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FACTORS INFLUENCING CONSUMERS' INTENTION TO ADOPT MOBILE WALLET IN HO CHI MINH CITY

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ABSTRACT

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Vietnam in on the cusp of a payment revolution, driven by the government's vision of a cashless society and the high smartphone penetration. An important initiative to this payment revolution is the mobile wallet technology.

The primary objective of the thesis is to gain knowledge about the current state of mobile wallet in Ho Chi Minh City, with a focus on examining effects of perceived factors on the residents of Ho Chi Minh City, and provide recommendations. Quantitative method of study was employed to collect data from the respondents.

The theoretical framework was built on the literature on the mobile wallet technology, the Technology Acceptance Model and the hypotheses adapted from the study of Nguyen & Pham (2014). In the empirical research, the attempt was to categorize the respondents into users and non-users.

The results showed that usefulness, ease of use, social influence, credibility, variety of services and mobility were deemed influential to the intention of the respondents. In addition, a large number of the respondents show the intention to continue using or start using the wallet service in the future. The research is useful to stakeholders in the business of mobile wallet, it enables them to have a comparison on their performance versus the perception of the customers, thus implementing changes where necessary.

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1. INTRODUCTION

1.1. Background of the research

Since the early days of the civilization, people have begun to trade. In the early times, people acquired the commodities they did not have at hand by exchanging goods of equivalent value, this concept is called bartering (Beattie, 2019). As the complexity of commercial activities increase, coins, paper bank note, and paper money were respectively invented and put in force as the medium of trade. In the 20th century, money in trade is electronically represented by the bank-issued credit and debit card (Mendoza, 2018). Following that, the rise of the Internet gave birth to e-commerce and online payment. Today, traders have the option of completing their transactions on mobile devices.

The mobile technology has been consistently and rapidly developing and consumers do not have to wait for long until the smartphone launch cycle leaps and new innovative services are revealed. For instance, since 2012, Apple has released a new iPhone model on September every year (see Figure 1 in page 9). Today, the capacity of mobile devices (smartphones, tablets, smartwatchs, etc.) of incorporating a wide range of capabilities, which make separate single-function gadgets including MP3 players, voice recorders, pocket digital cameras and dictionaries unnecessary. Apple confirmed to have discontinued their iPod nano and iPod shuffle in 2017, after the iPod classic met its end in 2014 (BBC, 2017). Similarly, Sony in 2017 stated that it does not plan on continuing its handheld gaming portable device as smartphone was foreseeably the dominant portable platform in the future (Jeffrey, C., 2017). Smartphones do not only function as a communication tool, but they also provides a means of socialization, entertainment, and internet access.
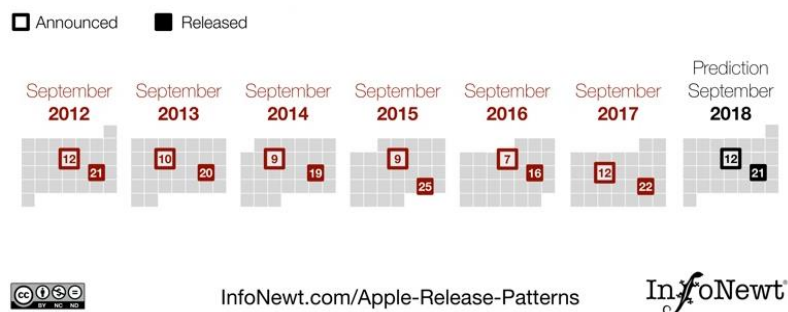
Figure 1 *Apple iPhone Release Pattern (Source: InfoNewt, 2018)*

