this study aimed to answer the main research question: “What are the determinants of consumer trust for m-payment continuance intention?”.

In recent decades, humans have entered the era of mobile devices and smartphones, which help consumers carry out a vast range of social, as well as, commercial interactive functions. Examples of activities include entertainment, social networking, shopping, browsing the internet, gaming, searching for information and taking and uploading photographs. The widespread use of mobile devices in commercial activities has led to the conceptualisation and development of a new area namely, mobile commerce (m-commerce). M-commerce refers to the exchange or purchase of services and commodities using mobile devices (Tiwari, Buse, & Herstatt, 2006; Tiwari, Husain, Srivastava, & Singh, 2011). It can be considered an extension of electronic commerce (e-commerce) through wireless handheld devices which allow consumers to process their transactions regardless of location and time (Keen & Mackintosh, 2001). M-payment is an important component of m-commerce or e-commerce which is responsible for

processing online financial transactions between buyers and sellers (Ngai & Wat, 2002).

M-payment refers to financial transactions made via mobile devices, such as tablets and mobile phones (Stringfellow, 2018). In other words, m-payment consumers can use mobile devices to pay for goods or services that they purchase, instead of using cash, debit cards, credit cards or any other type of bank card. M-payment is considered to be a subset of m-commerce, as well as e-commerce which processes the payment transaction for customers when purchasing goods or services (Kreyer, Pousttchi, & Turowski, 2002; MobiForge, 2014).

Over the last decade, m-payment has gained enormous growth worldwide (Jocovski, Ghezzi, & Arvidsson, 2020). The global m-payment market size was valued at US\$1.48 trillion in 2019 and is forecast to hit US\$12.06 trillion by 2027 (AlliedMarketResearch, 2021). Businesses and services worldwide are increasingly adopting and integrating popular m-payment services that are well-accepted by consumers, such as PayPal, Apple Pay, Samsung Pay, AliPay, and WeChat Pay (MordorIntelligence, 2021). In the current situation of the global COVID-19 pandemic, the usage of m-payment is considered a cleaner and safer way to pay for goods and services than traditional payment means, such as cash (ResearchAndMarkets, 2020).

M-payment brings many advantages and potential for consumers as well as businesses. For consumers, it is more convenient, flexible, faster and easier to

track financial transactions in a more secure environment (Silva, 2018). For organisations, m-payment helps them improve the customer's experience, expand their business and offers a powerful management tool (FisGlobal, 2019). However, despite the benefits of m-payment, the penetration of the market and adoption of m-payment has been lower than expected (Patil et al., 2018). A low rate of adoption for m-payment systems has been reported in some developed countries which have good technology infrastructure, such as, the United Kingdom, France (Kapoor, Dwivedi, & Williams, 2015) and the US (Garrett, Rodermund, Anderson, Berkowitz, & Robb, 2014). One of the main barriers to m-payment adoption is a lack of consumer trust (Asatryan, 2017; Shuhaiber, 2016).

In the area of m-payment adoption, trust was defined as customers/consumers' beliefs and willingness to rely on m-payment for transactions (adapted from Alhulail, 2018; McKnight, Choudhury, & Kacmar, 2002; Xin et al., 2015). Trust plays an important role in m-payment adoption in both research and practice. In research, many studies have empirically found a significant effect of trust on m-payment adoption decisions by individual consumers (Andreev, Pliskin, & Rafaeli, 2012; Liu, 2012; Patil et al., 2018). In practice, a lack of trust is reported as one of the main barriers to m-payment adoption, resulting in low rates of technology service use (Asatryan, 2017; Shuhaiber, 2016). It can be logically

summarised that trust is one of the key drivers for the intention to adopt and use m-payment (Alalwan, Dwivedi, & Rana, 2017).

However, most previous studies have focused on the adoption of m-payment rather than trust, leading to a lack of understanding of the determinants for CT in m-payment from the consumer's perspective (Nguyen et al., 2020; Patil et al., 2018). The literature also revealed that most of the studies about factors affecting trust in m-payment have been conducted in developed countries. However, the context of m-commerce adoption in developed countries is different from developing countries (Chau & Deng, 2018; Chau, Deng, & Tay, 2020). More specifically, advanced countries have better technological infrastructure and digital payment methods are more commonly used among their inhabitants (Matthews, 2016; Rosa-Bohrer, 2018; Talbot, 2015). As a result, research on the determinants of CT in m-payment adoption in developing countries was necessary and important.

In addition, there are some limitations in existing studies on trust in m-payment adoption. First, most previous studies in m-payment adoption assessed trust as a single construct and examined the impact of trust on other factors, such as, perceived usefulness and intention to adopt m-payment services without differentiating the types of trust that make up the more general concept (Nguyen et al., 2020). Researchers have pointed out that trust is a complex phenomenon, and thus it should be modelled as a multidimensional or multifaceted construct

(Hillman & Neustaedter, 2017; Jimenez, San-Martin, & Azuela, 2016). In particular, exploring the different types of trust in m-commerce or m-payment enables researchers to better understand trust as a phenomenon which ultimately allows predictions of consumer adoption and usage (Meng, Min, & Li, 2008; Min, Meng, & Zhong, 2008; Nguyen et al., 2020). Consequently, the identification of the different types of trust in m-payment adoption needed to be addressed further (Nguyen et al., 2020).

Another limitation of existing research on m-payment trust and its adoption was the lack of investigation of the moderating variables between trust and m-payment adoption. A moderating variable plays an important role in psychological or behavioural research because it can enhance or reduce the magnitude of the relationship between a predictor and an outcome (Lani, 2018). Undoubtedly, the role of moderating variables needed to be evaluated to provide a comprehensive understanding of the impact of trust on consumer intention to adopt m-payment. Culture is defined as the “collective programming of the mind which distinguishes the members of one group or category of people from those of another” (Hofstede, 1993, p. 4). Many studies have been conducted to test the significant moderating impact of Hofstede’s cultural dimensions at an individual level on the intention of consumers to adopt a new system or technology (Baptista & Oliveira, 2015; Yoon, 2009). However, an examination of the moderating role of culture between trust and the use of m-payment had not yet been performed.

As a result, an investigation of the moderating impact of culture on the relationship between trust and consumers' m-payment adoption was necessary and significant.

Literature also recognised the significant difference between initial and post or continuance intention/adoption (Bhattacharjee, 2001; Venkatesh, Thong, Chan, Hu, & Brown, 2011). While the former is considered a first step of acceptance of a new technology like m-payment, the long-term success of it depends on continuance intention (Venkatesh et al., 2011). Previous models about trust's determinants neglected the continuance intention m-payment context, in particular Xin et al. (2015) focused on initial adoption, and Shuhaiber (2016) mixed inexperienced and experienced m-payment consumers. This leads to a need to investigate the determinants for trust in the context of m-payment continuance intention.

For these above reasons, this study aimed to investigate the determinants for CT and the effect of CT on m-payment continuance intention. The proposed model aimed to address the limitations of previous studies and contribute to a deeper understanding of the concept of trust in m-payment in general and in developing countries in particular. The findings of this study expanded the literature not only on trust and m-payment adoption but also in research on technology adoption. The outcome can be used for both researchers and practitioners to better understand the impact of trust and thereby promote m-payment adoption.

The data collection was undertaken in Vietnam – a developing country that had the fastest global m-payment adoption growth rate, from 37% in 2018 to 61% in 2019 (PwC, 2019). The use of m-payment is voluntary in Vietnam. By 2018, the number of smartphone users in Vietnam was about 32.43 million which accounted for around 33% of the population, and was forecasted to increase to 40% by 2021 (Statista, 2018). Vietnam's financial technology market reached US\$4.4 billion in 2017 and was forecasted to increase to US\$7.8 billion by 2020 (Fintechnews, 2018a). The booming e-commerce market and support from the Vietnamese government were expected to lead to a boom in digital payments, especially m-payments in Vietnam (Fintechnews, 2018b). Accordingly, all the above made Vietnam an appropriate place to undertake this study.

1.2. Research objectives and questions

The main objectives of this study were to: (1) provide an empirical and theoretical understanding of which factors influence the trust of m-payment consumers, and (2) develop a framework to assist researchers, as well as businesses, enhance trust levels in m-payment consumers.

To achieve the above objectives and address the limitations of previous studies, the following questions were formulated:

- RQ1: What are the determinants of consumer trust in m-payment continuance intention in Vietnam?

- RQ2: What is the influence of consumer trust on intention to continue the use of m-payment in Vietnam?
- RQ3: To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment in Vietnam?

To answer the research questions, a comprehensive review of related literature was conducted including e-commerce, m-commerce, m-payment and mobile banking to propose an initial conceptual model including three types of factors which are acceptance trust factors based on the unified theory of acceptance and use of technology (UTAUT2), cultural factors based on Hofstede's cultural framework, and trust types. The factors of trust types include m-payment provider trust (PT), institution-based trust (IT) and seller trust (ST). These were identified in the literature as essential in order to overcome the limitations stemming from not differentiating between the different types of trust in m-payment research (Nguyen et al., 2020). Cultural factors included five dimensions which are power distance (PD), masculinity (MA), long term orientation (LO), collectivism (CO), and uncertainty avoidance (UA). These factors are based on Hofstede's cultural framework and were tested in terms of both the direct impact on trust and the moderating impact on the relationship between trust and m-payment continuance intention. This addressed the lack of consideration of the moderating impact of culture in research on m-payment adoption (Nguyen et al., 2020). In addition, this study argues that the acceptance factors based on the UTAUT2 are appropriate

and important for the context of adopting m-payment in developing countries because citizens need to accept a new digital payment method (such as m-payment) first and trust will then be built in the process of using m-payment. In the conceptual mode, this study names such factors as acceptance trust factors to avoid confusion and focus on the impact of these factors on trust rather than m-payment adoption. The method used in this study is briefly described in the next section.

1.3. Research method

One of the main objectives of this study was to investigate the determinants of CT in m-payment. Accordingly, a study with an emphasis on testing and validating a proposed model and its hypotheses for exploring trust's determinants in m-payment adoption was conducted. Due to the nature of this study, a quantitative methodology founded in the positivist paradigm was found to be suitable. Such a methodology was useful to examine the well-defined hypotheses in this study by statistically analysing a set of numeric data collected from m-payment consumers, thereby allowing the drawing of strong inferences (Creswell & Creswell, 2017; Straub, Boudreau, & Gefen, 2004; Vanderstoep & Johnson, 2008). Using a quantitative method also made it easy and convenient to investigate the causal relationship between factors, particularly between trust and its determinants, through statistical analysis (Creswell & Creswell, 2017). As a result, a quantitative methodology was employed in this study.

This study adopted the seven-stage research process of quantitative methodology (Chau, 2020) as depicted in Figure 1. First, the researcher began by formulating the research objectives and research questions to lead the overall study. Next, a comprehensive review of related literature was conducted including e-commerce, m-commerce and m-payment for a better understanding of the studies on trust and its determinants from a consumer perspective across related areas. This led to the recognition of the limitations of previous studies and the necessary grounds to propose and develop the conceptual model about the determinants for trust in m-payment adoption, which is presented in the third stage. In the fourth stage, a survey instrument to collect data for examining the conceptual model in this study was developed and revised. Then, the official instrument was deployed in the form of an online survey to collect data from m-payment consumers in Vietnam in the fifth stage (454 valid surveys were collected). In the sixth stage, descriptive statistics and structural equation modelling (SEM) were applied to the collected dataset to address the research questions. Finally, the outcomes of the data analyses were discussed and interpreted to provide answers to the research questions and research objectives.

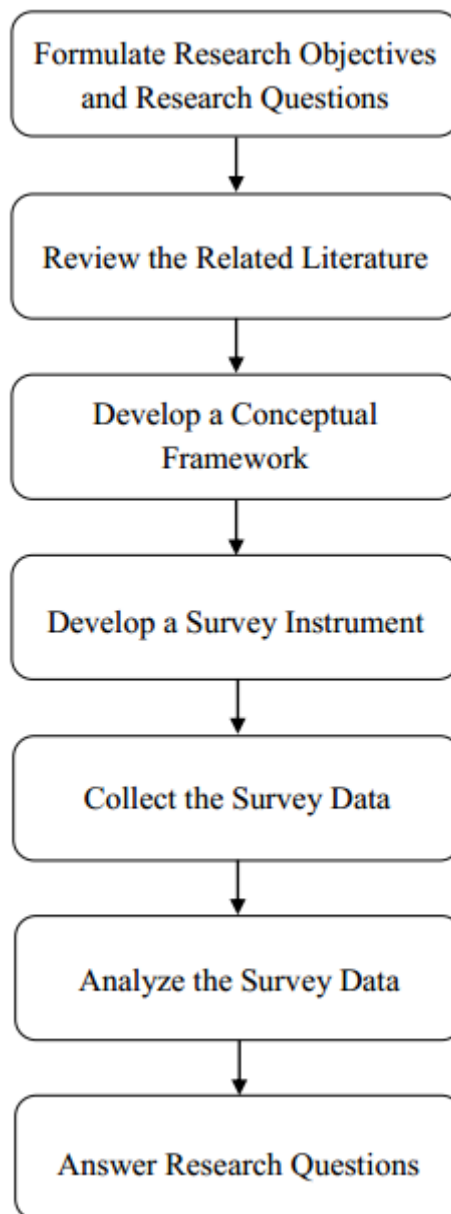


Figure 1: An overview of the research process (Chau, 2020).

1.4. Thesis structure

Figure 2 presents the overall structure of the thesis:

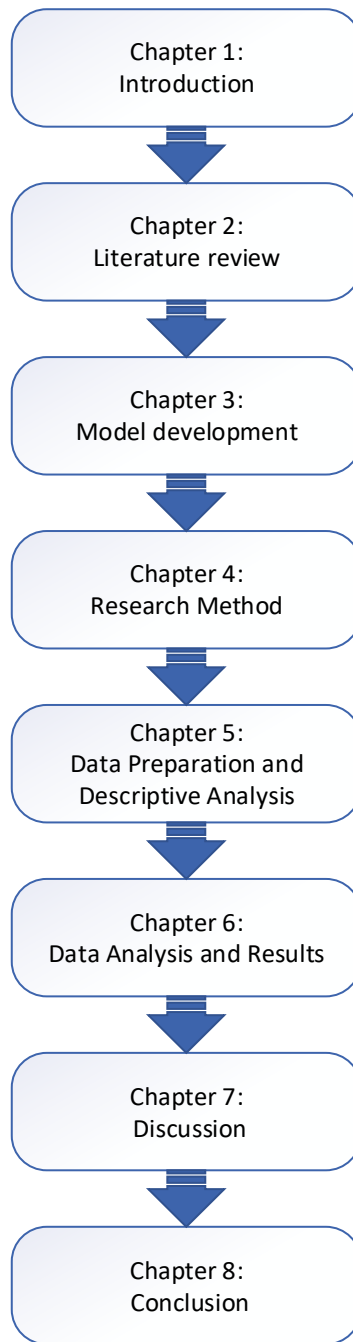


Figure 2: Overall structure of the thesis.

Chapter 1 introduces the research background and motivation, the research objectives and research questions, the rationale for the research method, and the overall structure of the thesis.

Chapter 2 presents a comprehensive review of related literature including e-commerce, m-commerce and m-payment, followed by a critical analysis of previous research on trust's determinants across these areas. This led to the identification of the limitations of existing literature on the determinants of CT in m-payment, thereby providing a rationale for the necessity of conducting this study.

Chapter 3 presents the development of a conceptual framework for examining the determinants of CT in m-payment adoption which aims to address some limitations from previous studies recognised from the literature review conducted in Chapter 2. The conceptual model includes three types of factors: acceptance trust, trust types and cultural, and was developed based on the theoretical frameworks which are the UTAUT2, Hofstede's cultural framework and related literature. This stage paved the way for developing the survey instrument for testing and validating the conceptual model.

Chapter 4 presents the research method employed in this study. This chapter provides the rationale for why a quantitative methodology guided by a positivist paradigm was adopted for this study, and why a survey was used for data collection purposes. Then the process used for the development of the survey instrument is described, followed by a discussion on the data collection and data analysis methods.

Chapter 5 presents the data preparation process including checking for outliers, missing data, examining normality and common method bias, and the results of the descriptive analysis.

Chapter 6 presents the results from the statistical analyses to identify the determinants of CT in m-payment in Vietnam including an assessment of the hypotheses proposed in the conceptual model in Chapter 3.

Chapter 7 discusses the outcomes from Chapter 6 to answer the research questions. The theoretical and practical contributions of this study to the literature are also presented.

Chapter 8 presents the conclusions of the study. A summary of the findings and the success of addressing limitations from previous literature are discussed. Suggestions for future research are also outlined.

Chapter 2: Literature review

M-payment is considered as an accelerator of standard payment methods for m-commerce, as well as e-commerce (Kumar, 2013), i.e. m-payment is a part of a large spectrum of e-commerce and m-commerce. Therefore, a comprehensive review of related literature was conducted regarding e-commerce, m-commerce, and m-payment to achieve the necessary background for this study. This chapter presents the literature review of m-payment topics. First, it starts with introducing two major related areas to m-payment which are e-commerce and m-commerce. Then, the concept of m-payment is described in detail with its definition, classification, the situation of m-payment in the world and Vietnam, and m-payment adoption and usage factors. Next, the concept of trust in e-commerce, m-commerce, and m-payment is presented. From the review, the study discusses the limitations of existing studies on trust in m-payment. Some dominant theories in technology adoption are described, and finally, Hofstede's cultural framework is presented.

2.1. Electronic commerce

Globalisation and information technology have changed the way that the business world operates. In the highly competitive business environment information technology has been a major investment and adopted widely in the world to help organisations achieve success. Digitalisation refers to the large number of different information technology applications applied in business in order to

transform the economy and enhance social interactions (IMF, 2018). According to the International Monetary Fund (2018), contemporary businesses worldwide have been impacted by the digital economy which covers the activities of digitalisation (such as internet usage or computerisation) across all sectors of the economy.

In this contemporary context, e-commerce has become a priority in business. Revenue drawn from e-commerce worldwide surpassed US\$1.5 trillion in 2019, and is forecasted to annually increase by 10.8%, and will reach over US\$2.2 trillion by 2023 (Statista, 2019a). The number of users of e-commerce is around 3.3 billion, and global user penetration is estimated to have reached 50.9% in 2019. The number of e-commerce users is predicted to grow to 60.0% by 2023 (Statista, 2019a).

Table 1 presents a number of valid definitions of e-commerce; however, no one definition has been universally accepted.

Table 1: Definitions of e-commerce (adapted from Alhulail, 2018; Rahman, 2018).

Definition	Reference
E-commerce sales/revenues are defined as the sales of goods and services where the buyer places an order, or the price and terms of the sale are negotiated, over the internet, mobile device (m-commerce), extranet, EDI network, electronic mail, or other comparable online systems. Payment may or may not be made online.	(US_Census_Bureau, 2019)
E-commerce is a fashionable electronic payment (e-payment) transaction within a wide network environment. Moreover, e-commerce activities are a unification of business flow, information flow, capital flow and logistics.	(Barenji, Wang, Li, & Guerra-Zubiaga, 2019)
E-commerce stands for electronic commerce. It is trading in goods and services using computer networks, such as the internet.	(Gomathi, 2016)
E-commerce can be simply defined as doing business online.	(Mehra, 2015)
E-commerce denotes the paperless exchange of trade information using electronic data interchange, electronic mail, electronic bulletin boards, electronic funds transfer, the internet, and other network-based technologies.	(Bhalekar, Ingle, & Pathak, 2014)
E-commerce indicates the buying and selling of goods and services through the internet.	(Lim, 2014)
E-commerce is the interaction among communication systems, data management systems, and security, which together exchange commercial information in relation to the sale of goods or services.	(Nanehkaran, 2013)
E-commerce is an online website application that contributes to the process of exchanging	(Matook, 2013)

Definition	Reference
manufactured products between purchasers and vendors.	
E-commerce can be defined as buying and selling merchandise or services on the internet or other networks.	(Khoshnampour & Nosrati, 2011)
E-commerce is a place where an intermediary enables online customers and suppliers to interconnect on an online gateway which depends on the structure of the internet for the sharing of data about products and services.	(Hadaya, 2006)
E-commerce is the sharing of business information, sustaining business relationships and doing business employing telecommunications networks.	(Vladimir, 1996)

Simply put, e-commerce can be considered as purchasing goods or services online. E-commerce brings many advantages for organisations such as lower costs, faster delivery, convenience, and the improvement of customer experience (Paris, Bahari, Iahad, & Ismail, 2016). The main idea of e-commerce is to enable a community of buyers and sellers to use an online platform together for trading. E-commerce has changed the business environment by bringing buyers and sellers to the online world where they can process real-time purchase transactions without any concerns about geographical barriers. It helps organisations to expand their markets as well as scaling their business, selling easily and conveniently, and most importantly cost-efficiently (Paris et al., 2016).

Additionally, one of the important aspects of e-commerce is e-payment systems which process online financial transactions between sellers and buyers via several digital financial instruments, such as, credit or debit cards and electronic cheques (Ngai & Wat, 2002). In the wireless environment, m-commerce is regarded as a part of e-commerce that is handled and operated via mobile devices (Coursaris & Hassanein, 2002; Yang, 2005). M-payment is the newest e-payment method in modern society, and thus it plays an important role in e-commerce and m-commerce.

2.2. Mobile commerce

This section presents a literature review of m-commerce including a definition of m-commerce services, applications and its characteristics.

2.2.1. Mobile commerce definition

M-commerce is sometimes referred to as mobile e-commerce, wireless commerce, or wireless e-commerce (Hsieh, 2007; Luarn & Lin, 2005; Tarasewich, Nickerson, & Warkentin, 2001). Along with its multiple names, there are also multiple definitions of the term ‘m-commerce’ that stem from different perspectives. Many authors have considered m-commerce as a subset of e-commerce which is conducted in the wireless environment (Deitel, Deitel, & Nieto, 2001; Huang, Wang, & Day, 2007; Ngai & Gunasekaran, 2007; Turban, Lee, King, Liang, & Turban, 2009; Varshney & Vetter, 2002). Following this perspective, Clarke (2001, p. 133) stated that “Mobile commerce as the ability to

purchase goods anywhere through a wireless internet-enabled device. Mobile commerce refers to any transaction with monetary value that is conducted via a mobile network”. Similarly, Yen (2008, p. 18) claimed that m-commerce is “the ability to conduct electronic commerce transactions over wireless media”. A more detailed definition with a description of operational procedures and instruments, was provided by Tarasewich et al. (2001, p. 435) who point out that “Wireless e-commerce (also called m-commerce) is the promotion, buying, and selling of goods and services through electronic data communication networks that interface with wireless (or mobile) devices”.

However, several authors have suggested a different viewpoint, that m-commerce should be regarded as a subset of mobile business (m-business). Turban, King, Lee, Liang, and Turban (2015) referred to m-commerce as m-business, and Cronin (2004) highlighted that m-commerce is not only a wireless expansion of e-commerce, but that it also includes business transactions focusing on data orientation. Following this perspective, the concept of m-commerce shares a similar idea about using wireless communication via wireless mobile devices on the internet; however, the difference comes from the distinction between the two terms, which are business and commerce. The term commerce is often considered as the activities associated with buying and selling, or exchanging goods or services, especially on a large scale (Andam, 2003; MBN, 2019; Turban, King, Lee, Warkentin, & Chung, 2008). In contrast, the term business covers a more

comprehensive concept, as well as, a more wide-ranging scope than e-commerce (Shuhaiber, 2016). Business includes any activities that an organisation can perform to achieve the target of making a profit, ranging from operating activities such as, manufacturing, production, distributing and monitoring; intra-organisational activities like human resources management and internal management process; financial activities, such as, payment and using a flow of cash; to marketing and sales (Andam, 2003; Tiwari et al., 2006). More broadly, Scornavacca, Barnes, and Huff (2005, p. 1) defined m-business as “the use of the mobile information technologies, including the wireless internet, for organisational communication and coordination, and the management of the firm”. This definition indicates that business activities not only cover commerce activities including selling and buying goods, but also any other operational business activities such as organisational communication and coordination, and management. Accordingly, m-commerce can be considered as a subset of m-business.

The definition from the OECD (2008) considers m-commerce as “[the] commercial transactions and communication activities conducted through wireless communication services and networks using short message services, multimedia messaging services, or the internet, using small, handheld mobile devices that typically have been used for telephonic communications”. This

definition is clear and covers all the concepts associated with m-commerce sufficiently.

2.2.2. The relationship between mobile commerce, electronic commerce and m-business

The above discussion raises an issue about the relationship between m-commerce and e-commerce. Many authors have referred to m-commerce as mobile e-commerce or wireless e-commerce, and therefore, m-commerce should be considered as a subset of e-commerce that employs wireless communication between wireless devices (Hsieh, 2007; Luarn & Lin, 2005; Tarasewich et al., 2001). Hsieh (2007) claim m-commerce is the development of e-commerce with the appearance of mobile phones and is the next stage of e-commerce. Tarasewich et al. (2001) categorise m-commerce as a form of wireless e-commerce. Similarly, other authors have also pointed out that m-commerce is merely the combination of e-commerce applications designed and supported by wireless or mobile networks including both business-to-customer (B2C) and business-to-business (B2B) (Luarn & Lin, 2005; Moshin, Mudtadir, & Ishaq, 2003; Varshney & Vetter, 2002; Yen, 2008).

Although both m-commerce and e-commerce have the purpose of selling and buying goods or services on the internet, and m-commerce is a subset of e-commerce that focuses on purchasing via wireless devices, m-commerce has its characteristics and differences (Forbes, 2018c). These arise from the different

platforms that each uses. Computers are used for e-commerce, and mobile devices for m-commerce. However, both can be used for processing transactions or any other type of commercial activity (Tiwari et al., 2011). Barnes (2002) points out that m-commerce can develop even further than traditional e-commerce. May (2001) claimed that m-commerce is an evolution of e-commerce in terms of its communication from fixed networks to wireless networks. Feng, Hoegler, and Stucky (2006) claimed that the differences of m-commerce involve the usage, the interaction style and the ubiquitous availability of mobile devices. Zhang and Yuan (2002) analysed the key differences between m-commerce and internet-based e-commerce based on three vital dimensions: the technologies, the nature of services, and the business models.

More specifically, m-commerce has several advantageous characteristics when compared to e-commerce. These are summarised below.

- (1) Mobility/Portability: Although in both m-commerce and e-commerce, users are able to purchase or exchange goods or services online, the difference comes from the terminal devices (Forbes, 2018c). Normally, traditional e-commerce activities are performed via desktop computers or laptops; therefore, users need a fixed position in front of these devices to use them. However, m-commerce arises from the adoption of mobile devices which are lighter and more mobile, thus users can conveniently and easily conduct their transactions for longer periods of time as long as

they have an internet connection (Goode, 2006; Hsieh, 2007; Junglas & Watson, 2006). Consequently, m-commerce is more mobile than traditional e-commerce, i.e. m-commerce can take place in a wide range of geographical contexts that are not possible for e-commerce.

(2) Localisation/Location tracking refers to the capability to physically locate the position of a person, thereby electronically recording and tracking their movement. For traditional e-commerce, this function is restricted due to the non-mobility of terminal devices (Forbes, 2018c). In contrast, mobile devices with the help of global positioning system (GPS) technology, mobile data or wi-fi connections, can be used for location tracking. Therefore, m-commerce users are able to use the function of localisation to help them access information about local products and services around their geographical locations. On the other hand, location tracking also helps local companies to promote their products or services to m-commerce users, who are potential customers, more conveniently and easily (Andreou et al., 2002). Localisation is considered one of the most notable advantages of m-commerce compared to traditional e-commerce (Junglas & Watson, 2006).

(3) Accessibility: refers to the capability to access services and make transactions. Unlike traditional e-commerce when conducting transactions on computers, mobile users are able to perform m-commerce services or

their business transactions regardless of time and geographical location as long as they have an internet connection via mobile data or wi-fi (Cook & Goette, 2006; Hsieh, 2007; Tarasewich et al., 2001). Due to the portability of mobile devices and the wide coverage of internet connections as well as mobile networks, these days, the scope of use of m-commerce goes beyond traditional e-commerce (Forbes, 2018c). This functionality helps users to conduct any m-commerce activities such as shopping, buying, selling, paying and exchange goods and services, as well as finding and retrieving information for any commerce activities more easily and flexibly (Andreou et al., 2002; Goode, 2006).

(4) Reachability: Mobile users can be contacted or reached by others as long as they keep their mobile devices ready under the coverage of mobile networks or internet connections (Junglas & Watson, 2006). This characteristic allows m-commerce users to be contacted instantly and flexibly, which is a prominent advantage, as opposed to traditional e-commerce (Forbes, 2018c).

As depicted in Figure 3, in general, m-commerce is a subset of e-commerce that functions using wireless devices; however, it goes beyond the scope of traditional e-commerce and has developed its own characteristics that allow users to use and conduct services and commerce activities with greater ease and flexibility

(Shuhaiber, 2016). In other words, m-commerce can be considered as the evolution of e-commerce (Swilley, Hofacker, & Lamont, 2012).

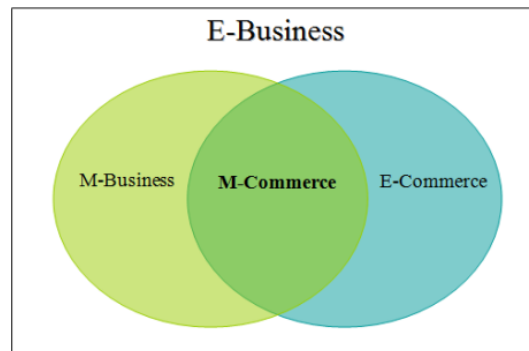


Figure 3: The relationship between m-commerce and m-business and e-commerce (Shuhaiber, 2016, p. 12).

M-commerce can also be considered as a subset of m-business. As discussed in the previous section, the term business is broader than the term commerce and can include commerce and other business activities. M-business is categorised as the application of e-business with mobile devices instead of desktops or laptops. Many authors have suggested that m-business will be the next phase of e-business development (Hsieh, 2007; Mathew, Sarker, & Varshney, 2004; Ngai & Gunasekaran, 2007; Urbaczewskj, Valacich, & Jessup, 2003). However, applying mobile devices in e-commerce produces the term m-commerce. Therefore, m-commerce can be seen as the intersection between m-business and e-commerce (Shuhaiber, 2016). M-commerce belongs to e-commerce because users use mobile devices to conduct e-commerce activities but it also belongs to m-business because of the usage of mobile devices in their business activities.

2.2.3. Mobile commerce services and applications

M-commerce is expected to significantly change the way worldwide business is conducted across many industries due to the wide proliferation of mobile devices and the huge coverage of data networks as well as the internet (Hsieh, 2007). Varshney and Vetter (2002) classified m-commerce applications into 10 types including:

- Mobile financial applications (B2C, B2B),
- Mobile advertising (B2C),
- Mobile inventory management (B2C, B2B),
- Product locating and shopping (B2C, B2B),
- Proactive service management (B2C, B2B),
- Wireless re-engineering (B2C, B2B),
- Mobile auctions or reverse auctions (B2C, B2B),
- Mobile entertainment services and games (B2C),
- Mobile offices (B2C),
- Mobile distance education (B2C), and
- Wireless data centres (B2C, B2B).

Tiwari et al. (2006) presented seven types of m-commerce applications and services, which are:

- Mobile banking (accounting, financial information),
- Mobile entertainment (mobile gaming, download music and ringtones),
- Mobile information services (travel information, tracking services),
- Mobile marketing,
- Mobile shopping (purchasing of goods and services),

- Mobile ticketing (public transport, parking, sports and cultural events) and telematics services (navigation services, vehicle tracking and theft protection and emergency services).

Similarly, Hu, Lee, and Yeh (2004) also mentioned the above types of m-commerce applications but added one more category namely enterprise resource planning.

On the other hand, Andreou et al. (2005) examined the functionality that m-commerce applications provide to users, and classified m-commerce into two major categories: directory and transaction-oriented services and applications. The main difference comes from the activity of users when using m-commerce applications. Users only perform reading requests to a directory in the former (such as location services or searching), whereas they conduct reading and writing requests to a transaction server in the latter (such as purchasing activities).

2.3. Mobile payment

M-payment has been recognised as the most recent step in the evolution of payment methods (Kolaki, 2017). In our modern society, the means of payment started with cash, then changed to allow the purchase of goods using debit or credit cards. The use of card systems was limited by physical devices and connections. However, m-payment enables the purchase of goods and services processed via smartphones with internet connections. This development of payment methods aimed to bring more freedom and availability to consumers in

the contemporary context where smartphones and internet connections are ubiquitous. M-payment applications help users to overcome the limitations of previous payment methods concerning accessibility and scope (Deng, Turner, Gehling, & Prince, 2010; Shen & Yazdanifard, 2015).

2.3.1. Definition and processes of m-payment

Payments are vital in any commerce transaction. E-payment plays an important role in e-commerce because it is responsible for processing online financial transactions between buyers and sellers (Ngai & Wat, 2002). M-payment brings e-payment to mobile devices to conduct financial payments for e-commerce activities. M-payment is also a significant service of m-commerce applications as it allows mobile users to conduct financial transactions to complete their m-commerce exchanges. As illustrated in Figure 4, m-payment can be seen as the intersection between m-commerce and e-payment.

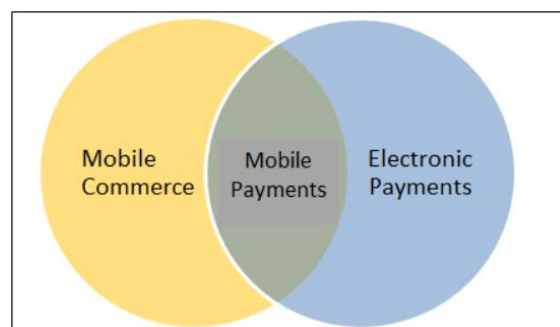


Figure 4: The relationship between m-commerce, m-payment and e-payment (Shuhaiber, 2016, p. 16).

There are a number of definitions of m-payment from different perspectives. Karnouskos (2004, p. 44) defined it as “any payment where a mobile device is

used in order to initiate, activate, and/or confirm this payment can be considered a mobile payment”. With no consideration about processing, Tiwari et al. (2006, p. 42) stated that “Mobile payment refers to payments that are made via mobile hand-held devices in order to purchase goods and services. Mobile payment services usually act as an intermediary between consumer and vendor”. Similarly, Dahlberg, Mallat, Ondrus, and Zmijewska (2008, p. 165) claimed that “Mobile payments are payments for goods, services, and bills with a mobile device (such as a mobile phone, smart-phone, or personal digital assistant (PDA)) by taking advantage of wireless and other communication technologies”. Where some authors have suggested that phases of m-payment include initiation and authorisation (Henkel, 2002), other definitions have encompassed realisation and execution (Dahlberg et al., 2008). However, most authors have agreed on a definition of m-payment that includes processing payment transactions using mobile devices, i.e. consumers can utilise mobile devices to pay or transfer monetary value, instead of using cash or any kind of debit or credit card.

This study adopted the definition of Au and Kauffman (2008, p. 141) who claimed that “A mobile payment or m-payment is any payment where a mobile device is used to initiate, authorise and confirm an exchange of financial value in return for goods and services”. Using this definition, this study adopted a broad perspective of m-payment which includes payment for any goods or services, and the necessary processing of m-payment transactions including initiation,

authorisation and confirmation. The factors influencing the adoption of m-payment at an organisational level may be different from the individual level (Schierz, Schilke, & Wirtz, 2010), thus this study focused on consumer or individual acceptance of m-payment.

Au and Kauffman (2008) provided three primary steps of m-payment transactions in their definition. These are initiation, authorisation and confirmation. More specifically, Vatsavayi and Mukkamala (2008) suggested five stages of an m-payment process. These are (1) registration: users register with the m-payment service provider, or login to be eligible to use the m-payment service; (2) payment submission: after choosing the suitable products online, mobile users submit the payment; (3) authentication: the consumer is authenticated by the sellers; (4) authorisation: the information is authorised by the service provider; and (5) confirmation: users confirm their payment transactions in mobile devices.

Figure 5 depicts the more complex procedures for an m-payment transaction. Buhan, Cheongsam and Tan (2002) pointed out four key stakeholders involved in the process including the consumer, the content provider, the payment service provider and the trusted third party. The pre-step refers to the registration of the consumer to the payment service provider. When processing an m-payment, the consumer purchases indicated products based on the content of the content provider. The request is sent to the payment service provider. Then the payment service provider and the trusted third party (such as banks) conduct the

authentication/authorisation process. Next, payment and billing are done by the consumer. Finally, the revenue is shared amongst the content provider, the payment service provider and the trusted third party.

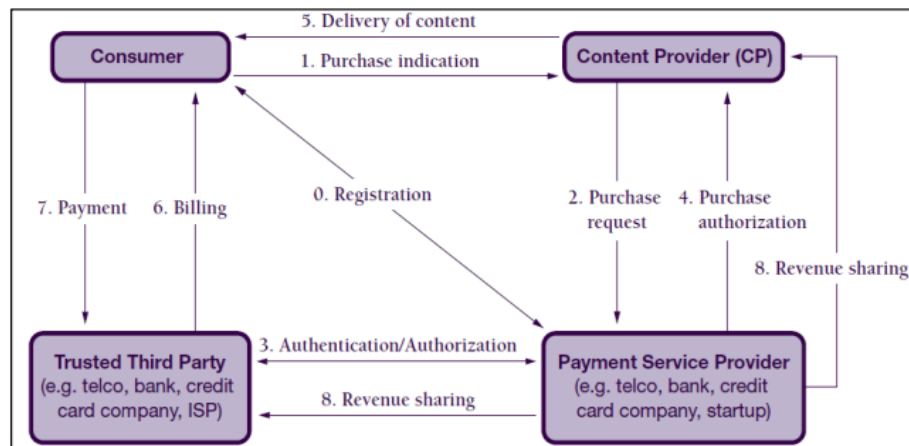


Figure 5: M-payment processes (Buhan, Cheong, & Tan, 2002, p. 10)

2.3.2. Classification of m-payments

There are several ways to classify m-payments. The most popular one is based on distance. Following this, m-payment provides two main methods: remote payment and proximity payment (Kolaki, 2017). For remote m-payment methods, all payment processes are implemented through an intermediate relay connection without direct interaction between buyers and sellers or the vendors' point of sale systems (POS). Some popular examples of remote m-payment are carrier billing, applications such as mobile banking, and short message service (SMS) payments (Emily, 2018).

Carrier billing is how money is charged to the consumer's phone bill through their mobile carrier. It is an easy-to-use system for customers across a broad age range

irrespective of the type of smartphone or mobile operating system that an individual has access to. Therefore, carrier billing is popular, especially in purchasing digital content (songs or applications from iTunes or Google Play) via smartphones. Citizens from any country can buy digital content without debit or credit cards which may be not supported in many countries (Regev, 2018). According to Ovum, direct carrier billing is forecasted to increase from US\$14.5 billion in 2014 to \$24.7 billion in 2019 due to the widespread use of smartphones (Sato, 2018).

Mobile banking with the function of payment may be considered as a type of remote m-payment. It is an application installed on smartphones that is provided by banks for their customers. Users can transfer money, pay bills, manage accounts and review their transaction history with mobile banking systems. Each bank has its own applications to provide services to customers. After registration and verification procedures, users can use mobile banking to handle their bank account(s). Mobile banking is considered one of the most important technological innovations which bring access to banking services to smartphones using mobile internet connections (Lin, 2011).

SMS payment is similar to carrier billing where users are charged via their phone bills. Once consumers send a text message including the relevant information as required to the phone number which is verified and allocated for vendors, the fee will be charged to the consumer's phone bill (Emily, 2018). SMS payments are

convenient and quick for customers since they just use a mobile phone with an authentic mobile number without any confidential information, such as credit cards or personal information transmitted during the payment process. For vendors, SMS payments help to expand the potential pool of customers without any fees for verification and registration of customers because the verification process is performed via SMS and customers' phones. SMS payment is fast, convenient and safe, and is becoming one of the most favoured payment options in the world (ACCEO, 2017).

For the proximity m-payment method, payment processes have been implemented with some interaction between buyers and sellers or vendors. The most popular type of proximity m-payment is near field communication (NFC) payments. Customers present their smartphones that support Apple Pay, Samsung Pay or Google Pay functions to the POS of vendors or sellers. Near field communication technology establishes short-range, and two-way communication in which data is encrypted and transferred immediately between a smartphone and a terminal device. With the widespread use of smartphones, Forrester forecasted that proximity m-payment will be the fastest-growing type of m-payment (Tode, 2018).

2.3.3. M-payment in the world

Global use of m-payment is predicted to rise to 28% in 2022, and beyond that to surpass cash and credit cards. It can be safely said that m-payment is contributing

to bringing societies towards a cashless world (MerchantSavvy, 2019). The m-payment market was worth US\$897.68 billion in 2018 and is predicted to rise to US\$3695.46 billion by 2024 with a compound annual growth rate of 26.93% (MordorIntelligence, 2019). Table 2 depicts m-payment applications such as PayPal, Samsung Pay, Apple Pay, Google Pay, AliPay, and WeChat Pay as being adopted widely and rapidly to make payment for goods or services across the world easier. Two Chinese applications dominate the m-payment applications being utilised in the world which are AliPay and WeChat Pay. In 2019, WeChat became the biggest m-payment platform in the world when it reached one billion users. AliPay was also forecast to achieve one billion users in 2019 (MerchantSavvy, 2019). The rank of m-payment applications based on active users is shown in Table 2:

Table 2: Top m-payment platforms in the world (MerchantSavvy, 2019).

Company	Active users	Latest figures from
WeChat	1 billion +	Tencent (Jan 2019)
Alipay	1 billion +	Alipay (Jan 2019/
Paypal	250 million	Paypal (Sep 2018)
Apple Pay	383 million	Loup[[Ventures QZ (Feb 2019)
Amazon Payuuu	50 million	Evercore ISI Investopedia (May 2018)
Samsung Pay	1 billion +	Statista (Aug 2017)
Google Pay	24 million	Statista (Aug 2017)

The growth in m-payment is expected to increase for several reasons. First, mobile devices and internet connections are essential for citizens in modern life, which is a necessary condition for the development of m-payment, as well as, m-commerce. Indeed, the development of technologies producing mobile devices or mobile phones generates a diversity of products with a wide range of options regarding price, models and functionalities for users. The wide coverage of data networks benefits internet connections making m-payments faster and more available. Besides, m-payment technology is being adopted and invested in by many companies, banks and financial institutions. It also receives the support and encouragement of governments. These conditions benefit the rapid growth and penetration of m-payment (Sonawane, 2018).

M-payment is being widely adopted in both developed and developing countries. For example, the huge telecommunications corporation, Vodafone, employs M-Pesa which is a mobile money transfer service to allow users to transfer money and make payments in many countries like Albania, the Democratic Republic of Congo, Egypt, Ghana, India and Kenya (Vodafone, 2017). TextPayMe is an SMS payment service allowing people to send and receive money via SMS in the US, which has been acquired by the technological giant, Amazon. Another famous example is PayPal which is an application for online payments and is available in 200 countries with 250 million users (Statista, 2019c). A report by Allied Market Research showed that SMS payment is the most preferred method of m-payment,

and on a regional basis, Asia-Pacific is the largest m-payment market in the world (Sonawane, 2018).