As its next move, the mobile technology is transforming the banking and payment industry (Gupta, 2013). Almost every financial institution in Vietnam now has its own mobile banking application, enabling customers to perform online banking tasks such as obtaining account balance, transfering funds, checking deposits remotely (see Figure 2). Following the mobile shift, the mobile wallet is a recent phenomenon in Vietnam. The country has welcomed over 20 liscensed mobile wallets in the recent years (VnExpress, 2018). The wallets recorded a total value of 53,109 billion VND (€2,046 billion[1]) mobile wallet transaction in 2016, achieving a 64% growth comparing to that of 2015 (Nguyen, 2017).
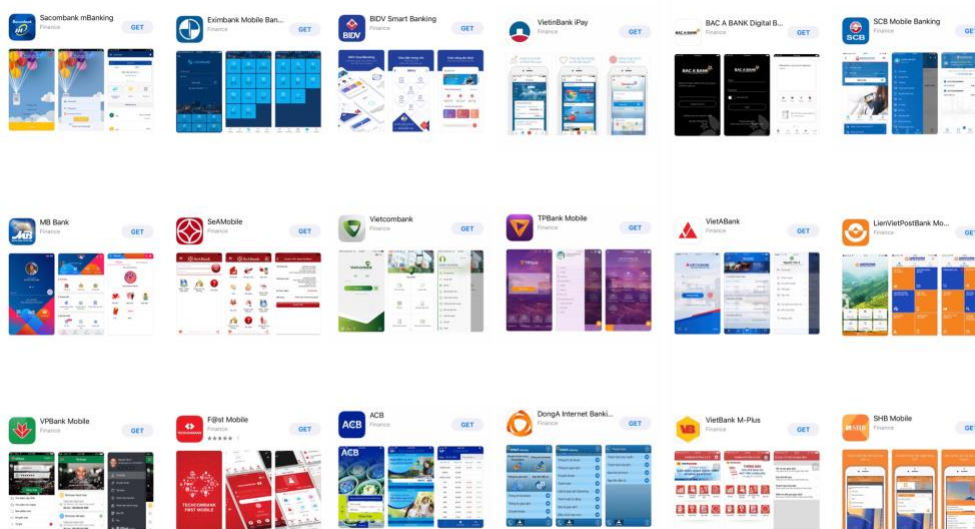
Figure 2 *Mobile banking applications*

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[1] All exchange rates recorded on April 22nd 2019: 1 EUR = 25,890.94 VND

Moreover, in 1/2019, the government of Vietnam, in an announcement of a solution encouraging cashless transaction, assigned The State Bank of Vietnam to find solutions to promote mobile wallet (Ariffin, 2019). Seeing the popularity and importance of mobile wallet growing in Vietnam, I am interested in researching the adoption intention of Vietnamese customers towards the service. Furthermore, I also want to support the growth of mobile wallet by providing recommendations for improvement.

1.2. Objective of the research

Mobile wallet is an emerging trend in the mobile payments space. While research on other mobile payment instruments (i.e mobile banking, mobile commerce) exists, the mobile wallet hass been minimally studied until now. The objective of the research is to gain knowledge about the current state of the mobile wallet in Ho Chi Minh City. From the acquired information, recommendations for improvement will be made for the stakeholders of the e-wallet.

In order to achieve the objective, the aim is to answer the following sub-questions:

1   How has the mobile wallet been adopted in Ho Chi Minh City?
2   What are the factors influencing the intention to adopt a mobile wallet?
3   What are the recommendations for the stakeholders to improve the mobile wallet service?

1.3. Methodology of the research

Quantitative research would be used to obtain answers to the research questions. The primary data was collected electronically via Google Form. The respondents of this thesis are students of University of Economics Ho Chi Minh (UEH) who are pursuing some bachelor's degree program or post-graduate's degree program. A well-educated sample implies that the respondents have the capability to learn about and use technology innovations.

1.4. Limitations of the research

The results of the study are useful to service providers and any stakeholders of mobile wallet to have a look at the current state of mobile wallet and further understand the factors influencing customer's intention to adopt mobile wallet, from the perspective of both users and non-users. Nevertheless, there are existing limitations that need to be acknowledged.

The first limitation is the small size of the sample; therefore, the results cannot represent the opinions of all Ho Chi Minh City's residents. Secondly, there is a limitation of Nguyen & Pham's research that was passed on to this study, as Nguyen & Pham's research model was adapted to this work. The study explores the influence of several factors on the intention to use a mobile wallet, however, it does not look into the relation between behavioral intention and the actual use. Besides, it is possible that there are other factors creating positive/negative effect on customers' use intention that are not included in this research, as the hypotheses only cover a total of seven aspects. The research does not explore the reason non-users do not intend to adopt the mobile wallet, but only what factors are persuasive to them.