2.3.4. M-payment in Vietnam

Vietnam, officially known as the Socialist Republic of Vietnam, is located in the Southeast of Asia with an area of approximately 331,200 square kilometres. It has borders with North China, Northwest Laos and Southwest Cambodia. The economy of Vietnam is a success story of transformation and development. Over the past 30 years, Vietnam has been performing the economic and political reforms called *Doimoi* since 1986 which has transformed Vietnam from one of the world's poorest nations in the world with a GDP of US\$14 billion in 1985 to a lower-middle-income country, i.e. a developing country, with a GDP of over US\$244 billion in 2018 (WorldBank, 2019b, 2021). Vietnam has achieved many benchmarks in the area of national development, especially in poverty reduction, and the provision of basic services, such as healthcare services and education, and gender equality. According to the World Bank (2021), the poverty headcount ratio at the national level was down to 9.8 in 2016 from 17.2 in 2012. Although the population of Vietnam has increased significantly from over 32 million in 1960 to over 95 million in 2018, the quality-of-life benchmarks have improved. The Human Capital Index (HCI) measuring the health and education level of Vietnam is 0.67 which is in the mid-range. The endeavour to keep the macro economy stable also gave an outcome where the Vietnamese inflation rate

decreased to 3.54% in 2018 after it peaked at 18.67% in 2011 (Macrotrends, 2019). The Vietnamese economy has been growing with stable domestic demand and export productivity. The GDP of Vietnam continued to rise with an increase of 6.8% in 2017, and 7.1% in 2018. The rate of growth in Vietnam was predicted to be 6.6% in 2019, and the medium-term outlook for Vietnam is positive (WorldBank, 2019b).

Along with the development of the economy, Vietnam is a potential market for digital or m-payment development. This is because Vietnam is a young nation with 24% of its population between the ages of 21 to 34 (RemoteResources, 2018), and the younger generation in Vietnam is interested in mobile phones and the internet perhaps more than anywhere else in Southeast Asia (Fintechnews, 2015; Ho, 2018). The internet penetration rate in Vietnam increased 52% in 2016 with 72% of citizens in urban areas using smartphones and 53% in rural areas (Fintechnews, 2018a). By 2018, the number of smartphone users in Vietnam was about 32.43 million which accounted for around 33% of the population, and it was forecasted to increase to 40% by 2021 (Statista, 2018). Consequently, Vietnam was considered as one of the countries which have the fastest-growing rate of smartphone adoption in Southeast Asia (Fintechnews, 2018a). The e-commerce market is also growing quickly. According to Solidiance, Vietnam's financial technology market reached US\$4.4 billion in 2017, and was forecast to increase to US\$7.8 billion by 2020 (Fintechnews, 2018a). The booming e-

commerce market and support from the Vietnamese government was expected to lead to a boom in digital payments, especially m-payment (Fintechnews, 2018b). Despite high demand and many opportunities for m-payment development in Vietnam, a lack of trust was reported as a significant barrier to m-payment adoption (Das, 2017; Fintechnews, 2017). Due to mistrust, only 3% of Vietnam consumers use online payment methods even though they have previously made online purchases (Vietnamnet, 2017b). Consequently, Vietnamese consumers still use cash for their online payments by directly paying the shippers. Consequently, e-commerce, as well as, m-commerce cannot revolutionise shopping or purchasing in Vietnam as might be expected of the potential of the Vietnamese e-commerce market (Vietnamnet, 2017a). Similarly, the negative impact of a lack of trust in m-payment is also recognised as one of the main barriers for m-payment adoption in many other developing countries (Bose & Mellado, 2018; Levy, 2016; Pelletier, Khavul, & Estrin, 2014; Traynor & Butler, 2015).

As a consequence, a comprehensive study to investigate the determinants of CT in m-payment continuance intention in Vietnam was necessary and significant. This would not only help Vietnam to improve m-payment adoption rates, thereby developing the online commerce market, but also contribute to the literature on trust's determinants in m-payment adoption.

2.3.5. M-payment adoption

Several complex and interrelated factors that influence m-payment adoption from a consumer perspective can be found in the literature. Several studies have found factors that positively influence the adoption of m-payment (Cheong, Park, & Hwang, 2004; Goeke & Pousttchi, 2010; Kim, Mirusmonov, & Lee, 2010; Mallat, Rossi, Tuunainen, & Öörni, 2009; Schierz et al., 2010). Based on the technology acceptance model (TAM), Cheong et al. (2004) investigated factors affecting Korean consumers' m-payment acceptance and identified the positive effect of perceived usefulness. The study by Goeke and Pousttchi (2010) extended the TAM model to explain the determinants of customer acceptance of m-payment, resulting in the significant positive effect of perceived usefulness and perceived ease of use. Kim et al. (2010) also used TAM to propose an m-payment research model including m-payment characteristics and evaluated it empirically using a survey. The study was conducted in Korea with those who had previously used m-payment. The results indicated that the significant predictors of intention to adopt m-payment were perceived usefulness and perceived ease of use. Mallat et al. (2009) combined TAM and the diffusion of innovation theory (DOI) as the theoretical basis and collected data from Helsinki citizens. The study confirmed the positive influence of use context, perceived ease of use and compatibility on the intention to use m-payment. Schierz et al. (2010) collected data in Germany to test the model of acceptance of m-payment services, and found a significant

positive impact of compatibility, perceived security, perceived usefulness, perceived ease of use and SI on attitude towards the use of m-payment.

Some studies identified both positive and negative factors affecting m-payment adoption (Chen, Yen, & Chen, 2009; Hongxia, Xianhao, & Weidan, 2011; Lu, Yang, Chau, & Cao, 2011). Chen et al. (2009) conducted a survey based on DOI and TAM instruments in a logistics company in Taiwan and found that the perceived ease of use and usefulness had a positive effect on the adoption of m-payment. Risk had a negative effect on m-payment adoption. The research of Hongxia et al. (2011) utilised the UTAUT integrated with cost and perceived risk to investigate the determinants of m-payment acceptance in China. The study found that while drivers like social influence (SI) and performance expectancy (PE) had a positive impact on m-payment adoption, cost and perceived risk were found to be barriers to the adoption of m-payment. Lu et al. (2011) examined customers' trust in m-payment as a determinant influencing adoption behaviour in China, and revealed the negative effect of cost and risk, along with the positive effect of trust on the adoption of m-payment.

In summary, factors positively influencing the adoption of m-payment encompass perceived ease of use (Chen et al., 2009; Goeke & Pousttchi, 2010; Kim et al., 2010); perceived usefulness (Chen et al., 2009; Cheong et al., 2004; Goeke & Pousttchi, 2010); compatibility (Chen et al., 2009; Lu et al., 2011; Mallat et al., 2009; Schierz et al., 2010; Yang, Lu, Gupta, Cao, & Zhang, 2012); SI (Hongxia

et al., 2011); use context (Mallat et al., 2009); and trust (Lu et al., 2011; Shin, 2010). In contrast, factors negatively affecting the adoption of m-payment include cost (Cheong et al., 2004; Hongxia et al., 2011; Lu et al., 2011); and risk (Chen et al., 2009; Hongxia et al., 2011; Lu et al., 2011; Yang, Cao, Mao, Zhang, & Luo, 2011).

2.4. Trust

Trust is crucial in our daily life for activities ranging from working or dealing, especially in interpersonal and commercial relationships. Although people use this term every day, it is still hard to define trust due to the complexity of the concept. Trust is a complex concept that has multiple meanings, facets and dimensions (McKnight & Chervany, 2001a, 2001b; McKnight et al., 2002; McKnight, Kacmar, & Choudhury, 2004). Such works play an important role in studying the concept of trust in e-commerce and has been cited many times in research on trust in technology adoption such as 6704 times of (McKnight et al., 2002), 308 times for (McKnight et al., 2004), 931 times for (McKnight & Chervany, 2001a), 3127 times for (McKnight & Chervany, 2001b). As a result, these studies were included and described in the literature of trust.

In addition, trust has been explored and examined in research across diverse areas, such as psychology, business, economy, commerce, management, sociology, politics and behavioural science; therefore, trust is also considered as a multidisciplinary concept (McKnight & Chervany, 2001b). Different fields

have their own different perspectives about trust. While trust can be seen as a personal attribute by psychologists, economists consider it as an economic choice, and sociologists argue it is a social structure (Lewicki, 2006). Therefore, there is no consensus about the definition of trust among the different disciplines.

However, a better and broad understanding of trust is necessary for research in many fields. Scholars have conducted a large amount of research on trust in organisations over many decades. Previously, scientists defined trust as the perceptions of people with others. Mellinger (1956) considered trust as the perception that a person feels about the intentions and motives, and the sincerity of speech of others. Similarly, Deutsch (1960) argued that trust is the association of belief that someone keeps their promises, and has a feeling of confidence about his/her intentions and capabilities. Recently, research pointed out more elements of trust. Araujo and Araujo (2003, p. 3) suggested that trust “indicates a positive belief about the perceived reliability of, dependability of, and confidence in a person, object, or process” (cited in Rempel, Holmes, & Zanna 1985; Rotter 1980). Mayer, Davis, and Schoorman (1995, p. 712) referred to trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”.

In the field of commerce, a trustor is the consumer and a trustee is the vendor. Therefore, Boon and Holmes (1991) defined trust as “a state which involves a

consumer's confident positive expectations about a vendor's attitude in situations entailing risk" (Shuhaiber, 2016, p. 27). With regards to the characteristics of trust, some authors have referred to trust as the beliefs of customers about the abilities, benevolence and integrity of sellers (Bhattacharjee, 2002; Gefen, Karahanna, & Straub, 2003; Jarvenpaa, Tractinsky, & Vitale, 2000). Other authors have extended the scope of trust including not only trustors and trustees but also objects such as technological devices (like mobile devices) used to operate as a means for a commerce transaction. Thus, technology can also be considered as an entity of trust (Grabner-Kräuter & Kaluscha, 2003; McKnight et al., 2004).

Regarding the classification of trust based on its definition, a holistic review was conducted by McKnight and Chervany (2001a). They synthesised and analysed the definition of trust from 80 sources from journals, conferences and books across a wide range of disciplines, such as psychology, social psychology, economics, political science, management, sociology and communications. The study provided a comprehensive trust taxonomy based on four high-level characteristics of trust including benevolence, integrity, competence, and predictability (McKnight & Chervany, 2001a). Benevolence means that one is motivated to provide care to others without expecting anything in return (Holmes, 1991). Integrity refers to "making good faith agreements, telling the truth, and fulfilling promises" (McKnight & Chervany, 2001a, p. 31) (Bromiley &

Cummings, 1992). Competence refers to the capability to do what people desire (Barber, 1983). Predictability means the consistency of actions from trustees so that these can be predicted in a given situation (Gabarro, 1978). These categories are represented in Table 3.

Table 3: Trust referent characteristic-based definition categories (McKnight & Chervany, 2001a, p. 40).

Trust-related characteristics	Definition count	Conceptual category with total relevant counts and percentage
Competent	14	Competence (20), 20.4%
Expert	3	
Dynamic	3	
Predictable	6	Predictability (6), 6.1%
Good, moral	6	Benevolence (38), 38.8%
Good will	10	
Benevolent, caring	18	
Responsive	4	
Honest	11	Integrity (26), 26.5%
Credible	1	
Reliable	8	
Dependable	6	
Open	3	Other (8), 8.2%
Careful, Safe	3	
Shared understanding	1	
Personally attractive	1	

As can be seen from the above table, benevolence (including characteristics of good/moral, good will, benevolent/ caring and responsive), was the most common category of trust for scholars. In contrast, predictability was the lowest characteristic identified by researchers. Two taxonomies namely competence (including competent, expert, and dynamic), and integrity (including honest, credible, reliable and dependable) accounted for 20.4% and 26.5% of the papers

on trust respectively. The remaining characteristics which are careful/safe, shared understanding and personally attractive were referred to in only 8.2% of the papers.

From the above summary, McKnight and Chervany (2001b) analysed these definitions further based on trust-related behaviours and divided these characteristics into different types regarding conceptual kinds including attitudes, beliefs, intention, behaviours, structural/institutional and disposition. Figure 6 illustrates the three high-level trust concepts based on the interdisciplinary analysis, as follows:

- Dispositional trust stems from psychology, meaning that childhood-derived attributes can mould actions.
- Institution-based trust comes from sociology which means that actions are constructed by the environment or given situations.
- Interpersonal trust refers to a person who can trust the situation or structures. Interactions between people and cognitive-emotional reactions of these interactions can significantly affect a person's behaviour (McKnight & Chervany, 2001b).

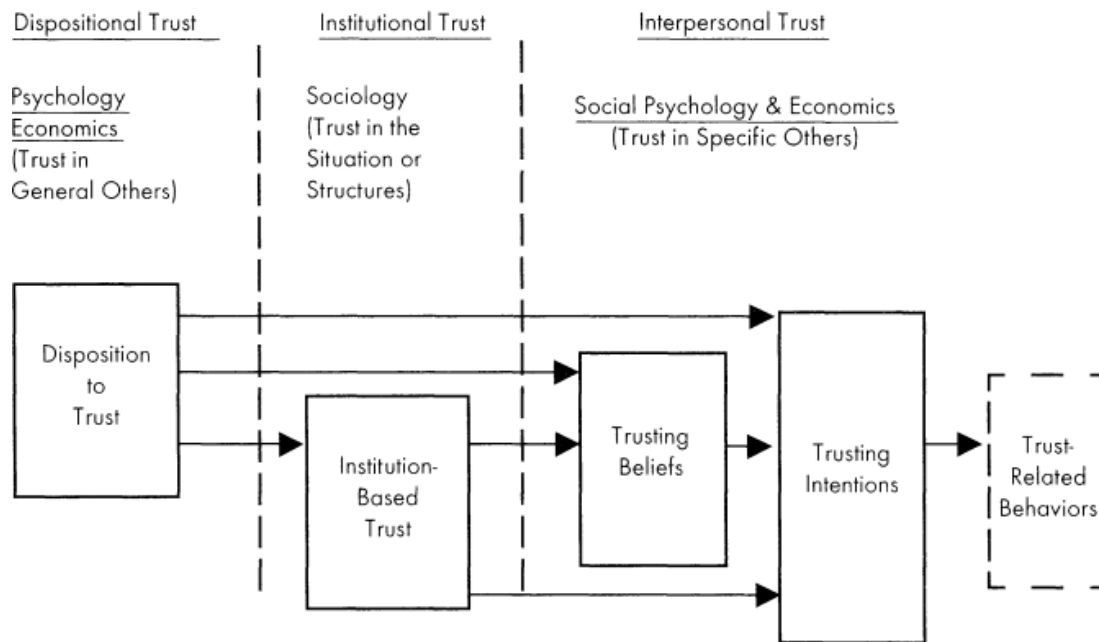


Figure 6: An interdisciplinary model of high-level trust concepts (McKnight & Chervany, 2001b, p. 42).

2.4.1. Trust in e-commerce and mobile commerce

McKnight and Chervany (2001b) applied their interdisciplinary model of high-level trust concepts to the e-commerce area to propose a model of e-commerce containing customer relationship trust constructs. In e-commerce, trustors are e-commerce consumers, trustees are e-vendors. Disposition to trust reflects the extent to which an e-commerce consumer “has a general propensity/tendency to depend on most people across most situations” (McKnight & Chervany, 2001b, p. 43). Institution-based trust is the belief that the necessary conditions, such as regulations, laws, security, the proper order of the internet, are presented in order to increase the likelihood of gaining an expected outcome in an endeavour like e-commerce (McKnight et al., 2002). Interpersonal trust including trusting beliefs, and intentions is person-specific and cross-situational because it refers to a person

trusting another person across diverse contexts (McKnight & Chervany, 2001b). These four constructs are subdivided into lower-level constructs in order to be measured by relevant scales. Disposition to trust includes faith in humanity and a trusting stance, while IT includes structural assurance and situational normality. Trusting beliefs encompass competence, benevolent beliefs, integrity beliefs and predictability beliefs. Trusting intentions cover the willingness to depend and subjective probability of depending. As shown in Figure 7, McKnight et al. (2002) integrated e-commerce customer relationship trust constructs with the theory of reasoned action (TRA) (Fishbein & Ajzen, 1977) to propose and test the trust model in e-commerce.

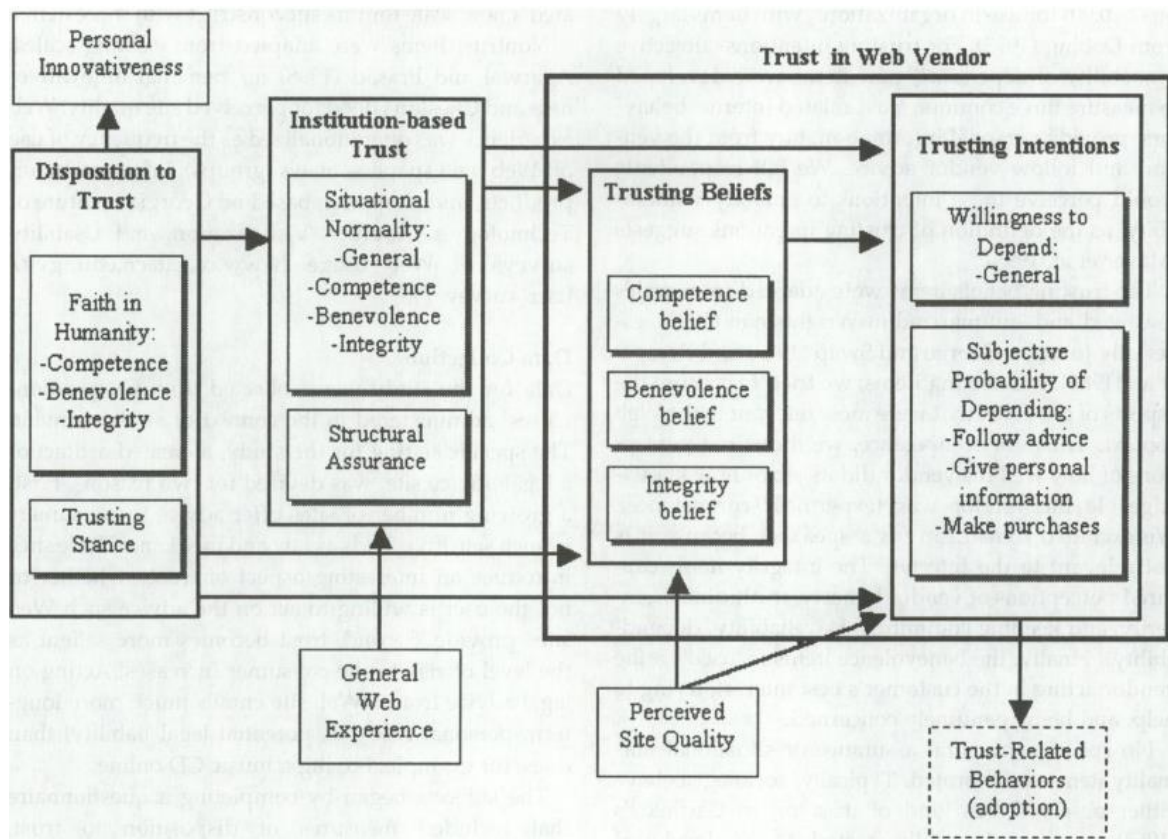


Figure 7: The trust model in e-commerce (McKnight et al., 2002, p. 341).

Conversely, Siau and Shen (2003) argued that the process of developing the trust of e-commerce customers is dynamic and time-consuming; thus, they proposed two types of trust namely initial and ongoing. Initial trust starts when consumers start to conduct their first transactions with vendors which may be first based on information gathered about advantages such as convenience or cost efficiency, and reward attraction. Then continuous trust, which may result in forming strong consumer loyalty. It is developed once consumers are convinced to continue to buy or repeat many transactions, then they evaluate their experiences based on their satisfaction. For continuous trust to develop they must have positive experiences with vendors. In contrast, if consumers have a bad experience, this could result in them dropping out due to distrust of the vendors. Trust across all stages of the customer relationship with the vendor is depicted in Figure 8.

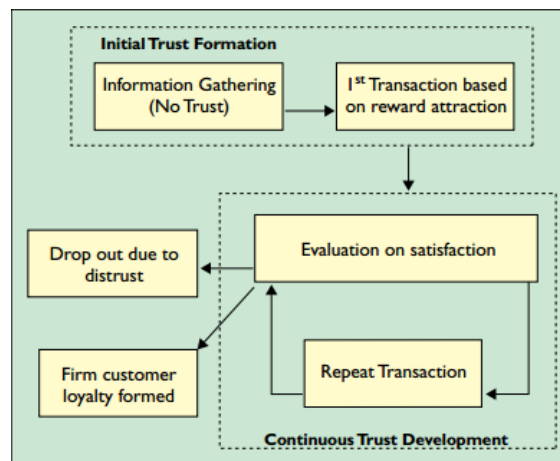


Figure 8: The e-commerce trust development life cycle (Siau & Shen, 2003, p. 92).

Figure 9 illustrates the suggested framework by Siau, Sheng, and Nah (2003) for trust in m-commerce. The framework is comprised of two proposed components

for building CT in m-commerce which are mobile technology trust and mobile vendor trust.

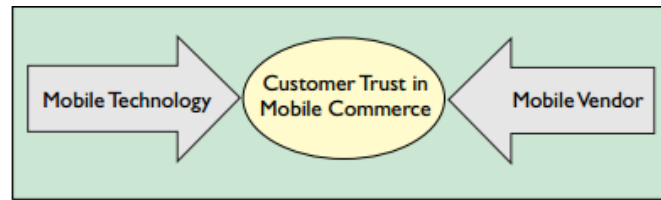


Figure 9: Framework for m-commerce trust building (Siau & Shen, 2003, p. 92).

Siau et al. (2003) extended the framework with five groups of factors including vendor and website characteristics, the technology of wireless services, the technology of mobile devices and other factors, such as legal regulations or third-party certification as shown in Figure 10.

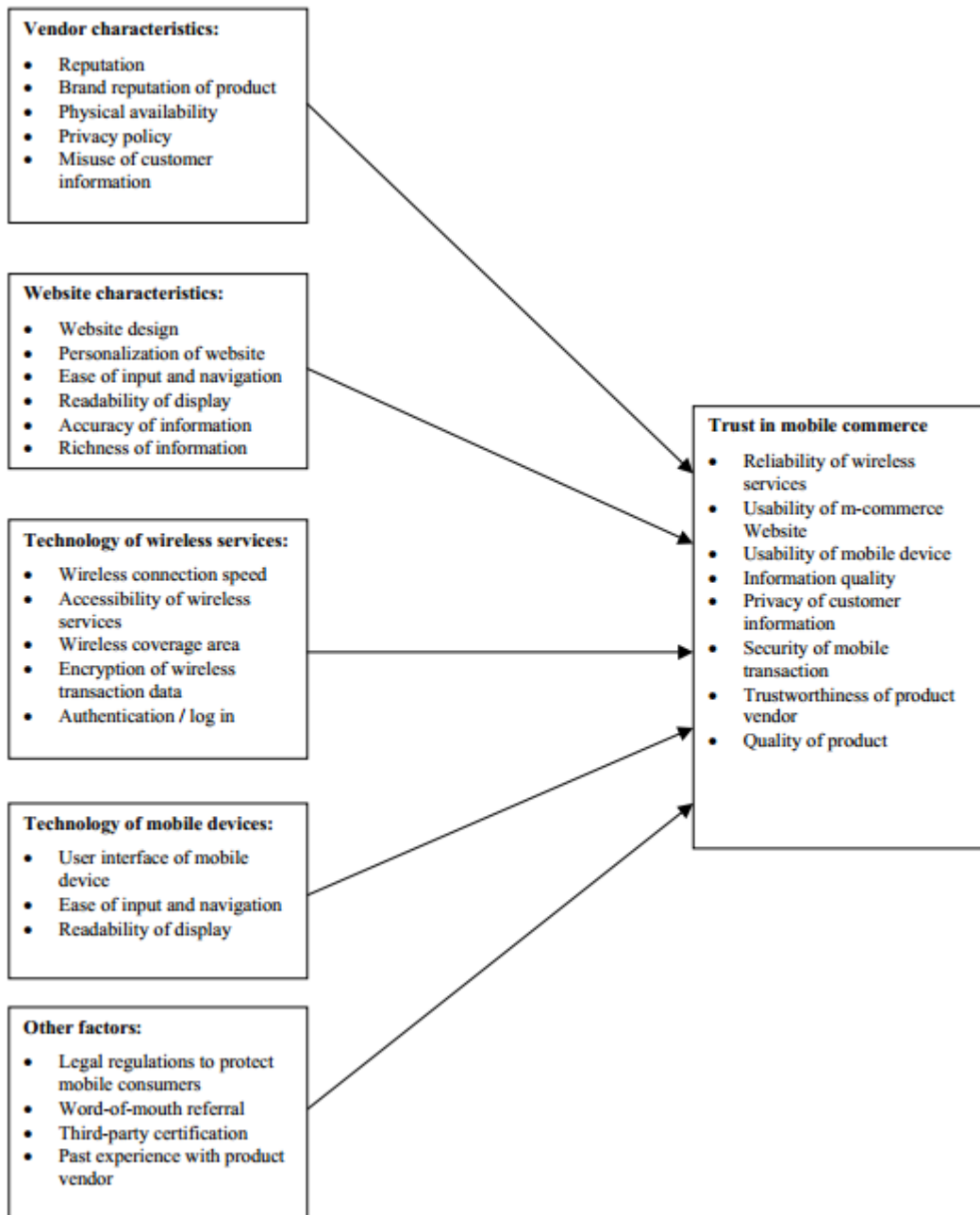


Figure 10: Proposed framework for trust in m-commerce (Siau et al., 2003, p. 88).

Many authors have conducted research on factors that affect trust in e-commerce or m-commerce. These factors are summarised in Table 4:

Table 4: Factors affecting trust in e-commerce or m-commerce

Factor	M-commerce literature	E-commerce literature
Familiarity	(Hollingsworth & Dembla, 2013; Li & Li, 2008; Piao, Wang, & Yang, 2012)	(Bhattacharjee, 2002; Chiravuri & Nazareth, 2001; Gefen, 2000; Gefen & Heart, 2006; Van Dyke, Midha, & Nemati, 2007; Yao & Li, 2008)
Company reputation / Perceived reputation /	(Guangming & Yuzhong, 2011; Li & Li, 2008)	(Chiravuri & Nazareth, 2001; Corbitt, Thanasankit, & Yi, 2003; Doney & Cannon, 1997; Friedman, Khan Jr, & Howe, 2000; Jarvenpaa, Tractinsky, & Saarinen, 1999; Jarvenpaa et al., 2000; Kong & Hung, 2006; Koufaris & Hampton-Sosa, 2004; Pavlou, 2003; Salo & Karjaluoto, 2007; Yao & Li, 2008)
Factual signals/heuristic cues		(Chiravuri & Nazareth, 2001)
Perceived security control		(Cheung & Lee, 2000; Connolly & Bannister, 2007; Koufaris & Hampton-Sosa, 2004; Yao & Li, 2008)
Privacy control		(Cheung & Lee, 2000; Connolly & Bannister, 2007; Salo & Karjaluoto, 2007; Van Dyke et al., 2007)
Integrity		(Chen & Dhillon, 2003; Cheung & Lee, 2000; Cody-Allen & Kishore, 2006; Connolly & Bannister, 2007; Gefen & Heart, 2006; Kong & Hung, 2006; Lee & Turban, 2001; McKnight & Chervany, 2001b; McKnight et al., 2002; Salo & Karjaluoto, 2007)

Factor	M-commerce literature	E-commerce literature
Competence		(Chen & Dhillon, 2003; Cheung & Lee, 2000; Cody-Allen & Kishore, 2006; Connolly & Bannister, 2007; Gefen & Heart, 2006; Kong & Hung, 2006; McKnight & Chervany, 2001b; McKnight et al., 2002; Salo & Karjaluoto, 2007)
Benevolence		(Chen & Dhillon, 2003; Cody-Allen & Kishore, 2006; Gefen & Heart, 2006; Kong & Hung, 2006; McKnight & Chervany, 2001a, 2001b; McKnight & Chervany, 2006; McKnight et al., 2002; Salo & Karjaluoto, 2007)
Predictability		(McKnight & Chervany, 2001b)
Propensity to trust / Disposition to trust	(Guangming & Yuzhong, 2011; Li & Li, 2008; Piao et al., 2012)	(Cheung & Lee, 2000; Connolly & Bannister, 2007; Gefen, 2000; Kim & Prabhakar, 2000; Kong & Hung, 2006; McKnight & Chervany, 2001b; McKnight & Chervany, 2006; McKnight et al., 2002)
Institution-based trust (Structural assurance, situational normality)	(Cho, Kwon, & Lee, 2007; Guangming & Yuzhong, 2011; Piao et al., 2012)	(Cheung & Lee, 2000; Gefen et al., 2003; Kim & Prabhakar, 2000; Kong & Hung, 2006; McKnight & Chervany, 2001a, 2001b; McKnight & Chervany, 2006; McKnight et al., 2002)
Vendor trust / Mobile vendor	(Piao et al., 2012)	(Salo & Karjaluoto, 2007)
Mobile technology	(Piao et al., 2012)	

Factor	M-commerce literature	E-commerce literature
Calculative trust		(Gefen et al., 2003)
Third-party		(Cheung & Lee, 2000; Salo & Karjaluoto, 2007)
Web design/quality/ Perceived site quality	(Li & Li, 2008; Piao et al., 2012)	(Corbitt et al., 2003; Cyr, 2008; Kong & Hung, 2006)
Hofstede's cultural dimensions / Culture		(Doney, Cannon, & Mullen, 1998; Salo & Karjaluoto, 2007)
Perception of risk	(Hollingsworth & Dembla, 2013)	(Lee, Lee, & Kim, 2007; Salo & Karjaluoto, 2007)
Past experience / User web experience		(Corbitt et al., 2003; Pavlou, 2003; Salo & Karjaluoto, 2007)
Service Provider Trust		(Salam, Iyer, Palvia, & Singh, 2005; Salo & Karjaluoto, 2007)
Perceived market orientation		(Corbitt et al., 2003)
Perceived technical trustworthiness		(Corbitt et al., 2003)
Perceived Usefulness	(Guangming & Yuzhong, 2011)	(Koufaris & Hampton-Sosa, 2004)
Perceived Ease of Use		(Koufaris & Hampton-Sosa, 2004)
Perceived Willingness to Customise/Willingness to explore the site		(Koufaris & Hampton-Sosa, 2004; McKnight et al., 2004)
Logistics	(Piao et al., 2012)	
Social network services	(Piao et al., 2012)	
Related groups	(Guangming & Yuzhong, 2011)	

2.4.2. Trust in mobile payment

Trust is essential to any economic activity (Coyle, 2013). A lack of trust has been found as a significant barrier to conducting any m-commerce activity (Chen & Dhillon, 2003; Joubert & Belle, 2009). As a result, trust is likely to play an important role in intention to adopt m-payment in any context and in continuing to use m-payment, and therefore, has received the attention of researchers. There are a number of studies found in the literature that involve trust in the adoption of m-payment.

TAM and UTAUT have both been widely used as a theoretical basis in research on trust in m-payment adoption from individual and customer perspectives. Zhou (2011) adopted TAM and DOI theory to investigate the effect of initial trust on user adoption of m-payment, in China. The study found a significant effect of perceived ubiquity, security and ease of use on initial trust which positively influenced m-payment usage intention. When researching drivers of the willingness to use m-payment in Israel, Andreev et al. (2012) extended the TAM and included the DOI theory, and found a direct and significant impact of vendor trust, and a non-significant impact of mechanism trust on the willingness to use m-payment. Similarly, based on TAM and DOI theory, Liu (2012) collected data from 200 university students in Jiangsu, China to test consumers' intention to use m-payment services. The outcome indicated that trust is one of the most important variables affecting intention to adopt m-payment. Mingxing, Jing, and Yafang

(2014) refined factors from TAM to analyse the effect of customers' perceived risk and trust in m-payment adoption and the impact of three types of trust including trust in mobile operators, application service providers, and financial organisations on m-payment adoption. All of these factors were found to have an effect on trust in m-payment adoption.

Yan and Yang (2014) used TAM2 to empirically examine user adoption of m-payment in China and recognised the vital effect of perceived ease of use, perceived usefulness, structural assurance, and ubiquity on trust, and the impact of trust on m-payment adoption. Phonthanakitithaworn, Sellitto, and Fong (2015) extended TAM to test user intentions to adopt m-payment services in Thailand and found that perceived trust had a significant influence on behavioural intention. A study conducted by Slade, Williams, Dwivedi, and Piercy (2015) was underpinned by UTAUT2. Based on data from the UK, they discovered that trust was an important predictor for the intention to adopt m-payment. Based on UTAUT and TAM, Qasim and Abu-Shanab (2016) examined the impact of network externalities, such as performance and effort expectancy (EE), SI, and trust on m-payment acceptance in Jordan. Except for EE, the important role of the other above drivers was proven. Gao and Waechter (2017) integrated TAM, UTAUT, DOI theory and the valence framework by Peter and Tarpey (1975) (which is a customer decision-making model examining customer behaviour) and argued that a lack of trust was the most significant long-term inhibitor for

acceptance and success of m-payment. Then they examined the role of initial trust on perceived benefit and convenience, which in turn influenced intention to adopt m-payment. Gao and Waechter collected data from a sample in Australia and revealed that perceived system quality, information quality and service quality also positively and significantly influenced initial trust, which positively affected the intention to adopt m-payment.

Besides TAM and UTAUT, several studies have adopted other theories as a theoretical basis to investigate m-payment user acceptance involving trust. Based on the literature of the concern for information privacy and internet users' information privacy concerns, Huang and Liu (2012) investigated the effect of users' privacy concerns on the intention to adopt m-payment in China and found a significant impact of control, awareness and collection on trust and the intention to use m-payment. Lu et al. (2011) adopted the valence framework by Peter and Tarpey (1975) to develop a trust-based customer decision-making model and examined how trust interacted with both positive and negative factors. They found that initial m-payment trust had a significantly positive impact on behavioural intention and a significantly negative impact on perceived risk. Zhou (2013) used the information systems success (ISS) model (Delone & McLean, 2003) as a theoretical basis to identify the factors influencing continuance intention to adopt m-payment in China. He found a positive and significant effect of the system, information and service quality on trust which has an important

impact on the intention to adopt m-payment. Similarly, based on the ISS model, Zhou (2014) examined the determinants of m-payment usage in China. The results confirmed that system and information quality are significant antecedents for trust in m-payment, which in turn influences usage. Jia, Hall, and Zhu (2015) utilised a multi-stage decision-making model and initial trust-building theory to explore how trust is built into the learning process of customers in China, and the effect of trust on the intention to use m-payment. The results indicated that exposure to m-payment and information searching have a significant and positive impact on trust which positively influence individual behavioural intentions to adopt m-payment.

Table 5 presents an overview of factors that influence trust in m-payment adoption.

Table 5: Factors affecting trust in m-payment.

Factors affecting trust in m-payment	Attribute of relationship	Country	References
Ease of use	Positive	China	(Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011)
Perceived usefulness	Positive	China	(Yan & Pan, 2014; Yan & Yang, 2014)
Online payment trust	Positive	China	(Yan & Pan, 2014)
Ubiquity	Positive	China	(Yan & Yang, 2014; Zhou, 2011)
Perceived security	Positive	United Arab Emirates, China	(Shuhaiber, 2016; Zhou, 2011)

Factors affecting trust in m-payment	Attribute of relationship	Country	References
Perceived reputation of a mobile service provider	Positive	United Arab Emirates, New Zealand, Singapore	(Shuhaiber, 2016; Srivastava, Chandra, & Theng, 2010; Xin et al., 2015)
Perceived opportunism of mobile service provider	Positive	United Arab Emirates, New Zealand, Singapore	(Srivastava et al., 2010; Xin et al., 2015)
Perceived reputation of an m-payment vendor	Positive	United Arab Emirates, New Zealand	(Shuhaiber, 2016; Xin et al., 2015)
Culture variable (Uncertainty avoidance)	Negative	United Arab Emirates, New Zealand, Australia	(Gao & Waechter, 2017; Shuhaiber, 2016; Xin et al., 2015)
Personality variable (Disposition to trust/Propensity to trust)	Positive	United Arab Emirates, New Zealand	(Shuhaiber, 2016; Xin et al., 2015)
Perceived structural assurance	Positive	Singapore, New Zealand, China	(Srivastava et al., 2010; Xin et al., 2015; Yan & Pan, 2014; Yan & Yang, 2014)
Perceived environmental risk	Negative	United Arab Emirates, Singapore, New Zealand	(Shuhaiber, 2016; Srivastava et al., 2010; Xin et al., 2015)
Perceived system quality	Positive	Australia, China	(Gao & Waechter, 2017; Zhou, 2013, 2014)
Perceived information quality	Positive	Australia, China	(Gao & Waechter, 2017; Zhou, 2013, 2014)
Perceived service quality	Positive	Australia, China	(Gao & Waechter, 2017; Zhou, 2013, 2014)

Factors affecting trust in m-payment	Attribute of relationship	Country	References
Perceived asset specificity	Negative	Australia	(Gao & Waechter, 2017)
Perceived benevolence	Positive	Australia, United Arab Emirates	(Gao & Waechter, 2017; Shuhaiber, 2016)
Perceived ability	Positive	Australia, United Arab Emirates	(Gao & Waechter, 2017; Shuhaiber, 2016)
Perceived integrity	Positive	Australia, United Arab Emirates	(Gao & Waechter, 2017; Shuhaiber, 2016)
Awareness	Positive	United Arab Emirates	(Shuhaiber, 2016)
Design features suitability	Positive	United Arab Emirates	(Shuhaiber, 2016)

Although trust is usually researched theoretically in the literature on m-payment, it is often looked at as a part of m-payment adoption factors or an independent variable rather than being studied independently (Shuhaiber, 2016). As a result, there is a lack of research focusing on the determinants of CT in m-payment.

As can be seen in Table 5 above, there are only two studies by Shuhaiber (2016) and Xin et al. (2015) that have focused on the antecedents of CT in m-payment adoption. Shuhaiber (2016) conducted a study in the United Arab Emirates with both inexperienced and experienced consumers, which resulted in CT in the mobile payments model. Shuhaiber's model explained 44.8% of the variance of CT and included five groups of factors affecting m-payment CT in the United Arab Emirates. These are provider's characteristics including provider's reputation and provider's trustworthiness; customer's characteristics including

awareness, a propensity to trust, UA, past personal experience; environmental influences including trust environment, mobile devices' characteristics including the capability of mobile devices, design features suitability, security of the mobile devices; personal risks including security level and privacy risks. Xin et al. (2015) collected data in New Zealand and suggested a model of antecedents of initial trust in m-payment. This model explained 56% of the variance of CT and encompassed four groups of factors:

- Characteristics of the mobile service provider, including the perceived reputation of the mobile service provider and perceived opportunism of the mobile service provider,
- Characteristics of the m-payment provider including the perceived reputation of the m-payment vendor and perceived opportunism of the m-payment vendor,
- Characteristics of mobile technology including perceived structural assurance and perceived environmental risk,
- A cultural variable (UA),
- A personality variable (a disposition to trust).

Section 2.4 has presented the literature review on trust in m-payment and summarised which factors influence trust found in m-payment consumers. Based on this, the limitations of existing studies are discussed in the following section.

2.5. Limitations of existing studies on trust in mobile payment

The literature review on m-payment adoption shows that trust is empirically proven as a vital driver for m-payment adoption from an individual or consumer perspective. However, the existing research has largely investigated the influence of trust on consumer intention to adopt m-payment, while little attention has been paid to factors that can be utilised as determinants of trust (Nguyen et al., 2020; Patil et al., 2018; Shuhaiber, 2016). As a result, research on factors that can be employed as determinants for trust in m-payment adoption needed to be investigated further to achieve generalisability (Nguyen et al., 2020).

In addition, most of the studies that examined factors affecting trust were conducted in China (Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011, 2013, 2014), and the rest were conducted in the context of developed countries, such as New Zealand (Xin et al., 2015), Singapore (Srivastava et al., 2010), Australia (Gao & Waechter, 2017), and the United Arab Emirates (Shuhaiber, 2016). Although China is classified as a developing country with an upper middle income (WorldBank, 2018), it is completely different from other developing countries. This is because China is an emerging country that ranks as the second-largest economy in the world (Forbes, 2018b). China has an enormous influence on the global economy due to its huge trade surplus, stock market and foreign capital (Forbes, 2018a). In terms of e-commerce or m-commerce, China is

recognised as “the fastest-growing and largest e-commerce market in the world” (Asialinkbusiness, 2018). According to Forrester, China’s online retail market is expected to increase at 8.5% annually, and it is forecasted to reach \$1.8 trillion in 2022, which will be double the US market, and ten times bigger than Japan (Long, 2018). Along with this, m-payment is widely used and has experienced dramatic growth in China, in recent times. While 96% of payments were made via cash in 2012, and m-payment had just started to be developed in 2014, in 2018 85.2% of payments were processed by m-payment (Saarinen, 2018). According to the forecast of eMarketer, 79.3% of smartphone users in China will frequently use m-payment by 2021, while the corresponding number for the US may be 23%, and 15% for Germany (Shen, 2018). There are two popular applications, namely AliPay and WeChat Pay for Chinese consumers, which are supported by the Chinese government due to the purpose of collecting data that prioritises control (Cheng, 2018). China seems to be heading forward to a cashless era. Staff in shops usually ask customers to pay for their goods by using Alipay or WeChat Pay, instead of asking for cash or credit cards. There is a story that even street beggars request mobile donations rather than cash (Cheng, 2018). Undoubtedly, China leads the world in m-payment due to the fastest rate of m-payment adoption by Chinese consumers, the large size of the Chinese e-commerce market, the digital infrastructure support from the Chinese government as well as the enormous Chinese technology corporations, such as Alibaba which drive dramatic adoption rates (Rosa-Bohrer, 2018).

As a result, the context of m-payment adoption in China which is a distinctive developing country is completely different from the remaining developing countries, especially ones that have low incomes or lower-middle incomes, such as Vietnam (WorldBank, 2019a). Many authors have highlighted that different research contexts can make a key distinction between studies (Sellers, 2014; Tennant, 2017). In particular, in the area of m-payment, developed countries or China usually adopt m-payment faster and more easily than developing countries because they have better technological infrastructure along with the evidenced popularity of e-payment methods like credit or debit cards (Matthews, 2016; Talbot, 2015). Consequently, factors influencing trust in m-payment adoption that have been found in a few developed countries, and a distinctive developing country as China cannot necessarily be fully applied to the cases of the remaining developing countries. Obviously, a lack of research in developing countries calls for a study on the identification of the determinants of CT in m-payment in the context of a developing country like Vietnam.