1.5. Structure of the research

The thesis contains six chapters which can be divided into two primary sections: the theoretical study and empirical study. Chapter 1 explains the research background, research aims and research questions to the readers. Chapter 2 & 3 introduced the readers to relevant literature of the research, First, chapter 2 gives the readers an overview of the mobile wallet, the functionality of the technology, and the types of wallet available in the market. Secondly, chapter 3 focuses on the theoretical framework of this thesis, the Technology Acceptance Model (TAM). Based on the TAM literature, the adapted hypotheses is proposed and the each hypothesis that constructs the research model is explained in details respectively.

The emipircal section began from chapter 4, which reasons the choice of research methodology, desccribes the process of survey creation and data collection, as well as evaluates the reliability and validity of the research. Description and analysis of results are presented in chapter 5. Chapter 6 provides answers to the research questions; defines the limitations and proposes suggestion for future research. Figure 3 illustrated the structure of the thesis.
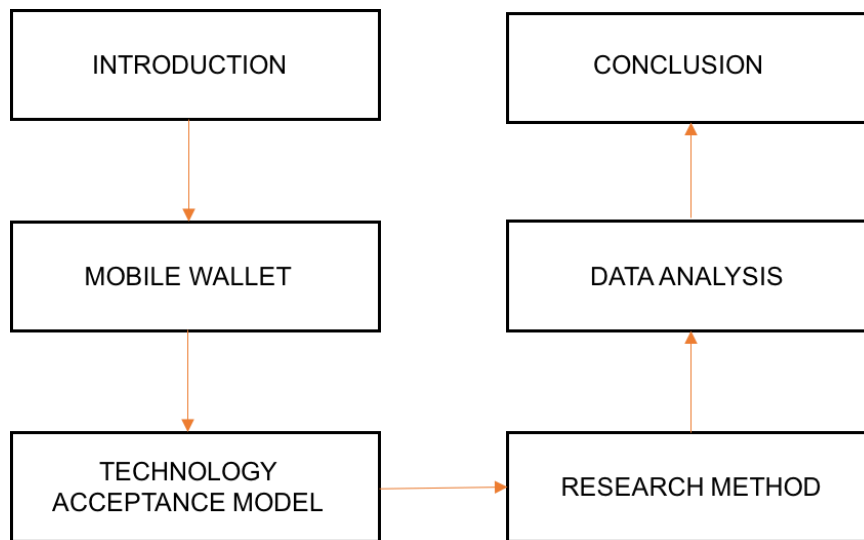
Figure 3 *Structure of Thesis*

Chapter 1 has given an overview of this research. From this chapter, the readers have been informed of the intital motivations, the objective, the employed research method, the existing limitations and the structure of the research. In the next chapter, the subject of the research – the mobile wallet, will be brought to the discussion.

2. THE MOBILE WALLET

In this chapter, essential knowledge about the main subject of this thesis – the mobile wallet, will be introduced. First, a definition of the concept of mobile wallet. In the next section, data security technology and functions of the wallet will be discussed. The chapter will end with the discussion of different mobile wallet types.

2.1. Definition of Mobile Wallet

To begin, it is to note that the mobile wallet of the research is not the wallet made for storage and trading of cryptocurrencies, instead, it is a digital version of a wallet that keeps money, cheques,and cards. So far, many research papers have given definition of mobile wallet by describing the mobile payment system. Dahlberg, Mallat, Ondrus & Zmijewska (2008) via Aydin & Burnaz (2016) defined mobile payment as "*the capability of the mobile device to facilitate payments for goods, services, and bills by exploiting the wireless and other communication technologies*". In another source, mobile payment is" *any payment transaction performed by a mobile device capable of connecting to the cellular networks*". (Amoroso & Magnier-Watanabe, 2012). Mobile payment is a wider term, which include payment methods performed by mobile devices, including the mobile wallet.