Another limitation of existing research on trust as a determinant in the intention to use m-payment is the lack of investigation on the moderating variables between trust and intention to adopt m-payment. Undoubtedly, the role of moderating variables should be considered to have a comprehensive understanding of the impact of trust on customer intention to adopt m-payment. A moderating variable plays an important role in psychological or behavioural research because it affects

the relationship between an independent variable and a dependent variable. In other words, a moderator can enhance or reduce the magnitude of the relationship between a predictor and an outcome (Baron & Kenny, 1986; Lani, 2018).

Culture is defined as the “collective programming of the mind which distinguishes the members of one group or category of people from those of another” (Hofstede, 1993, p. 4). Culture is considered as one of the most important factors for justifying and describing the causes for a distinction of customers’ behaviour (Xu-Priour, Truong, & Klink, 2014). Many studies have been conducted to examine the moderating impact of Hofstede’s cultural dimensions on the intention of consumers to adopt a system or technology. For example, a study by Cheung and Chang (2009) revealed the significant and moderating influence of culture regarding the association of perceived risk, social exchange, information content and trust in online shopping. Similarly, Carmen, Dolores, and Castañeda (2012) found an important moderating impact of culture on the relationship between service quality and customers’ satisfaction in online purchase behaviour. Zhang, Zhu, and Liu (2012) also confirmed the moderating effect of culture on m-commerce adoption. Zendehdel, Paim, and Delafrooz (2016) analysed the factors influencing Malaysian students’ online shopping attitude and recognised a significant moderating effect of culture on the impact of subjective norms on attitudes. Baptista and Oliveira (2015) conducted research in Mozambique and found the significant moderating impact of cultural variables

including individualism, UA, long/short term orientation and PD on the relationship between behavioural intention and use behaviour of customers in mobile banking adoption. Yoon (2009) collected customer data in China about e-commerce acceptance and recognised the significant moderating effect of PD, individualism, LO, and UA on the impact of trust on the intention to use e-commerce, and MA on the relationship between perceived ease of use, perceived usefulness and the intention to use e-commerce.

However, examining the moderating role of culture between trust and the intention to adopt m-payment and usage of m-payment has not yet been addressed (Nguyen et al., 2020). As a result, an investigation on the moderating impact of culture on the relationship between trust and consumers' intention to adopt m-payment was necessary and significant (Nguyen et al., 2020).

Finally, trust is considered a complex concept; thus, it should be adopted as a multidimensional, multidisciplinary or multifaceted phenomenon (Chen & Dhillon, 2003; Hillman & Neustaedter, 2017; Jimenez et al., 2016; McKnight et al., 2002; Meng et al., 2008; Yan, Niemi, Dong, & Yu, 2008). However, this literature review revealed that most of the existing research on trust in m-payment adoption, has adopted trust as a single construct. Researchers have claimed that exploring different types of trust in m-commerce can help to achieve a better understanding of CT, which has a significant impact on understanding and prediction of consumer adoption (Meng et al., 2008; Min et al., 2008; Nguyen et

al., 2020). As a consequence, research on trust in m-payment adoption and usage needed to identify the different types of trust which are suitable to the context of m-payment adoption and usage (Nguyen et al., 2020). This was beneficial to achieving a comprehensive understanding of the concept of trust in the context of m-payment adoption and usage, such as, understanding the relationship between each type of trust and its antecedents, or to what extent each aspect of trust impacts on continuance intention to use m-payment.

2.6. Theories in technology adoption

Technology adoption is a common research topic in the information systems area. Many papers have been published to study user acceptance as well as adoption. This section presents an overview of some of the most influential theories in technology adoption.

Technology Acceptance Model (TAM) was proposed by Davis (1986) and published in 1989 in MIS Quarterly. Since then, TAM has been widely adopted in research on technology adoption as well as acceptance and has become one of the most influential models in the information systems field with thousands of studies conducted to test it (Chen, Shing-Han, & Chien-Yi, 2011), and over 45,000 citations in Google Scholar in 2019. TAM includes two primary determinants which are perceived usefulness and perceived ease of use. Perceived usefulness is defined as “the degree to which an individual believes that using a particular system would enhance his or her job performance” (Davis, 1986, p.

26). Figure 11 describes the factors important to ascertaining technology adoption. Perceived ease of use is defined as “the degree to which an individual believes that using a particular system would be free of physical and mental effort” (Davis, 1986, p. 26). While perceived ease of use positively affects perceived usefulness, both factors have positive impacts on attitudes towards using an information system. Perceived usefulness and attitude have further positive effects on behavioural intention to use an information system which positively influence actual system use of the information system by users. In addition, both perceived usefulness and perceived ease of use are affected by external variables.

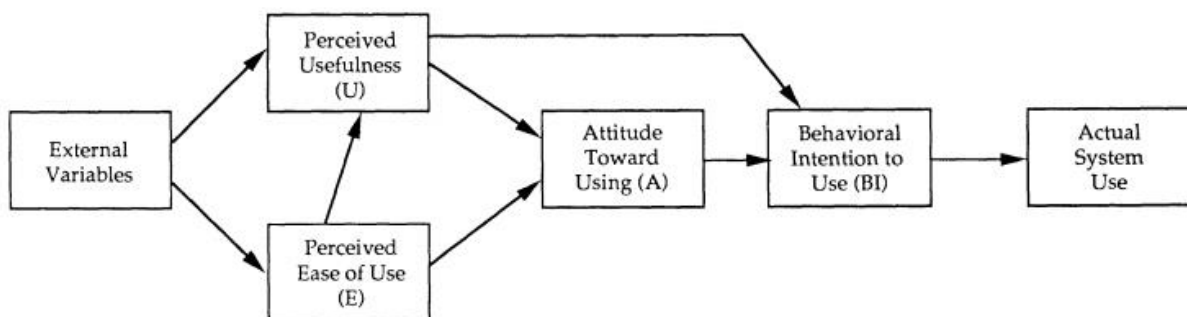


Figure 11: The technology acceptance model (Davis et al., 1989, p. 985).

Although TAM was developed based on the TRA, TAM is different from TRA regarding its content and application of scope. In terms of content, the TAM does not include subjective norms as a critical determinant as TRA. Instead, TAM introduces two new factors which are perceived usefulness and perceived ease of use which can be used for predicting attitudes towards using an information

system. Regarding the scope, TAM is more relevant to the information systems area because it was developed specifically for the prediction of user acceptance of information systems. Figure 12 illustrates the extension to the standard model.

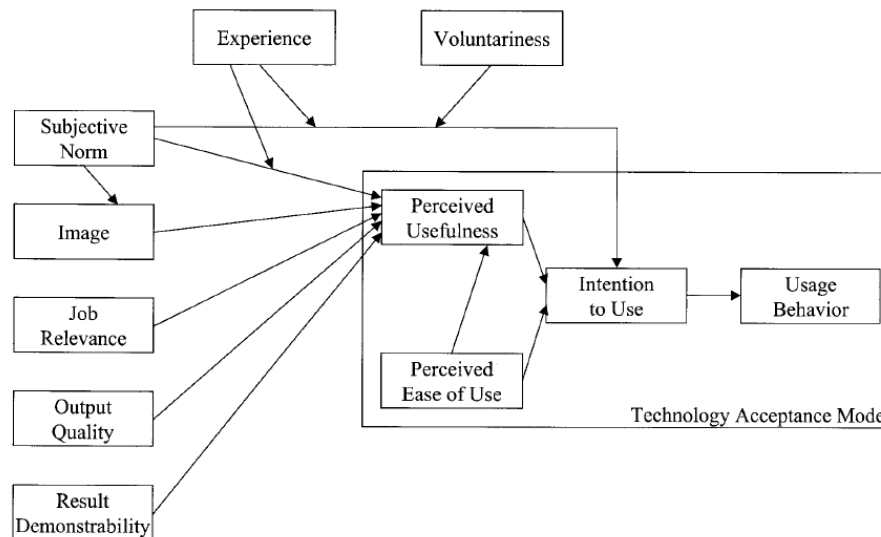


Figure 12: Technology acceptance model 2 (TAM2) (Venkatesh & Davis, 2000, p. 188).

TAM was extended to become TAM2 by Venkatesh and Davis (2000). TAM2 has more external variables influencing perceived usefulness, which are subjective norms, image, job relevance, output quality, and result demonstrability along with the moderating impacts of experience and voluntariness. Venkatesh and Davis (2000) collected data from four organisations and confirmed the significant impact of these external variables on perceived usefulness.

Both TAM and TAM2 are recognised as the most common and influential models for predicting the adoption of technology (Alam & Ahangari, 2016; Liébana-Cabanillas, Marinković, & Kalinić, 2017; Mather, Caputi, & Jayasuriya, 2002; Mugo, Njagi, Chemwei, & Motanya, 2017) because they are well-established,

clear and robust models for forecasting individual acceptance (Zhang et al., 2012). TAM has been widely adopted to predict users' behaviour with new systems or technologies in various information systems fields such as information science, e-government, learning management systems, wireless, e-commerce, internet banking, mobile banking, mobile learning application, and m-payment (Mugo et al., 2017). However, TAM has also been criticised for being incomplete (Brown & Venkatesh, 2005; Davis, 1989; Liébana-Cabanillas et al., 2017; Lu, Yao, & Yu, 2005), many have suggested that it needs to be complemented with more constructs to explain and forecast consumer intention and behaviour (Chong, Liu, Luo, & Keng-Boon, 2015; Liébana-Cabanillas et al., 2017; Tsu Wei, Marthandan, Yee-Loong Chong, Ooi, & Arumugam, 2009; Wu & Wang, 2005). It has been claimed that TAM would achieve a better power of prediction and explanation if it is tested and integrated with more constructs in other technology acceptance situations (Legris, Ingham, & Colletette, 2003; Serenko, 2008).

The Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated and proposed by Venkatesh, Morris, Davis, and Davis (2003) based on the unification of eight prominent models which are TRA, TAM, the motivational model, the theory of planned behaviour (TPB), a model combining TAM and TPB, the model of PC utilisation, DOI theory, and social cognitive theory. Venkatesh et al. (2003) collected data from four organisations to explain the impact of the eight models on user intention to adopt a new system or

technology. They then used this data to test a proposed model namely UTAUT2 (Figure 13). The confirmation phase for the UTAUT2 was conducted in two new organisations, resulting in the significant effect of four drivers including PE, EE, SI, and facilitating conditions (FC) on behavioural intention, along with the moderating impact of gender, age, experience, and voluntariness of use on the relationship between drivers and intention. The UTAUT2 has frequently been adopted in research on the intention to adopt new technology, such as e-commerce, m-commerce, and m-payment due to its ability to predict intention and usage, and thereby help organisations or managers to evaluate the likelihood of success when implementing a new system or technology (Hongxia et al., 2011; Park, Yang, & Lehto, 2007; Venkatesh et al., 2003).

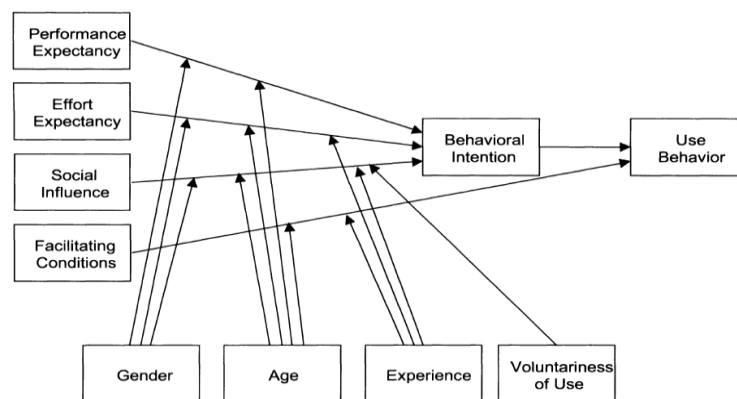


Figure 13: The unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003, p. 447).

Venkatesh, Thong, and Xu (2012) extended UTAUT to become UTAUT2 which is depicted in Figure 14, to research acceptance and intention to use in a consumer or individual context. They added three constructs: hedonic motivation (HM),

price value (PV), and habit (HB) to UTAUT2, where the individual differences including age, gender, and experience acted as moderators for the impact of drivers on behavioural intention. Then, analysing data collected from two online surveys, they showed that UTAUT2 provided a more significant explanation of behavioural intention than UTAUT (Venkatesh et al., 2012). Qasim and Abu-Shanab (2016) highlighted that UTAUT is beneficial to researchers due to its ability to cover most variables necessary to study technology acceptance or behavioural intention to adopt a new system. Nonetheless, similar to TAM and TAM2, when applying UTAUT, researchers need to consider or carefully extend it with suitable constructs to fit the context of the study (Attuquayefio & Addo, 2014; Cheng, Yu, Huang, Yu, & Yu, 2011).

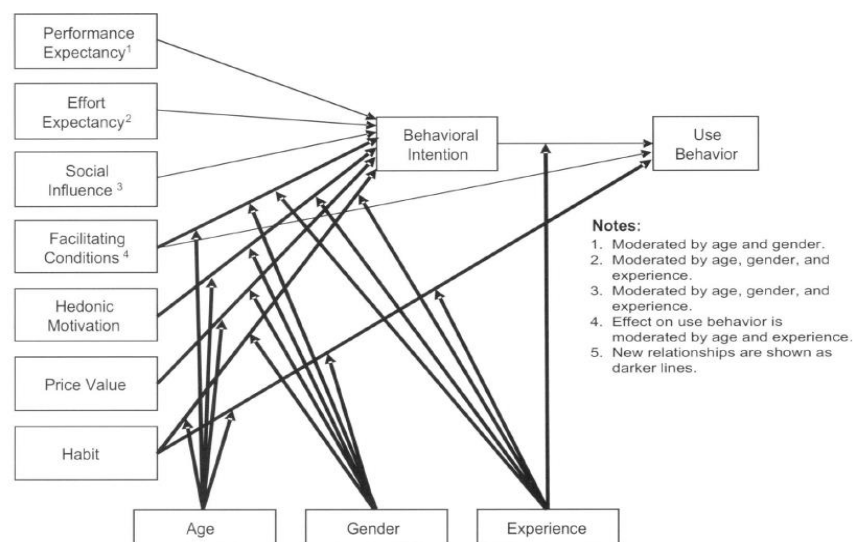


Figure 14: The extended unified theory of acceptance and use of technology (UTAUT2)
(Venkatesh et al., 2012, p. 160).

2.7. Information Systems Continuance Intention Research

This section presents the literature of IS continuance intention. In the area of technology adoption, there are two stages of acceptance from users or consumers which are initial and continued intention/adoption. While the former plays an essential beginning role in the successful implementation of an IS, the long-term success of an IS actually relies on the latter because initial adoption does not guarantee that users or consumers will continue to use it. As result, IS continued intention or continuance intention at the individual level has received attention from researchers. Based on expectation-confirmation theory (ECT) (Oliver, 1980) which has been broadly adopted by researchers to study behaviour of consumers in many fields such as satisfaction, post-purchase (e.g. repurchase, reuse), and service marketing, the Information Systems Continuance Model (ISCM) proposed by Bhattacharjee (2001) is a solid theoretical foundation that has been used the most in research on IS continuance intention (Nabavi, Taghavi-Fard, Hanafizadeh, & Taghva, 2016). ISCM posits that IS continuance intention is determined by perceived usefulness and satisfaction, while perceived usefulness and confirmation of expectations from prior use have a positive impact on satisfaction, and confirmation also positively influence perceived usefulness (Figure 15). Many studies has applied ISCM to examine the post-adoption behaviour of various technologies (Nabavi et al., 2016; Oghuma, Libaque-Saenz, Wong, & Chang, 2016; Yuan, Liu, Yao, & Liu, 2016), and also in the context of mobile technologies adoption with results showing its effectiveness in predicting

continuance usage (Chong, 2013; Luqman, Razak, & Ismail, 2014). However, researchers has also criticised that ISCM includes only one aspect of post-usage belief which is perceived usefulness, and neglects other vital constructs influencing consumer behaviour (Luqman et al., 2014).

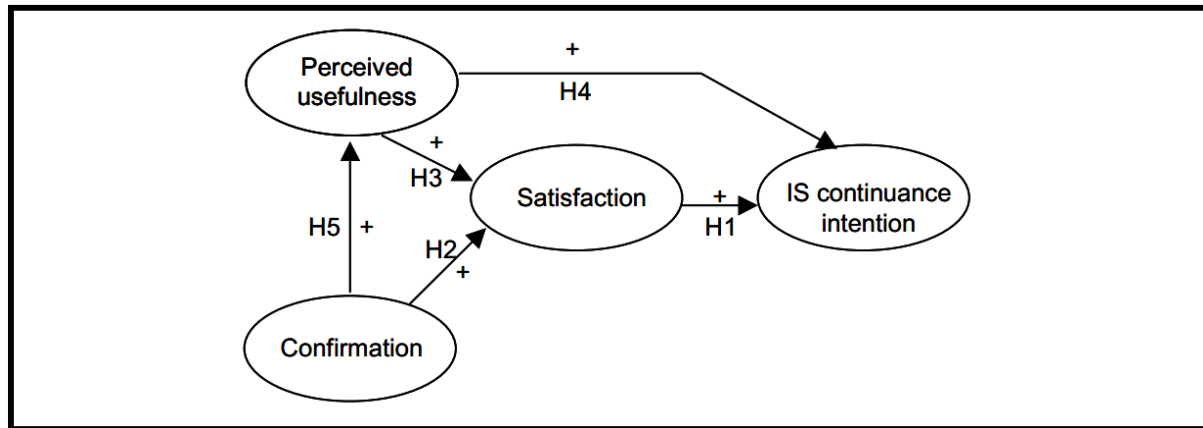


Figure 15: IS Continuance Model (ISCM)

Besides ISCM, researchers have investigated continuance adoption as an extension to other traditional adoption models such as TBP, TAM, UTAUT, and the IS Success model (Nabavi et al., 2016). Extension models commonly use the same variables in the adoption models to model IS continuance, however they replaced the intention construct with continuance intention which aim to represent the post adoption context (Chiu & Wang, 2008; Chiu, Chiu, & Chang, 2007; Wu & Zhang, 2014).

2.8. Hofstede's cultural framework/culture in technology adoption research

In the field of adopting new technology or system, culture plays an important role because it can cause differences in customers' behaviour, in particular, it can significantly influence the purchase intentions of consumers (Xu-Priour et al., 2014). Hofstede analysed the characteristics of culture around the world and suggested five dimensions of national culture. These are Power Distance (PD), Collectivism (CO), Uncertainty Avoidance (UA), Masculinity (MA), and Long term Orientation (LO) (Hofstede-insights, 2018b).

The PD dimension is defined as “the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally” (Hofstede, 2001, p. 98). This dimension manifests the inequality between superiors and subordinates; thus, countries with a high PD index may accept hierarchy in organisations or institutions more easily.

“Individualism stands for a society in which the ties between individuals are loose: Everyone is expected to look after him/herself and her/his immediate family only. Collectivism stands for a society in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty” (Hofstede, 2001, p. 225). In other words, CO “represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a

particular ingroup to look after them in exchange for unquestioning loyalty” (Hofstede-insights 2018). This dimension evaluates how individuals in society consider the benefits of themselves and their groups/organisations. While citizens with a high individualism index are more likely to care about themselves and their own benefits, people with a low individualism index tend to put the group/organisation ahead of their own interests (Wu, 2006).

“Masculinity stands for a society in which social gender roles are clearly distinct: Men are supposed to be assertive, tough, and focused on material success; women are supposed to be more modest, tender, and concerned with the quality of life. Femininity stands for a society in which social gender roles overlap: Both men and women are supposed to be modest, tender, and concerned with the quality of life” (Hofstede, 2001, p. 297). The MA dimension manifests in the way gender roles are played out in leadership (Wu, 2006). MA represents a society’s preference for success, achievement, heroism, assertiveness, and material rewards (Hofstede-insights 2018). Societies with a high MA score are predicted to be more competitive, while societies with a high femininity index tend to be more consensus-oriented.

“Long term orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift. Its opposite pole, short term orientation, stands for the fostering of virtues related to the past and present, in particular, respect for tradition, preservation of ‘face’ and fulfilling social

obligation” (Hofstede, 2001, p. 359). Long term orientation refers to the extent to “link with the culture’s own past while dealing with the challenges of the present and the future” (Hofstede-insights 2018). The LO dimension was renamed from the dimension previously called Confucian work dynamic (Wu, 2006). Societies with a low score in long-term orientation tend to maintain traditions, whereas ones with high scores are more likely to prefer a pragmatic approach and they encourage thrift, persistence and a sense of shame when preparing for the future.

The UA dimension is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede, 2001, p. 161). The way that UA manifests is how a society deals with the fact that the future can be ambiguous, i.e. how members in society answer the question: “should we try to control the future or just let it happen?” (Hofstede-insights 2018). This dimension represents the citizens’ tolerance of ambiguity. Societies with a high UA index tend to have more written rules to reduce ambiguity, while societies with a low UA index have fewer written rules (Wu, 2006).

Since its appearance, Hofstede’s cultural framework has been widely accepted and adopted in research on cultural, as well as, intercultural studies (Eringa, Caudron, Rieck, Xie, & Gerhardt, 2015). In the area of information systems adoption, Hofstede’s cultural framework has been frequently used. Many authors have used the framework to compare technology adoption by citizens between different countries (Carter & Weerakkody, 2008; Erumban & De Jong, 2006;

Hwang, 2005; Im, Hong, & Kang, 2011; Straub, Keil, & Brenner, 1997; Wu, 2006). In contrast, some authors have adopted Hofstede's cultural dimensions to examine the impact of national culture on technology adoption by citizens of a country (Baptista & Oliveira, 2015; Yoon, 2009).

2.9. Summary

This chapter presented the concepts involved with the research topic which is trust in m-payment adoption. A comprehensive literature review of m-commerce, m-payment, and trust in such areas was conducted to recognise some important gaps from previous studies which are a lack of research on antecedents for CT in m-payment adoption in general (and in developing countries in particular), a lack of differentiated trust types, and researchers not investigating the moderating impact of culture in m-payment adoption. Then, the related concepts of technology adoption theories and Hofstede's cultural framework were presented. The next chapter presents and discusses the proposed model for investigating the determinants of CT in m-payment.

Chapter 3: Model development

This chapter presents the rationale for this study which was based on several issues and important gaps that were discussed in Chapter 2. Then, it presents the research questions and the theoretical background. Finally, it covers the proposed model with a justification of the theoretical hypotheses and their relevance to the context of m-payment.

3.1. Rationale for this study

This study was motivated by a number of issues and important gaps which were discussed in Section 2.6 of the previous chapter. They are:

- The importance of m-payment as the newest form of payment in modern society (Kolaki, 2017). M-payment is a major part of the future of payment methods because of its growth. It also contributes to bringing societies towards a cashless world (MerchantSavvy, 2019).
- The significance of trust as a vital driver to m-payment adoption has been empirically proven in the literature (Andreev et al., 2012; Gao & Waechter, 2017; Huang & Liu, 2012; Jia et al., 2015; Liu, 2012; Lu et al., 2011; Phonthanakitithaworn et al., 2015; Qasim & Abu-Shanab, 2016; Slade, Dwivedi, Piercy, & Williams, 2015; Xin et al., 2015; Zhou, 2011, 2013, 2014).

- Research had not yet emerged in empirical literature, at the onset of this research investigation that explored the determinants of CT in m-payments in developing countries (Nguyen et al., 2020; Patil et al., 2018; Shuhaiber, 2016).
- At the beginning of this research study, the empirical literature review did not reveal any studies that investigated the moderating impact of culture on the relationship between trust and m-payment adoption, in developing nations (Nguyen et al., 2020).
- Most previous studies on m-payment trust adopted trust as a single construct; however, trust is considered a complex phenomenon with a multidisciplinary and multifaceted concept (Jimenez et al., 2016; McKnight et al., 2002; Meng et al., 2008). Exploring different types of trust in m-commerce can achieve a better understanding of CT, leading to a significant improvement in understanding and predicting consumer adoption (Meng et al., 2008; Nguyen et al., 2020). Therefore, research on trust in m-payment adoption needs to adopt different types of trust (Nguyen et al., 2020).
- A lack of investigating of trust's determinants in the context of m-payment continuance intention. Previous models in the literature including Shuhaiber (2016) collected data from both inexperienced and experienced consumers while Xin et al. (2015) investigated initial trust.

3.2. Research questions

The main objectives of this study were to investigate the determinants of CT and its effects on the intention to continue using m-payment, and the moderating impact of culture on the relationship between trust and m-payment adoption. In addition, differently from previous studies, this study focused on experienced consumers and continuance intention rather initial intention or mixed consumers.

More specifically, it aimed to answer the following research questions:

- RQ1: What are the determinants of consumer trust for m-payment continuance intention in Vietnam?
- RQ2: What is the influence of consumer trust on intention to continue the use of m-payment in Vietnam?
- RQ3: To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment in Vietnam?

3.3. Theoretical frameworks

As discussed in the previous chapter, although ISCM has been widely used in research on IS continuance intention, it has been criticised as lacking consideration of important factors in technology adoption except for perceived usefulness. Chong (2013) criticised that there are only three factors used in ISCM including satisfaction, confirmation and postadoption expectations, leading to a need to integrate other models with ISCM such as TAM in studying m-commerce

continuance intention. Kim (2010) also found that an integrated model of ISCM and TPB is able to explain better mobile data service continuance than either model itself. Lee (2010) synthesised ISCM, TAM and TPB to explain and predict e-learning continuance intention of consumers. Hung, Yang, and Hsieh (2012) added trust into ISCM and identified that trust can help to overcome the deficiency of ISCM and predict mobile shopping continuance better than initial ISCM. Hsiao and Chang (2014) extended ISCM with perceived value of mobile ads and perceived trust in advertiser to investigate consumers' continuance intention towards mobile advertising. Many previous authors agreed that the limitation of ISCM is that it ignores many important determinants (Luqman et al., 2014). The target of this thesis is investigating the determinants of trust, thus the applied theoretical background needs to include necessary and important factors involved m-payment adoption as possible. As a result, ISCM may be not relevant to use as a theoretical framework in this thesis.

UTAUT2 was formulated based on the unification of eight prominent models that predict technology acceptance or adoption. These are TRA, TAM, the motivational model, TPB, the combined TAM and TPB, the model of PC utilisation, DOI theory, and social cognitive theory (Venkatesh et al., 2003; Venkatesh et al., 2012). Thus, UTAUT2 covers most of the variables necessary to study technology acceptance or the intention to adopt a new system (Qasim & Abu-Shanab, 2016). In addition, after collecting data for six months from four

organisations, the analysis outcome revealed that UTAUT2 has an adjusted R^2 of 69%, which outperformed each of the eight previous models (Venkatesh et al., 2003). Since its appearance, UTAUT/UTAUT2 has been widely and successfully adopted as a theoretical lens in a large number of studies on technology adoption or acceptance (Williams, Rana, & Dwivedi, 2015). Consequently, this study adopted UTAUT2 as its theoretical background.

Additionally, Hofstede's framework on culture was employed to hypothesise the moderating role of cultural variables between trust and m-payment adoption. As described in Chapter 2, Hofstede analysed the characteristics of culture around the world and suggested five (later six) dimensions of national culture. The original five were individualism/collectivism, uncertainty avoidance, long/short term orientation, masculinity/femininity, power distance and the sixth at a later stage indulgence/restraint. Hofstede's cultural framework has been widely adopted in technology adoption as well as acceptance. Many authors have recognised the significant impact of it in investigating technology adoption of consumers (Baptista & Oliveira, 2015; Carmen et al., 2012; Yoon, 2009; Zendehdel et al., 2016; Zhang et al., 2012). Thus, this study used the original five cultural variables from Hofstede's cultural framework to examine the impact of these on CT in m-payment at an individual level.

In addition, m-payment is considered as a subset or as an accelerator of payment methods for e-commerce as well as m-commerce (Kumar, 2013). Therefore, a

comprehensive review of related literature regarding e-commerce, m-commerce, mobile banking, and m-payment was conducted to support the background and hypotheses of this study.

3.4. Development of the research model and hypotheses

From the comprehensive review of related literature, the researcher identified three groups of determinants for trust including acceptance factors based on the UTAUT2, cultural factors based on Hofstede's cultural dimensions, and the different types of trust found in the literature.

3.4.1. Acceptance trust factors

The first group in the model are the acceptance factors which are necessary for the acceptance of new technology like—m-payment—by consumers. This study argues that research on trust's determinants found in m-payment consumers needs to take acceptance factors into account. This is because consumers build their trust through the process by which they choose to accept m-payment, i.e. consumers need to have some reasonable level of trust in m-payment to commence using it. In developing countries like Vietnam, citizens do not have a habit of using digital payment systems and modern technological infrastructure like citizens in developed countries do (Matthews, 2016; Talbot, 2015). As result, acceptance factors of m-payment technology are even more important in research on trust's determinants in m-payment consumers from developing countries. In the conceptual model, such factors were named as acceptance trust factors to

avoid confusion and to highlight the role of these factors. Furthermore, determinants of trust in m-payment consumers were used rather than determinants of m-payment adoption for brevity. These acceptance factors were chosen from UTAUT2 because of their suitability with the area of m-payment and based on the evidence from the related literature. They are explained in greater detail below.

Performance expectancy

Performance expectancy “is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447). Performance expectancy was conceptualised from perceived usefulness found in TAM/TAM2 (Davis, 1986; Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000), extrinsic motivation (Davis, Bagozzi, & Warshaw, 1992), job-fit (Thompson, Higgins, & Howell, 1991), relative advantage (Moore & Benbasat, 1991), and outcome expectations (Compeau, Higgins, & Huff, 1999; Compeau & Higgins, 1995). Perceived usefulness is a key construct in TAM/TAM2, and it has been frequently adopted in research on technology or system adoption (Mingxing et al., 2014). In the context of this study, PE was adapted to mean the extent to which a consumer believes that using m-payment would enhance his or her payment performance.

The significant impact of perceived usefulness/performance expectancy on consumers’ trust has been proven through many studies in e-commerce, m-

commerce, and m-payment adoption (Li & Yeh, 2010; Lin, Wang, Wang, & Lu, 2014; Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011). Li and Yeh (2010) collected data in Taiwan to examine the impact of usefulness on CT in m-commerce. Lin et al. (2014) recognised the significant effect of perceived usefulness on satisfaction which significantly influenced post-use trust of m-commerce users in China. When examining user adoption m-payment, Yan and Yang (2014) identified the important impact of perceived usefulness on user trust in China. Yan and Pan (2014) adopted TAM to study a trust transfer in user adoption of m-payment in China and found a significant effect of perceived usefulness on trust. Zhou (2011) recognised the important effect of initial trust on the perceived usefulness of m-payment users in China. As a result, this study argues that if consumers perceive the usefulness or the enhanced performance of m-payment, they may be more likely to trust it. This leads to the following hypothesis:

- *H1: Performance expectancy positively influences consumer trust in m-payment.*

Effort expectancy

Effort expectancy “is defined as the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450). Effort expectancy was conceptualised from perceived ease of use in TAM/TAM2 (Davis, 1986; Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000), complexity (Thompson et al., 1991), and

ease of use (Moore & Benbasat, 1991). Perceived ease of use is another crucial factor in technology adoption, which has been widely employed in research on technology adoption (Mingxing et al., 2014). In the context of m-payment, EE refers to the extent to which consumers find it easy to adopt m-payment. Several studies in e-commerce, m-commerce and m-payment have found that perceived ease of use/effort expectancy has a significant impact on CT (Li & Yeh, 2010; Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011). A study conducted by Li and Yeh (2010) recognised the important effect of ease of use on trust in m-commerce customers from Taiwan. Yan and Yang (2014) identified the important impact of perceived ease of use on trust when they examined m-payment adoption amongst Chinese consumers. Similarly, Yan and Pan (2014) used TAM for their research on user adoption of m-payment in China which revealed the vital effect of perceived ease of use on trust. Zhou (2011) confirmed that perceived ease of use has a significant effect on m-payment CT in China.

An easy-to-use m-payment application may reflect the ability and reliability of an m-payment application. As a result, this study argues that EE has a significant impact on m-payment CT. This leads to the following hypothesis:

- *H2: Effort expectancy positively influences consumer trust in m-payment.*

Social influence

Social influence is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al.,

2003, p. 451). Social influence plays an important role as a direct determinant of intention to adopt new technology and behaves in the form of a subjective norm (Ajzen, 1991; Davis et al., 1989; Fishbein & Ajzen, 1977; Mathieson, 1991; Taylor & Todd, 1995), social factors (Thompson et al., 1991), and image (Moore & Benbasat, 1991). Subjective norms refer to “the person's perception that most people who are important to him think he should or should not perform the behaviour in question” (Fishbein & Ajzen, 1977, p. 302). Although they have different names, basically these constructs convey the notion that an individual's perception of society's expectations influences his or her behaviour. Social influence has been commonly used in research on technology adoption due to its relevant concept to explain behaviour (Hwang, Al-Arabi, & Shin, 2016; Venkatesh & Morris, 2000).

Regarding the trust concept, a study by Malaquias and Hwang (2016) conducted in Brazil – a developing country, found a significant impact of SI on CT in mobile banking services. Montazemi and Qahri-Saremi (2015) also recognised the contribution of SI to the reduction of uncertainty in online banking for customers. As a consequence, there may be a trust transference in the context of m-payment, in which consumers may trust m-payment because it is important to them. In other words, if a person perceives that important people with him/her trust m-payment applications and want him to use these, he/she is likely to generally trust m-

payment. As a result, this study argues that SI has a significant impact on CT in m-payment. This leads to the hypothesis:

- *H3. Social influence positively influences consumer trust in m-payment.*

Hedonic motivation

Hedonic motivation “is defined as the fun or pleasure derived from using a technology” (Venkatesh et al., 2012, p. 161) and is conceptualised as perceived enjoyment in information systems research. Hwang and Kim (2007) found a significant impact of enjoyment on trust in e-commerce acceptance. A study conducted by Rouibah, Lowry, and Hwang (2016) recognised the positive and significant effect of perceived enjoyment on CT in the intention to use online payment systems in Kuwait. Bilgihan (2016) found a positive and significant impact of hedonic features on customer trust and loyalty in online shopping. Lee, Khong, and Hong (2014) identified the influence of shopping enjoyment on CT regarding purchase intention on social commerce sites. Consequently, the authors argued that if consumers feel hedonic when using m-payment, they may be more likely to trust m-payment. This leads to the following hypothesis:

H4: Hedonic motivation positively influences consumer trust in m-payment.

Habit

Habit “is a perceptual construct that reflects the results of prior experiences” (Venkatesh et al., 2012, p. 161). Habit is a significant predictor for the use of any

technology in the future (Venkatesh et al., 2012). Obviously, if consumers choose to use m-payment for a period of time, they may be more likely to trust m-payment. This leads to the following hypothesis:

H5: Habit positively influences consumer trust in m-payment.

Price value

Price value is defined as “consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them” (Venkatesh et al., 2012, p. 161). The cost and PV have been shown to have a significant effect on the use of technology (Venkatesh et al., 2012). Thus, the researcher assumed that if m-payment provides consumers good value, they may be more likely to trust m-payment. This leads to the following hypothesis:

H6: Price value positively influences consumer trust in m-payment.

Facilitating conditions

Facilitating conditions are defined as “the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). Facilitating conditions have been found to be important drivers of technology use (Venkatesh et al., 2003). Therefore, the researcher assumed that the more FC for using m-payment that consumers have, the greater their trust for m-payment. This leads to the following hypothesis:

H7: Facilitating conditions positively influence consumer trust in m-payment.

3.4.2. Trust types in m-payment

Trust is crucial in any e-commerce, m-commerce and m-payment activity. The concept of trust has been investigated and analysed across disciplines ranging from psychology to technology adoption with many different viewpoints. However, researchers agree that there are two participants in the process of trust-building namely trustor and trustee, and the development of trust is dependent on the trustor's expectation of the trustee's behaviour, ability and motivation (Doney & Cannon, 1997; Meng et al., 2008).

In m-payment adoption, CT is defined as the customers/consumers' beliefs and willingness to rely on m-payment for transactions (adapted from Alhulail, 2018; McKnight et al., 2002; Xin et al., 2015). Researchers have posited that trust should be considered as a multidimensional, multidisciplinary, or multifaceted phenomenon due to its complex concept (Gefen & Straub, 2003; Hillman & Neustaedter, 2017; Jimenez et al., 2016). Based on the comprehensive review of related literature about trust in m-payment, m-commerce, mobile banking and e-commerce, the researcher suggested that a group of determinants for trust in m-payment should be dissected into trust types including PT, IT and ST.

M-payment provider trust

M-payment provider trust (PT) refers to the belief of the consumers that the m-payment service provider performs and completes transactional commissions as well as any obligations which might arise from risky or uncertain circumstances

(Joubert & Belle, 2009, 2013). Put simply, PT manifests when the provider of m-payment service can be trusted by consumers using m-payment. Mingxing et al. (2014) highlighted the significance of m-payment service provider trust as the extent to which customers believe that a service provider can implement m-payment service correctly, fast, conveniently, and safely.

Service provider trust plays an important role in establishing the trust of consumers. As a result, it is widely used in research on technology or system acceptance ranging from e-commerce to m-commerce and m-payment (Joubert & Belle, 2009, 2013; McKnight et al., 2002; Meng et al., 2008; Mingxing et al., 2014; Siau & Shen, 2003; Srivastava et al., 2010). Depending on the context of research, a service provider can be named as a web vendor in a traditional e-commerce context, or an m-commerce service provider in the m-commerce context, or an m-payment provider in the m-payment context. In many previous studies, service provider trust sometimes is referred to as ‘vendor trust’ depending on the context.

In the context of traditional e-commerce, the service provider is the web vendor who provides e-commerce services for customers. The significance of web vendor trust has been empirically and theoretically proven in building the trust of customers (McKnight & Chervany, 2001a, 2001b; McKnight et al., 2002; McKnight et al., 2004). McKnight and Chervany (2001b) conceptualised trust in web vendor/business, which include competence beliefs, benevolence beliefs,

integrity beliefs and predictability beliefs which are affected by web vendor interventions including privacy policies, third party seals, reputation and guarantees. A study by McKnight et al. (2002) also recognised the importance of web vendor trust in e-commerce.

In regards to the m-commerce context, Siau, Sheng, Nah, and Davis (2004) pointed out vendor trust as one of the main components in building CT. They classified vendor trust into two types including m-commerce vendor and product vendor. When examining the role of trust in m-commerce adoption in South Africa, Joubert and Belle (2009) found a significant impact of trust in m-commerce vendor, who provides m-commerce service, on CT and the intention to participate m-commerce. Meng et al. (2008) claimed that mobile vendor trust is a vital driver of CT in m-commerce adoption. A study by Min et al. (2008) collected data from China, which showed a significant effect of m-commerce service provider trust on general trust and the customers' intention to adopt m-commerce.

In the context of m-payment, Mingxing et al. (2014) identified the important impact of trust in application service providers on intention to use m-payment. Similarly, a study conducted by Srivastava et al. (2010) confirmed the significant role of mobile service providers in building CT in m-payment. More specifically, Xin et al. (2015) collected data from Auckland, New Zealand, and found a significant impact on the perceived reputation of m-payment vendor which refers

to “the extent to which consumers believe in the mobile payment vendor’s competency, honesty, and benevolence” (p. 3) on m-payment CT.

In the context of this study, vendor trust or service provider trust is referred to as PT. As a result, PT is the first type of trust in building CT in m-payment adoption. This study argues that if consumers perceive that an m-payment provider is trustworthy, they are more likely to trust m-payment. This leads to the following hypothesis:

- *H8: M-payment provider trust positively influences consumer trust in m-payment.*

Institution-based trust

Institution-based trust (IBT) is the belief of consumers that necessary structural conditions for increasing the likelihood of gaining a successful outcome in an endeavour like m-payment, are present (Joubert & Belle, 2013; McKnight et al., 2002). Normally, IBT includes two dimensions: structural assurance and situational normality. Structural assurance is related to laws, regulations, institutions, legal protection, and legal systems, which contribute to the feeling of trust in an environment. Situational normality refers to the belief that the online environment is appropriate, well ordered, and favourable for conducting e-transactions (McKnight & Chervany, 2001a). Many researchers have highlighted that trust cannot be built without institutional infrastructures that set up and consolidate regulations (Cheung & Lee, 2001). Mahadevan and Venkatesh (2000)

claimed that the power of IBT is based on the fact that the legal system plays an essential role in regulating the vendors to provide fair information and protect users' privacy and other concerns, thereby building customers' confidence and beliefs. Pavlou and Gefen (2004, p. 37) stated that "Institution-based trust is a buyer's perception that effective third-party institutional mechanisms are in place to facilitate transaction success". Due to the importance of IBT, many authors employ it in research on e-commerce, m-commerce and m-payment (Gefen et al., 2003; Joubert & Belle, 2009, 2013; McKnight et al., 2002). As a result, the researcher argues that if consumers perceive that they are protected by third-party institutional mechanisms, they are more likely to trust m-payment. This leads to the hypothesis:

- *H9: Institution-based trust positively influences consumer trust in m-payment.*

Seller trust

Seller trust is the degree to which the consumer trusts a community of sellers, and this is necessary for any e-commerce as well as social commercial activities (Lu, Fan, & Zhou, 2016). Andreev et al. (2012) pointed out that ST plays a vital role in m-commerce where there is anonymous contact between sellers and buyers, as well as, a lack of formal contractual agreement. Seller trust has been adopted in many studies on e-commerce as well as m-payment adoption (Andreev et al., 2012; Lu et al., 2016; Pavlou & Gefen, 2004). Pavlou and Gefen (2004) collected

data from Amazon's auction websites and recognised the significant impact of trust in sellers on the transaction intention of customers in an online market. Lu et al. (2016) found an important effect of trust in sellers on the social commerce purchase intention of customers in China. A study by Andreev et al. (2012) collected data in Israel, with results showing the significant influence of trust in vendors on the willingness to use m-payment. Obviously, a reputable seller must not only provide qualified goods but also use a fast, accurate and secure payment method. As a result, if customers trust reputable sellers accepting m-payment, they are more likely to trust m-payment. This leads to the following hypothesis:

- *H10: Seller trust positively influences consumer trust in m-payment.*

3.4.3. Cultural factors

Hofstede defined culture as the “collective programming of the mind which distinguishes the members of one group or category of people from those of another” (1993, p. 4), which plays a significant role in technology adoption (Al-Gahtani, Hubona, & Wang, 2007; Bagchi, Cerveney, Hart, & Peterson, 2003; Herbig & Miller, 1993). Hofstede's cultural framework is one of the most common frameworks adopted in research involving culture (Eringa et al., 2015), and includes six dimensions: individualism/collectivism, UA, long/short term orientation, masculinity/femininity, PD and indulgence/restraint. As described in the literature review, the significant role of cultural dimensions drawn from

Hofstede's framework in technology or system adoption has been empirically proven in several studies.

However, culture is usually employed as a macro-level phenomenon, i.e. most previous studies have explored cross cultures in different countries (Carmen et al., 2012; Cheung & Chang, 2009; Zendehdel et al., 2016; Zhang et al., 2012), while there is a lack of studies exploring culture at the individual level (Srite & Karahanna, 2006). Straub, Loch, Evaristo, Karahanna, and Srite (2002, p. 18) state that "Most such definitions of culture rely on the assumption that an individual's membership in a cultural group, such as their national culture, defines the nature of values they espouse. However, an individual's values are influenced and modified by membership in other professional, organisational, ethnic, religious, and various other social groups, each of which has its own specialised culture and value set. Thus, individuals vary greatly in the degree in which they espouse, if at all, values dictated by a single cultural group, such as their national culture". The implication is that national culture is varied at an individual level, i.e. individuals can be identified with national culture to varying degrees (Srite & Karahanna, 2006). Srite and Karahanna (2006, p. 681) argued that "the individual level of analysis culture can be treated as an individual difference variable the individual level of analysis national culture manifests through an individual's espoused national cultural values". They employed Hofstede's culture framework as individual difference variables that moderate the relationship between

perceived usefulness, perceived ease of use, subjective norms and behavioural intention to use with TAM. Similarly, Baptista and Oliveira (2015) found a significant moderating impact of Hofstede's culture dimensions on the relationship between behavioural intention and use behaviour of Chinese consumers using mobile banking. Yoon (2009) also identified the important moderating impact of Hofstede's culture variables on the relationship between trust and intention to use e-commerce in China. Many other authors have also employed Hofstede's culture dimensions at the individual level (Aaker & Lee, 2001; Dawar & Parker, 1994; Rinuastuti, Hadiwidjojo, Rohman, & Khusniyah, 2014). Accordingly, this study examined the impact of culture variables in a country, instead of cross country, i.e. the study adopted culture as a group of individual variables to examine the impact of culture on CT in m-payment.

On the other hand, there are some authors criticised applying Hofstede constructs at the individual level. Spector, Cooper, and Sparks (2001) collected data from 7,000 employees in 23 countries across Africa, Asia, Europe, and the Americas to assess the reliability and validity of the five Hofstede constructs at the individual level and revealed that the results are unacceptably low. Bearden, Money, and Nevins (2006) used data collected from four countries and identified that Hofstede cultural constructs did not perform accurately and reliability at the individual level. The similar results of low reliability and validity of Hofstede

constructs at the individual level also was found by Blodgett, Bakir, and Rose (2008).

For the purpose of investigating the impact of culture on consumers using m-payment, this thesis adopted the stream of measuring Hofstede cultural dimensions at the individual level as previous studies (Baptista & Oliveira, 2015; Hassan, Shiu, & Walsh, 2011; Srite & Karahanna, 2006; Yoon, 2009). Due to the demand of using Hofstede's culture items at the individual level, Yoo, Donthu, and Lenartowicz (2011) developed a CVScale to measure Hofstede's culture at the individual level. The items used in this thesis was adapted and revised from papers measuring Hofstede cultural dimensions at the individual level on the top journals such as MIS Quarterly, Computers in Human Behavior, Information & Management, International Marketing Review (Baptista & Oliveira, 2015; Hassan et al., 2011; Srite & Karahanna, 2006; Yoon, 2009). In addition, such items are also quite similar to CVScale of Yoo et al. (2011) in wording (see [Appendix 7](#)), therefore, items used in this thesis are appropriate and acceptable to the purpose of measuring Hofstede's culture constructs at the individual level.

Hofstede (2011) highlighted that his cultural dimensions should be selected depending on the level of aggregation, i.e. the suitability of the research context. Although there is evidence to prove the direct impact (Huang, 2017; Olasina & Mutula, 2015; Sriwindono & Yahya, 2012) and the moderating impact (Baptista & Oliveira, 2015; Cheung & Chang, 2009; Yoon, 2009) of culture in technology

adoption, there is no clear rationale in the literature to explain why a culture impacts trust. Previous studies have also not explored culture's moderating impact between trust and technology adoption. As a result, in this study, both the direct impact of culture on trust and the moderating impact of culture on the relationship between trust and m-payment continuance intention are tested. Based on the review of the literature review of culture in technology adoption and the appropriateness with m-payment, this study proposed the following hypotheses with regard to culture.

Power distance reflects the inequality of power between managers and employees. In cultures with a high PD index like Vietnam, management decisions tend to be centralised and hierarchical, and people are more likely to comply with their managers' opinions (Hofstede, 1993; Lonner, Berry, & Hofstede, 1980). In contrast, in low PD societies, superiors and subordinates are equal; therefore, relationships are more mutual. People in low PD societies tend to display interpersonal trust rather than ones in high PD societies because mutuality or interdependence is an important necessary condition for trust (Yoon, 2009). Consequently, customers with high PD scores may have less trust toward m-payment adoption than ones with lower PD scores. This leads to the hypotheses:

- *H11: Power distance negatively influences consumer trust in m-payment.*

- *H16: Power distance moderates the relationship between trust and intention to continue to use m-payment, in such a way that the relationship will be weaker amongst people with higher power distance cultural values.*

With regards to CO, people in individualist cultures are expected to be more focused on themselves than the group. In contrast, people who have high collectivistic scores are more sensitive to the group's needs (Hofstede 1993). As a result, citizens in collectivistic societies trust members in their group more, and trust people outside their in-group less. They are expected to be more likely to consider other's opinions about new technology (Hofstede 1984; Zakour 2004). Vietnam is a collectivistic society (Hofstede-insights 2018), and m-payment is quite popular in Vietnam; thus, citizens may be more likely to trust a new technology like m-payment (Arpaci & Baloglu 2016; Baptista & Oliveira 2015; Hofstede 1984). This leads to the following hypotheses:

- *H12: Collectivism positively influences consumer trust in m-payment.*
- *H17: Collectivism moderates trust and intention to continue to use m-payment, in such a way that the relationship will be stronger amongst people with high collectivist cultural values.*

Long term orientation refers to the extent to which a person has a "link with the culture's own past while dealing with the challenges of the present and the future" (Hofstede-insights 2018). Citizens in societies with a high score of LO like Vietnam are more prone to thrift, persistence and have a sense of shame when

preparing for the future (Hofstede-insights, 2018a). Accordingly, some studies have found a negative impact of LO on technology adoption (Baptista & Oliveira, 2015; Hassan et al., 2011). This leads to the following hypotheses:

- *H13: Long term orientation negatively influences consumer trust in m-payment.*
- *H18: Long term orientation moderates trust and intention to continue to use m-payment, in such a way that the relationship will be weaker amongst people with high long-term cultural values.*

“The masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness, and material rewards for success” (Hofstede-insights, 2018b). In masculine regions challenges, earnings, assertiveness, ambition, and dealing with facts are the most valued factors (Minkov & Hofstede, 2010). As a result, if people with a high MA index value the performance and EE of m-payment, they may have more trust towards m-payment adoption. This leads to the hypotheses:

- *H14: Masculinity positively influences consumer trust in m-payment.*
- *H19: Masculinity moderates the relationship between trust and intention to adopt m-payment, in such a way that the relationship will be stronger amongst people with masculine cultural values.*

The UA dimension is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede, 2001, p. 161). Prior research has found contradictory outcomes about the impact of UA on technology adoption. Some researchers have argued that cultures with high levels of UA usually feel scared of uncertain and ambiguous situations (Bagchi et al., 2003). As a result, they will try to avoid them, leading to less trust as well as a low rate of technology adoption because new technology such as m-payment may be highly risky and uncertain (Xin et al., 2015). In contrast, other researchers have found a positive significant impact of UA on technology adoption because the concerns about the risks are offset by the effectiveness that new technology brings with it, leading to a greater willingness to use it (Ebrahimi, Singh, & Tabrizi, 2010; Perez-Alvarez, 2014). Data in this study were collected from experienced m-payment consumers in Vietnam. Vietnam is a low UA society; therefore, avoiding uncertainty is a low preference, and innovation (such as m-payment) are not seen as a threat for Vietnam m-payment consumers in general (Hofstede-insights, 2018a). In addition, experienced m-payment consumers who participated in the survey may be aware of the performance and usefulness of m-payment. Consequently, m-payment may not be considered a highly risky technology anymore once experienced m-payment consumers continue to use it. Accordingly, the perception of performance and usefulness of new technology like m-payment can offset its potential risks; therefore, they are more prone to

trust m-payment (Ebrahimi et al., 2010; Perez-Alvarez, 2014). This leads to the following hypotheses:

- *H15: Uncertainty avoidance positively influences consumer trust in m-payment.*
- *H20: Uncertainty avoidance moderates trust and intention to continue to use m-payment, in such a way that the relationship will be stronger amongst people with high uncertainty avoidance cultural values.*

3.4.4. Consumer trust on intention to continue the use of m-payment

Consumer trust has been identified as one of the key predictors of m-payment adoption (Gao & Waechter, 2017; Jia et al., 2015; Shuhaiber, 2016; Xin et al., 2015; Yan & Yang, 2014). As a result, this study suggested the following hypothesis.

- *H21: Consumer trust positively influences intention to continue the use of m-payment.*

The conceptual model and hypotheses are presented in Figure 16.

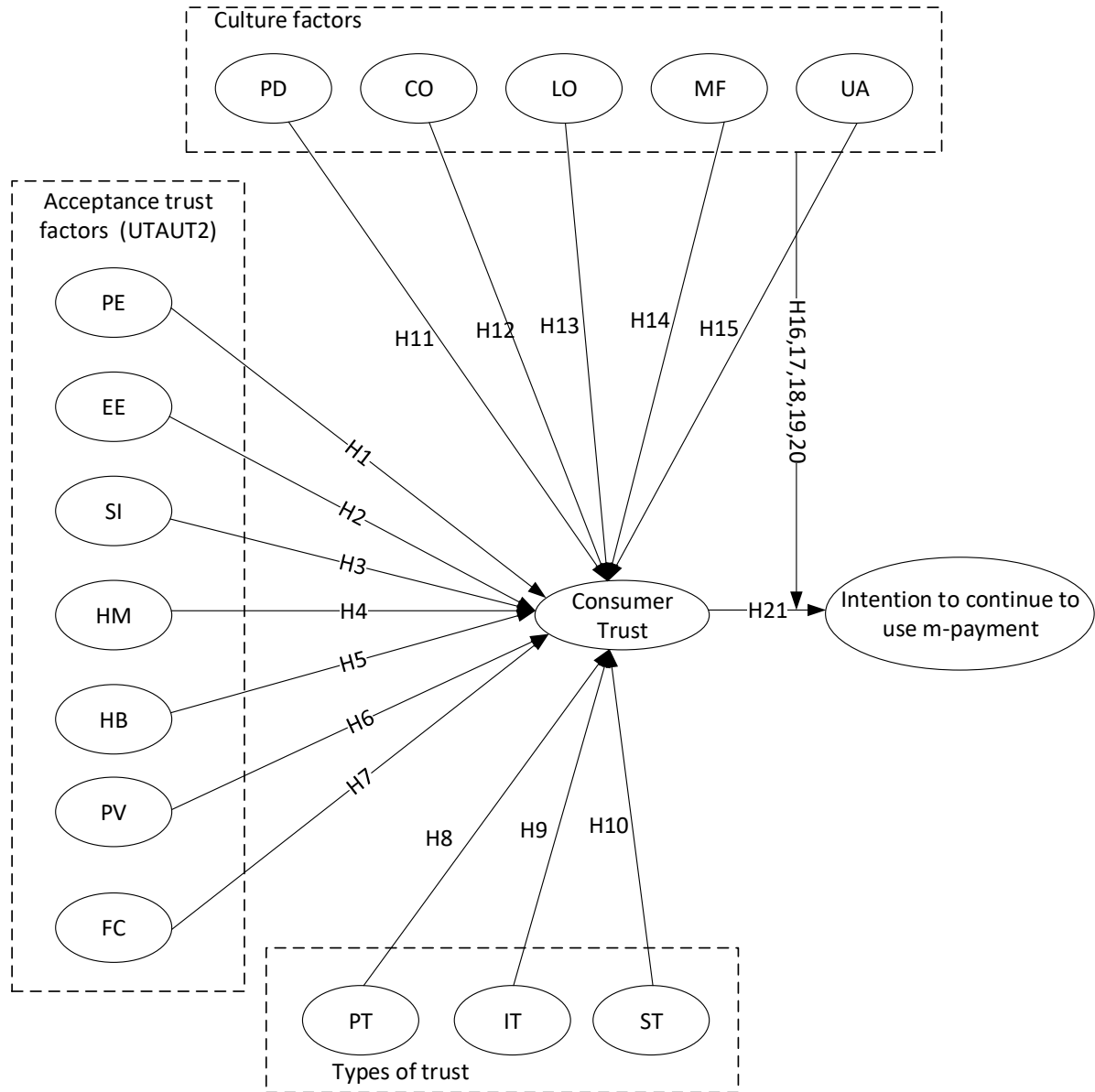


Figure 16: The initial conceptual model.

3.5. Summary

This chapter presented the theoretical background which are the UTAUT2, Hofstede's cultural framework and the reasons behind choosing relevant determinants and the related literature review of e-commerce, m-commerce, m-payment and mobile banking to answer the research questions. It also presented

the research model including three important groups of factors that influence CT in m-payment. They are trust types, acceptance factors, and culture. It then revealed the justification for the hypotheses that arose from the theoretical background. The next chapter discusses the research methodology.

Chapter 4: Research method

A research method refers to an array of procedures conducted sequentially in a study to examine the research problem. It ranges from choosing the theoretical background of a study to the analysis and explanation of the research findings (Sekaran & Bougie, 2016). More specifically, this includes data collection, data analysis, and an interpretation of the outcome which aims to resolve the research problem, i.e. answer the research question (Alkalbani, Deng, Kam, & Zhang, 2017; Sek, 2016). The research method plays an essential role in a study because it provides guidance on how the study is implemented and substantially influences research findings, i.e. it is one of the key elements that can improve or damage a research project (Collis & Hussey, 2013). In addition, a relevant method can ensure the quality of the study which enhances the accuracy and reliability of the study results (Saunders, Lewis, & Thornhill, 2009). As a result, choosing a proper research method is vital to any study.

However, many researchers struggle with the choice of an appropriate research method for their studies because it is the most difficult step in the research process (Chen & Deng, 2019; Walker, 1997). The research method needs to be in agreement with the essence of the research such as exploratory, confirmatory, or descriptive, and the applied research approaches such as survey, interview, case study, experiment or focus group (Creswell & Creswell, 2017; Kothari, 2004). Consequently, a comprehensive and rigorous evaluation of the research

problems/research questions, the research objectives and the research context need to be considered to specify the relevant method (An, Deng, Chao, & Bai, 2014; Sek, Deng, & McKay, 2015).

There are four components of a specific research method that need to be addressed. These are the research paradigm, the research methodology, the research design, and the detailed implementation in its specific circumstances such as sampling and population, questionnaire/instrument design process, and data collection (Creswell & Creswell, 2017). The research paradigm offers the fundamental philosophical underpinning which can be utilised as a guide to select and develop the research methodology (Sek, 2016). Then the research methodology is selected to identify the sets of procedures that will be conducted in the research. This leads to the designing of the research method systematically. Finally, the detailed implementation of the research procedures in a specific circumstance should be identified.

Based on the above discussion, this chapter is organised into the following sections. Sections 4.2, 4.3, 4.4 describe the research paradigm, the research methodology and the research design respectively. Then, sampling and population, and the design process of the questionnaire and the online instrument are discussed in Sections 4.5 and 4.6. Construct specification is explained in Section 4.7, which is followed by the ethical approval process in Section 4.8.

4.1. Research paradigm

A research paradigm refers to a set of beliefs, assumptions and theoretical frameworks that guide researchers on how to address their research problems in a particular circumstance (Krajewski & Ritzman, 2005; Lincoln, Lynham, & Guba, 2011). More specifically, it helps to clarify (1) the way which the world operates; (2) the way to know something, i.e. knowledge is extracted or found in the world; (3) which questions can be asked; and (4) the way to find the knowledge or answers to these questions (Dills & Romiszowski, 1997).

There are three fundamental dimensions of a research paradigm that instruct and frame a researcher's view and activity namely ontology, epistemology, and methodology (Lincoln et al., 2011; Mertens, 2007). Ontology refers to the assumption of the existence of reality which aims to answer the question of what is real and the way to decide whether an entity is real based on evidence (Lincoln et al., 2011; Long, White, Friedman, & Brazeal, 2000). Orlikowski and Baroudi (1991) pointed out that by specifying ontology, researchers can specify the nature of reality in their research, in particular, whether the essence of the specific phenomenon in the research is objective and independent or subjective and perceivably established by the researcher.

Epistemology is related to the essence of knowledge which refers to the way knowledge can be extracted in a particular situation via empirically validating the theories or associating with the researcher through a social connection (Long et

al., 2000; Ritchie, Lewis, Nicholls, & Ormston, 2013; Rowland, 2003). Epistemology answers the questions of how and what people can know in reality, or how to acquire knowledge about the world (Lincoln et al., 2011). Normally, knowledge can be acquired by hypothetico-deductive reasoning or non-hypothetico-deductive reasoning. The former refers to a research outcome that can be achieved through inference, i.e. the research hypotheses can be tested or verified as well as rejected by empirical evidence collected from the methods such as observation or experiments. In contrast, the latter refers to the way in which researchers start by collecting data that is suitable to their research problems, then looking at the data to recognise any patterns and suggest a theory to explain this pattern.

The third vital principle of a research paradigm is the methodology which is related to the procedures, techniques or tools of collecting and analysing the research data such as qualitative or quantitative or mixed-method used in the study to explore or investigate the research problem in a specific situation (Healy & Perry, 2000; Lincoln et al., 2011). The methodology is the transfer of the ideas of ontology and epistemology into detailed research activities in the study to draw the qualified outcome (Tuli, 2010).

These three essential dimensions including ontology, epistemology and methodology form a research paradigm that guide, inform, and shape the way a researcher identifies and recognises the reality in their study (Guba & Lincoln,

1994; Mertens, 2007). The choice of a researcher regarding these three dimensions directly impacts and leads to the choice for a research paradigm (Lincoln et al., 2011). Selecting a suitable paradigm helps a researcher avoid errors when implementing a research method.

There are two prominent research paradigms commonly found in social and business research namely interpretivism and positivism. They determine the role of a researcher in a research project as part of the researched issues or as an independent observer (Creswell & Creswell, 2017). The researcher is considered a crucial part of the study in the paradigm of interpretivism. In contrast, the positivist perspective requires the researcher to be an independent observer in the study.

The philosophy of positivism is that social phenomenon, such as human behaviour, in reality, operates in line with the natural world; therefore, the methods of the natural sciences should be applied to research social phenomena (Mertens, 2014). According to Chen and Hirschheim (2004), the characteristics of positivism are as follows: first, value freedom, which is keeping the impact of researchers' prejudice out of their research, for the interpretation of collected data because positivists perceive that research in behavioural or social sciences should be free from the researcher's values. Second, identifying and suggesting models, hypotheses, or causal relationships between constructs. Third, utilising

quantitative methods for testing and verification of the theories suggested in the study.

Under the positivist paradigm, the underlying intention is to find dependable and well-founded generalisations about a theory (Carlsson, 2005; Myers, 2019), or more specifically to recognise and assess the cause and effect in many situations (Chen & Hirschheim, 2004; Mertens, 2014). Positivist-oriented research often answers the research questions by theory testing, extension, verification or postulating the relation between theories to contribute to the knowledge of understanding of phenomena in the world (Lincoln et al., 2011; Orlikowski & Baroudi, 1991). Normally, the research question is related to testable hypotheses that contribute to forming a theory in the research. Then, the researchers proceed to collect data and test the hypotheses to conclude whether they are supported or rejected. This procedure is referred to as collecting deductive reasoning. As a result, positivist research is based on the empirical findings which are drawn from the quantitative data. However, positivism is criticised for a shortage of a detailed explanation of the social phenomenon because of a lack of insight into in-depth issues (Chen & Hirschheim, 2004).

The philosophy of the interpretivist paradigm, which is in contrast to the positivist paradigm, is that social phenomena are different from the physical world, and can only be perceived and understood via subjective interpretation of reality and connected intervention (Mertens, 2014). With the adoption of the interpretivist

paradigm, the target of the researchers is to understand, recognise and explain the social phenomena by answering the question of how and why based on the interpretation of qualitative data (Lincoln et al., 2011; Orlikowski & Baroudi, 1991). The characteristics of interpretivism are as follows first, a subjective interpretation of the research data which is collected during the study. Second, the engagement of the researchers in the arranged situations in the investigation. Third, utilising a qualitative method for collecting and analysing data in the research project. Interpretivism is often criticised for a lack of generalisability of the research findings due to the limited number of participants or observations collected in the study (Chen & Hirschheim, 2004).

Table 6 presents the differences between positivism and interpretivism.

Table 6: Differences between research paradigms (adapted from Almkhlyfi, 2019; Duan, 2012).

Factor	Positivism	Interpretivism
Ontology What is the nature of the world?	“Reality exists objectively and independently from the researcher”	Reality is only accessed through a subjective interpretation which is “based on social interaction and the researchers”
Epistemology How to know the world?	“Focus on hypothetic deductive testability of theories. Knowledge should be obtained through verification or falsification and seek generalisable results”	“Knowledge should be obtained through an understanding of human and social interaction by which the subjective meaning of the reality is constructed”
Methodology What is the best way to extract knowledge about the world?	Quantitative methods	Qualitative methods
Sample size	Large	Small
Purpose	Hypothesis testing	Theory generation
Approach	Deductive	Inductive
The research findings	High reliability and low validity	Low reliability and high validity
Generalisation of findings	From the sample size to population	From one setting to another similar setting

In this step, the choice of the research paradigm (positivist or interpretivist) should be undertaken because it helps the researcher understand, form and process the following research procedures in ways that reflect that knowledge and avoid errors when conducting the research (Collis & Hussey, 2013; Saunders et

al., 2009). In addition, in information systems research, more in-depth insight on a particular circumstance can be achieved by identifying, choosing and applying an appropriate philosophy or a research paradigm (Orlikowski & Baroudi, 1991). Based on the discussion of previous sections, the aims and the research questions presented in the previous chapters, this study utilised a positivist paradigm

The typical characteristics of positivist information systems research are that the proposed hypotheses are supported by clear evidence from the literature, will be validated and tested by quantitative data, and deductions about a particular phenomenon can be extracted from the sample in the research and extrapolated to the population (Orlikowski & Baroudi, 1991). This study aimed to propose and test a theoretical model based on the UTAUT2 and Hofstede's cultural framework, which includes testable hypotheses drawn from the related literature review to assess the effect of multiple factors (acceptance, culture, trust types and customer characteristics) on CT in m-payment to identify the determinants of CT in m-payment. The data was collected from a sample of m-payment consumers in Vietnam to draw the findings and test the hypotheses. As a result, the inferences of this study about the impact of trust's antecedents in m-payment was suitable to the characteristics of positivist information systems research.

Second, this study examined factors affecting the trust of consumers in m-payment by surveying m-payment consumers in Vietnam. The researcher used a questionnaire instrument with a 7-point Likert scale to measure variables, which

produced quantitative data. Then statistical methods were employed to evaluate the reliability and validity of constructs in the conceptual model and to validate the proposed hypotheses, model measurement and structural model by applying the SEM technique using SmartPLS software. The quantitative method was selected for this study because it validated the hypotheses by adopting statistical methods with numerical data to generalise the findings (Creswell & Creswell, 2017). Consequently, the ontology, epistemology and methodology of this study are consistent with the positivist paradigm.

The data collection in this study was implemented without direct interaction with the researcher, i.e. the researcher played the role of an independent observer in this study, and then examined the hypotheses and relationships between constructs through hypothesis testing. As result, the positivist approach was the most appropriate paradigm for this study.

4.2. Research methodologies

A research methodology is a framework that researchers follow to conduct their studies (Sileyew, 2019). It includes formulating the research problem, objectives and the research question(s), rationalising the conceptual model and constructs, choosing a suitable sample from the population, collecting the data, choosing the relevant statistical method for analysing data and interpretation of the results, and finally presenting the research outcomes (Wiersema & Bowen, 2009). An appropriate and good research methodology is beneficial to a study by (1)

offering a clear plan and pathway for the researcher to implement necessary research processes to answer the research question; (2) ensuring the study is conducted within the allowed timeframe; and (3) ensuring the quality of the research findings to achieve the proposed research objectives (Creswell & Clark, 2017).

Qualitative and quantitative methods are two prominent approaches that are used the most in studies (Bryman & Bell, 2015). The choice of a research approach entails the recognition of a suitable research philosophy, that guide and aid researchers in their studies. Generally, quantitative approaches are related to the positivist paradigm, and qualitative approaches are linked to the interpretivist paradigm (Duan, 2012).

The choice of the two approaches is specified based on the data type and the research objective regarding the particular social phenomenon. The nature of a qualitative methodology is descriptive and is guided by the interpretivist paradigm (Vanderstoep & Johnson, 2008). It focuses on the interpretation of perceptions, attitudes and an assessment of participants who are the target of data collection in the research, in order to explore and understand a social phenomenon (Creswell & Creswell, 2017). As a result, the data type collected in a qualitative methodology is usually words-based, rather than numerical data. Case study, grounded theory and action research are popular qualitative methodologies applied widely in research (Creswell & Clark, 2017).

A quantitative method is usually aligned with the positivist paradigm which focuses on using objective data to test hypotheses and acquire insights about a specific circumstance (Walsham, 1995). As a result, quantitative methodologies are commonly adopted for investigating particular theories by validating the relationship between constructs about a given phenomenon (Creswell & Creswell, 2017). A quantitative methodology emphasises quantifying hypotheses in a given study; therefore, it collects and analyses numerical data in situations related to the purpose and context of the study (Bryman & Bell, 2015). A quantitative methodology presumes that the proposed hypotheses about a given phenomenon can be empirically tested, validated and analysed. As a result, quantitative methodologies are useful, convenient and suitable to research that utilises numerical data collected from a sample to represent the findings for a population (Vanderstoep & Johnson, 2008). Popular examples of quantitative methodologies are surveys, experiments, observation and cross-sectional studies (Collis & Hussey, 2013).

There are some advantages of adopting quantitative research for researchers. Under the philosophy of the positivist paradigm, quantitative methods use observable facts and can produce bias-free outcomes based on logical and statistical analysing methods, which enhance the validity and reliability of the research findings (Creswell & Creswell, 2017). In addition, quantitative methods can collect data from a broad sample in the population which helps a study gather

many different perspectives from respondents. As a result, the inferences in quantitative research are objective and empirical and are drawn from the collective information brought by participants (Alhulail, 2018).

This study used a quantitative methodology to answer the research questions and achieve the research objectives. The nature of this study was confirmatory because it aimed to examine the determinants for a social phenomenon in information systems research (Almukhlifi, Deng, & Kam, 2017, 2018), which is CT in the adoption of m-payment in Vietnam. A quantitative methodology matched this study because of the following reasons. First, it was suitable for investigating hypotheses about causal relationships between theoretical constructs that could be empirically analysed through numerical data (Creswell & Creswell, 2017; Tuli, 2010). Second, the proposed hypotheses could be tested to conclude whether the researcher's propositions are accepted or rejected. In addition, a quantitative methodology is suitable for generalising the research findings from a sample to a large population (Straub et al., 2004; Vanderstoep & Johnson, 2008).

Along with the adoption of quantitative methodology, the survey was adopted to collect data in this study. This method is usually adopted for investigating the determinants of a social phenomenon involving the attitudes, perceptions and behaviours of a sample (Hair, Anderson, Babin, & Black, 2010; Vanderstoep &

Johnson, 2008). Consequently, it was relevant to the purpose of this study which was investigating the determinants of CT in m-payment adoption.

4.3. Research design

After the selection of the research paradigm and the research approach, the design of the research—which include the research process, integrating the methods and related information coherently and logically—needs to be specified in order to ensure that the research problems will be resolved appropriately (De Vaus, 2001). The research design must align with the philosophy of the research paradigm and the research approach (Wilson, 2014). Figure 17 shows the research design of this study which was characterised by a quantitative methodology and the positivist research paradigm.

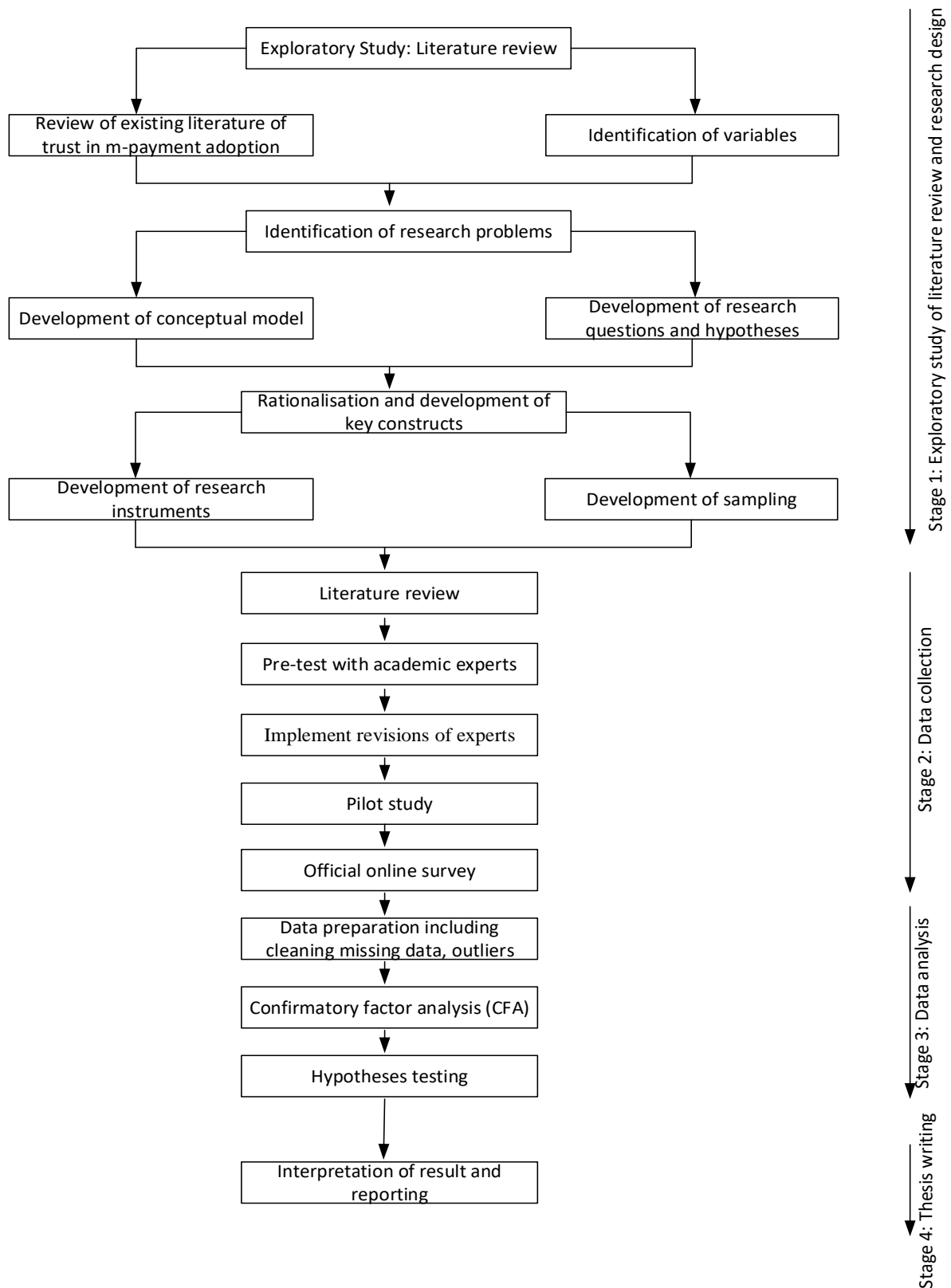


Figure 17: Research design diagram (Adapted from Alhulail, 2018)

At the beginning of this study, an exploratory study was conducted to produce the outcome which was the conceptual model about the determinants of CT in m-payment continuance intention. The researcher started by conducting a comprehensive review of the related literature including accordant information, such as previous studies about trust and factors affecting trust in m-payment adoption and related areas including m-payment and e-commerce, applied theoretical background, existing theories and models. This led to the identification of four important groups of antecedents for trust in m-payment adoption which was trust types, acceptance trust factors, cultural factors and consumer characteristics. Based on the extensive literature review, the research objectives, research questions and hypotheses were formulated, the theoretical frameworks for the research were chosen, and the conceptual model including key constructs and the causal relationship between these was proposed and justified. Then the instruments measuring constructs were built based on adapting questionnaires from previous research in order to fit the context of m-payment adoption in this study. The exploratory study stage ended with the plan of sampling frames to prepare for the following phase namely data collection.

In the data collection phase, a literature review was conducted again to develop the questions used to measure the constructs from the conceptual model. Then a pre-test survey with academic experts in the field of information systems was employed to revise the items and the model. The discussion between the research

team including the researcher and supervisors, and the experts kept going until interrater agreement about the English version of questionnaires was achieved. Next, a pilot study with the translated Vietnamese version of questions was implemented with around 30 Vietnamese m-payment consumers to revise the wording of items and the design of the online instrument. Finally, an official large-scale survey was conducted with the targeted sample. The outcomes of this phase were the refined questions in English and Vietnamese, the online instrument, and the implementation and distribution of the main survey to the identified respondents.

Phase 3 involved the data analysis based on statistical methods with SPSS and SmartPLS software. The data were cleaned to eliminate missing data and outliers, and then a confirmatory factor analysis (CFA) was conducted to test and validate the hypotheses. Finally, in Stage 4, the researcher reported the research findings.

4.4. Sampling frame and data collection

Sampling is defined as “the process of selecting a sample unit (a subset) from a larger population (a larger group) of interest to address the research questions” (Teddle & Tashakkori, 2003). Sampling is a vital and useful process of any study and is associated with the research design (Gokhale & Srivastava, 2017). It consists of choosing a number of participants from a group or a population, in which the likelihood of selection of each element of the population is known or

unknown depending on the type of applied sampling technique (Teddlie & Tashakkori, 2003).

Non-probability sampling and probability sampling are two common types of sampling techniques in research (Saunders et al., 2009). The first is based on the assumption that the probability of inclusion for each attendant from a sample population is indeterminable (Zikmund, Carr, & Griffin, 2013). Non-probability sampling is more relevant for research that employs data collection from a small-sized group of respondents (Teddlie & Yu, 2007), rather than research that examines a social circumstance based on a large number of respondents (Bryman, 2016; Sekaran & Bougie, 2016). This is due to the data collected not being representative of the entire population; therefore, the non-probability sampling technique is limited in generalising the research findings (Bryman, 2016). Popular examples of non-probability sampling are convenience sampling, consecutive sampling, judgemental or purposive sampling.

In contrast, probability sampling is based on the assumption that the probability of inclusion for each participant from a sample population is determinable (Teddlie & Tashakkori, 2003). In probability sampling, the selection of a participant in a research study is random, and it is relevant to collect data from a large number of participants from the whole population (Teddlie & Yu, 2007). The probability sampling technique allows researchers to achieve representativeness which means that the sample used in research for data

collection represents the population (Guest, Bunce, & Johnson, 2006). Consequently, the adoption of probability sampling can help researchers to generalise the research findings from a sample to the whole population (Almukhlifi et al., 2018). Popular examples of probability sampling are stratified, cluster and random sampling.

Due to the impossibility of obtaining an official list of m-payment consumers in Vietnam, the researcher applied a non-probability convenience sampling technique for this study. The data collection was conducted in Vietnam from November 2019 to April 2020 via the online survey using the RMIT Qualtrics system. The survey was distributed to respondents through the online social connections of the researcher. In particular, the researcher used Facebook to promote the online survey by sending invitations to his friends, and members of Facebook groups that the researcher participated in including groups for students, teachers in universities, researchers, and business communities in Vietnam. M-payment is quite popular in Vietnam (VietnamInsider, 2020); therefore, this approach was effective and helped respondents feel safe when accessing the online survey without concerns about spam, computer viruses, malware, or scams. The respondents were informed of the purpose of the survey, and that the survey was anonymous and that no private information would be collected to keep tracking. In order to access the survey, the respondents needed to confirm that they were over 18 years old and had used m-payment in the last three months.

The researcher also reminded respondents that they could only do the survey one time and set up the Qualtrics tool to ensure this.

As described in the section 3.2 and 3.3, this thesis focused on continuance intention which is different from initial intention/adoption. Continuance or post intention/adoption is one of the most important research topics in Information Systems (Bhattacharjee, 2001; Venkatesh et al., 2011). While initial intention/adoption is just a first step in the acceptance of a new information system, continuance intention/adoption is influenced by initial adoption but may be in contrast to the initial decision (Bhattacharjee, 2001). In other words, the initial adoption of a new technology does not ensure the continuance adoption of users, while the long-term success of an innovation or a new information system like m-payment relies more on consumers' continuance intention/adoption rather than initial adoption (Venkatesh et al., 2011). As a result, research on continuance intention must collect data from at least moderately experienced users of m-payment who have passed the initial adoption phase. Accordingly, this thesis collected data from m-payment consumers who have at least 3 months of using m-payment.

Structural equation modelling is a statistical term commonly used to test and validate proposed theories with empirical data. There are two techniques of SEM: covariance and variance. This study used variance-based techniques, i.e. partial least squares (PLS) through SmartPLS (software version 3.3.2). This is because

PLS is considered as a convenient and powerful statistical process that is relevant for various research phenomena (Henseler, Ringle, & Sinkovics, 2009), especially for researching models with many constructs (Chin, 1998). In addition, the PLS technique is effective for minimising limitations regarding residual distribution and sample sizes when compared with other SEM techniques like covariance-based means (Chin, 1998). However Tabachnick, Fidell, and Ullman (2007) highlight that any SEM technique needs to have a suitable number of observations, otherwise variance or covariance will be unstable.

Indeed, the sample size is important for any study because it directly affects the consistency and reliability of the research findings (Hair et al., 2010). There are different opinions about what constitutes an adequate sample size. While Hair et al. (2010) point out that 500 observations are relevant to research having more than seven latent constructs, Kline (2015) states that the sample size should be 10 times the number of items. This study applied the rule of thumb for sample size which is 10 times greater than the biggest number of relationships of a construct (Gefen & Straub, 2005). The key construct in the proposed model of this study is trust with 15 direct impacts from its proposed antecedents, therefore, the minimum number of respondents necessary for this study was 150.

4.5. Instrument design

The research measurement process needs to be operationalised in a rigorous manner to avoid potential errors which may seriously influence the research

findings. An effective solution to ensure this is following validated and rigorous research steps. The well-known procedure for developing the survey instrument which was proposed by Straub (1989) and Churchill (1979), was applied in this study to ensure the reliability and validity of the survey instrument. It includes four steps: specifying the domain of constructs, generating measurement items for each construct, pre-test, and pilot test of the survey instrument (Churchill, 1979; Straub, 1989) as seen in Figure 18.

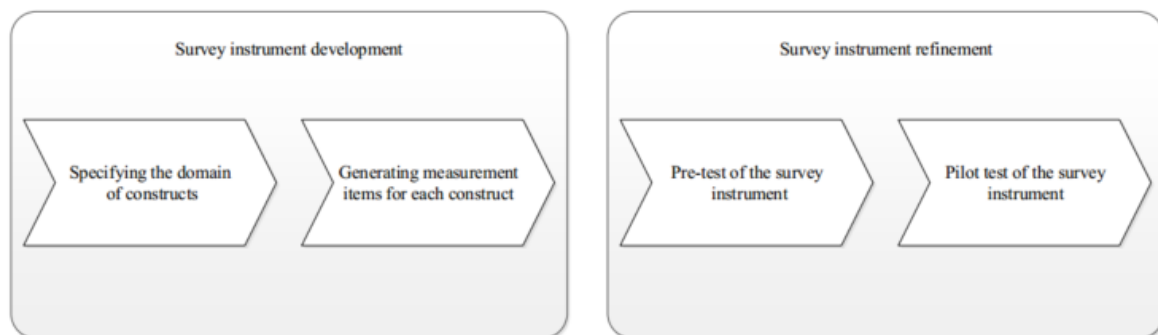


Figure 18: The procedure of the survey instrument development (Almukhlifi, 2019, p. 96).

4.5.1. Specifying the domain of constructs

This phase aims to offer a specific and distinct definition and explanation of the constructs in the conceptual model (Churchill, 1979). The domain of constructs was specified after an extensive review of related literature on m-payment adoption, m-commerce and e-commerce was conducted (see Chapters 2 & 3). Table 7 shows the definition and associated references for each construct.

Table 7: Construct definition.

Construct	Definition	References
Performance expectancy (PE)	The degree to which an individual believes that using m-payment will help him or her to attain gains in payment performance.	(Venkatesh et al., 2012)
Effort expectancy (EE)	The degree of ease associated with the use of m-payment.	(Venkatesh et al., 2012)
Social influence (SI)	The degree to which an individual perceives that important other believe he or she should use m-payment.	(Venkatesh et al., 2012)
Hedonic motivation (HM)	The fun or pleasure derived from using a technology such as m-payment.	(Venkatesh et al., 2012)
Habit (HB)	A perceptual construct that reflects the results of prior experiences.	(Venkatesh et al., 2012)
Price value (PV)	Consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them.	(Venkatesh et al., 2012)
Facilitating conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system.	(Venkatesh et al., 2012)
Power distance (PD)	The extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed inequality.	(Hofstede, 2011)
Masculinity (MA)	A society's preference for success, achievement, heroism, assertiveness, and material rewards.	(Hofstede, 2011)
Collectivism (CO)	A preference for a tightly-knit framework in society in which individuals can expect their relatives	(Hofstede, 2011)

Construct	Definition	References
	or members of a particular ingroup to look after them in exchange for unquestioning loyalty.	
Long term Orientation (LO)	The choice of focus for people's efforts: the future or the present and past.	(Hofstede, 2011)
Uncertainty Avoidance (UA)	The extent to which the members of a culture feel threatened by uncertain or unknown situations.	(Hofstede, 2001)
M-payment provider trust (PT)	The belief of consumers that the m-payment service provider would perform and complete the transactional commissions as well as obligations eventually facing risky or uncertain circumstances.	(Joubert & Belle, 2009, 2013)
Institution-based trust (IBT)	The belief of consumers that necessary structural conditions for increasing the likelihood of achieving a successful outcome in an endeavour like m-payment, are present.	(Joubert & Belle, 2013; McKnight et al., 2002)
Seller trust (ST)	The degree to which the consumer trusts a community of sellers, and is significant for any e-commerce as well as social commercial activities.	(Lu et al., 2016)
Customer Trust (CT) (Dependent Variable)	Customers/consumers' beliefs and willingness to rely on m-payment for transactions.	(Alhulail, 2018; McKnight et al., 2002; Xin et al., 2015)
Intention to continue to use m-payment (IN)	An individual's subjective probability that he or she will continue to use m-payment.	(Davis, 1986; Venkatesh et al., 2003)

Construct	Definition	References
(Dependent Variable)		

4.5.2. Generating measurement items for each construct

Once the meaning of each construct is defined, the items measuring each construct need to be specified and developed to generate a pool of measurement items for the data collection. An effective way to generate validated items and minimise the potential risks is by adopting items from previous studies which have already been tested and validated (Alhulail, 2018). The items that were used in this study were extracted through a comprehensive review of the related literature and the consideration of the suitability with the research problem which is about trust's determinants in the adoption of m-payment in Vietnam. This led to the identification of 71 measurement items presented in [Appendix 1](#).