Mobile wallet is digital wallet that operates on a mobile device. In other words, it is an application that can be downloaded from Appstore, Google Play Store and installed on the mobile device. In an introductory research paper of mobile wallet, Marinova-Kostova defined the mobile wallet as "*a digital cardholder for different payment instruments which provide payment account information. This method typically use the "tap and go", in other words, the Near Field Communication (NFC) technology to facilitate payment*". The GSMA White Paperfurther interprets that not only payment cards are digitized, the mobile wallet al.so holds items such as tickets, receipts, coupons, vouchers – things that can be found in a leather wallet.

2.2. Security technology & major functionalities:

In order to protect the payment credentials from being revealed, a mobile wallet providers use encryption or tokenization, the recent data security technology in the payment processing industry. According to the white paper of First Data (2012), both technologies restructure the sensitive card data (primary account number, CVV2, expiration date) into another form: ciphertext (encryption) or a unique digital identifier (tokenization). By doing this, the provision and transmission of payment credentials are more secured and protected.

When the data safely reaches the end-point of the transmission, a master key, in possession of the acquiring bank or payment processor, the system ultimately decrypts the ciphertext back to the initial format. On the other hand, the token is irreversible and it uses a secure cross-reference table to map back to the original card data. The U.S Payment Forum noted that before generating the token, the wallet shall seek and have the approval from the cardholder's financial institution.

The European Payment Council (EPC) - an association of the European banking industry in relation to payments, has specified a number of features of the mobile wallet in its report on the mobile payment initiatives:

- Initiate, authorize and confirm payments for goods or services remotely or at the point of sale.
- Store customer-identity information, payment information, shipping details for convenient identification and authentication.
- Manage the mobile payment services of multiple providers including sensitive data to be protected.
- Store tickets (movie tickets, flight tickets, parking tickets) needed to be shown at inspection.
- Store cards, coupons and vouchers retrieved from the incentive programs of different merchants.

In the following section, four types of wallet that are enabled by different delivery technology will be introduced

2.3. Types of mobile wallet

There are many possibilities of classifying types of mobile wallet, the rationale given by Aite (2016) for the classification is the delivery technologies that support e-wallets. E-wallets are enabled by the near field communication, optical/QR codes, digital (online)-only transactions or text-based transaction. As an enabler of commerce, today, there are e-wallets that incorporate more than one delivery technology to provide additional convenience.

Near Field Communication (NFC)

Near Field Communicarion (NFC) is a technology that is spreading popularity across Asia, Europe and North America. The wireless technology allows users to make payment at the physical point of sale (POS) by waving or tapping the NFC-embedded mobile devices and the NFC compatible device (payment reader) in close proximity (within 10cm). NFC eliminates the need to align the two devices together, or go through multiple steps setting up a connection. Examples of mobile wallet using NFC technology include: Apple Pay, Android Pay, Samsung Pay.

Optical/ QR code

QR code is also a mobile proximity payment, unlike the traditional one dimension barcode, the QR two-dimensional barcode can carry larger size and more types of data (alphabets, numbers, binary) (Chang Jae, 2014) (1). To be specific, barcode can contain 20-25 characters, while QR code can hold up to 7,000 characters. QR code is readable by the barcode scanner and any devices that are equipped with a camera also read QR Code. Example of QR code wallet include: Alipay, Wechat Pay.

There are two types of QR code payments: consumer-presented QR Code and merchant-presented QR code. The customers pay by scanning the QR code generated by their wallet app at the merchant's POS terminal. The later type requires the customers to scan the QR code generated by the merchant using the camera in their wallet app. The transaction will not be processed until the wallet app have received the merchant details from the code. In practice, the wallet app can offer both QR code payment types. An example is Alipay, whose payment products include Merchant QR Code Payment and Transaction Barcode Payment options. (U.S Payments Forum, 2018)

Digital only

As of its name, digital-only wallet has the main purpose of serving online purchase in certain e-marketplaces that accept and offer this wallet for payment. Digital only wallet category has limited application in the physical-world (Aite, 2016). Examples of digital-only wallet are Paypal, Pay with Amazon.