The PE construct was operationalised with four items. The four items used to operationalise PE were based on UTAUT2 by Venkatesh et al. (2012). These consisted of the respondents' assessment about m-payment in terms of (1) usefulness; (2) the chances of completing important financial transactions; (3) the quickness when paying; and (4) payment productivity.

The EE construct was operationalised with six items. Four items which were based on UTAUT2 by Venkatesh et al. (2012) related to the respondents' assessments about (1) the ease level of learning how to use m-payment; (2) interaction with m-payment; (3) the ease level of use of m-payment; and (4) the

level of becoming skilful in using m-payment. The two remaining items which were based on the comments and the discussion between the panel of experts include: (5) the time taken to study how to use m-payment compared to other types of payment; and (6) the effort to set up m-payment compared to other types of payment.

The SI construct was operationalised with seven items which were adapted from UTAUT2 by Venkatesh et al. (2012). Three items included the respondents' assessments of the opinion of others about using m-payment. These include (1) those who are important to respondents; (2) those who influence respondents' behaviour; (3) those whose opinions that respondent's value. Four items asked about the social surroundings of the respondents including: (4) people around the respondents; (5) people who are important to the respondents; (6) people who influence respondents' behaviour; and (7) people whose opinions that respondent's value.

The HM construct was operationalised with three items which were adapted from UTAUT2 by Venkatesh et al. (2012). These items relate to the assessment of respondents about using m-payment. These included (1) fun; (2) enjoyable; (3) very entertaining.

The PV construct was operationalised with three items. These items were based on UTAUT2 by Venkatesh et al. (2012), and relate to the assessment of

respondents about m-payment and whether it is (1) reasonably priced; (2) good value for money; and (3) at the current price, m-payment provides good value.

The HB construct was operationalised with four items which were based on the UTAUT2 by Venkatesh et al. (2012). These items relate to the reasons why the respondents use m-payment (1) habit; (2) addiction; (3) must use; (4) become natural.

The PT construct was operationalised with six items which were adapted from the studies by Andreev et al. (2012), Srivastava et al. (2010), and Zhou (2011). These items relate to the assessment of respondents about the m-payment provider based on respondents' perceptions and experience. In particular, these consisted of the perception of respondents about the following characteristics of m-payment providers (1) expertise and resources; (2) honesty; (3) reliability; (4) secure level of m-payment service; (5) trustworthiness; and (6) reputation.

The IT construct was operationalised with six items based on the studies by McKnight et al. (2002), Srivastava et al. (2010), and Nguyen (2016). These items relate to the perception of respondents about (1) feelings when using m-payment; (2) comfortability when using m-payment; (3) security safeguards for m-payment; (4) the protection from the legal system and institutions; (5) encryption and other mobile technology safeguards for m-payment; and (6) a robust and safe environment for m-payment.

The ST construct was operationalised with four items which were adapted from the studies by Pavlou and Gefen (2004), Lu et al. (2016), and Andreev et al. (2012). These items relate to the perception of respondents about the following characteristics of sellers who accept m-payment transactions. These characteristics are (1) reliability; (2) honesty; (3) trustworthiness; and (4) how they keep their promises.

The CT construct was operationalised with four items which were adapted based on the studies by Lu et al. (2011), and Qasim and Abu-Shanab (2016). These items relate to the perception of respondents about the following characteristics of m-payment: (1) accurate financial services; (2) reliability; (3) safety; and (4) overall level of trust in m-payment.

The PD construct was operationalised with five items which were based on the studies by Hofstede (2001), Baptista and Oliveira (2015), Yoon (2009) and Srite and Karahanna (2006). These items relate to the perceptions of the respondents about the role of managers regarding (1) making most decisions; (2) asking subordinates for advice; (3) decision-making power; (4) questioning manager's decision; (5) following superior's decisions unconditionally.

The CO construct was operationalised with four items which were based on the studies by Hofstede (2001), Baptista and Oliveira (2015), Yoon (2009) and Srite and Karahanna (2006). These items relate to the opinions of the respondents about

(1) being accepted as a member of a group; (2) group success; (3) being loyal to a group; and (4) individual rewards.

The MA construct was operationalised with four items which were based on the studies by Hofstede (2001), Baptista and Oliveira (2015), Yoon (2009) and Srite and Karahanna (2006). These items relate to the opinions of the respondents about (1) a high-level position of man; (2) an active forcible approach in solving organisational problems; (3) the professional career of a man; and (4) recognition of value and promotion in work.

The UA construct was operationalised with four items which were adapted based on the studies by Hofstede (2001), Baptista and Oliveira (2015), Yoon (2009) and Srite and Karahanna (2006). These items relate to the perception of respondents about (1) the importance of rules and regulations; (2) the importance of order and structure; (3) attitude when facing uncertain situations; and (4) whether avoid making changes.

The LO construct was operationalised with four items which were adapted based on the studies by Hofstede (2001), Baptista and Oliveira (2015), Hassan et al. (2011) and Srite and Karahanna (2006). These items relate to the perception of respondents about the importance of (1) thriftiness; (2) hard work; (3) persistence; and (4) plans for the long term.

The IN construct was operationalised with three items based on the UTAUT2 by Venkatesh et al. (2012). These items relate to the perceptions of the respondents

about (1) intention to use m-payment in the future; (2) intention to use m-payment in daily life; and (3) plan to use m-payment.

Overall, the survey instrument consisted of three parts. The first part presented the purpose of the survey, an explanation about the terms, confirmation about the anonymity of the survey with the assurance that no private information would be collected, and the requirement of confirmation that the respondents were over 18 and had used m-payment in the last three months to answer the survey. The second part collected the demographic information of the respondents such as age, gender, education, occupation, income, the frequency of use of m-payment and the m-payment service that they usually use to make transactions. The third part was designed to gather the perceptions and opinions of m-payment consumers about the important factors which influenced their trust in m-payment. The study used a seven-point Likert scale in the survey instrument because: (1) this scale was employed in previous studies to extract the items, and (2) this aims to provide consistent and accurate data that can be analysed further (Hair et al., 2010). A seven-point Likert scale describes the degree of agreement about a questionnaire where the value '1' indicates 'strongly disagree' and the value '7' indicates 'strongly agree'.

After generating the items, a pre-test and pilot-test were conducted to adapt these items to ensure the relevance between items and constructs, to revise the wording,

and to improve the online survey. These steps are presented in the following sections.

4.5.3. Pre-test survey

The purpose of a pre-test is to examine and improve the validity of the instrument as well as the initial pool of items designed for collecting data in a study (Hair et al., 2010). In this step, a panel of experts (POE) including experts in the same research area should be established to assess the survey based on understandability, rationality, terminology, validity, wording, and consistency (Churchill, 1979; Hair et al., 2010; Lewis, Templeton, & Byrd, 2005; Straub et al., 2004). As a result, the researcher invited six experts from the field of information systems at the School of Business Information Technology and Logistics (BITL) at RMIT University in Australia and the School of Business and Management in Vietnam to participate in the POE. A copy of the instrument was sent to the POE to test it. The comments of the POE were used to improve the questions such as rephrasing wording, eliminating irrelevant questions, modifying questions, and suggesting new questions. Based on their comments, the English version of the survey instrument was finalised and is presented in [Appendix 1](#).

4.5.4. Pilot study

The survey was conducted in Vietnam with Vietnamese m-payment consumers; therefore, the survey was translated into the Vietnamese language to facilitate

survey completion. The forward-backward translation method was applied in the translation process (Alkalbani et al., 2017). In this method, a translator translated the English version to Vietnamese, and then another translator back-translated the Vietnamese version back to English. Checking the meaning between the two English versions by the research team including the researcher and supervisors revealed that the Vietnamese version fully and accurately conveyed the meaning of the English version.

After receiving the Vietnamese version, a pilot test was conducted to ensure the content validity of the instrument before actual data collection (Straub, 1989). It included three steps: distributing the survey to respondents, interviewing respondents, and analysing the outcomes. First, the online survey was distributed to 31 Vietnamese m-payment consumers. The respondents were asked to answer all the questions in the online survey. At the same time, they were prompted to explain their concerns or give any comments that they may have had when going through the survey on a paper version prepared by the researcher. Second, after the respondents finished the survey, the researcher conducted an in-person interview. The questions were (1) What do you think about the survey? Was it difficult? (2) Please raise any problems in the survey. Overall, the respondents did not reveal any difficulties or serious problems when going through the survey. Based on the pilot study, the wording of 10 items were revised and adapted to be

easier to understand for the respondents. The design of the online survey was also improved to be more attractive to the respondents such as colour, and font size.

Finally, construct reliability which is the consistency of items measuring a specific construct (Lu, Lai, & Cheng, 2007) was tested to ascertain the reliability of the constructs. The research used Cronbach's alpha with a cut-off value of 0.7 (Hair et al., 2010) to examine the reliability of each construct. The result of analysing data from 31 respondents revealed that the Cronbach's alpha value of all constructs was greater than 0.7. Consequently, the construct reliability of the survey instrument was satisfied.

4.6. Reflective and formative construct specification

This section presents the rationale for choosing the construct specification (reflective and formative) used in this study.

4.6.1. Overview of reflective and formative construct

There are two types of constructs in SEM models, these are reflective and formative. Along with this, there are two parts, i.e. two levels, of model specification in SEM (Baxter, 2009). The first part is a measurement model in which each construct of the conceptual model is tested to clearly indicate whether the indicator measuring each factor is reflective or formative. The second part is to determine the test model names, whether they are structural models or path models in which the causal relationships among constructs are tested (Roy, Tarafdar, Ragu-Nathan, & Erica, 2012).

A measurement model is considered as a reflective measurement model or a principal factor model if the causality relationship directs from a construct to its items or indicators, i.e. a reflective construct is seen as the cause and its indicators are seen as manifestations of this construct (Diamantopoulos & Winklhofer, 2001; Edwards & Bagozzi, 2000). In a reflective construct, its indicators can be deleted or altered without changing the nature of the construct. In contrast, a formative measurement model or a composite factor model considers the causality path which goes from the indicators to the constructs, i.e. a formative construct is seen as the consequence of its indicators. Consequently, formative indicators cannot be eliminated or altered with each other because this directly affects the identity of the formative construct (Chin, 2010). Figure 19 shows the path between constructs and indicators of the reflective and formative measurement models.

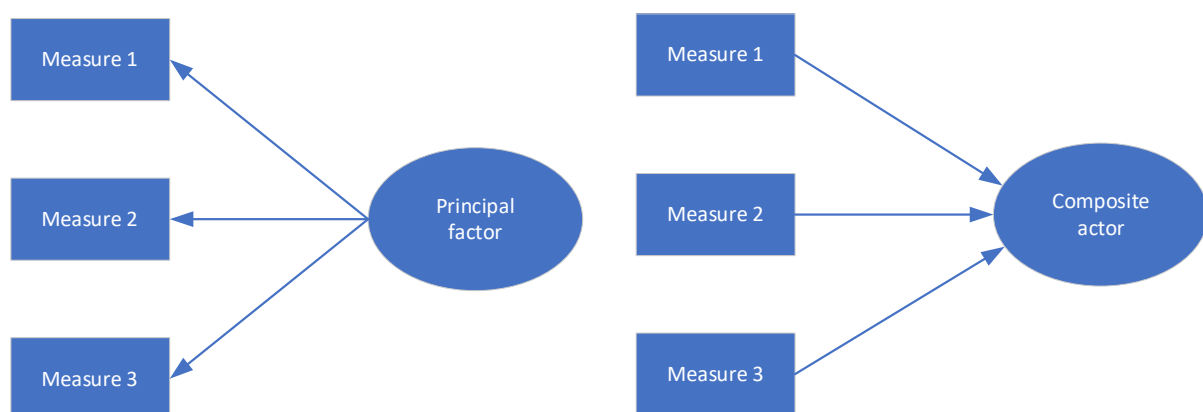


Figure 19: The reflective and formative measurement model (Jarvis, MacKenzie, & Podsakoff, 2003).

Recognition of the appropriate nature of measurement construct is vital in theory development (Alhulail, 2018). The reflective measurement model has been widely adopted in social sciences and information systems research (Diamantopoulos & Winklhofer, 2001). However, many studies have confused and overlooked the formative measurement model (Henseler et al., 2009; Jarvis et al., 2003). Mistaking the nature of constructs may lead to misleading results and failure in explaining and validating the proposed model or theory, which reduces the contribution of a study to the body of existing knowledge (Baxter, 2009). Diamantopoulos and Winklhofer (2001) state that the reliability and validity of data analysing are dependent on the identification of the nature of the constructs and whether they are formative or reflective.

The second level of model specification is the identification of the relationship between constructs as being reflective or formative. This leads to the conception and meaning of a unidimensional construct and a multidimensional construct. The measurement of a unidimensional construct (Figure 20), i.e. first-order construct, is a single dimension including a group of items (Hattie, 1984). In contrast, a multidimensional construct (Figure 21) is a higher-level construct (the second and higher orders) including distinct dimensions that are linked to the higher-level construct based on a theoretical concept (Edwards, 2001). A dimension that belongs to a multidimensional construct may be unidimensional or multidimensional (Law, Wong, & Mobley, 1998). Multidimensional constructs

have been adopted widely in information systems research (Polites, Roberts, & Thatcher, 2012).

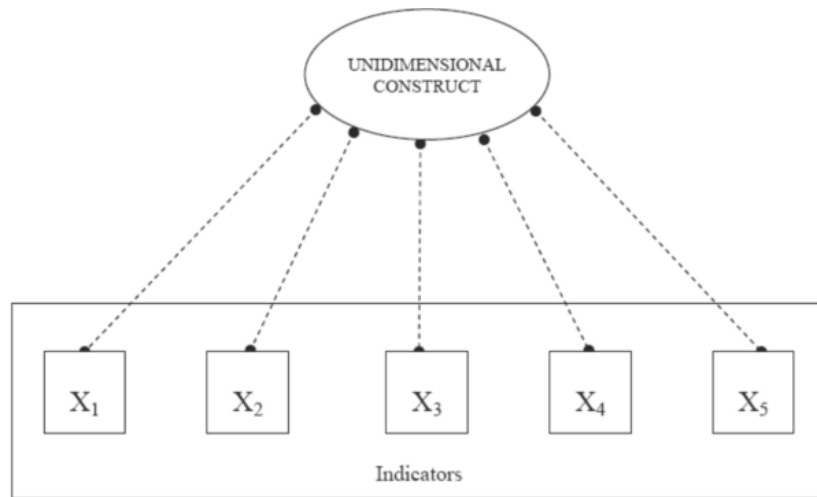


Figure 20: A unidimensional construct (Roy et al., 2012, p. 38).

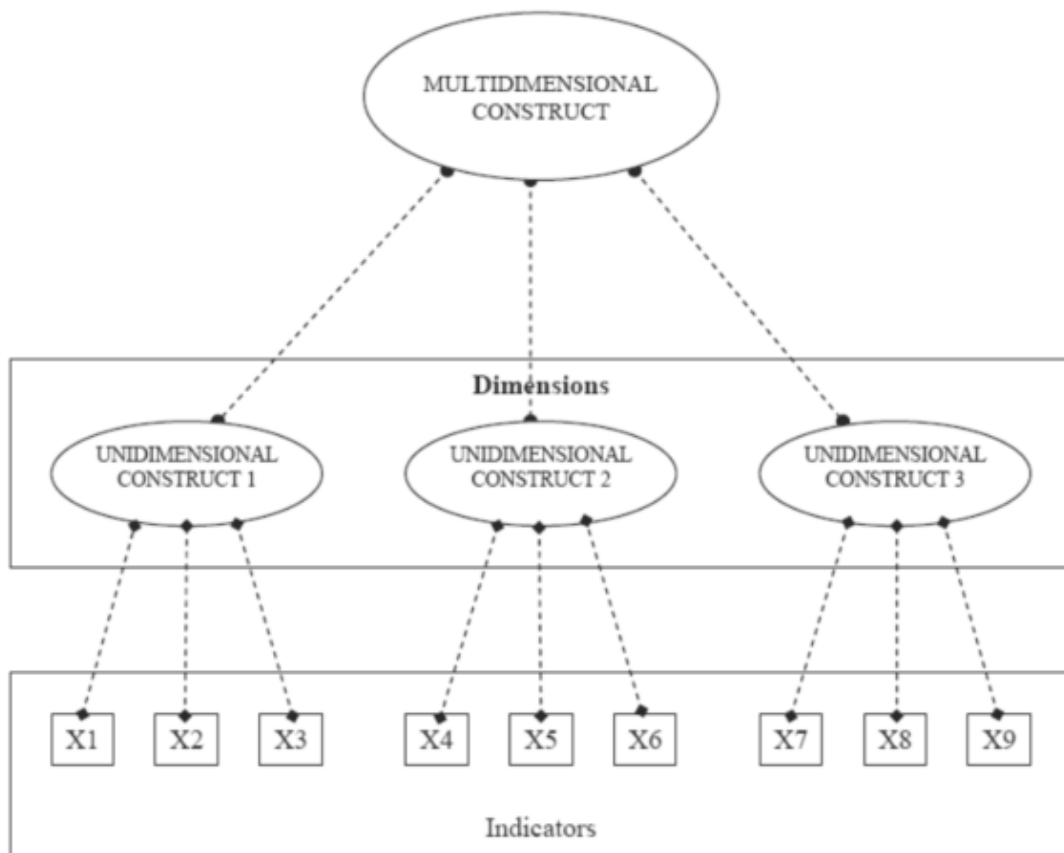


Figure 21: A multidimensional construct (Roy et al., 2012, p. 39).

A model consisting of more than one multidimensional construct that is theoretically connected is referred to as a hierarchical component model (Chin, 1998). A hierarchical component is known as two models in research which include the first-order factor and the second-order factor. Each order can be either reflective or formative, leading to the classification of four distinct types of a hierarchical model (Figure 22). They are: (1) type 1: reflective-reflective; (2) type 2: reflective-formative; (3) type 3: formative-reflective; and (4) type 4: formative-formative.

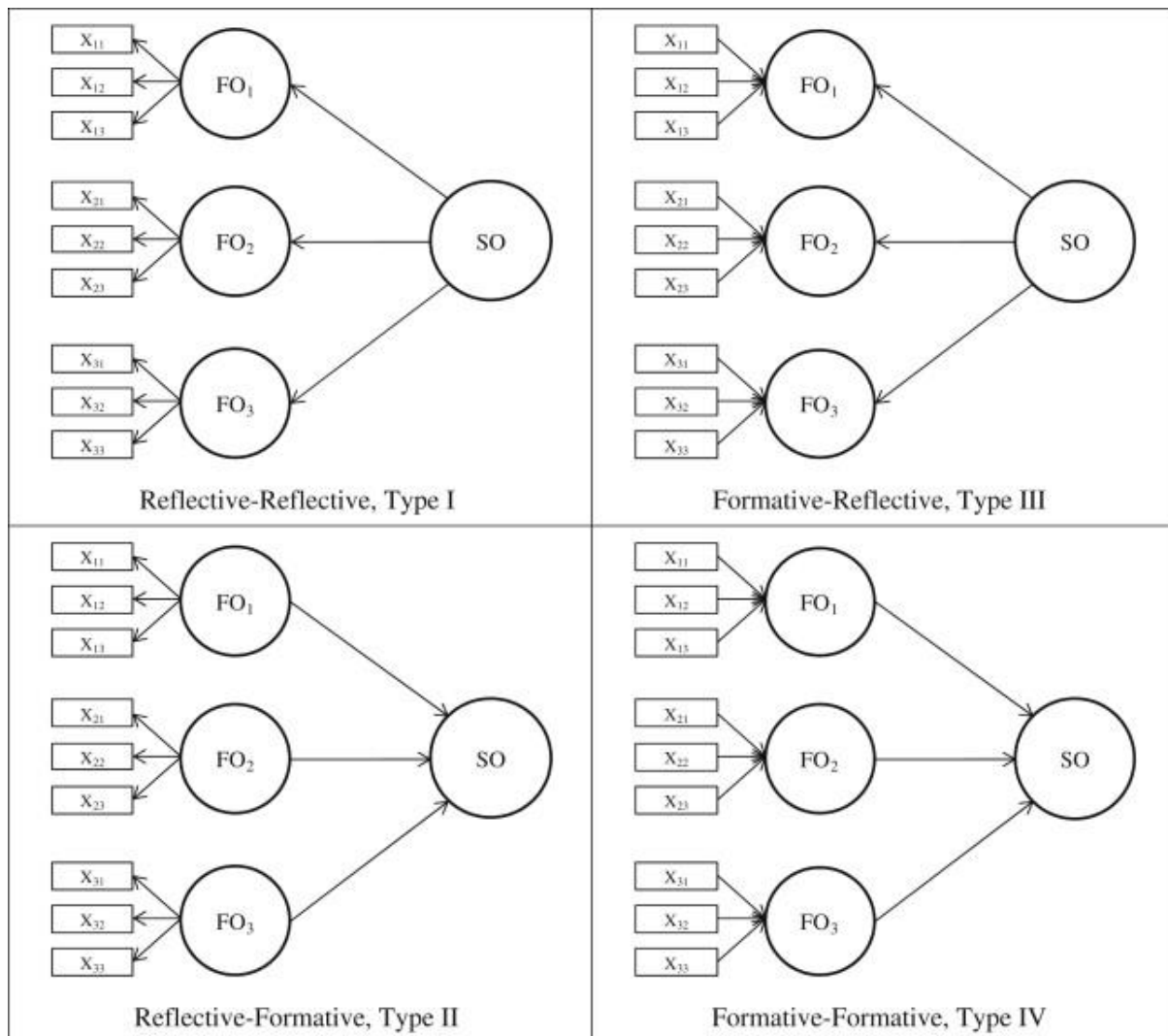


Figure 22: Four types of hierarchical component models (Alhulail, 2018, p. 130).

Previous studies related to areas of marketing, management, and information systems have commonly used hierarchical component models (Alhulail, 2018). Ringle, Sarstedt, and Straub (2012) found that the type 2 model which is Reflective-Formative, was utilised the most in research published in MIS Quarterly during the period from 1992 to 2011.

4.6.2. Construct specification

This study used type 2 namely the reflective-formative model to model constructs in the conceptual model. This is because of the following reasons. First, all the first-order factors, are reflective because the research adopted reflective constructs which were tested and validated from previous research in the field of information systems as well as in technology adoption. In addition, the second-order factors are formative which means that the arrows indicate from the lower-order constructs to the higher-order construct, more specifically from trust's determinants to trust, because this study aimed to investigate what constitutes CT in m-payment adoption (Xin et al., 2015).

4.7. SEM approach, PLS technique and Normality

This study adopted a variance-based structural equation modelling (SEM) approach with the partial least squares (PLS) technique and the software SmartPLS 3.3.2 to analyse the data (Lowry & Gaskin, 2014; Ringle et al., 2012).

The SEM approach provides several parameters to analyse the structural relationship between measured variables and latent constructs such as reliability and discriminants analysis, and average variance extracted (AVE) for a measurement model, and multiple regression, path coefficient, R^2 , and variance inflation factor (VIF) for a structural model (Bagozzi & Yi, 2012; Lowry & Gaskin, 2014). More specifically, SEM assesses the reliability and validity of constructs employed in a study and evaluates the relationships among distinctive

constructs simultaneously (Hair, Sarstedt, Ringle, & Mena, 2012). As a result, SEM is considered a robust analytical method for quantitative studies because it provides both regression and factor analysis for researchers to evaluate a measurement and structural model (Gefen, 2000).

Covariance-based and variance-based (also known as PLS) are two popular methods of SEM techniques (Hair, Sarstedt, Ringle, et al., 2012). Covariance-based SEM is a traditional SEM that is applied commonly by researchers across many disciplines such as psychology, marketing and management (Reinartz, Haenlein, & Henseler, 2009). It focuses on maximum-likelihood estimation and conducts covariance-based analyses to provide a set of model parameters such as goodness of fit index, comparative fit index, and root mean square error of approximation (Roldán & Sánchez-Franco, 2012). The theoretical matrix provided in covariance-based SEM implies that “the system of structural equations is as close as possible to the empirical covariance matrix observed within the estimation sample” (Reinartz et al., 2009, p. 332). In contrast, instead of working with latent variables like covariance-based SE, variance-based SEM or PLS focuses on block variables and use ordinary least squares estimation to compute the statistical paths between variables, i.e. estimate the variance that is explained by independent variables in the proposed model (Gefen, 2000).

Covariance-based SEM requires a set of assumptions that must be met to produce a proper result such as data normality (Götz, Liehr-Gobbers, & Krafft, 2010), and

having an adequate sample size with at least 200 responses to avoid non-convergence or invalid solutions (Boomsma & Hoogland, 2001). Another important assumption of covariance-based SEM is the measurement model must be reflective rather than formative, and thus it ignores constructs with a formative nature. As a result, it may lead to misspecification errors (Becker, Klein, & Wetzels, 2012), which is caused when indicators need to be adopted as formative rather than reflective (Albers, 2010).

In contrast, assumptions about the data required in PLS are more flexible (Chin, 2010). The PLS method does not require normal distribution of data, and it works well with a small sample size (Hair, Hult, Ringle, & Sarstedt, 2016; Henseler et al., 2009). The PLS method provides non-parametric parameters such as AVE and R square (R^2) for analysing prediction relationships. In addition, PLS can effectively handle both formative and reflective measurement models instead of only reflective constructs like covariance-based SEM (Henseler et al., 2009).

Rationale for using partial least squares

The PLS method has been widely adopted in research in business, marketing, management and information systems over the last few decades (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014; Hair, Sarstedt, Ringle, et al., 2012; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). Practically, PLS shows no bias when using it to analyse data from discrepant and composite populations whereas covariance-based SEM shows severe biases. Consequently, PLS is the preference

of social researchers due to its efficiency when dealing with unknown underlying data populations (i.e. common factor or composite), leading to its widespread adoption (Sarstedt et al., 2016). In addition, PLS focuses on predicting applied researched constructs rather than the confirmation of predicted linkage (Hair, Ringle, & Sarstedt, 2011). Consequently, PLS is effective and appropriate for examining causal-predictive relationships (Alhulail, 2018; Baptista & Oliveira, 2015; Chin, 1998; Henseler et al., 2009). As a result, PLS was most suitable for the purpose of this study which aimed to examine the causal-predictive relationship among trust's determinants and trust.

Normality Assessment

The assumption of normality in statistics means that the figure describes a data distribution that fits a symmetric curve which indicates that the data is normally distributed. Many statistical tests such as parametric tests require that data is normally distributed (Arbuckle, 2010). Non-normal data distribution may cause misleading or false results for studies in some circumstances, while normality of the dataset helps the study achieve more valid and precise results (Sek, 2016). Consequently, data normality is an important prerequisite for a multivariate data analysis (Byrne, 2016).

The normality assessment aims to identify whether the collected data is normally distributed across the sample or not (Hair et al., 2010). Normality can be identified based on an assessment of the graphics or statistics (Sek, 2016).

Graphically, it is performed by examining the figure of data distribution across the sample in a study. Statistically, researchers can use statistical values such as skewness and kurtosis for each variable in the study to check the normality of a dataset (Hair et al., 2010). Kurtosis refers to “the peakedness or flatness of the graph of a frequency distribution especially with respect to the concentration of values near the mean as compared with the normal distribution” (George & Rodger, 2010, p. 102). Kurtosis represents the thickness or heaviness of data distribution across a random variable compared to a normal data distribution (Byrne, 2016). A negative value of kurtosis indicates that a probability distribution is skewed left or has a lighter tail, while a positive one indicates it is skewed right or has a heavier tail than the normal distribution. Skewness is the measure of the direction of the probability distribution of a dataset with the centre, i.e. it indicates the orientation of the data distribution is right or left or central (Hair et al., 2010). A positive or negative skewness value represents a distribution skewed to the left or right respectively. Prior studies suggested different criteria for values of skewness and kurtosis to ensure the normality of data. While Hair et al. (2010) suggest an acceptable range value of skewness and kurtosis is -2.58 to +2.58, Kline (2015) proposed a more lenient range of $-/+10$.

This study used skewness and kurtosis values to assess normality. The result which is displayed in [Appendix 5.3](#), revealed that all 90 variables were within the normal range proposed by Kline (2015). In addition, this study had a large sample

size with 454 observations and used SmartPLS to analyse the conceptual model. Some authors have claim that the problem of normality assumption may not cause serious issues when having big enough sample sizes (>30 or 40) (Ghasemi & Zahediasl, 2012; Pallant, 2011). SmartPLS also has an advantage which is that it handles non-normal data well (Kock, 2016). As a result, normality was not a concern for this study.

4.8. Ethics

The ethics of this research was approved and managed by the Human Research Ethics Committee at RMIT University. The ethical approval number is 0000021957 which was designated for the researcher to collect data in Vietnam. Ethical approval is shown in [Appendix 5](#).

4.9. Summary

This chapter presented the research method which was employed in this study. First, the research paradigms were presented, which was followed by the rationale for choosing the positivist paradigm for this study. Then, the quantitative research methodology, the research design and sampling were presented. Next, the chapter discussed and described the design of the survey instrument and data collection based on the well-known framework proposed by Churchill (1979) and Straub (1989). Finally, the decision to select a reflective-formative hierarchical component model was discussed. The next chapter discusses the process of data preparation and preliminary data analysis.

Chapter 5: Data preparation and descriptive analysis

This chapter presents the process of data preparation and descriptive analysis. The data preparation phase consists of four stages: (1) missing data assessment; (2) outlier assessment; (3) normality assessment; and (4) common method bias assessment. Table 8 describes the methods adopted for preparing the data for the following data analysis phase.

Table 8: Description of methods for data preparation.

Aims	Method	Description
Missing Data Assessment	Missing Completely at Random (MCAR), Missing at Random (MAR), Missing not at Random (MNAR)	Identifying missing data is vital for any study because it directly affects the result of data analysis. This research used MCAR, MAR and MNAR methods to assess missing data. Nonetheless, the research used an online survey to collect data and made answering compulsory for every question. As a result, respondents could not skip any question, leading to no likelihood of omitting any question, if they completed the survey.
Outliers Assessment	Multivariate Outliers	This is a value that is highly different from other observations in the collected data in a study. Outliers may be caused by (1) respondents answered the questionnaires incorrectly or (2) the collected data was not coded precisely. Outliers indicate bad data, i.e. outliers seem to be likely to be biased due to the

Aims	Method	Description
		significant difference with other values; therefore, they should be identified and eliminated from the data set. Although there are some existing techniques to identify outliers, the selection of which method is arbitrary and dependent on the researchers.
Multivariate Normality Assessment	ZSkewness, ZKurtosis	Normality assessment is used to determine whether the research sample data is distributed normally. It is also used for checking how likely it is for a random construct or variable underlying the research data set to be normally distributed. In this research, the researchers used ZSkewness and ZKurtosis to test the normality of the research data set.
Common Method Bias Assessment	Exploratory Factor Analysis (EFA) with Harman's test	Common method bias refers to the likelihood of the instruments used to collect data to cause variations in responses rather than the actual opinion of respondents in the survey. In other words, common method bias indicates that if there is a bias in responses in the research dataset because of external factors rather than respondents themselves such as the design of questionnaires or the way to measure constructs. It can negatively and seriously influence the results of data analysis; therefore, the research dataset should be assessed carefully for common method bias. In this study, the

Aims	Method	Description
		researcher used Harman's test to assess common method bias.

After the data preparation process, a descriptive analysis of the collected data was conducted, and the results are presented in this chapter. This is vital for the following reasons. First, a descriptive analysis is useful to illustrate the collected data in an effective and meaningful way (Chau, 2020). Second, it helps to achieve a better understanding of participants' behaviour regarding the topic of this study (Chau, 2020), thereby, contributing to the body of knowledge about the effect of descriptive parameters such as gender, education, income, experience in using m-payment on trust in m-payment.

In particular, the descriptive parameters described in this study were:

- Gender
- Age
- Education
- Income
- Occupation
- Use of m-payment experience
- Frequency of use of m-payment

5.1. Missing data assessment

Missing data is any questionnaire item that was not answered by a respondent in the survey (Hair et al., 2010). Missing data in the dataset is a concern that any researcher must face and solve when conducting a study. For example, a respondent might refuse to provide an opinion about an issue in a study or forget to respond to a question when going through the survey. As a result, a researcher must make a decision about how to solve the problem of missing values when they have inadequate information from some of the respondents (Allison, 1987; Schafer & Olsen, 1998).

Statistical and mathematical analyses need proper and adequate information or values in order to provide an accurate result; therefore, missing data has always been a problem for any study or report. The loss of appropriate data may cause bias in the estimation of variables. The researcher must handle this by assuming that missing values diverge from other cases in a systematically important way (Alhulail, 2018). Missing data not only reduces the sample size or decreases the representativeness of the sample, but also causes a biased impact on the collected data (Byrne, 2016; Hair et al., 2010). Researchers have discussed the problem of missing data in statistical analysis since the 1980s (Barnard & Rubin, 2000).

Missing data also includes situations where an appropriate value of a variable is not accessible for data analysis. There are three types of missing data which are MCAR, MAR and MNAR (Hair et al., 2010). Missing completely at random

exists when the missing values are just a random subgroup of the dataset and there is no connection between a missing value and any others across all observations, i.e. the disposition of missing value points in the dataset is random. Researchers can check MCAR by classifying a dataset into two parts (including or not including missing data) and using t-tests or chi-square tests on age, sex, income and other variables in the dataset to determine whether there is a significant difference between these two parts on any variable. In contrast, MAR means the disposition of a missing data point has a systematic relationship with the observed data rather than having a random pattern; however, it is not related to the missing data. For example, when there is a question about weight on a survey, men are more likely to provide this information while women are less likely to provide this information; therefore, weight is MAR. Missing at random and missing value points are forecasted by additional variables in the dataset. The last category of missing data is MNAR which is different from MAR and MCAR, and is therefore considered as the most challenging and problematic type (Brand, Van Buuren, Groothuis-Oudshoorn, & Gelsema, 2003; De Waal, Pannekoek, & Scholtus, 2011). In MNAR, there is a connection between the propensity of missing values and data. For example, those who have the lowest levels of education decline to answer questions about education in a survey. This leads to a need to adopt one or more models to explain for the missingness of data including why this happens and how to solve this or what the likely replaced values may be. As a result, MNAR is also considered as non-ignorable missingness while MCAR and MAR

are called ignorable missingness because it is unnecessary to add any information to solve the missing data in these two types.

There are several distinctive statistical programs to analyse data and support dealing with missing data and data accusations such as SPSS, SAS, STATA. This study adopted SPSS to analyse data and solve the problem of data preparation including checking missing data, checking for outliers, normality analysis and common method bias. There is a function namely “Missing Value Analysis” (MVA) in SPSS to support dealing with missing data via some algorithms. One of the most well-known ones is expectation maximisation (EM) (Schafer & Olsen, 1998).

In this study, MCAR, MAR and MNAR techniques were employed to recognise any missing data. However, the researcher set up some constraints in the online survey tool namely Qualtrics provided by RMIT to collect data to ensure that there is no likelihood of missing data once respondents finished the survey. In particular, respondents were reminded and required to answer all the questions of the survey to complete it. As a result, respondents could not dismiss or forget to answer any questions in the survey, leading to no likelihood of missing data once respondents finished the survey. The test MVA with EM method on SPSS to the dataset of 482 observations collected from the online survey revealed that there was no missing data in the dataset (see [Appendix 5.1](#)).

5.2. Outliers' assessment

Outliers are values that are divergent from the rest of the other values in the dataset (Byrne, 2016). There are some reasons that cause outliers such as data coding errors, respondent errors, and instrument errors (Schumacker & Lomax, 2004). Outliers may greatly impact the statistical results of data analysis such as the mean, standard deviation, parameter estimation, the slope of the regression line, model estimation which leads to a misleading interpretation (Gallagher, Ting, & Palmer, 2008). In addition, outliers can make data distribution non-normal (Kline, 2015). Normality is a requirement for many statistical analyses; therefore, identifying and eliminating outliers is needed for data preparation. However, prior studies have revealed that many researchers do not check for and clean outliers (Chau, 2020). This may be because a value or case which is extremely different or dissimilar from others cannot default to an irregularity or unacceptability, and must be deleted. Hair et al. (2010) state that the collected data should be relevant to the topic; therefore, removing values that are not aligned with the hypotheses is necessary and acceptable. As a result, outliers should be assessed and checked in a study by adopting statistical procedures (Byrne, 2016).

In this study, the researcher employed the Mahalanobis distance (D_2) for each measurement item used in the survey to identify outliers (Hair et al., 2010). The D_2 refers to the distance in standard deviation between a single case and the mean

of all the cases in a dataset of a given study (Kline, 2015). In other words, D_2 assesses the degree of the disparity of all the cases over the dataset. The researcher used chi-square (χ^2) distribution with a P-value (<0.001), and degrees of freedom (df) to evaluate the D_2 of each observation in the dataset (Tabachnick et al., 2007). An observation is recognised as an outlier if it has a D_2 larger than the value of χ^2 (Tabachnick et al., 2007). Accordingly, 28 cases were identified as outliers and were removed from the dataset ([Appendix 5.2](#)), and 454 remaining cases were chosen for further analysis.

5.3. Common method bias assessment

Common method bias or common method variance implies a variance caused by the measurement items or technique to gather data, rather than the actual measure of the constructs represented by the participants in a study (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is considered as one of the major causes of measurement errors that threaten the validity and reliability of the research findings of any study (Bagozzi & Yi, 1991). Consequently, common method bias assessment is important and necessary to any study to ensure the validity of the research data as well as the research outcome.

There are many methods to identify and evaluate common method bias and Harman's single factor test is widely used (Podsakoff et al., 2003). The method is conducted by loading all of the measurement items or variables into one factor and using an exploratory factor analysis (EFA) with an unrotated factor solution

to define the number of factors accounting for the variance in the measurement items (Aulakh & Gencturk, 2000).

Using Harman's single factor test for the dataset in this study revealed that 14 factors explained 70.8% of the variance of data. The greatest factor explained only 36.2% of the model. This is much smaller than the cut-off value of 50% which indicates the presence of common method bias (Chau et al., 2020). As a result, it is unlikely that the data in this study were affected by common method bias. The results of the common method bias assessment are shown in Table 9.

Table 9: Common method bias test-total variance explained.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	32.636	36.262	36.262	32.058	35.620	35.620
2	7.969	8.854	45.116			
3	4.445	4.939	50.056			
4	3.236	3.596	53.652			
5	2.339	2.599	56.250			
6	2.058	2.286	58.536			
7	1.975	2.194	60.730			
8	1.638	1.820	62.550			
9	1.467	1.629	64.180			
10	1.398	1.553	65.733			

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
11	1.304	1.448	67.181			
12	1.215	1.350	68.531			
13	1.085	1.205	69.736			
14	0.963	1.070	70.806			

5.4. Descriptive analysis and discussion

A descriptive analysis of demographic data aims to analyse the characteristics of the participants in a study (An et al., 2017; An, Sun, Bai, & Deng, 2016). This is useful for explaining the data sample in a meaningful way for a social context and demonstrating the representativeness of the sample. Demographic statistics also help to achieve more understanding of the relationship between the attributes of participants in a study with the variables or factors employed in the conceptual model (Almukhlifi, 2019). However, this is just a description of data rather than testing the hypotheses that are proposed in a study. The statistical measures used to analyse demographic data in this study were: central tendency, variability and normality (Ott & Longnecker, 2015). The descriptive analysis of demographic data of m-payment consumers is beneficial to provide the characteristics of respondents and describe the context of m-payment adoption.

This section presents the results from the descriptive analysis of demographic data of the respondents in the survey.

5.4.1. Respondents' gender

There were 235 females and 219 males that completed the survey which accounted for 51.76% and 48.24% of the sample respectively. The analysis result for gender shows that there was no significant difference between the ratio of females and males attending the survey. There is no official report or data regarding gender distribution of m-payment usage in Vietnam that could be found; therefore, the researcher found several reports in similar fields such as e-payment or mobile POS payment to make a comparison. A survey conducted in 2020 about e-payment usage revealed that 88% of female and 88% of male respondents had used e-payment (Statista, 2020a). Regarding the usage of mobile POS payment, the report by Statista (2019b) shows that in 2019, 51.6% of consumers were male while 48.4% were female.

5.4.2. Respondents' age

Figure 23 *Figure 23* represents the distribution of respondents' age in this study. As can be seen in Figure 23, the majority of respondents were aged from 18-24 (52.4%), while the second-largest group was 25-34 (24.3%). Similarly, Statista (2020c) reported that the first and second age groups that used the two most popular e-wallets in Vietnam (MoMo and BankPlus) were aged 18-24 and 25-34 in respectively.

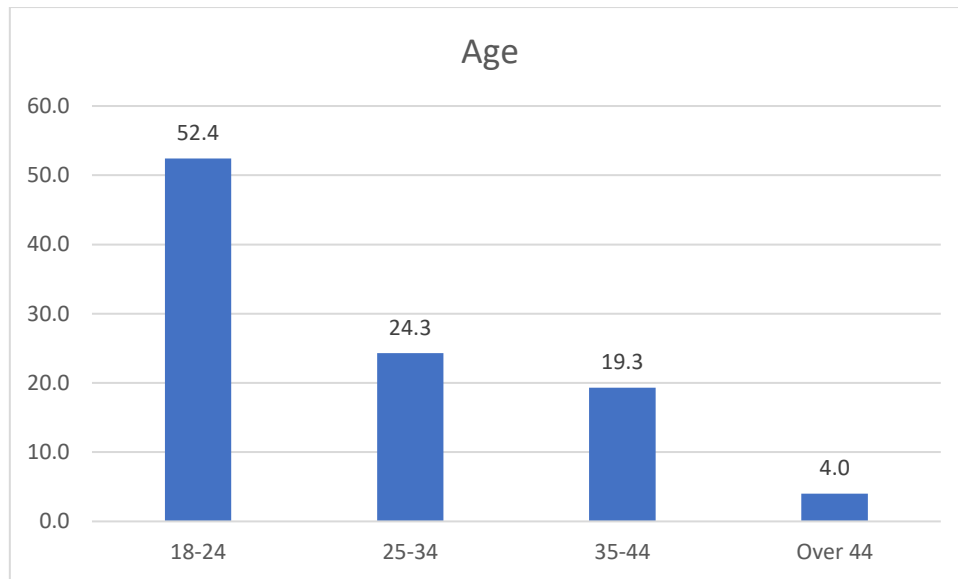


Figure 23: Age distribution.

5.4.3. Respondents' education

The respondents' education is shown in Figure 24. As can be seen in this figure, most respondents have a bachelor's degree (69.96%). As there is no official report or data about the level of education of Vietnam m-payment consumers, it was impossible to compare this category of the population of m-payment consumers with the sample in this study. As can be seen in Figure 24, the number of respondents who were educated significantly differ from the other categories. This may mean that m-payment adoption may be preferred or easier to adopt for those who have a higher level of education, or may be because the researcher's social network is comprised of people who are educated.

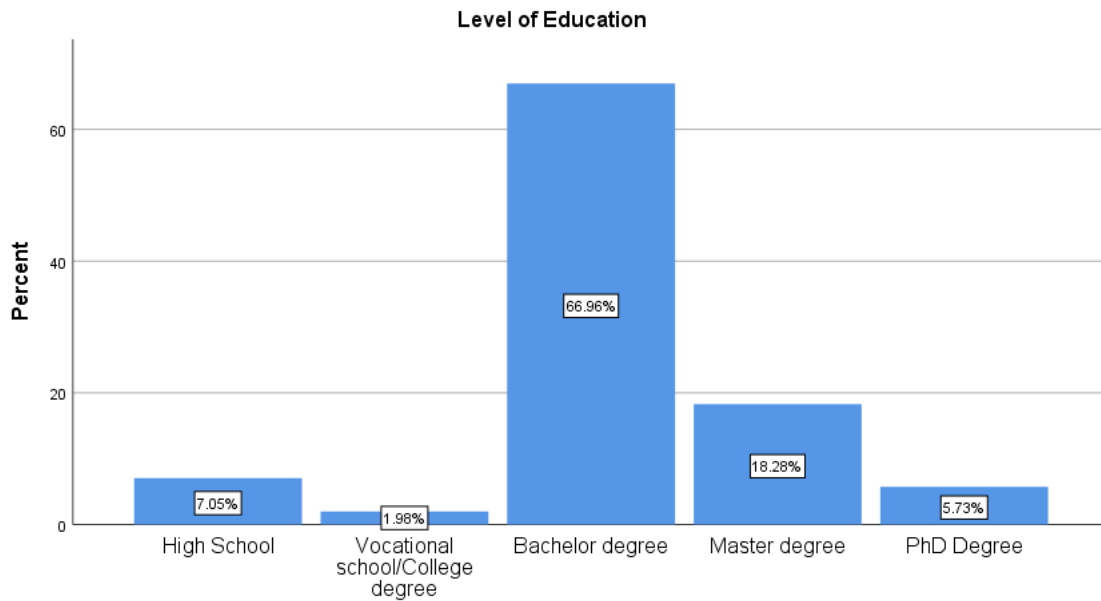


Figure 24: Education distribution.

5.4.4. Respondents' income

Figure 25 presents the respondents' income distribution of the sample in this study. As can be seen, the chart tends to descend which means that the higher income, the smaller the number of respondents. The classification of income was based on the income tax rate of the Vietnamese government (VietnamLaw, 2021).

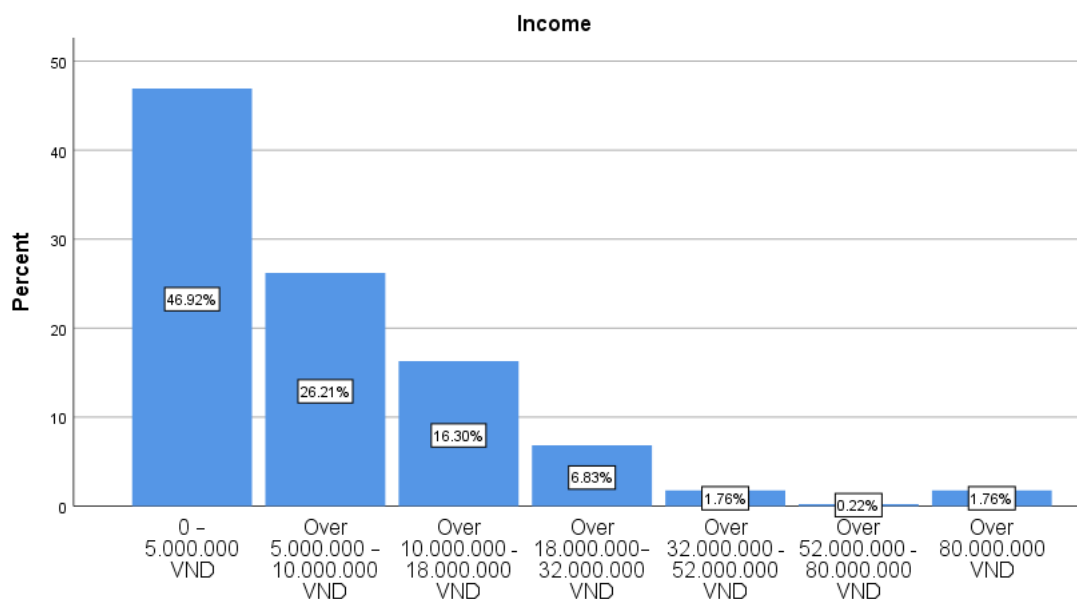


Figure 25: Income distribution.

There is no official report about the income distribution of m-payment consumers in Vietnam; therefore, the report by Statista (2019b) about the income distribution of mobile POS payment consumers in Vietnam was used. As can be seen in Figure 26, the ratio of income categories is relatively different. As can be seen, the largest group (35.6%) was made up of people with medium incomes, whereas the smallest group (29.6%) was made up of people with low incomes.

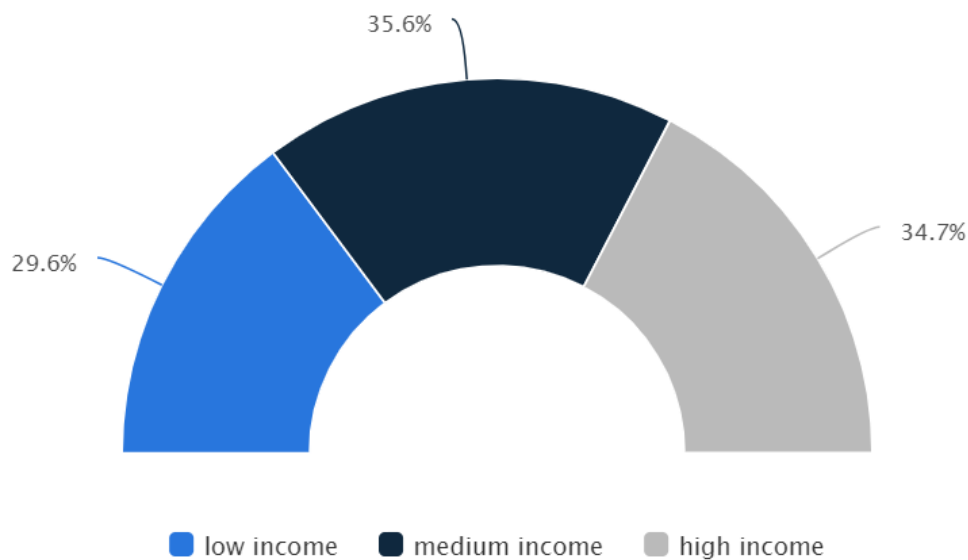


Figure 26: Income distribution of Vietnamese mobile POS payment consumers in 2019 (Statista, 2019b).

Clearly, there is a relative difference between people using mobile POS payment and the sample of people using m-payment in this study.

5.4.5. Respondents' occupation

Figure 27 presents the respondents' occupation distribution of the sample in this study. As can be seen in this figure, students accounted for the highest number of respondents, which is aligned with the age distribution presented in Section 5.5.2 where people aged from 18-24 accounted for the largest number of m-payment consumers. In contrast, workers accounted for the lowest number of respondents in the sample, which may reflect the social connections of the researcher. No comparative data about the occupation of m-payment consumers in Vietnam could be found.

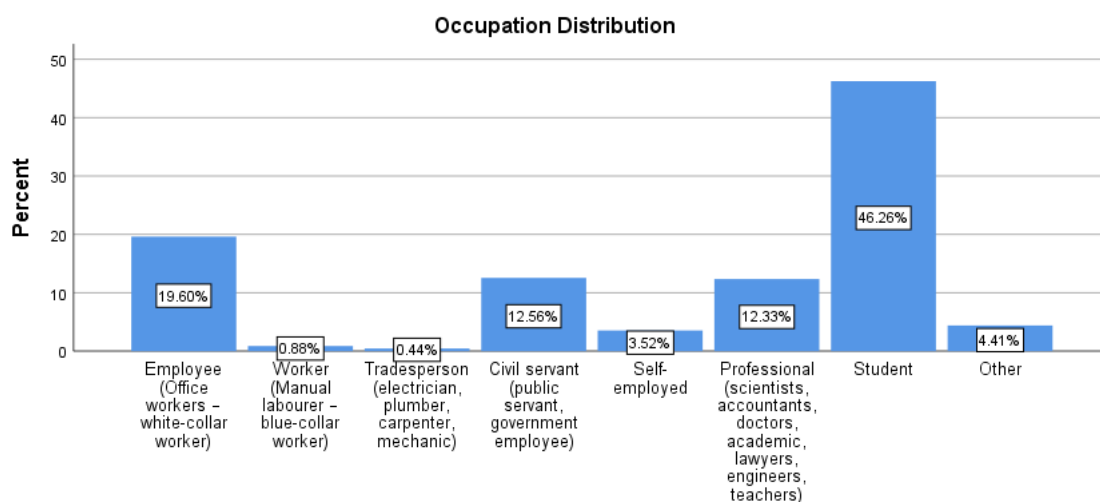


Figure 27: Occupation distribution.

5.4.6. Respondents' experience of using m-payment

Figure 28 presents the distribution of the respondents' experience with using m-payment. This study aimed to survey people who had used m-payment in the previous three months; therefore, all the respondents were experienced

consumers. As can be seen in Figure 28, the largest number had three years or more experience, while people who had two to three years of experience accounted for the smallest group. This is suitable with the boom of m-payment in Vietnam which ranked first worldwide regarding an increase in the percentage of users using m-payment (PwC, 2019).

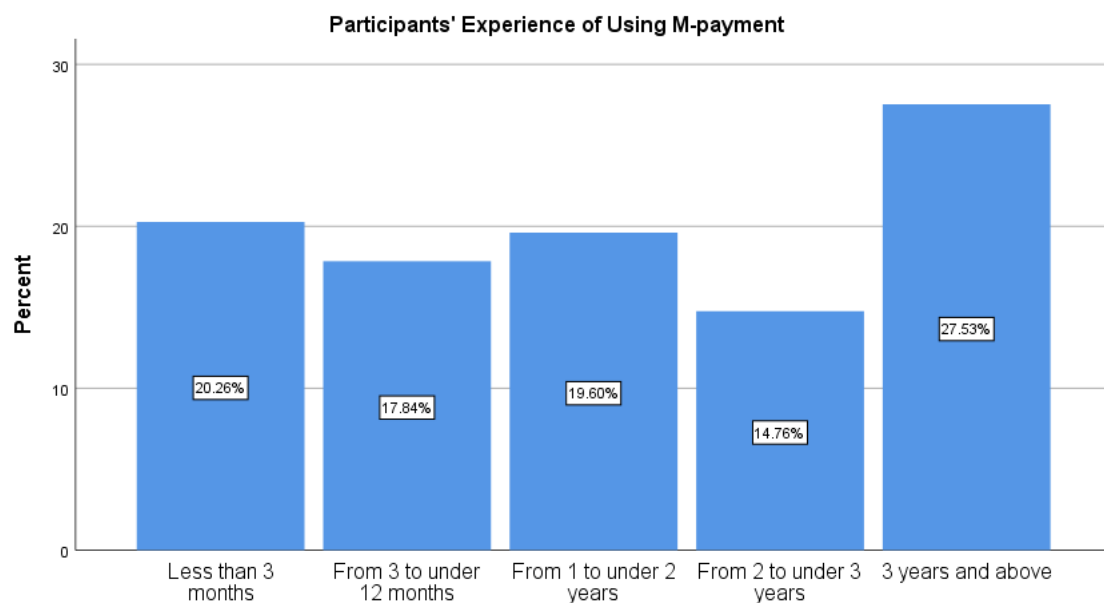


Figure 28: Respondents' experience of using m-payment.

5.4.7. Respondents' frequency of using m-payment

Figure 29 represents the distribution of respondents' frequency using m-payment. It can be seen that the frequency of once in 2-3 days is the highest amount while once in three months is the lowest.

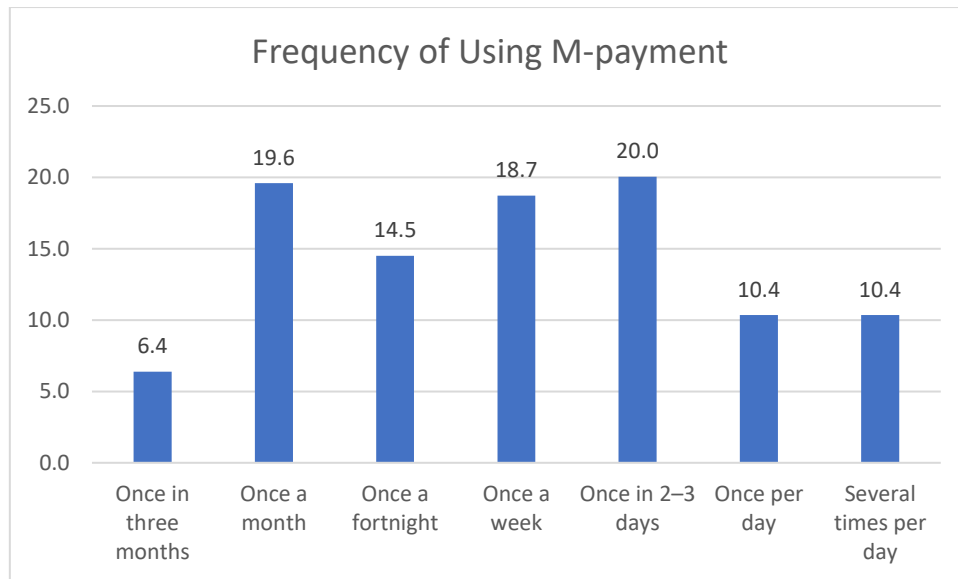


Figure 29: Respondents' frequency of using m-payment.

The data from Statista (2020b) presented in Figure 30 about the frequency of making e-payments in Vietnam in 2020 was used for reference. The sample only included people who had used m-payment in the last three months; therefore, there was no data about rare usage (at least once in the last year) and no usage. The usage of other categories including sometimes, frequently, and daily is quite similar to the distribution of frequency of using m-payment in this study.

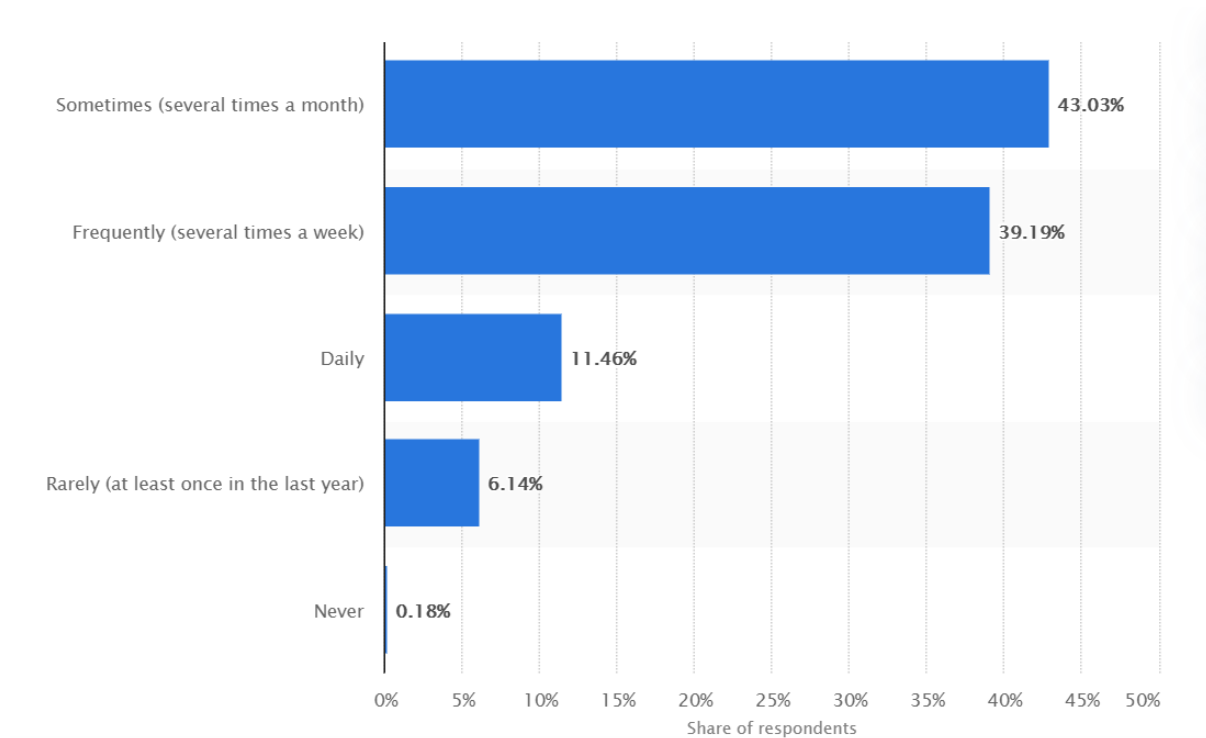


Figure 30: Frequency of making e-payments in Vietnam in 2020 (Statista, 2020b).

5.5. Summary

This chapter presented the data preparation process and the descriptive analysis of this study. After the process of checking for missing data and outliers, 454 valid observations were used for further analysis. The normality test was conducted, and the result met the requirement of multivariate data analysis, while the common method bias test indicated that response bias was not a concern for the data in this study. The sample of 454 observations was then used for descriptive analyses with seven items including gender, age, education, income, occupation, experience, and frequency of use of using m-payment. The next chapter discusses the process of data analysis and the results.

Chapter 6: Data analysis and findings

This chapter describes the data analysis process and the results to the research questions concerning the determinants of CT in m-payment continuance intention in Vietnam. First, the analysis procedures, the PLS method in this study, and the model evaluation are presented. Then, the analysis of the measurement model, the structural model and the hypotheses are presented in turn.

6.1. Data analysis procedures

According to Hair, Sarstedt, Ringle, et al. (2012), there are three stages for data analysis which are data preparation, data validation with a measurement model, and data evaluation with a structural model. The data preparation phase was conducted and described in the previous chapter. The SPSS was used to identify missing data, outliers, and common method bias which can significantly influence the accuracy of the results due to the violation of requirements of statistical methods (Hair, Money, Samouel, & Page, 2007; Marcoulides & Saunders, 2006; Ott & Longnecker, 2015). The data preparation phase resulted in 454 observations for further data analysis. This study adopted a variance-based SEM approach with the PLS technique and the software SmartPLS 3.3.2 to analyse the data (Lowry & Gaskin, 2014; Ringle et al., 2012) (as described in the section 4.7).

Data analysis procedures of a structural equation model include two steps. First, the measurement model which aims to evaluate the psychometric properties of the data and model (Hair et al., 2011; Urbach & Ahlemann, 2010) is conducted. It is necessary to examine the psychometric properties of all the indicators' measured factors to ensure that these observed factors are reflected by their items (Chin, 2010). In this step, the validity and reliability of items' measured factors, i.e. first-order factors, are examined. The second step is assessing the structural model. The significance of all path coefficients, effect size, and the variance explained for the relationships among independent and dependent variables were calculated and are discussed below.

6.2. Operationalisation of constructs

The conceptual model was discussed and shown in Chapter 3. Table 10 presents the research constructs, the codes of the constructs and the codes of the indicators that were used in this study.

Table 10: Operationalisation of constructs.

Construct	Operationalisation	Code of constructs	Code of Indicators	References
Customer Trust	Reflective Construct	CT	CT1, CT2, CT3	(Lu et al., 2011; Qasim & Abu-Shanab, 2016)
Performance Expectancy	Reflective Construct	PE	PE1, PE2, PE3, PE4	(Venkatesh et al., 2003; Venkatesh et al., 2012)

Construct	Operationalisation	Code of constructs	Code of Indicators	References
Effort Expectancy	Reflective Construct	EE	EE1, EE2, EE3, EE4, EE5, EE6	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Social Influence	Reflective Construct	SI	SI1, SI2, SI3	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Facilitating Conditions	Reflective Construct	FC	FC1, FC2, FC3, FC4	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Hedonic Motivation	Reflective Construct	HM	HM1, HM2, HM3	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Price Value	Reflective Construct	PV	PV1, PV2, PV3	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Habit	Reflective Construct	HB	HB1, HB2, HB3, HB4	(Venkatesh et al., 2003; Venkatesh et al., 2012)
Power Distance	Reflective Construct	PD	PD1, PD2, PD3, PD4, PD5	(Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009)

Construct	Operationalisation	Code of constructs	Code of Indicators	References
Collectivism	Reflective Construct	CO	CO1, CO2, CO3, CO4	(Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009)
Masculinity	Reflective Construct	MA	MA1, MA2, MA3, MA4	(Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009)
Uncertainty Avoidance	Reflective Construct	UA	UA1, UA2, UA3, UA4	(Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009)
Long term Orientation	Reflective Construct	LO	LO1, LO2, LO3, LO4	(Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009)
M-payment Provider Trust	Reflective Construct	PT	PT1, PT2, PT3, PT4, PT5, PT6	(Andreev et al., 2012; Srivastava et al., 2010; Zhou, 2011)

Construct	Operationalisation	Code of constructs	Code of Indicators	References
Institution-based Trust	Reflective Construct	IBT	IBT1, IBT2, IBT3, IBT4, IBT5, IBT6	(McKnight, Choudhury & Kacmar 2002; Nguyen 2016; Srivastava, Chandr
Seller Trust	Reflective Construct	ST	ST1, ST2, ST3, ST4	(Pavlou & Gefen, 2004)
Intention to continue to use m-payment	Reflective Construct	IN	IN1, IN2, IN3	(Venkatesh et al., 2003; Venkatesh et al., 2012)

The initial conceptual model is presented in Figure 31.

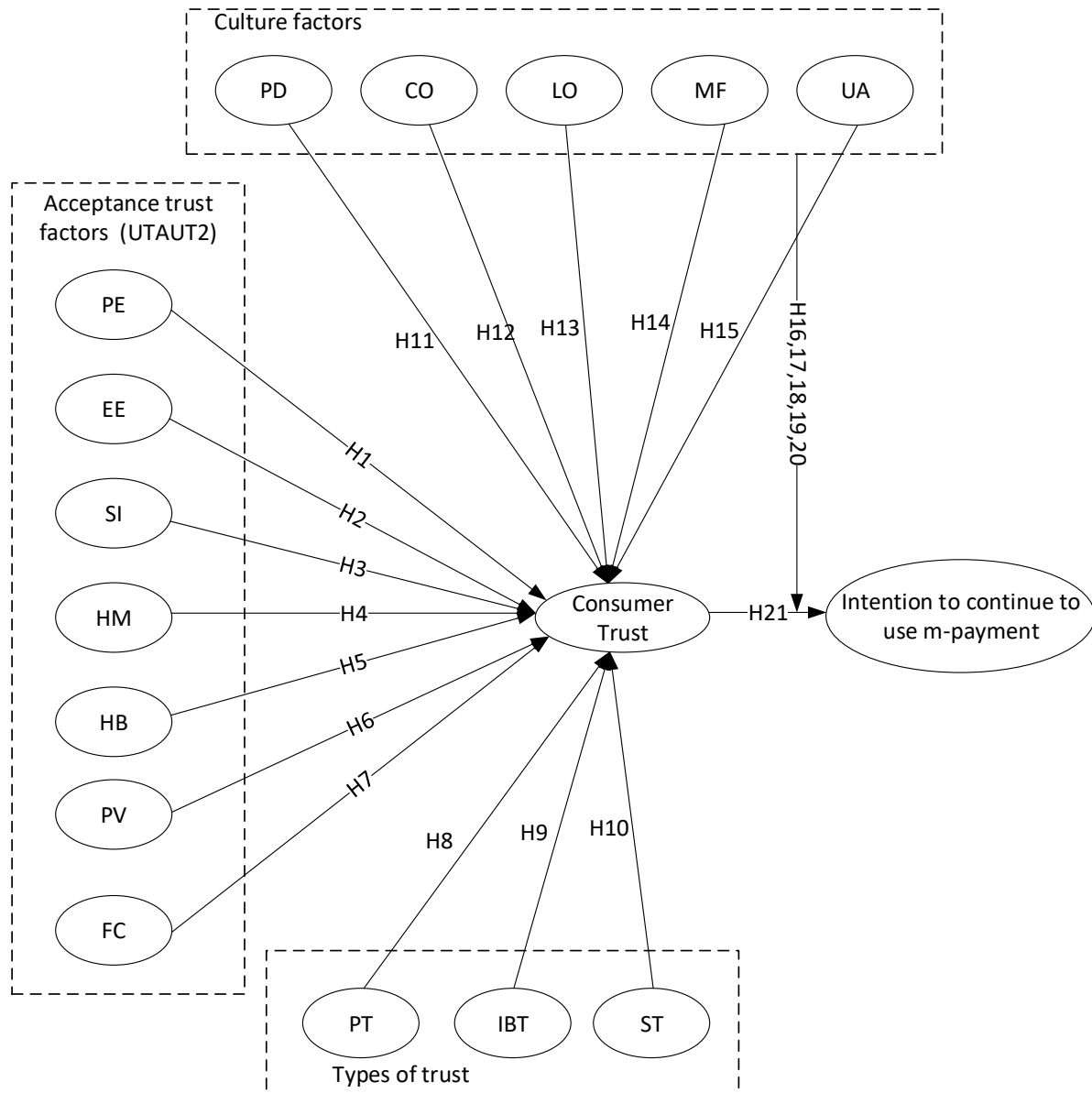


Figure 31: The initial conceptual model.

6.3. Assessment of the measurement model

As mentioned in Chapter 4, the conceptual model used was type 2: reflective-formative which means that all the first-order factors are reflective, and the second-order factors are formative. The measurement model including constructs, indicators, convergent and discriminant validity was examined in this

section. For this purpose, the researcher used SmartPLS to conduct a CFA instead of an EFA. This is because, in this study, the linkage between studied variables was well established from the comprehensive review of related literature (Barney, 1986; Hardin, 2002; Treiblmaier & Filzmoser, 2010). In addition, a CFA is considered a more rigorous method than the EFA (Alhulail, 2018; Chau, 2020). First, the items' reliability was tested to ensure that they were consistent, then the validity of items was tested to ensure that the used items reflect their factors (Sekaran & Bougie, 2016).

6.3.1. Indicator reliability

In this step, the researcher used a path weighted with 500 iterations to check the reliability because it was suitable for establishing the causal relationship between constructs in the model (Urbach & Ahlemann, 2010; Vinzi, Trinchera, & Amato, 2010). Indicator validity was tested with the cut-off value factor loading of items set to 0.7 (Churchill, 1979; Hair, Ringle, & Sarstedt, 2013). This led to the dropping of items PE1, UA3, UA4, LO1, LO2, IBT1, IBT2, SI3, FC4 due to their low factor loading. Items ST1, ST2, IT3, PT4 were dropped due to cross-loading. Table 11 presents the factor loading of the remaining items that satisfied the requirement for indicator reliability.

Table 11: Factor loading of constructs.

	CO	CT	EE	FC	HB	HM	IN	IBT	LO	MA	PD	PE	PT	PV	SI	ST	UA
CO1	0.766																
CO2	0.767																
CO3	0.777																
CO4	0.777																
CT1		0.835															
CT2		0.88															
CT3		0.842															
EE1			0.73														
EE2			0.916														
EE3			0.836														
EE4			0.832														
EE5			0.764														
EE6			0.797														
FC1				0.801													
FC2				0.823													
FC3				0.856													
HB1					0.88												
HB2					0.874												
HB3					0.783												
HB4					0.875												
HM1						0.872											
HM2						0.914											
HM3						0.74											
HM4						0.812											
IN1							0.805										
IN2							0.798										
IN3							0.874										

IBT4								0.792									
IBT5								0.861									
IBT6								0.843									
LO2									0.793								
LO3									0.898								
MA1										0.829							
MA2										0.863							
MA3										0.863							
MA4										0.828							
PD1											0.825						
PD2											0.809						
PD3											0.747						
PD4											0.849						
PD5											0.883						
PE2												0.853					
PE3												0.792					
PE4												0.822					
PT1													0.822				
PT2													0.823				
PT3													0.821				
PT5													0.849				
PT6													0.839				
PV1														0.813			
PV2														0.899			
PV3														0.843			
PV4														0.79			
SI1															0.816		
SI2															0.859		
ST3																0.924	
ST4																0.867	

UA1																	0.865
UA2																	0.825

6.3.2. Construct validity

This study used composite reliability (CR) and Cronbach's alpha with the cut-off value set to 0.7 (Hair et al., 2011; Straub, 1989) to test construct validity. This type of validity aims to test whether the measurement items of each construct accurately measure the construct itself. Table 12 presents the results of the construct validity test which indicates the requirements of construct validity are satisfied.

6.3.3. Convergent validity

Convergent validity aims to check the correlations between the measurement items and their measured constructs. The AVE parameter aims to recognise the average of shared variance between a construct and its measurement items (Chin, 2010; Hulland, 1999). The cut-off value of an AVE for convergent validity is 0.5 (Fornell & Larcker, 1981). Table 12 shows the AVE of all constructs in this study which indicates that the requirement of convergent validity is satisfied.

Table 12: Construct validity and convergent validity.

Construct	Cronbach's Alpha	Composite Reliability	AVE
CO	0.855	0.855	0.855
CT	0.888	0.889	0.889
EE	0.921	0.925	0.922
FC	0.866	0.867	0.867
HB	0.914	0.917	0.915
HM	0.902	0.908	0.903
IN	0.866	0.868	0.866
IBT	0.871	0.873	0.871

LO	0.832	0.841	0.835
MA	0.91	0.91	0.91
PD	0.913	0.916	0.913
PE	0.863	0.863	0.862
PT	0.917	0.918	0.918
PV	0.904	0.906	0.903
SI	0.824	0.826	0.825
ST	0.89	0.892	0.89
UA	0.833	0.834	0.834

6.3.4. Discriminant validity

Another important validity is discriminant validity which aims to ensure that the items of different constructs are not related (Chin, 2010). In this study, discriminant validity was tested by (1) ensuring that the square root of the AVE was greater than the correlation between constructs (Fornell & Larcker, 1981); and (2) that the Heterotrait-monotrait analysis had a cut-off value of 0.85 (Ab Hamid, Sami, & Sidek, 2017; Kline, 2015). The results of this test are shown in Table 13 and Table 14 which indicate that the requirement for discriminant validity is satisfied.

Table 13: Discriminant validity with Fornell-Larcker criteria.

	CO	CT	EE	FC	HB	HM	IN	IBT	LO	MA	PD	PE	PT	PV	SI	ST	UA
CO	0.772																
CT	0.486	0.853															
EE	0.244	0.592	0.815														
FC	0.288	0.623	0.768	0.827													
HB	0.286	0.567	0.656	0.791	0.854												
HM	0.337	0.584	0.627	0.751	0.742	0.837											
IN	0.321	0.601	0.692	0.756	0.745	0.616	0.826										
IBT	0.539	0.831	0.482	0.533	0.506	0.551	0.488	0.833									
LO	0.321	0.434	0.433	0.43	0.269	0.325	0.509	0.341	0.847								
MA	0.589	0.254	0.064	0.067	0.176	0.243	0.082	0.375	0.003	0.846							
PD	0.622	0.271	0.087	0.071	0.198	0.252	0.097	0.341	0.009	0.727	0.824						
PE	0.229	0.434	0.785	0.641	0.515	0.507	0.58	0.335	0.412	0.061	0.068	0.823					
PT	0.478	0.824	0.52	0.643	0.566	0.541	0.57	0.796	0.421	0.225	0.264	0.477	0.831				
PV	0.334	0.612	0.598	0.803	0.751	0.751	0.633	0.546	0.364	0.143	0.228	0.486	0.652	0.837			
SI	0.265	0.596	0.623	0.63	0.661	0.737	0.602	0.499	0.329	0.171	0.2	0.605	0.555	0.632	0.838		
ST	0.48	0.816	0.424	0.455	0.471	0.538	0.429	0.785	0.296	0.36	0.372	0.318	0.754	0.505	0.506	0.896	
UA	0.319	0.491	0.431	0.52	0.372	0.326	0.592	0.336	0.728	0.02	-0.018	0.399	0.493	0.395	0.313	0.281	0.845

Table 14: Discriminant validity with the Heterotrait-monotrait analysis.

	CO	CT	EE	FC	HB	HM	IN	IBT	LO	MA	PD	PE	PT	PV	SI	ST
CO																
CT	0.486															
EE	0.243	0.591														
FC	0.288	0.624	0.767													
HB	0.288	0.569	0.655	0.793												
HM	0.338	0.584	0.622	0.751	0.743											
IN	0.321	0.601	0.693	0.757	0.745	0.61										
IBT	0.54	0.832	0.48	0.533	0.508	0.554	0.487									
LO	0.324	0.436	0.433	0.427	0.269	0.322	0.51	0.345								
MA	0.59	0.254	0.066	0.067	0.177	0.246	0.114	0.376	0.077							
PD	0.625	0.273	0.091	0.073	0.202	0.255	0.131	0.343	0.058	0.725						
PE	0.228	0.433	0.787	0.639	0.512	0.504	0.579	0.334	0.413	0.061	0.07					
PT	0.478	0.825	0.52	0.643	0.568	0.541	0.569	0.796	0.422	0.225	0.266	0.477				
PV	0.334	0.611	0.598	0.803	0.75	0.751	0.631	0.544	0.365	0.142	0.23	0.485	0.652			
SI	0.264	0.598	0.624	0.63	0.663	0.737	0.602	0.5	0.331	0.17	0.2	0.603	0.555	0.63		
ST	0.48	0.817	0.423	0.455	0.472	0.54	0.426	0.787	0.299	0.36	0.372	0.317	0.755	0.504	0.506	
UA	0.319	0.492	0.432	0.518	0.372	0.322	0.595	0.337	0.731	0.042	0.075	0.4	0.492	0.395	0.312	0.28

6.3.5. Multicollinearity

This study also assessed multicollinearity which is the shared variance between the measurement items of two or more factors (Alhulail, 2018). This indicates that two or more different factors may describe a similar concept (Bagozzi & Yi, 2012). Variance inflation factor (VIF) is the parameter used to indicate the extent of multicollinearity which is the observed variance explained by an item to other items of a construct (Urbach & Ahlemann, 2010). The cut-off value for VIF is 5.0 (Hair et al., 2014) which means that a VIF smaller than 5.0 is acceptable while a VIF smaller than 0.2 is excellent (no multicollinearity). The VIF measurement for all the items used in this study is shown in Table 15 which indicates that the requirement of multicollinearity is satisfied.

Table 15: The VIF value for all the items.

Items	VIF	Items	VIF	Items	VIF
CO1	1.478	HM1	2.629	PD5	3.17
CO2	2.361	HM2	3.252	PE2	2.029
CO3	2.653	HM3	2.356	PE3	2.595
CO4	2.2	HM4	2.927	PE4	2.224
CT1	2.305	IN1	1.979	PT1	2.014
CT2	3.415	IN2	2.658	PT2	3.061
CT3	2.648	IN3	2.371	PT3	3.25
EE1	3.068	IBT4	2.225	PT5	3.809

EE2	3.71	IBT5	2.787	PT6	3.229
EE3	4.431	IBT6	2.185	PV1	2.39
EE4	4.445	LO2	2.031	PV2	2.35
EE5	2.071	LO3	2.031	PV3	3.562
EE6	1.984	MA1	3.393	PV4	3.056
FC1	2.048	MA2	2.494	SI1	1.966
FC2	2.798	MA3	3.445	SI2	1.966
FC3	2.281	MA4	2.356	ST3	2.79
HB1	3.518	PD1	2.373	ST4	2.79
HB2	3.284	PD2	3.348	UA1	2.04
HB3	2.165	PD3	1.908	UA2	2.04
HB4	3.308	PD4	3.447		

6.4. Assessment of the structural model

The measurement model was examined and showed that the psychometric properties such as indicator, construct, convergent and discriminant validity of the measurement items were satisfied. The next step is examining the structural model which refers to the impact of dependent variables (or endogenous variables) on independent variables (exogenous variables). Figure 32 shows the final model of this study which is the best fit model with supported hypotheses based on the results of the assessment of the structural model. The study followed

the suggestion of Hair et al. (2016) and used the following procedure to assess the structural model:

Step 1: Examining the collinearity

Step 2: Examining the significance level in the relationships among variables

Step 3: Examining the coefficient of determination (R^2)

Step 4: Examining f squared (f^2)

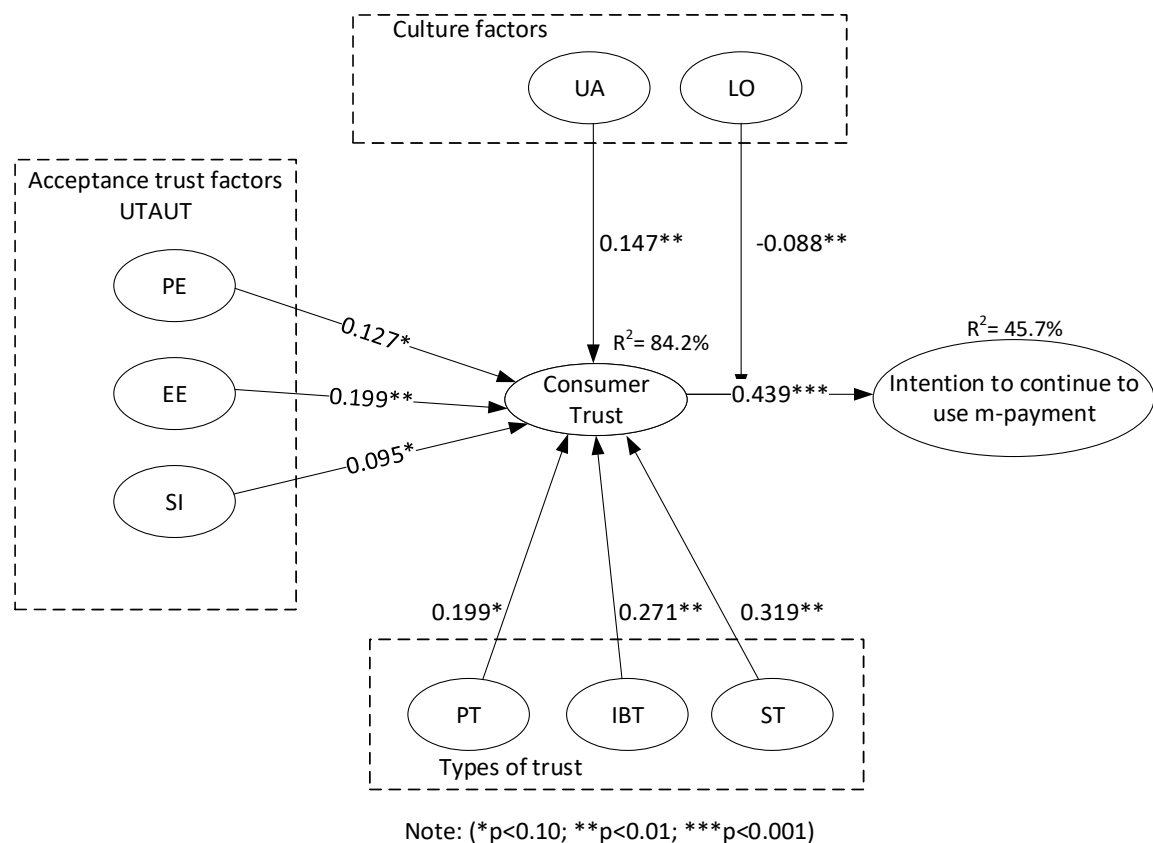


Figure 32: Structural model.

6.4.1. Examining the collinearity of factors

This study used the VIF and cut-off value of 5 (Hair et al., 2016) to assess the collinearity of the relationship between trust and its determinants, and between

trust and intention to continue the use of m-payment. Table 16 shows the results of examining the collinearity of factors included in the final model which indicates that the requirement of collinearity is satisfied.

Table 16: Collinearity values among exogenous constructs.

	CT	IN
CT		1.271
EE	3.249	
IBT	3.709	
LO		1.397
PE	3.04	
PT	4.075	
SI	2.021	
ST	3.083	

6.4.2. Examining the significance level in the relationships among variables

The significance level with p-value < 0.1 has been used in many studies in the social sciences (e.g. Baptista & Oliveira, 2015; Cho et al., 2007; Erumban & De Jong, 2006; Hair et al., 2011; Yoon, 2009). As a result, the significance of the hypothesised relationships among the dependent endogenous variables on the independent exogenous variables was examined with the $p < 0.1$, $p < 0.01$, $0 < 0.001$ values. Table 17 shows the results of significance level assessment which indicate

that hypotheses 1, 2, 3, 8, 9, 10, 15, 18, 21 are supported; As a result, these hypotheses and corresponding factors were included in the final model (Figure 32).

Table 17: Results of the structural model assessment.

Hypothesis		Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Result
H1	PE -> CT	0.127	0.069	1.837	0.067	Supported
H2	EE -> CT	0.199	0.072	2.787	0.006	Supported
H3	SI -> CT	0.095	0.048	1.993	0.047	Supported
H8	PT -> CT	0.199	0.106	1.873	0.062	Supported
H9	IBT -> CT	0.271	0.112	2.41	0.016	Supported
H10	ST -> CT	0.319	0.099	3.234	0.001	Supported
H15	UA -> CT	0.147	0.053	2.749	0.006	Supported
H18	Moderating Effect: LO -> IN	-0.088	0.028	3.139	0.002	Supported
H21	CT -> IN	0.439	0.056	7.856	0.000	Supported

The rejected hypotheses are presented in Table 18.

Table 18: Rejected hypotheses.

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
CO -> CT	0.274	0.272	0.063	4.381	0.865
FC -> CT	0.18	0.182	0.147	1.227	0.22
HB -> CT	0.148	0.152	0.105	1.404	0.161
HM -> CT	0.151	0.15	0.092	1.637	0.102
LO -> CT	-0.022	-0.019	0.059	0.363	0.717
MA -> CT	-0.022	-0.017	0.078	0.284	0.777
Moderating Effect 1: UA -> IN	-0.041	-0.021	0.127	0.326	0.745
Moderating Effect 2: CO -> IN	0.02	0.012	0.133	0.152	0.879
Moderating Effect 3: PD -> IN	-0.003	-0.02	0.329	0.008	0.994
Moderating Effect 4: MA -> IN	-0.056	-0.053	0.103	0.545	0.586
PD -> CT	0.097	0.095	0.093	1.042	0.298
PV -> CT	0.092	0.086	0.092	1.003	0.316

In terms of the control variables, the researcher conducted a test about the impact of age, gender and m-payment experience on CT, and the results revealed that there was no significant impact (see Table 19).

Table 19: The impact of control variables on consumer trust.

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Results
AGE -> CT	-0.036	-0.034	0.027	1.33	0.184	Not Supported
GENDER -> CT	0.005	0.006	0.027	0.166	0.869	Not Supported
EX_MP -> CT	0.03	0.032	0.03	1.032	0.303	Not Supported

6.4.3. Examining the coefficient of determination (R^2)

The R^2 is examined to identify the strength of the structural model (Hair, Sarstedt, Ringle, et al., 2012). The R^2 refers to the percentage of endogenous variables explained by the proposed model (Chin, 2010). Table 20 shows the results of the R^2 which indicates that the model explains 84.2% of CT in m-payment which can be classified as substantial (Chin, 1998), and 45.7% of intention to continue the use of m-payment which can be classified as moderate (Chin, 1998).

Table 20: Results of the coefficient of determination (R^2).

	R Square	R Square Adjusted
CT	0.842	0.839
IN	0.457	0.453

6.4.4. Examining f squared (f^2)

Effect size refers to the strength of the impact between two variables (Hair, Sarstedt, Pieper, & Ringle, 2012). Cohen's f^2 is the effect size that is appropriate for multiple regression and is calculated based on the following equation (Cohen, 2013):

$$f^2 = \frac{R^2}{1 - R^2}$$

Table 21 shows the f^2 of CT and IN in this model.

Table 21: The strength of effect size for CT and IN.

Dependent Variable	f²
Consumer Trust	4.41
Intention	0.264

The F^2 is classified as large, medium and small with values of 0.35, 0.15 and 0.02 respectively (Ringle et al., 2012). Based on these criteria, trust's determinants leading to CT had a large effect size, while trust for intention had a moderate effect size.

6.5. Summary

By using the SEM technique with the PLS approach, this chapter presented the examination of the model about the determinants of CT for m-payment continuance intention in Vietnam. First, the measurement model was assessed to test the psychometric properties, and the results indicated that the reliability and validity were satisfied. Then, the structural model was examined to determine the statistically significant impact of PE, EE, SI, UA, PT, IBT, ST on CT, and IN to continue the use of m-payment, and that the moderating impact of LO on CT is significant. The discussion of the data analysis results is presented in the next chapter.

Chapter 7: Discussion and analysis of findings

This chapter presents a discussion on the results of the data analyses (Chapter 6) in order to address the research aim and research questions. This study aimed to investigate the determinants of CT, the effect of m-payment CT on continuance intention, and the moderating effect of culture in the relationship between trust and intention to continue the use of m-payment. More specifically, it aimed to answer the following research questions:

- RQ1: What are the determinants of consumer trust for m-payment continuance intention in Vietnam?
- RQ2: What is the influence of consumer trust on intention to continue the use of m-payment in Vietnam?
- RQ3: To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment in Vietnam?

The rest of the chapter is organised into six sections. Sections 7.2, 7.3 and 7.4 describe the relevant implications and current trend of findings obtained from testing the impact of a number of factors including acceptance trust factors, trust types, and cultural factors on the trust of m-payment consumers. Each hypothesis is presented and followed by an explanation of the finding and compared with previous studies. Section 7.5 discusses the findings on the impact of CT on m-payment continuance intention. The theoretical and practical contributions and

implications of this study are discussed in Section 7.6. Finally, Section 7.7 provides a summary of this chapter.

Figure 32 presents the final structural model with the supported hypotheses that were presented in Chapter 6. Effect size refers to the strength of the relationship between dependent and independent variables and is classified as large, medium or small with the respective values of 0.35, 0.15 and 0.02 (Ringle et al., 2012). Overall, five factors including PT, IBT, ST, PE, EE had a medium effect size, and three factors including SI, UA, LO had a small effect size on CT in m-payment. Consumer trust had a large effect size on m-payment continuance intention. In terms of groups of factors in the conceptual model, the group of trust types had the strongest effect with all three factors (PT, IBT, ST) having a moderate effect, while the group of cultural factors had the weakest effect with two factors (UA, LO) having a small effect size. Acceptance trust factors ranked in the middle having two factors (PE, EE) with a moderate effect, and one factor (SI) with a small effect. A detailed discussion is presented in the following sections.

7.1. The impact of acceptance trust factors on trust

This section presents the findings of the hypotheses (H1-H3) which relate to the effect of UTAUT2's acceptance factors including PE, EE, and SI on CT in m-payment. This study argues that acceptance factors which include relevant factors influencing consumers to adopt new technology such as m-payment, need to be considered in investigating the determinants of CT in m-payment. This is because

consumers need to trust a new technology like m-payment to adopt it. Conversely, trust is also built through the process by which they come to accept the use of m-payment technologies. Identifying the acceptance factors for a new payment method such as m-payment is even more important in developing countries like Vietnam where the technological infrastructure is not as modern as developed countries and citizens do not have a habit of using digital payment systems in general like people in developed countries (Matthews, 2016; Talbot, 2015). Accordingly, consumers in developing countries need to accept m-payment first and then trust in m-payment will be gradually built after using it. Consequently, acceptance factors need to be considered as determinants of trust for m-payment consumers, especially in developing countries. In the conceptual model, this study named these factors acceptance trust factors to highlight the role of the determinants of CT in m-payment instead of determinants of m-payment acceptance.

7.1.1. The impact of performance expectancy on trust

This section outlines the discussion on the relationship between PE and trust. Performance expectancy is defined as the degree to which an individual believes that using m-payment will help them attain gains in payment performance (adapted from Venkatesh et al., 2003, p. 447). In this study, the effect of PE on trust was tested in order to identify whether PE is a determinant of trust in m-payment consumers (RQ1). The hypothesis was:

- *H1: Performance expectancy positively influences consumer trust in m-payment.*

The analysis result showed that PE had a positive and significant impact on trust found in m-payment consumers ($\beta = 0.127$, $t = 1.837$, $p = 0.067$). As a consequence, H1 was supported. The result suggested that if consumers perceive the positive performance of m-payment, they are more likely to trust m-payment. This finding was consistent with previous studies in technology adoption (Lin et al., 2014; Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011).

This finding confirmed the importance of PE as an acceptance factor that not only influences the adoption of consumers but also contributes to building CT in technology adoption in general and in m-payment in particular. Performance expectancy has been widely adopted and is considered as one of the best predictors in technology adoption studies using TAM/TAM2 and UTAUT/UTAUT2 as their theoretical background (Mingxing et al., 2014; Williams et al., 2015). In the area of m-payment, PE has also been used frequently when investigating factors affecting m-payment adoption (such as Phan, Tran, Hoang, & Dang, 2020; E. Slade et al., 2015; E. L. Slade et al., 2015). Nonetheless, PE has been neglected in previous models on the determinants of trust in m-payment such as Xin et al. (2015) and Shuhaiber (2016).

Theoretically, this finding made by this study confirms the significant impact of PE on CT in m-payment, thereby highlighting the need to consider PE when

investigating determinants of trust in m-payment in particular and for other technology adoption in general. If consumers experience a high level of performance, they may show a high level of trust towards m-payment as well as other technologies. As a result, this calls for further research on investigating the role of PE and other acceptance factors in building the trust of consumers in adopting m-payment or other technologies. Practically, the performance of an m-payment application is critical to establish CT; therefore, an m-payment provider must focus on the accuracy, reliability, compatibility and quickness of m-payment transactions being conducted in order to enhance the trust of consumers, thereby increasing the level of m-payment adoption.

7.1.2. The impact of effort expectancy on trust

This section presents the discussion on the relationship between EE and trust. Effort expectancy is defined as the degree of ease associated with the use of m-payment (adapted from Venkatesh et al., 2003, p. 450). In this study, the impact of EE on trust was tested in order to identify whether EE is a determinant of trust for m-payment consumers (which aims to answer the research question RQ1). The hypothesis was:

- *H2: Effort expectancy positively influences consumer trust in m-payment.*

Analysis of the hypothesis (Section 6.5) showed that EE had a positive and significant impact on trust in m-payment consumers ($\beta = 0.199$, $t = 2.787$, $p = 0.006$). Consequently, H2 was supported, which was consistent with some

previous studies in technology adoption (Li & Yeh, 2010; Yan & Pan, 2014; Yan & Yang, 2014; Zhou, 2011). Accordingly, EE was considered as a determinant of CT in m-payment.

This finding confirmed the importance of EE as an acceptance trust factor in contributing to building CT in technology adoption in general and in m-payment in particular. Effort expectancy is one of the most important factors in technology adoption, which has been widely adopted in many research studies (Mingxing et al., 2014). In the area of m-payment, the importance of EE on m-payment adoption has been shown by many studies (such as Phan et al., 2020; E. Slade et al., 2015; E. L. Slade et al., 2015). However, the role of EE as a determinant of trust in m-payment has been neglected in previous models such as those by Xin et al. (2015) and Shuhaiber (2016).

Theoretically, this finding confirmed the significant role of EE in building the trust of consumers in m-payment, thereby confirming the important role of EE as an acceptance trust factor that not only affects m-payment adoption but also significantly influences consumers' trust in m-payment. This calls for further research on EE in investigating the determinants of CT for m-payment in particular and other technology adoption in general. This finding shows that an easy to use m-payment application may be reflected in the capability and reliability of an m-payment application (Nguyen et al., 2020). In other words, if consumers experience a high level of ease with m-payment, they will show a high

level of trust towards m-payment. As a consequence, in practice, an m-payment provider should focus on the ease of use of an m-payment application such as designing user-friendly interfaces, improving the user experience and convenience because the level of ease of use of an m-payment application is important in building CT, leading to a higher level of m-payment adoption.

7.1.3. The impact of social influence on trust

In this study, SI is defined as the degree to which individuals perceive that those who are important to them, believe they should use m-payment (adapted from Venkatesh et al., 2003, p. 451). Simply put, SI implies a notion that individual perception of society's expectations influences his or her behaviour. In this study, it was argued that SI had a positive impact on trust, and therefore it should be considered as a determinant of trust for m-payment consumers (which aims to answer RQ1). The hypothesis was:

- *H3: Social influence positively influences consumer trust in m-payment.*

Analysis of the hypothesis (Section 6.5) showed that SI had a positive and significant impact on the trust of m-payment consumers ($\beta = 0.095$, $t = 1.993$, $p = 0.047$). As a result, H3 was supported. This finding was consistent with previous studies in technology adoption (Lu et al., 2005; Malaquias & Hwang, 2016; Montazemi & Qahri-Saremi, 2015). Malaquias and Hwang (2016) collected data in Brazil – a developing country and found a significant effect of SI on CT when using mobile banking services. Montazemi and Qahri-Saremi

(2015) also recognised the contribution of SI to the reduction of uncertainty in online banking for customers.

However, SI which is an acceptance factor has not yet been assessed in terms of its effect on CT in the area of m-payment. This finding confirmed that if consumers perceive that people who are important to them trust and want them to use m-payment applications, they are more likely to trust m-payment themselves (Nguyen et al., 2020). In other words, if consumers experience a high level of SI towards m-payment, they will show a high level of trust towards m-payment. Accordingly, in theory, the importance of SI as a factor in building CT in m-payment, in particular, was confirmed. This calls for the inclusion of SI in research on trust's determinants for m-payment as well as other technologies. When m-payment is accepted and trusted by more people in a society, this could lead to a wider spread of m-payment. Accordingly, in practice, this finding provides some directions for practitioners to promote m-payment. For example, m-payment providers can provide a recommendation function for current consumers to invite their friends or acquaintances to use m-payment, and thereby attract more prospective consumers. Current consumers may be encouraged to invite new consumers by getting rewards if new consumers agree to use m-payment. A marketing strategy to promote m-payment also can take into account the impact of society such as using the images of famous people or by creating and supporting an online community using m-payment.

7.2. The impact of trust types on trust

In this study, m-payment CT is defined as customers/consumers' beliefs and willingness to rely on m-payment for transactions (adapted from Alhulail, 2018; McKnight et al., 2002; Xin et al., 2015). Trust is essential for any activity in the area of e-commerce, m-commerce and m-payment where there is usually no specified paper contract or face-to-face meetings as is the norm in traditional commerce and forms of payment. The concept of trust is complex and involves many distinct perspectives. As a result, trust is seen as a multidimensional, multidisciplinary, or multifaceted phenomenon (Gefen & Straub, 2003; Hillman & Neustaedter, 2017; Jimenez et al., 2016). In particular, exploring different types of trust in m-commerce or m-payment enables researchers to better understand trust as a phenomenon that ultimately allows predictions of consumer adoption (Meng et al., 2008; Min et al., 2008; Nguyen et al., 2020). Accordingly, the identification of the different types of trust in m-payment adoption was important and necessary (Nguyen et al., 2020).

As a consequence, the second group of factors investigated as determinants of CT in m-payment included PT, IBT and ST. This was done in order to consider the different types of trust in overall m-payment trust. The results of testing hypotheses (H8, H9, H10) which are related to trust types will be discussed in the following section.

7.2.1. The impact of m-payment provider trust on trust

M-payment provider trust refers to “the belief of consumers that the m-payment service provider will perform and complete the transaction even if there are risky or uncertain circumstances” (Nguyen et al., 2020, p. 32), i.e. the extent to which consumers trust the m-payment provider. This study suggested that PT was needed to build CT in m-payment services (which aims to answer RQ1). The hypothesis was:

- *H8: M-payment provider trust positively influences consumer trust in m-payment.*

Analysis of the hypothesis (Section 6.5) showed that PT had a positive and significant impact on m-payment consumers’ trust ($\beta = 0.199$, $t = 1.873$, $p = 0.062$). As a result, H8 was supported. This finding was consistent with earlier research which recognised the important role of the service provider in e-commerce and m-commerce (Joubert & Belle, 2009; McKnight et al., 2002; Mingxing et al., 2014). In the context of m-payment, an m-payment service provider uses and stores private and important consumer information, such as personal and financial information, bank account data, and information about purchased goods and services. Obviously, in order to use m-payment, consumers must be confident that m-payment providers can provide and process m-payment services correctly, fast, conveniently, and securely (Mingxing et al., 2014; Nguyen et al., 2020).

Theoretically, this finding confirmed the significant role of PT in building CT in m-payment. This calls for employing service provider trust in studies on adopting m-payment as well as other technologies. Researchers can also use provider trust when investigating the concept of trust in technology adoption to achieve a better understanding of the impact of service provider trust on consumers or the mediating impact of trust on the relationship between service provider trust and other important factors such as continuance intention or adoption. Practically, the finding reminds m-payment providers of the need to build their image with the public. This is vital to consolidate the trust of consumers in their m-payment applications, leading to higher levels of m-payment adoption.

7.2.2. The impact of institution-based trust on overall consumer trust

Institution-based trust refers to “the belief of consumers that necessary structural conditions for increasing the likelihood of achieving a successful outcome in an endeavour like m-payment, are present” (Nguyen et al., 2020, p. 32). In this study, the researcher suggested that IBT is another type of trust valuable in building CT in m-payment (which aims to answer RQ1). The hypothesis was:

- *H9: Institution-based trust positively influences consumer trust in m-payment.*

Analysis of the data (Section 6.5) showed that IBT had a positive and significant impact on m-payment CT ($\beta = 0.271$, $t = 2.41$, $p = 0.016$). As a result, H9 was supported. Accordingly, IBT was found to be a determinant for trust in m-

payment consumers. The impact of IBT on trust is aligned with earlier research in e-commerce (McKnight et al., 2002; McKnight et al., 2004; Nguyen, 2016), and mobile banking (Nguyen, 2016).

The finding confirms that if consumers trust that they are protected by third-party institutional mechanisms when using m-payment, they are more likely to trust m-payment. Theoretically, this finding identified the important role of IBT in building m-payment CT, leading to a call for the adoption of IBT in research on adopting m-payment as well as other technologies. Practically, consumers consider that the protection of third-party mechanisms is vital to use m-payment services. As a result, policy makers and governments should clearly enact sufficient regulation to manage financial transactions via m-payment in order to help consumers feel safe when using m-payment, leading to a higher level of trust, leading in turn to a higher level of m-payment adoption rates.

7.2.3. The impact of seller trust on consumer trust in m-payment

Seller trust is “the degree to which the consumer trusts a community of sellers, and this is necessary for any e-commerce as well as social commercial activities” (Nguyen et al., 2020, p. 32). In this study, it was suggested that ST is a type of trust that contributes to building CT in m-payment adoption (which aims to answer RQ1). The hypothesis was:

- *H10: Seller trust positively influences consumer trust in m-payment.*

Analysis of the data (Section 6.5) showed that ST had a positive and significant impact on m-payment CT ($\beta = 0.319$, $t = 3.234$, $p = 0.001$). As a result, H10 was supported. The relationship between ST and CT in m-payment was confirmed, which is in line with earlier research in technology adoption (Lu et al., 2016; Pavlou & Gefen, 2004; Siau et al., 2004). As a result, ST was found to be a determinant of trust for m-payment consumers. Obviously, ST is a vital factor in m-commerce because in the online environment, sellers and buyers may make contact anonymously, and normally conduct transactions without a formal contractual agreement (Andreev et al., 2012).

Accordingly, if consumers trust reputable sellers who accept and use m-payment for their goods or services, consumers are more likely to trust m-payment. Theoretically, this finding confirmed the importance of ST in m-payment adoption. Researchers should consider employing ST in research not only in m-payment adoption but also in investigating trust's determinants in other technologies. Obviously, a reputable seller must not only provide qualified goods but also use a fast, accurate and secured payment method. As a result, in practice, m-payment providers should cooperate with famous sellers or reputable e-markets such as eBay and Amazon to encourage them to use their m-payment applications. If so, this can enhance the level of trust of m-payment consumers, leading to higher rates of m-payment adoption.

7.3. The impact of culture

Culture plays a crucial role in consumer technology adoption because it may cause and explain a discrepancy in consumer behaviour in acceptance as well as the intention to adopt a new system or technology (Choi, Lee, Sajjad, & Lee, 2014; Goodrich & de Mooij, 2011; Xu-Priour et al., 2014). Previous studies have found a direct and significant impact of culture on technology adoption (Ebrahimi et al., 2010; Huang, 2017; Olasina & Mutula, 2015; Srite & Karahanna, 2006), and a moderating impact of culture in technology adoption (Baptista & Oliveira, 2015; Carmen et al., 2012; Srite & Karahanna, 2006; Yoon, 2009; Zendehdel et al., 2016). However, this has not yet been addressed with m-payment adoption (Nguyen et al., 2020). Consequently, the influence of culture on e-commerce in general and on m-payment in particular needs to be investigated further (Hallikainen & Laukkanen, 2018; Nguyen et al., 2020; Xu-Priour, 2015).

In alignment with previous studies (e.g. Baptista & Oliveira, 2015; Srite & Karahanna, 2006; Yoon, 2009), this study aimed to investigate the impact of culture variables at an individual level in the context of m-payment adoption. There is evidence for both direct impact and moderating impact of culture in technology adoption; therefore, both the direct impact of culture on CT and the moderating impact of culture on the relationship between trust and intention to continue the use of m-payment were tested. In the final model, the direct impact of UA on trust (H15), and the moderating impact of LO on the relationship

between trust and intention to adopt m-payment (H18) were included because these hypotheses were supported. This section presents the findings of hypotheses (H15, H18) that were related to the effect of culture on CT in m-payment.

7.3.1. The impact of uncertainty avoidance on trust

Uncertainty avoidance is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede, 2001, p. 161). In this study, the following hypothesis was proposed:

- *H15: Uncertainty avoidance positively influences consumer trust in m-payment adoption.*

The results showed that UA had a positive and significant impact on CT in m-payment ($\beta = 0.147$, $t = 2.749$, $p = 0.006$). As a result, H15 was supported. This interesting finding of UA is in contrast to some previous studies (e.g. Bagchi et al., 2003; Bagchi, Hart, & Peterson, 2004; Olasina & Mutula, 2015; Xin et al., 2015) which found that UA had a negative impact on technology adoption because new technologies can be riskier. In this study, UA has a significantly positive impact on trust. This may be because of the following reasons: first, in general, citizens in a low UA society such as Vietnam do not consider a new technology such as m-payment as a threat (Hofstede-insights, 2018a). In addition, m-payment consumers who participated in this survey may consider m-payment as a useful and safe payment method rather than a risky method since they have had experience in using m-payment for a while. According to the demographic

data of the survey, 14.76% of the respondents had 2-3 years of m-payment experience which was the smallest group, and people who had over three years in m-payment experience accounted for 27.53 % which was the biggest group of respondents. The remaining respondents had less than three months or one to two years' experience. This clearly shows that all the respondents are experienced m-payment consumers; therefore, they clearly see the performance/effectiveness and reliability of m-payment as they have decided to continue using it. Consequently, their concerns about the latent risks of new technology such as m-payment were offset by the effectiveness and reliability that it brought after a period of using and experiencing m-payment. In other words, they may consider m-payment as a safe, effective and convenient payment method rather than a risky payment method, leading to a positive impact of UA on m-payment CT. Accordingly, in a low UA society and with experienced consumers, UA had a positive and significant impact on m-payment CT as a result, UA can be considered as a determinant of trust for m-payment consumers.

This finding contributes an interesting and new result to the literature about the impact of UA or culture on m-payment CT as well as technology adoption. This also highlights the importance of research on culture in technology adoption because different groups and countries with different cultural characteristics may have different behaviours in technology adoption or beliefs about such

technologies. As a result, researchers need to place more attention on investigating the impact of culture on technology adoption.

7.3.2. The impact of long-term orientation on trust

Long-term orientation refers to the extent to “link with the culture’s own past while dealing with the challenges of the present and the future” (Hofstede-insights 2018). Societies with a high score of LO like Vietnam are more likely to prefer a pragmatic approach and they encourage thrift, persistence and have a sense of shame when preparing for the future (Hofstede-insights, 2018a). As a result, the hypothesis about the moderating impact of LO on trust was proposed to answer RQ3: “To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment?” as the following:

- *H18: Long term orientation moderates trust and intention to continue the use of m-payment, in such a way that the relationship will be weaker amongst people with long-term cultural values.*

The results showed that LO had a negative and significantly moderating impact on the relationship between trust and intention to continue the use of m-payment ($\beta = -0.088$, $t = 3.139$, $p = 0.002$). As a result, H18 was supported. Accordingly, citizens in a culture with a high LO score, such as Vietnam, tend to focus more on their traditional values instead of being open to new ideas and technologies, leading to a negative moderating impact of LO on m-payment adoption. This finding is in contrast to previous research (Erumban & De Jong, 2006; Gales,

2008) which identified the positive moderating impact of LO, and is in line with a number of earlier studies (Baptista & Oliveira, 2015; Hassan et al., 2011) which found that LO had a strong and negative moderating effect. Long term orientation has not yet been extensively analysed in technology adoption research and there are contrary results in different countries (Özbilen, 2017). Nevertheless, this finding contributes to the literature on culture in general and LO in particular with regard to technology adoption.

7.4. The impact of trust on m-payment continuance intention

The hypothesis (H21) about the impact of trust on m-payment continuance intention was tested to answer RQ2: “What is the influence of consumer trust on intention to continue the use of m-payment?”. The results reveal that H21 was supported ($\beta = 0.439$, $t = 7.856$, $p = 0.000$). In addition, the effect size of the relationship between CT and intention to use m-payment (0.439) is large (>0.35) and was the strongest effect size in the conceptual model. As a consequence, this finding confirms the importance of trust as one of the key drivers of m-payment continuanceintention and is consistent with previous studies (Andreev et al., 2012; Hillman & Neustaedter, 2017; Patil et al., 2018; Qasim & Abu-Shanab, 2016; Xin et al., 2015; Yan & Yang, 2014) which identified the significant and positive impact of trust on technology adoption. Accordingly, higher levels of trust in m-payment lead to higher levels of m-payment continuance intention. As

a result, research on trust's determinants in m-payment adoption was necessary and important to achieve a better understanding of the concept of trust in m-payment. Based on this understanding, researchers and practitioners may have more appropriate methods to increase the level of trust of consumers, thereby promoting the continuance intention as well as the adoption of m-payment.

7.5. The impact of control variables on trust

Analysis of the data revealed that there is no significant impact of age, gender, and m-payment experience on m-payment CT. This means that experienced respondents do not consider their trust in m-payment is dependent on their age, gender and m-payment experience. This is aligned with the studies by Shuhaiber (2016) and Xin et al. (2015) in terms of gender and contrasts with Shuhaiber (2016) in terms of age and Xin et al. (2015) in terms of experience. This may be because respondents in this study were experienced consumers; therefore, most of them use m-payment fluently regardless of their gender, age or experience, leading to the conclusion that such control variables had no significant impact on m-payment continuance intention. In contrast, Shuhaiber (2016) surveyed both inexperienced and experienced consumers and found that “young people with no experience in m-payments tend to trust less in these payments than mature people in the Emirates” (Shuhaiber, 2016, p. 142), and Xin et al. (2015) focused on initial trust and surveyed consumers with experience in mobile banking, instead of m-payment.

7.6. Contributions and implications

M-payment is a state-of-the-art payment method that plays an important role in the evolution of payment for society, especially during the COVID-19 pandemic. Trust is a significant driver of m-payment adoption and understanding trust can help to predict as well as increase the adoption of m-payment. As a result, the results of this study have important implications for research and practice.

This study addresses the importance of trust in m-payment adoption and contributes an understanding of the determinants of CT in m-payment adoption to the literature. There is a great difference between developed countries and developing countries regarding the adoption of m-commerce (Chau & Deng, 2018). However, the literature review in Chapter 2 showed a lack of research on the factors affecting trust in m-payment adoption, especially in developing countries. This shows that an investigation on the determinants of CT in m-payment adoption in developing countries was useful and significant. This study was the first to be conducted in a developing country (Vietnam) with the potential for m-payment development. Theoretically, this study developed an integrated model to better understand CT in m-payment adoption, which expands the body of knowledge on CT in m-payment adoption in general and in developing countries in particular. Practically, based on the understanding of the impact of different types of factors such as trust types, culture, and acceptance, the findings provide suggestions for practitioners such as policy makers, authorities, and m-

payment providers to increase CT in m-payment adoption, leading to the promotion of m-payment.

In addition, the conceptual model in this study also has *some important improvements* when compared to previous models such as those by Xin et al. (2015) and Shuhaiber (2016). First, this is the first study that considered the role of acceptance factors including the necessary factors for accepting a new technology like m-payment by consumers as determinants of trust. Obviously, CT is built after the process of accepting the new technology like m-payment, i.e. consumers are more likely to accept/use new technology if they trust it. Consequently, acceptance factors need to be considered when studying trust's determinants in m-payment adoption. This is especially vital when promoting m-payment adoption in developing countries that have less modern technological infrastructure and where citizens do not have a habit of using e-payment methods like credit or debit cards before compared to citizens living in developed countries or China (Matthews, 2016; Talbot, 2015). As a result, citizens in developing countries may find it more difficult to accept m-payment. This is why it was essential to study acceptance factors as determinants of trust of m-payment consumers in these countries. The finding confirmed the significant and positive impact of acceptance factors including PE, EE and SI on m-payment CT. Theoretically, the important role of acceptance factors in building CT in m-payment in particular and in technology adoption in general was identified in this

study. This highlighted the significant impact of acceptance factors in not only technology adoption but also in studying trust's determinants in technology adoption. As a result, this calls for investigating the effect of acceptance factors in studying trust's determinants in technology adoption in the future. Practically, m-payment providers now know that a useful and easy-to-use m-payment application increases CT; therefore, they need to focus on improving their m-payment applications in terms of performance and ease of use. Furthermore, if m-payment is accepted and recommended by others who are important to the consumer, consumers may be more likely to trust m-payment and thereby use m-payment. Accordingly, m-payment providers can provide functions to invite consumers' friends to try using m-payment along with gifts for both current consumers and invitees in order to encourage prospective m-payment consumers.

Second, another important achievement of this study is that it uniquely identified and employed three important types of trust of m-payment consumers, leading to a better understanding of CT and overcoming the limitation of previous studies (which is a lack of differentiation of trust types in m-payment adoption) (Nguyen et al., 2020). In the conceptual model, all three trust types had a moderate effect size on CT, leading to the fact that trust types had the biggest effect size on trust when compared to the two other groups of factors. This highlighted the effect of trust types on m-payment CT. For researchers, this study provides the classification and recognition of these three types of trust including PT, IBT and

ST which significantly impact m-payment CT. This could lead to further research on investigating the relationship between each type of trust and other critical factors in m-payment adoption, identifying determinants for each type of trust, or studying the mediating impact of trust on the relationship between the three types of trust and m-payment adoption. Future research should also consider measuring or employing CT as a reflective construct with these three trust types in the context of m-payment adoption. In addition, these three types of trust can also contribute to the body of literature regarding trust in technology adoption in general.

For practitioners, the conceptual model may help them understand the significant types of trust to refine, promote, and implement m-payment services that are highly adopted and accepted by consumers. M-payment providers can cooperate with reputable sellers and convince them to accept using m-payment for their goods or services. When m-payment is adopted in popular e-markets such as Amazon or eBay with reputable sellers, consumers may be more likely to trust m-payment. From a consumer perspective, the m-payment provider is fully responsible for not only the quality but also the technology of m-payment services; thus, m-payment providers must focus on improving their applications to operate well in different conditions regarding mobile operating systems, networking, speed connection, and security. Policy makers need to enact regulations or mechanisms to protect the legal rights of m-payment consumers,

and clearly specify the responsibility of stakeholders such as m-payment providers, banks and financial institutions. This makes consumers feel safe when using m-payment, leading to higher trust in m-payment.

The third important improvement of the research is that this study uniquely addressed the importance of cultural variables at an individual level both directly and as moderating impacts of trust in m-payment adoption. Different groups or countries having different cultural characteristics will have differing acceptance and use of technology such as m-payment. For researchers, this study provides more understanding for investigating the impact of culture at an individual level in the context of technology adoption, leading to a stronger basis for individual models of technology adoption in the future. For practitioners, understanding the key findings of this study about the impact of culture on m-payment CT provides more important points to design, refine, and implement m-payment applications that are appropriate for more consumers in the future.

The direct impact of UA on trust found in this study is interesting. This study revealed that UA has a positive and significant impact on CT in a low UA society like Vietnam and with experienced consumers, instead of having a negative impact as some previous studies (e.g. Bagchi et al., 2003; Bagchi et al., 2004; Olasina & Mutula, 2015; Shuhaiber, 2016; Xin et al., 2015). Accordingly, in a low UA society, if m-payment is accepted over a certain period of time, it may be considered as a safe payment method instead of a risky method. Consequently,

in practice, m-payment providers and governmental authorities need to carefully consider the cultural characteristics of citizens when promoting m-payment. For example, m-payment providers need to focus on providing reliable, and convenient m-payment services for consumers to convince them to adopt and continue using m-payment, and governmental authorities can enact policies to encourage the community to use m-payment, leading to a wider m-payment adoption. In theory, the importance of culture also calls for a need to further investigate the direct impact of cultural variables (such as Hofstede's cultural dimensions) at an individual level on m-payment adoption in particular and in technology adoption in general.

The significance of the moderating impact of LO as a cultural variable on the relationship between trust and m-payment adoption was also confirmed in this study, which addressed a lack of considering the moderating impact of culture in research on trust in m-payment adoption (Nguyen et al., 2020). This study found that citizens in a LO society are less likely to adopt new technology like m-payment. Theoretically, this highlights the importance of the moderating impact of culture in the context of technology adoption in general. The finding also contributes to the literature on LO in m-payment in particular and in technology adoption in general, especially since LO has not yet been extensively investigated in research on technology adoption (Özbilen, 2017). This calls for a further investigation of the moderating impact of LO as well as other cultural variables

in technology adoption studies. Practitioners need to understand the cultural characteristics of citizens in countries where technology is implemented in order to provide the appropriate methods to promote technology adoption such as m-payment or m-commerce.

In addition, the finding of the impact of culture in this study also calls for future research on explaining why such cultural factors have a direct impact on trust but have no moderating impact on the relationship between trust and m-payment continuance intention and reverse. More specifically, in this study, UA had a direct impact on CT, but had an insignificant moderating impact, while LO had a significant moderating impact but had an insignificant impact on CT. These interesting results need to be investigated further to explain how and why culture works in the context of m-payment adoption as well as technology adoption.

The fourth achievement of this study is that it firstly investigated the determinants of trust in the context of continuance intention. While previous studies investigated collected data from inexperienced or mixed consumers, this study focused on experienced consumers and continuance intention which addresses a need to study trust's determinants in the context of continuance intention and also contribute more knowledge to the literature of m-payment as well as IS continuance intention.

The final achievement of the model is that based on the identification of and including three important groups of factors which are acceptance trust factors,

trust types and culture, the proposed model in this study not only addresses limitations of previous studies as indicated in the above discussion but also achieved a better R^2 (0.842). In particular, the model explained 84.2% variance of trust which can be classified as substantial (Chin, 1998), and outperformed previous models about the antecedents of CT in m-payment found in the literature such as Xin et al. (2015) (56%) and Shuhaiber (2016) (44.8%). Accordingly, the conceptual model provided a better fit model with a substantial improvement for identifying the determinants of CT in m-payment adoption over previous models. Thus, this study contributes a better understanding of the concept of trust in m-payment in particular and technology adoption in general.

7.7. Constructs with an insignificant impact on trust

This section presents the factors that had an insignificant impact and were not included in the final model. This helps researchers, as well as practitioners, have more reasons to make decisions when choosing which determinants of trust to focus on in the context of m-payment as well as technology adoption.

The model, which is presented in Figure 32, is the final model with the best result from analysing the data. The research collected data for other factors including FC, HM, PV, and HB from UTAUT2, and PD, CO, and MA from Hofstede's cultural framework, and the data analysis revealed that such factors had an insignificant impact on m-payment CT and the relationship between trust and continuance intention.

In terms of acceptance factors from the UTAUT2, HM “is defined as the fun or pleasure derived from using a technology” (Venkatesh et al., 2012, p. 161). Price value is defined as “consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them” (Venkatesh et al., 2012, p. 161). Facilitating conditions are defined as “the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). These factors had an insignificant impact on trust which means that fun, cost and technical support for m-payment do not influence m-payment CT. Surprisingly, HB which refers to “a perceptual construct that reflects the results of prior experiences” (Venkatesh et al., 2012, p. 161) also had an insignificant impact on trust although respondents in the survey were experienced m-payment consumers. This means that even after using m-payment for a while, experienced m-payment consumers still focus on performance, ease of use and SI of m-payment to trust it rather than HB. This highlights the role of PE, EE and SI in theory as well as in practice regarding m-payment CT. M-payment providers should focus on improving performance, ease of use of m-payment applications, and their image to the public in order to enhance CT. If these acceptance factors including PE, EE and SI are not satisfied, even though consumers have a habit of using m-payment, m-payment CT can decrease, leading to lower levels of m-payment adoption.

In terms of culture, a review by Mandler, Seifert, Wellbrock, Knuth, and Kunz (2018) based on the data from 43 countries across six continents revealed that except for UA, the other remaining cultural factors from Hofstede's framework including PD, CO, MA, LO and indulgence/restraint had no significant impact on both the adoption and actual usage of m-payment. The findings of this study are aligned with the study by Mandler et al. (2018) about the insignificant direct impact of PD, CO, MA, LO on m-payment CT. However, this study discovered that LO has a significant moderating impact on the relationship between trust and m-payment adoption.

The insignificant impact of such cultural factors on trust and the relationship between trust and m-payment adoption may be because of the following reasons. The context of m-payment adoption is a utilitarian and voluntary application. Accordingly, the effect of PD, which refers to the relationship between supervisors and subordinates in organisations does not seem to be an influence on technology adoption in the case of m-payment adoption as there is no superior/subordinate relationship involved in the m-payment service. The MA dimension which refers to what motivates people, masculine values (such as award or achievement) or feminine values (such as nurturing or helping others) also does not fit the context of m-payment applications, which aim to conduct payment transactions for consumers without a clear achievement or nurturing result. These findings are aligned with previous studies by Xin et al. (2015) and

Mandler et al. (2018) which found that gender, as well as the MA dimension, had an insignificant impact on trust and m-payment adoption. Collectivism, which means that individuals with collectivist values focus more on the cohesiveness of the group, also had an insignificant impact on trust, may be because using m-payment is not compulsory to a group or a community.

7.8. Summary

This chapter presented a detailed discussion on the findings of this study. Each finding was discussed to answer the corresponding research question and was followed by a comparison with previous studies and their theoretical and practical implications. Finally, the contributions and implications in both theory and practice of this study were presented to address and confirm the position of this study in the literature. The proposed model in this study not only provides a more comprehensive understanding of m-payment CT as well as overcomes limitations of previous studies, but also has a better R^2 than previous models on m-payment trust's antecedents found in the literature review. In addition, the study also mentioned factors—that did not have an impact on trust—not to be included in the model to facilitate researchers and practitioners to identify determinants of CT in m-payment as well as in technology adoption in general.

Chapter 8: Conclusion

This chapter concludes with the major findings of this study about the determinants of CT in m-payment along with a summary of the hypotheses proposed in Chapter 3. The discussion includes how the research findings answer the three research questions, then the theoretical and practitioner implications and contributions are presented. Finally, the research limitations and suggestions for future research are also covered.

8.1. Research conclusion

The benefits of m-payment are obvious for both business and consumers such as convenience, security, better tracking of transactions, a safer way of payment, especially in the global COVID-19 pandemic. As a result, m-payment is considered a useful modern tool that is being adopted worldwide. The literature review presented in Chapter 2 showed that there was limited understanding of trust's determinants (Nguyen et al., 2020; Patil et al., 2018), and the context for developing new technologies such as m-payment in developing countries was different from developed countries and China in terms of technological infrastructures and popularity of using digital payment methods (Chau & Deng, 2018; Chau et al., 2020; Matthews, 2016; Rosa-Bohrer, 2018; Talbot, 2015). In addition, there was a lack of differentiation between the different trust types in m-payment adoption. There was also a lack of consideration of the moderating

impact of culture in research on trust in m-payment adoption (Nguyen et al., 2020). Accordingly, the main research questions of this study were:

- RQ1: What are the determinants of consumer trust for m-payment continuance intention in Vietnam?
- RQ2: What is the influence of consumer trust on intention to continue the use of m-payment in Vietnam?
- RQ3: To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment in Vietnam?

This study first proposed a conceptual model about the determinants of CT in m-payment based on the comprehensive review of related literature including e-commerce, m-commerce, mobile banking and m-payment. Then, the model was tested and validated by employing a quantitative methodology and the use of SEM and SmartPLS with the data collected from m-payment consumers in Vietnam which is a developing country with high potential for m-payment service development. Differently from previous models in the literature, this study collected data from experienced consumers and focused on continuance intention.

The proposed model not only addressed the lack of investigation of the determinants of CT in m-payment adoption in general and in developing countries (Nguyen et al., 2020; Patil et al., 2018), but it also overcame the limitations of previous studies in which different trust types are not identified and the lack of

consideration of the moderating impact of culture on the relationship between trust and m-payment adoption (Nguyen et al., 2020). In addition, this study identified and argued for the necessity and importance of acceptance factors in developing trust in m-payment adoption, especially in developing countries where the acceptance of new technologies like m-payment is limited due to the limitations of technological infrastructure and citizens' habits of using digital payment means (Matthews, 2016; Talbot, 2015). In the conceptual model, such factors were referred to as acceptance trust factors to highlight their role in the model (which are determinants for trust rather than for m-payment adoption). As result, this study proposed a conceptual model about determinants of CT in m-payment which included the following three groups of factors:

- Acceptance trust factors: PE, EE, SI.
- Trust types: PT, IBT, seller trust.
- Culture: UA (direct impact on trust), LO (moderating impact).

Answers to the research questions are summarised below:

RQ1: The determinants for consumer trust in m-payment continuance intention in Vietnam:

Acceptance trust factors: With regards to H1, H2, H3 respectively, PE, EE, SI had a significant positive impact on the trust of m-payment consumers. Consequently, PE, EE, SI are determinants of CT in m-payment.

- H1: Performance expectancy → trust: supported
- H2: Effort expectancy → trust: supported
- H3: Social influence → trust: supported

Trust types: With regards to H8, H9, H10 respectively, PT, IBT and ST had a significant positive impact on trust found in m-payment consumers. Consequently, PT, IBT and ST are determinants of trust in m-payment consumers.

- H8: M-payment provider trust → trust: supported
- H9: Institution-based trust → trust: supported
- H10: Seller trust → trust: supported

Culture: according to H15, the results showed that an increase of UA, increased the trust of experienced m-payment consumers in a low UA society like Vietnam.

- H15: Uncertainty avoidance → trust: supported.

RQ2: The influence of consumer trust on intention to continue the use of m-payment in Vietnam

H21 was proposed to answer RQ2. The results showed that CT had a positive and significant impact on intention to continue the use of m-payment.

- H21: Trust → Intention to continue to use m-payment: supported.

RQ3: To what extent does culture moderate the impact of consumer trust on intention to continue the use of m-payment in Vietnam?

In regards to H18, the results showed that LO had a significantly negative moderating impact on the relationship between trust and intention to continue the use of m-payment.

- H18: Long term orientation → (trust → intention to continue the use of m-payment): supported.

8.2. Contribution to theory

Based on UTAUT2 (Venkatesh et al., 2012), Hofstede's culture framework (Hofstede, 2011), and a comprehensive review of related literature, this study proposed and validated the conceptual model on the determinants of CT in m-payment. This study has made major and multidimensional contributions by addressing research limitations in the area of m-payment which is a subset of m-commerce, e-commerce, and in the area of information systems which is cross-disciplinary in nature.

This is the first study investigating trust's determinants in a developing country, thereby addressing a gap found in previous studies (which is that there is little understanding of determinants of trust in general) (Nguyen et al., 2020; Patil et al., 2018), and especially in developing countries in which the necessary conditions for m-payment adoption such as technological infrastructures and

citizens' habits of using digital payment method are less available and modern than developed countries and China (Chau & Deng, 2018; Chau et al., 2020; Matthews, 2016; Rosa-Bohrer, 2018; Talbot, 2015).

The conceptual model included acceptance trust factors which were necessary factors to investigate the adoption of new technology. This was especially important and necessary in developing countries where citizens do not have a habit of using as well as adopting digital payment methods unlike citizens from developed countries. The results showed that acceptance factors including PE, EE, and SI had significant and positive impacts on CT in m-payment adoption. As a result, the findings highlighted the importance of acceptance factors in investigating trust's determinants of m-payment consumers which have been neglected in previous models, namely those of Shuhaiber (2016) and Xin et al. (2015). Acceptance factors are significant for m-payment consumers in developing countries because trust is built in the process of adopting m-payment which is a new technology for them. Consequently, acceptance factors need to be considered as determinants in not only further research on technology adoption but also for studies on trust's determinants in technology adoption as well as in m-commerce or m-payment in general, especially in developing countries.

This study was also the first to employ three different types of trust which are PT, IBT and ST. The results showed that these three types of trust have significant impacts on the trust of m-payment consumers in Vietnam. As a result, this study

identified and validated three important types of trust in m-payment which overcomes the limitation of previous studies (a lack of differentiating between the different trust types in m-payment) (Nguyen et al., 2020). This has led to a better understanding of the concept of trust and thereby to more effectively predicting technology acceptance behaviours of consumers in m-payment adoption (Nguyen et al., 2020). The finding also provided the classification and identification of trust types for future research on technology adoption such as investigating the impact of these three types of trust on intention and other important acceptance factors. In addition, future research can also consider employing these three types of trust on research on the trust of consumers or employing the trust of consumers as a reflective construct with these three trust types in m-payment adoption or other technologies adoption.

This study uniquely considered culture in both direct impact and moderating impact on trust. This study overcomes the limitation of previous studies which is neglecting the moderating impact of culture on the effect between trust and m-payment adoption (Nguyen et al., 2020). The results showed that LO had a negative moderating impact on the relationship between trust and intention to continue to use m-payment. Accordingly, tradition is a priority for citizens in LO societies rather than new technologies, leading to lower rates of technology adoption. In contrast, UA had a positive direct impact on trust in a low UA society and with experienced m-payment consumers which was in contrast to some

previous studies which found that UA had a negative impact on technology adoption (e.g. Bagchi et al., 2003; Bagchi et al., 2004; Olasina & Mutula, 2015; Shuhaiber, 2016; Xin et al., 2015). As a result, this study theoretically proved the importance of culture in m-payment adoption and technology adoption in general. The result of investigating the impacts of culture in technology adoption is also varied and different across different cultures or countries. This calls for further research on the role of culture in m-payment adoption as well as technology adoption, and in studies on trust's determinants of m-payment or technology adoption in terms of both direct and moderating impacts.

This study also contributed to the body of literature of m-payment as well as IS continuance intention and addressed a lack of investigating trust's determinants in the context of m-payment continuance intention. The difference of initial and post or continuance intention/usage has been highlighted in the literature, especially the latter guarantees the success of an IS.

Finally, this study contributes a more comprehensive model on the determinants of CT in m-payment to the literature. This model not only addresses limitations of previous studies but also achieves a better R^2 (0.842) which outperforms previous models such as those by Xin et al. (2015) (56%) and Shuhaiber (2016) (44.8%).

8.3. Contribution to practice

This study also makes contributions to practitioners such as organisations, policy makers, m-payment service providers, and consultants to improve CT when adopting m-payment. For m-payment service providers, they need to focus on improving the performance and ease of use of their m-payment applications. M-payment providers can also provide invitation functions for current m-payment consumers to invite or recommend their acquaintances or friends to try and use m-payment. These acceptance factors are not only important to m-payment adoption but also necessary for improving the trust of m-payment consumers, leading to higher adoption rates of m-payment.

In terms of trust types including m-payment provider, institution-based and seller trust that constitute trust of m-payment consumers, practitioners can perceive the importance of each type of trust to improve, strengthen, and implement m-payment services that are more attractive and interesting to consumers. An m-payment provider is responsible for the trust of consumers; therefore, they need to focus on improving the quality of these applications and enhancing their public image. Cooperation with famous sellers can help m-payment providers make consumers feel more confident in accepting m-payment as a safe payment method. Regulations as well mechanisms to defend consumers and manage stakeholders of m-payment such as payment providers, banks, and financial

institutions, need to be enacted by governments to ensure the legal rights of consumers, leading to higher trust levels in m-payment.

In regards to culture, the findings of this study showed the importance of culture in terms of building the trust of m-payment consumers. M-payment providers and consultants need to consider the cultural characteristics of citizens in the countries that they want to implement m-payment to provide suitable policies to promote m-payment adoption. In a low UA society, if m-payment can show its usefulness or performance, citizens will consider it as a safer payment method rather than being concerning about it. In a LO society, citizens may focus more on tradition, therefore, practitioners need to have appropriate approaches such as discounts for traditional goods.

In relation to the specific context of Vietnam, the Vietnamese government and Vietnamese m-payment providers could implement the following suggestions in order to improve trust in the m-payment ecosystem in Vietnam:

- The government could enact regulation to clearly state the responsibilities of each of the stakeholders in m-payment such as m-payment providers and sellers in order to ensure the protection of the legal rights of m-payment consumers and thereby increase consumer trust. Currently, the legal framework requires clarity.
- M-payment providers could consider the characteristics of culture in order to promote m-payment, e.g. forming a strong connection with traditional

payment methods such as cash may negatively influence m-payment continuance intention, therefore the benefits of a new payment method should be promoted such as safety without direct contact in the current situation where COVID has spread, or give the ability to save money by providing a discount for purchase, and so on. This will help to increase trust.

- M-payment providers need to focus on improving and enhancing performance, ease of use of m-payment app and build their image in public to increase trust.
- M-payment providers need to build links with prominent markets in major cities such as Hanoi and Ho Chi Minh City and with prominent sellers (e.g. Aeon Vietnam, Lotte Mart Vietnam, Co.op Mart). This cooperation will be likely to increase trust by consumers.

8.4. Limitations and future research

There were several limitations in this study as following. First, the data sample of 454 observations was limited to the social connections of the researcher, which may have led to a potential bias in the data. This thesis used a non-probability convenience sampling technique, instead of probability sampling which can help researcher generalise the result better (as indicated in the section 4.4). This is because the data collected in a non-probability sampling technique not being representative of the entire population, therefore, this technique is limited in

generalising the research findings (Bryman, 2016); in contrast, the sample collected in a probability sampling technique represents the population (Guest et al., 2006), leading to the ability to generalise better the research findings from a sample to the whole population (Almukhlifi et al., 2018). As a result, future research should collect data with a wider scope and consider using a probability sampling technique which is the best solution for acquiring representative sample for generalisation (Polit & Beck, 2010).

Second, although Vietnam is a developing country with a large potential for m-payment development, the conceptual model in this study needs to be tested with more data collected from other developing countries. Researchers pointed out that the difference that different research contexts can make a key distinction between studies (Sellers, 2014; Tennant, 2017). In particular, each developing country has its own characteristics regards culture, the social economic and political background. These factors may significantly influence the generalisation of the model, thus it would be best if actual data collection took place in other countries to verify the model in other contexts, especially in the developing countries in Asian which share some similarities in culture and the economy.

Thirdly, the items measuring the cultural constructs at an individual level can be revised and improved by using the CVScale of Yoo et al. (2011). As pointed out in the literature review and the section 3.4.3, there is an argument of researchers that applying Hofstede's national level question items to measure constructs at

the individual level revealed the low and unacceptable reliability and validity of constructs (Bearden et al., 2006; Blodgett et al., 2008; Spector et al., 2001; Yoo et al., 2011). Such items used in this thesis were revised and adapted based on the papers measuring Hofstede cultural dimensions at the individual level, which were published in the top journals MIS Quarterly, Computers in Human Behavior, Information & Management and International Marketing Review (Baptista & Oliveira, 2015; Hassan et al., 2011; Srite & Karahanna, 2006; Yoon, 2009), and the results of the reliability and validity of constructs are highly acceptable and met the statistical requirements (as indicated in the chapter 6). Nonetheless, there is another way to measure Hofstede cultural dimensions at the individual level is using the CVScale of Yoo et al. (2011) which was developed specifically for the this purpose. Future research may consider using CVScale in investigate the impact of culture on trust of m-payment consumers.

Fourthly, although UTAUT2 covers most necessary factors in technology acceptance, future research also can consider employing other factors from other models to update the determinants for trust of m-payment consumers, such as confirmation, satisfaction from ISCM of Bhattacharjee (2001), attitude from TAM of Davis et al. (1989).

Finally, this study found both a direct and moderating impact of culture in the context of m-payment; however, it cannot explain why such cultural factors have a direct impact or the reverse. As a result, future studies should proceed to

investigating and explaining how and why cultural factors have or do not have direct impacts and moderating impacts in the context of m-payment continuance intention as well as technology adoption in general.

8.5. Summary

This study began from the identification of gaps and limitations found in the literature on the determinants of trust for consumers in m-payment adoption and successfully resulted in a validated conceptual model. A quantitative method was employed to answer the research questions to identify the determinants for m-payment CT including three groups of factors: acceptance trust, trust types and culture. Each of these groups has been addressed and have overcome limitations in previous studies. The data was collected in Vietnam which is a developing country ranked first worldwide in m-payment development in 2019 to verify the conceptual model and answer the research questions.

The outcome of this study revealed that all of these groups of factors have a significant impact on trust in m-payment consumers; thereby contributing a more comprehensive model about trust's determinants to the literature and helping to expand the body of knowledge in technology adoption. This study also confirmed the significant impact of trust on m-payment continuance intention. Although the study had some limitations, the findings still make both theoretical and practical contributions.

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Appendices

Appendix 1: Items

Construct and items	References
<p>M-payment provider trust (PT)</p> <p>M-payment Provider Trust (PT) refers to “the belief of consumers that the m-payment service provider will perform and complete the transaction even if there are risky or uncertain circumstances” (Nguyen et al., 2020, p. 32)</p> <p>PT1: Based on my perception and experience of the mobile payment provider, I know they have sufficient expertise and resources to conduct mobile payment services.</p> <p>PT2: Based on my perception and experience of the mobile payment provider, I know them to be honest.</p> <p>PT3: Based on my perception and experience of the mobile payment provider, I know them to be reliable.</p> <p>PT4: Based on my perception and experience of the mobile payment provider, I know they provide secure services</p> <p>PT5: Based on my perception and experience of the mobile payment provider, I know them to be trustworthy.</p>	<p>(Andreev et al., 2012; Srivastava et al., 2010; Zhou, 2011)</p>

<p>PT6. Based on my perception and experience of the mobile payment provider, I believe they have a good reputation.</p>	
<p>Seller Trust (ST)</p> <p>Seller trust is the degree to which the consumer trusts a community of sellers, and this is necessary for any e-commerce as well as social commercial activities (Lu et al. 2016). Andreev et al. (2012) pointed out that vendor trust plays a vital role in m-commerce where there is an anonymous contact between sellers and buyers, as well as, a lack formal contractual agreement, and found the significant impact of vendor trust on willingness to accept m-payment of customers.</p> <p>ST1 Based on my experience, sellers who accept mobile payment are in general reliable.</p> <p>ST2 Based on my experience, sellers who accept mobile payment are in general honest.</p> <p>ST3 Based on my experience, sellers who accept mobile payment are in general trustworthy.</p> <p>ST4. Based on my experience, sellers who accept mobile payment generally keep their promises.</p>	<p>(Pavlou & Gefen, 2004)</p>

<p>Institution-based trust (IBT)</p> <p>Institution-based Trust (IT) is “the belief of consumers that necessary structural conditions for increasing the likelihood of gaining a successful outcome in an endeavour like m-payment, are present” (Nguyen et al., 2020, p. 32).</p> <p>IBT1. I feel good about how things go when I use mobile payment.</p> <p>IBT2. I am comfortable making a mobile payment.</p> <p>IBT3. I believe the internet has enough security safeguards to make me feel comfortable using it to make a mobile payment.</p> <p>IBT4. I feel assured that the legal system and institutions adequately protect me from mobile payment problems (such as financial frauds, and duplicate payments).</p> <p>IBT5. I feel confident that encryption and other mobile technology safeguards make it safe for me to make mobile payments.</p> <p>IBT6. In general, the internet is now a robust and safe environment in which to make a mobile payment.</p>	<p>(McKnight et al., 2002; Nguyen, 2016; Srivastava et al., 2010)</p>

<p>Consumer Trust (CT)</p> <p>Consumer Trust (CT) is defined as customers/consumers' beliefs and willingness to rely on m-payment for transactions (adapted from Alhulail, 2018; McKnight et al., 2002; Xin et al., 2015)</p> <p>CT1: Mobile payment always provides accurate financial services.</p> <p>CT2: Mobile payment always provides reliable financial services.</p> <p>CT3: Mobile payment always provides safe financial services</p> <p>CT4. Overall, I trust mobile payment.</p>	<p>(Lu et al., 2011; Qasim & Abu-Shanab, 2016)</p>
<p>Intention to continue to use mobile payment (IN)</p> <p>IN1. I intend to continue using mobile payment in the future.</p> <p>IN2. I will always try to use mobile payment in my daily life.</p> <p>IN3. I plan to continue to use mobile payment frequently.</p>	<p>(Venkatesh et al., 2012)</p>
<p>Performance Expectancy (PE)</p> <p>Performance expectancy (PE) “ is defined as the degree to which an individual believes that using the system will help him</p>	<p>(Venkatesh et al., 2003;</p>

<p>or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447)</p> <p>PE1. Using mobile payment has been useful in my daily life.</p> <p>PE2. Using mobile payment has increased my chances of completing financial transactions that are important to me.</p> <p>PE3. Using mobile payment has helped me pay things more quickly.</p> <p>PE4. Using mobile payment has increased my payment productivity.</p>	<p>Venkatesh et al., 2012)</p>
<p>Effort Expectancy (EE)</p> <p>Effort expectancy (EE) “is defined as the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450)</p> <p>EE1. Learning how to use mobile payment was easy for me.</p> <p>EE2. My interaction with mobile payment is clear and understandable.</p> <p>EE3. I find mobile payment easy to use.</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>

<p>EE4. It was easy for me to become skilful at using mobile payment</p> <p>EE5. It takes me less time to use mobile payment than other types of payment.</p> <p>EE6. It takes me less effort to set up mobile payment than other types of payment.</p>	
<p>Social Influence (SI)</p> <p>Social influence (SI) is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451). SI plays an important role as a direct determinant of intention to behave in form of subjective norm in TRA, TAM2, and TPB</p> <p>SI1. People who are important to me think that I should use mobile payment.</p> <p>SI2. People who influence my behaviour think that I should use mobile payment.</p> <p>SI3. People whose opinions that I value prefer that I use mobile payment</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>

<p>Hedonic motivation (HM)</p> <p>The fun or pleasure derived from using a technology such as m-payment.</p> <p>HM1. Using mobile payment is fun.</p> <p>HM2. Using mobile payment is enjoyable.</p> <p>HM3. Using mobile payment is very entertaining.</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>
<p>Habit (HB)</p> <p>A perceptual construct that reflects the results of prior experiences.</p> <p>HB1. The use of mobile payment has become a habit for me.</p> <p>HB2. I am addicted to using mobile payment.</p> <p>HB3. I must use mobile payment.</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>
<p>Price value (PV)</p> <p>Consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them.</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>

<p>PV1. Mobile payment is reasonably priced.</p> <p>PV2. Mobile payment is a good value for the money.</p> <p>PV3. At the current price, mobile payment provides a good value.</p> <p>PV4: Mobile payment services are reasonably priced comparing with other payment channels.</p>	
<p>Facilitating conditions (FC)</p> <p>The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.</p> <p>FC1. I have the resources necessary to use mobile payment.</p> <p>FC2. I have the knowledge necessary to use mobile payment.</p> <p>FC3. Mobile payment is compatible with other technologies I use.</p> <p>FC4. I can get help from others when I have difficulties using mobile payment.</p>	<p>(Venkatesh et al., 2003; Venkatesh et al., 2012)</p>
<p>Power distance (PD)</p>	<p>(Baptista & Oliveira, 2015; Hassan et al.,</p>

<p>The extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed inequality</p> <p>PD1. Managers should make most decisions without consulting subordinates</p> <p>PD2. Manager should not ask subordinates for advice, because they might appear less powerful</p> <p>PD3. Decision making power should stay with top management in the organization and not delegate to lower-level employees</p> <p>PD4. Employees should not question their manager's decision</p> <p>PD5: Subordinates should follow their superior's decisions unconditionally</p>	<p>2011; Srite & Karahanna, 2006; Yoon, 2009)</p>
<p>Masculinity (MA)</p> <p>A society's preference for success which are achievement, heroism, assertiveness, and material rewards.</p> <p>MA1. It is preferable to have a man in a high-level position rather than a woman</p>	<p>(Baptista & Oliveira, 2015; Hassan et al., 2011; Srite & Karahanna,</p>

<p>MA2. Solving organizational problems requires the active forcible approach which is typical of men</p> <p>MA3. It is more important for men to have a professional career than it is for women to have one</p> <p>MA4. Women do not value recognition and promotion in their work as much as men do</p>	<p>2006; Yoon, 2009)</p>
<p>Collectivism (CO)</p> <p>A preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular ingroup to look after them in exchange for unquestioning loyalty.</p> <p>CO1. Being accepted as a member of a group is more important than having autonomy and independence.</p> <p>CO2. Group success is more important than individual success</p> <p>CO3. Being loyal to a group is more important than individual gain</p> <p>CO4. Individual rewards are not as important as group welfare</p>	<p>(Baptista & Oliveira, 2015; Hassan et al., 2011; Srite & Karahanna, 2006; Yoon, 2009)</p>

<p>Uncertainty Avoidance (UA)</p> <p>“The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen?” (Hofstede-insights, 2018b).</p> <p>UA1. Rules and regulations are important because they inform workers what the organization expects of them</p> <p>UA2. Order and structure are very important in a work environment</p> <p>UA3. When starting a new job, I fear doing it.</p> <p>UA4. I fear uncertainty about the future.</p>	<p>(Baptista & Oliveira, 2015; Srite & Karahanna, 2006)</p>
<p>Long term Orientation (LO)</p> <p>Long term orientation refers to the extent to “link with the culture’s own past while dealing with the challenges of the present and the future” (Hofstede-insights 2018).</p>	<p>(Baptista & Oliveira, 2015; Hassan et al., 2011; Srite &</p>

LO1. Thrift is important in the workplace.	Karahanna, 2006; Yoon, 2009)
LO2. I work hard for success in the future	
LO3. Persistence is important in the workplace.	
LO4. I plan for the long term	

Appendix 2: Missing Value Assessment Results

Univariate Statistics							
	N	Mean	Std. Deviation	Missing		No. of Extremes ^a	
				Count	Percent	Low	High
PE1	482	6.26	1.802	0	.0	70	0
PE2	482	6.10	1.659	0	.0	24	0
PE3	482	6.56	1.676	0	.0	44	0
PE4	482	6.35	1.555	0	.0	49	0
EE1	482	5.43	1.377	0	.0	52	0
EE2	482	5.48	1.224	0	.0	37	0
EE3	482	5.55	1.297	0	.0	38	0
EE4	482	5.46	1.346	0	.0	40	0
EE5	482	5.52	1.423	0	.0	46	0
EE6	482	5.19	1.410	0	.0	58	0
SI1	482	4.82	1.434	0	.0	16	0
SI2	482	4.81	1.424	0	.0	16	0
SI3	482	4.77	1.424	0	.0	17	0
SI4	482	5.37	1.151	0	.0	31	0
SI5	482	4.97	1.303	0	.0	9	0
SI6	482	4.92	1.318	0	.0	9	0
SI7	482	4.99	1.375	0	.0	13	0
HM1	482	4.95	1.282	0	.0	11	0
HM2	482	5.10	1.249	0	.0	10	0
HM3	482	4.52	1.432	0	.0	11	0
HM4	482	4.87	1.357	0	.0	11	0
FC1	482	5.13	1.238	0	.0	11	0
FC2	482	5.42	1.112	0	.0	22	0
FC3	482	5.37	1.157	0	.0	28	0
FC4	482	5.23	1.290	0	.0	42	0
PV1	482	5.09	1.335	0	.0	56	0
PV2	482	5.05	1.271	0	.0	9	0
PV3	482	5.12	1.269	0	.0	8	0
PV4	482	5.12	1.260	0	.0	6	0
HB1	482	4.97	1.418	0	.0	14	0
HB2	482	5.22	1.310	0	.0	45	0
HB3	482	4.96	1.388	0	.0	12	0
HB4	482	5.12	1.350	0	.0	14	0
DT1	482	4.46	1.401	0	.0	52	19
DT2	482	5.13	1.290	0	.0	49	0
DT3	482	4.03	1.480	0	.0	0	0

DT4	482	3.87	1.515	0	.0	0	0
DT5	482	4.52	1.311	0	.0	41	17
DT6	482	4.37	1.368	0	.0	52	14
DT7	482	5.09	1.290	0	.0	53	0
DT8	482	4.58	1.355	0	.0	9	0
DT9	482	4.49	1.383	0	.0	11	0
PT1	482	5.04	1.257	0	.0	11	0
PT2	482	4.88	1.228	0	.0	9	0
PT3	482	4.95	1.178	0	.0	10	0
PT4	482	4.96	1.220	0	.0	10	0
PT5	482	4.98	1.154	0	.0	8	0
PT6	482	5.07	1.173	0	.0	9	0
TT1	482	4.95	1.172	0	.0	9	0
TT2	482	4.83	1.223	0	.0	9	0
TT3	482	4.89	1.246	0	.0	11	0
TT4	482	5.02	1.161	0	.0	7	0
IT1	482	5.18	1.203	0	.0	38	0
IT2	482	5.02	1.203	0	.0	10	0
IT3	482	4.72	1.275	0	.0	10	0
IT4	482	4.66	1.311	0	.0	13	0
IT5	482	4.83	1.218	0	.0	8	0
IT6	482	4.79	1.301	0	.0	11	0
ST1	482	4.92	1.134	0	.0	7	0
ST2	482	4.85	1.212	0	.0	9	0
ST3	482	4.84	1.194	0	.0	8	0
ST4	482	4.77	1.197	0	.0	8	0
CT1	482	5.00	1.205	0	.0	11	0
CT2	482	4.97	1.157	0	.0	8	0
CT3	482	4.93	1.172	0	.0	8	0
CT4	482	5.07	1.144	0	.0	34	0
PD1	482	3.32	1.683	0	.0	0	0
PD2	482	3.34	1.655	0	.0	0	0
PD3	482	3.88	1.672	0	.0	0	0
PD4	482	3.41	1.657	0	.0	0	0
PD5	482	3.24	1.710	0	.0	0	0
IC1	482	4.09	1.548	0	.0	0	0
IC2	482	4.57	1.500	0	.0	16	0
IC3	482	4.56	1.445	0	.0	13	0
IC4	482	4.41	1.460	0	.0	0	0
MA1	482	3.21	1.800	0	.0	0	0

MA2	482	3.73	1.688	0	.0	0	0
MA3	482	3.28	1.830	0	.0	0	0
MA4	482	3.41	1.834	0	.0	0	0
LO1	482	5.11	1.306	0	.0	57	0
LO2	482	5.52	1.182	0	.0	24	0
LO3	482	5.77	1.072	0	.0	16	0
LO4	482	5.16	1.225	0	.0	5	0
UA1	482	5.36	1.179	0	.0	30	0
UA2	482	5.63	1.139	0	.0	25	0
UA3	482	4.30	1.428	0	.0	0	0
UA4	482	4.68	1.518	0	.0	16	0
BI1	482	5.65	1.161	0	.0	28	0
BI2	482	5.23	1.261	0	.0	9	0
BI3	482	5.37	1.198	0	.0	30	0

Appendix 3: Outliers Assessment Results

(Df = 17, $\chi^2 = 40.790$, $p = 0.001$)

Mahalanobis Distance	Cases	P Value
91.40073	264	0.0000
83.92559	55	0.0000
76.60565	434	0.0000
69.98315	225	0.0000
69.90206	92	0.0000
61.2579	170	0.0000
59.91448	268	0.0000
59.24991	255	0.0000
56.70109	76	0.0000
55.36152	67	0.0000
54.59354	34	0.0000
54.12842	288	0.0000
52.55553	381	0.0000
51.96496	48	0.0000
51.37717	151	0.0000
50.54068	441	0.0000
49.30326	183	0.0001
47.7697	2	0.0001
45.6452	262	0.0002
45.63529	400	0.0002
44.28262	464	0.0003
43.64946	23	0.0004
42.14672	208	0.0006
41.47289	297	0.0008
41.19579	234	0.0009
41.01154	429	0.0009
40.75025	84	0.0010
40.72365	11	0.0010

Appendix 4: Normality Assessment Results

	N		Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing				
PE1	454	0	-1.823	0.115	3.385	0.229
PE2	454	0	-1.583	0.115	3.001	0.229
PE3	454	0	-2.525	0.115	7.373	0.229
PE4	454	0	-1.820	0.115	4.621	0.229
EE1	454	0	-1.725	0.115	3.341	0.229
EE2	454	0	-1.467	0.115	2.912	0.229
EE3	454	0	-1.759	0.115	4.254	0.229
EE4	454	0	-1.717	0.115	3.876	0.229
EE5	454	0	-1.622	0.115	2.957	0.229
EE6	454	0	-1.234	0.115	1.494	0.229
SI1	454	0	-0.726	0.115	0.271	0.229
SI2	454	0	-0.812	0.115	0.348	0.229
SI3	454	0	-0.752	0.115	0.374	0.229
SI4	454	0	-1.259	0.115	2.668	0.229
SI5	454	0	-0.952	0.115	0.777	0.229
SI6	454	0	-0.866	0.115	0.676	0.229
SI7	454	0	-0.911	0.115	0.641	0.229
HM1	454	0	-0.822	0.115	1.040	0.229
HM2	454	0	-0.968	0.115	1.650	0.229
HM3	454	0	-0.395	0.115	-0.283	0.229
HM4	454	0	-0.708	0.115	0.355	0.229
FC1	454	0	-1.011	0.115	1.534	0.229
FC2	454	0	-1.194	0.115	3.040	0.229
FC3	454	0	-1.387	0.115	3.435	0.229
FC4	454	0	-1.167	0.115	1.653	0.229
PV1	454	0	-1.131	0.115	1.341	0.229
PV2	454	0	-0.877	0.115	0.936	0.229
PV3	454	0	-1.062	0.115	1.329	0.229
PV4	454	0	-0.811	0.115	0.666	0.229
HB1	454	0	-0.901	0.115	0.636	0.229
HB2	454	0	-0.982	0.115	1.186	0.229
HB3	454	0	-0.727	0.115	0.273	0.229
HB4	454	0	-1.011	0.115	1.110	0.229
DT1	454	0	-0.477	0.115	-0.180	0.229
DT2	454	0	-1.038	0.115	1.330	0.229
DT3	454	0	-0.057	0.115	-0.716	0.229
DT4	454	0	-0.027	0.115	-0.767	0.229
DT5	454	0	-0.534	0.115	0.006	0.229
DT6	454	0	-0.378	0.115	-0.270	0.229
DT7	454	0	-0.999	0.115	0.980	0.229
DT8	454	0	-0.597	0.115	-0.331	0.229

DT9	454	0	-0.565	0.115	-0.361	0.229
PT1	454	0	-0.998	0.115	1.397	0.229
PT2	454	0	-0.573	0.115	0.508	0.229
PT3	454	0	-0.731	0.115	1.314	0.229
PT4	454	0	-0.692	0.115	0.839	0.229
PT5	454	0	-0.663	0.115	0.848	0.229
PT6	454	0	-0.701	0.115	1.034	0.229
TT1	454	0	-0.634	0.115	0.716	0.229
TT2	454	0	-0.508	0.115	0.306	0.229
TT3	454	0	-0.455	0.115	0.340	0.229
TT4	454	0	-0.708	0.115	0.901	0.229
IT1	454	0	-1.121	0.115	2.264	0.229
IT2	454	0	-0.702	0.115	0.802	0.229
IT3	454	0	-0.449	0.115	0.172	0.229
IT4	454	0	-0.403	0.115	0.064	0.229
IT5	454	0	-0.432	0.115	0.316	0.229
IT6	454	0	-0.588	0.115	0.379	0.229
ST1	454	0	-0.536	0.115	0.639	0.229
ST2	454	0	-0.508	0.115	0.514	0.229
ST3	454	0	-0.487	0.115	0.506	0.229
ST4	454	0	-0.374	0.115	0.249	0.229
CT1	454	0	-0.812	0.115	1.289	0.229
CT2	454	0	-0.677	0.115	0.960	0.229
CT3	454	0	-0.554	0.115	0.688	0.229
CT4	454	0	-0.748	0.115	1.280	0.229
PD1	454	0	0.381	0.115	-0.996	0.229
PD2	454	0	0.443	0.115	-0.863	0.229
PD3	454	0	0.048	0.115	-1.219	0.229
PD4	454	0	0.468	0.115	-0.856	0.229
PD5	454	0	0.456	0.115	-0.983	0.229
IC1	454	0	-0.208	0.115	-0.736	0.229
IC2	454	0	-0.549	0.115	-0.430	0.229
IC3	454	0	-0.360	0.115	-0.569	0.229
IC4	454	0	-0.301	0.115	-0.612	0.229
MA1	454	0	0.387	0.115	-1.029	0.229
MA2	454	0	0.025	0.115	-1.033	0.229
MA3	454	0	0.351	0.115	-1.103	0.229
MA4	454	0	0.311	0.115	-1.141	0.229
LO1	454	0	-0.957	0.115	0.939	0.229
LO2	454	0	-1.207	0.115	2.334	0.229
LO3	454	0	-1.512	0.115	3.947	0.229
LO4	454	0	-0.807	0.115	0.757	0.229
UA1	454	0	-1.175	0.115	2.081	0.229
UA2	454	0	-1.450	0.115	3.187	0.229
UA3	454	0	-0.255	0.115	-0.728	0.229
UA4	454	0	-0.707	0.115	-0.164	0.229

BI1	454	0	-1.750	0.115	4.664	0.229
BI2	454	0	-0.944	0.115	1.106	0.229
BI3	454	0	-1.245	0.115	2.673	0.229

Appendix 5: List of Publications Arising from the Thesis

Nguyen, T. A., Dick, M., & Pham, H. C. (2020). Investigating the Critical Determinants of Trust and Their Impact on Mobile Payment Adoption. *Proceedings of the 13th IADIS International Conference Information Systems 2020, Sofia University, Bulgaria, pp. 29-36.*

[Accepted and in production stage] Nguyen, T. A., Pham, H. C., Dick, M. & Richardson J. (2021). Trust Types and Mediating Effect of Consumer Trust in Mobile Payment Adoption: An Empirical Examination of Vietnamese Consumers. *Australasian Journal of Information Systems, 25.*

[Accepted and will be published in Vol 14 No 2, March 2022] Nguyen, T. A., Dick, M., Nguyen, T. B., Vu, L. Q. G., Nguyen, T. B. L. & Le, D. H. (2022). The Effect of Culture on Performance Expectancy, Intention and Trust in Mobile Payment Adoption. *International Journal of E-Services and Mobile Applications (IJESMA) - Online ISSN 1941-627X, indexed in Scopus.*

[Under review] Nguyen, T. A., Dick, M., Pham, H. C., Nguyen, B. T. T. An Investigation of Determinants for Trust of Mobile Payment Consumers. *Computers in Human Behavior*

Appendix 6: Ethics Approval



Participant Information Sheet/Consent Form

Title	The impact of trust on individual's intention to adopt mobile payment systems, in Vietnam
Chief Investigator/Senior Supervisor	Professor Joan Richardson
Associate Investigator(s)/Associate Supervisor(s)	Dr Pham Cong Hiep
Principal Research Student(s)	Nguyen Anh Tuan

What does my participation involve?

1 Introduction

You are invited to take part in this research project, which is called "The impact of trust on individual's intention to adopt mobile payment systems, in Vietnam". You have been invited because you have been identified as a suitable participant in the mobile payment field who can provide useful insight about cyber security issues. Your contact details were obtained by Mr Nguyen Anh Tuan (email: anhtuan.nguyen@rmit.edu.au)

This Participant Information Sheet/Consent Form tells you about the research project. It explains the processes involved in taking part in the research. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with a relative or friend.

Participation in this research is voluntary. If you don't wish to take part, you don't have to.

If you decide you want to take part in the research project, you will be asked to click on the consent check box. By clicking it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project

You will be sent a copy of this Participant Information and Consent Form to keep.

2 What is the purpose of this research?

This research aims to investigate the critical determinants for trust on individual intention to adopt mobile payment systems, in Vietnam. It would help business in Vietnam understand how to improve mobile payment adoption and the quality of the service. A better understanding of the factors that contribute to the adoption of m-payment systems, in Vietnam, will also help other developing countries that share similar technology infrastructure, e-markets, and culture to improve adoption rates. Consequently, this research contributes to the literature describing the identification of trust's determinants and interrelationships. There is a paucity of research describing the influence of vendor and application trust on m-payment adoption in developing countries. The theoretical model, built from the literature, is underpinned by the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT).

The results of this research will be used by the researcher Nguyen Anh Tuan to obtain a PhD qualification at RMIT.

This research has been initiated by the researcher, Mr Nguyen Anh Tuan

3 What does participation in this research involve?

The respondents will receive an invitation email including the link to the online survey name "An empirical study on the determinants for trust in mobile payment in Vietnam". If they agree to take part in the survey, they will click on a link that requests a "YES" or "NO" to the question "Do you consent to take part in this project?" If a respondent selects "YES", then they have consented to take part in the research and will proceed to undertake the survey.

The survey is anonymous, and confidential. No personal information of participants, such as, their name, mobile number, email, and personal financial information is recorded. No video or any audio will be recorded.

There are two parts of the questionnaire in the online survey:

1. Demographic data of respondents, such as, age range, gender, occupation, education level and mobile technology and mobile payment use experience.
2. The extent of user agreement or disagreement about the impact of critical determinants on consumers trust and intention to adopt m-payment systems.

Participants will be asked to respond questions in an online survey, which will take approximately 15 minutes to finish. Only the researcher can use the collected data for the purpose of analysis, and interpretation.

4 Other relevant information about the research project

To ensure the necessary sample size for a structural equation modelling statistical analysis technique to be used, this study will need a minimum of 200 survey responses. There are no control groups in the survey.

In the analysis phase participants may be classified based on control variables such as age, gender, mobile experience.

The scope of this study restricts data collection to staff and customers of three Vietnamese companies, that use mobile technologies. The project is the first study, and it does not involve any other researchers from other organisations.

5 Do I have to take part in this research project?

Participation in any research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

Your decision about whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with the researchers or with RMIT University.

Submitting your completed questionnaire is an indication of your consent to participate in the study. You can withdraw your responses any time before you have submitted the questionnaire. Once you have submitted it, your responses cannot be withdrawn because they are non-identifiable and therefore we will not be able to tell which submitted survey was yours.

6 What are the possible benefits of taking part?

We cannot guarantee or promise that you will receive any benefits from this research; however, you may appreciate contributing to knowledge. Possible benefits may include better m-payment services from the company or institution enabling your participation in this research project.

There will be no clear direct benefit to you from your participation in this research.

7 What are the risks and disadvantages of taking part?

This project will use an external site to create, collect and analyse data collected in a survey format. The survey system we are using is Qualtrics. If you agree to participate in this survey, the responses you provide will be stored on the Qualtrics host server. No personal information will be collected in the survey and none will be stored as data. Once we have completed our data collection and analysis, we will import the data to the RMIT server where it will be stored securely for five years. The data on the host server will then be deleted and expunged.

8 What if I withdraw from this research project?

If you do consent to participate, you may withdraw at any time. If you decide to withdraw from the project, please notify a member of the research team: Nguyen Anh Tuan (email:), or Joan Richardson (email:)

Once you have started the survey even if you have not completed, your responses cannot be withdrawn because they are not identifiable. However, data from partially completed surveys will not be included in the analysis.

9 What happens when the research project ends?

The result of the research will be published on the RMIT repository of PhD theses. The result also can be published on the conference or journal after survey 1-2 years, with the name: "The critical determinants for trust on intention to adopt mobile payment systems in Vietnam".

How is the research project being conducted?

10 What will happen to information about me?

By signing the consent form you consent to the research team collecting and using the information you provided for the research project. Any information obtained in connection with

this research project that can identify you will remain confidential. No personal information of participants such as name, mobile number, and financial information is recorded from the online survey.

Data will be stored on the RMIT server, which only the researcher the right to access.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified. Only statistical results will be published based on the analysis of collected data, no personal information of participants is revealed.

11 Who is organising and funding the research?

This research project is being conducted by Mr. Nguyen Anh Tuan, subsequent to ethical approval by the RMIT Ethics Committee.

12 Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). This research project has been approved by the RMIT University HREC.

This project will be carried out according to the *National Statement on Ethical Conduct in Human Research* (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies.

13 Further information and who to contact

If you want any further information concerning this project, you can contact the researcher Nguyen Anh Tuan based on following information: phone number:, email:, or any of the following people:

Research contact person

Name	Professor Joan Richardson
Position	Senior supervisor
Telephone	
Email	

14 Complaints

Should you have any concerns or questions about this research project, which you do not wish to discuss with the researchers listed in this document, then you may contact:

Reviewing HREC name	RMIT University
HREC Secretary	Peter Burke
Telephone	
Email	
Mailing address	Research Ethics Co-ordinator Research Integrity Governance and Systems RMIT University GPO Box 2476 MELBOURNE VIC 3001

Consent Form

Title	The impact of trust on intention to adopt mobile payment systems in Vietnam
Senior Supervisor	Professor Joan Richardson
Associate Supervisors	Dr Pham Cong Hiep
Research Student(s)	Nguyen Anh Tuan

Acknowledgement by Participant

I have read and understood the Participant Information Sheet.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the project without affecting my relationship with RMIT.

I understand that I will be given a signed copy of this document to keep.

Name of Participant (please print) _____	
Signature _____	Date _____

Declaration by Researcher*

I have given a verbal explanation of the research project, its procedures, and risks and I believe that the participant has understood that explanation.

Name of Researcher* (please print) _____	
Signature _____	Date _____

* An appropriately qualified member of the research team must provide the explanation of, and information concerning, the research project.

Note: All parties signing the consent section must date their own signature.

Notice of Project Amendment Approval

Date: 29 October 2019

Project number: 21957

Project title: *The impact of trust on individual's intention to adopt mobile payment systems, in Vietnam*

Risk classification: Low Risk

Chief Investigator: Professor Joan Richardson
Student Investigator: Tuan Anh Nguyen
Other Investigators: Dr Martin Dick, Dr Pham Cong Hiep

Project Approved: From: 4 March 2019 To: 26 October 2021

Project Amendment Approved: From: 24 October 2019

Amendment Details: Amend survey, recruitment method and participant pool.

Terms of approval:*Responsibilities of the principal investigator*

It is the responsibility of the principal investigator to ensure that all other investigators and staff on a project are aware of the terms of approval and to ensure that the project is conducted as approved by BCHEAN. Approval is only valid while the investigator holds a position at RMIT University.

1. *Amendments*
Approval must be sought from BCHEAN to amend any aspect of a project including approved documents. To apply for an amendment submit a request for amendment form to the BCHEAN secretary. This form is available on the Human Research Ethics Committee (HREC) website. Amendments must not be implemented without first gaining approval from BCHEAN.
2. *Adverse events*
You should notify BCHEAN immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
3. *Participant Information and Consent Form (PICF)*
The PICF must be distributed to all research participants, where relevant, and the consent form is to be retained and stored by the investigator. The PICF must contain the RMIT University logo and a complaints clause including the above project number.
4. *Annual reports*
Continued approval of this project is dependent on the submission of an annual report.
5. *Final report*
A final report must be provided at the conclusion of the project. BCHEAN must be notified if the project is discontinued before the expected date of completion.
6. *Monitoring*
Projects may be subject to an audit or any other form of monitoring by BCHEAN at any time.
7. *Retention and storage of data*
The investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

Regards,

Appendix 7: Comparison of items used in this thesis and CVScale

Used Items	CVScale
<p>Powder Distance The extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed inequality</p> <p>PD1. Managers should make most decisions without consulting subordinates PD2. Manager should not ask subordinates for advice, because they might appear less powerful PD3. Decision making power should stay with top management in the organization and not delegate to lower-level employees PD4. Employees should not question their manager's decision PD5: Subordinates should follow their superior's decisions unconditionally</p>	<p>PO1. People in higher positions should make most decisions without consulting people in lower positions. PO2. People in higher positions should not ask the opinions of people in lower positions too frequently. PO3. People in higher positions should avoid social interaction with people in lower positions. PO4. People in lower positions should not disagree with decisions by people in higher positions. PO5. People in higher positions should not delegate important tasks to people in lower positions.</p>
<p>Masculinity (MA) A society's preference for success which are achievement, heroism, assertiveness, and material rewards. MA1. It is preferable to have a man in a high-level position rather than a woman MA2. Solving organizational problems requires the active forcible approach which is typical of men MA3. It is more important for men to have a professional career than it is for women to have one MA4. Women do not value recognition and promotion in their work as much as men do</p>	<p>MA1. It is more important for men to have a professional career than it is for women. MA2. Men usually solve problems with logical analysis; women usually solve problems with intuition. MA3. Solving difficult problems usually requires an active, forcible approach, which is typical of men. MA4. There are some jobs that a man can always do better than a woman.</p>
<p>Collectivism (CO) A preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular ingroup to look after them in exchange for unquestioning loyalty. CO1. Being accepted as a member of a group is more important than having autonomy and independence.</p>	<p>Collectivism CO1. Individuals should sacrifice self-interest for the group.</p>

<p>CO2. Group success is more important than individual success</p> <p>CO3. Being loyal to a group is more important than individual gain</p> <p>CO4. Individual rewards are not as important as group welfare</p>	<p>CO2. Individuals should stick with the group even through difficulties.</p> <p>CO3. Group welfare is more important than individual rewards.</p> <p>CO4. Group success is more important than individual success.</p> <p>CO5. Individuals should only pursue their goals after considering the welfare of the group.</p> <p>CO6. Group loyalty should be encouraged even if individual goals suffer.</p>
<p>Uncertainty Avoidance (UA)</p> <p>“The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen?” (Hofstede-insights, 2018b).</p> <p>UA1. Rules and regulations are important because they inform workers what the organization expects of them</p> <p>UA2. Order and structure are very important in a work environment</p> <p>UA3. When starting a new job, I fear doing it.</p> <p>UA4. I fear uncertainty about the future.</p>	<p>Uncertainty Avoidance</p> <p>UN1. It is important to have instructions spelled out in detail so that I always know what I’m expected to do.</p> <p>UN2. It is important to closely follow instructions and procedures.</p> <p>UN3. Rules and regulations are important because they inform me of what is expected of me.</p> <p>UN4. Standardized work procedures are helpful.</p> <p>UN5. Instructions for operations are important.</p>
<p>Long term Orientation (LO)</p> <p>Long term orientation refers to the extent to “link with the culture’s own past while dealing with the challenges of the present and the future” (Hofstede-insights 2018).</p> <p>LO1. Thrift is important in the workplace.</p> <p>LO2. I work hard for success in the future</p> <p>LO3. Persistence is important in the workplace.</p> <p>LO4. I plan for the long term</p>	<p>Long-Term</p> <p>LT1. Careful management of money (Thrift)</p> <p>LT2. Going on resolutely in spite of opposition (Persistence)</p> <p>LT3. Personal steadiness and stability</p> <p>LT4. Long-term planning</p> <p>LT5. Giving up today’s fun for success in the future</p> <p>LT6. Working hard for success in the future</p>