Text-based

SMS payment has been in use for a long time now and today it remains a popular payment option. This payment protocol operates without the need of internet connection. Additionally, the text-to-pay method requires the user neither his/her credit card information nor personal details (Roberts, 2013). Instead, the 'wallet' is the pre-paid balance of the user, or his/her post-paid bill. The costs of the purchase is added to or deducted from the user's account, depending on his/her payment plan. Roberts described that the user initiates the purchase request either by sending a text message contains a code to a designated phone number or entering his/her phone number onto the website.

This wallet service is primarily used for micropayments, for instance, the technique applies to mobile data plan registration/renewal or topping up credits for an account.

Xemtailieu, a Vietnam-based digital scholarly publisher of academic journals, access to the articles are granted upon payment of a fee. Specifically, the carrier deducts 15,000 VND (€0.58) and the user receives 5,000 VND (€0.19) in her credit for each message.

Chapter 2 has provided essential knowledge of the subject of this thesis – the mobile wallet. Important characteristics of the mobile wallet were introduced including the definition, the features, the technology of data security and the types of mobile wallet. In the chapter 3, the Technology Acceptance Model (TAM), which is the key to answer the research questions.

3. THEORETICAL FRAMEWORK

This chapter will discuss the theoretical framework of this thesis, the Technology Acceptance Model (TAM). The adapted TAM extension and the hypotheses which will be the basis for the empirical research of this thesis will also be introduced. The chapter will end with a discussion about the factors of the adapted TAM extension.

3.1. The Technology Acceptance Model (TAM)

In 1980, two reseachers Fisbein & Ajzen developed the Theory of Reasoned Action (ToRA), which discusses the determinants of individuals' behaviour. In this model, behavioural intention was identified as the proximal cause of a behavior. Any intention to engage in a particular behaviour is shaped by attitudes and subjective norm. Fishbein & Ajzen's work is an influential theory whose application is not only seen in the field of social psychology but also in communication and consumer behaviour.

In the technology sector, understanding of human behavioral complexity enabled innovators to predict users' behaviours towards technology products. In 1986, Fred Davis published the Technology Acceptance Model (TAM), which is derived from the ToRA. TAM is one of the well-recognized extensions in academic research that studies the acceptance and usage of new technological innovations (Aydin & Buznar, 2016). In this model, the user's motivation to abstain or adopt a new information technology product was determined by the intention to utilize the product, which is in turn explained by two components perceived usefulness (PU) and perceived ease of use (PEU) (Aydin & Buznar, 2016).
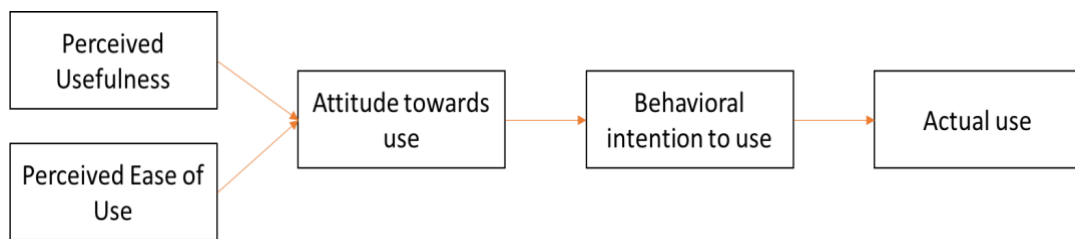
Figure 4 *Original version of TAM (Source: Sawadogo,2017)*

However, Mathieson et al. (2001) pointed that the predictive power of TAM is limited, because aside from PU and PEU, there are other factors that are also important to the usage behavior. For instance, ToRA's subjective norm was absent from the TAM. Regconizing the limitation, researchers added extra factors to the classic, which resulted in extensions such as TAM2, TAM3, United theory of acceptance and use of technology (UTAUT). These models retain the underlying simplicity of TAM and improve the predictability and explainability of technology adoption (Mathieson et al., 2001).

This thesis adapts the TAM extension and the hypotheses created by Nguyen & Pham (2016). In other words, the empirical research will adapt and be designed on the basis of Nguyen & Pham's hypotheses. The research of Nguyen & Pham was published in the volume 57th of Journal of Science: Ho Chi Minh City Open City. Their study analyzed the factors influecing the intention to use mobile commerce service of An Giang residents. As mobile wallet is a subcategory of mobile payment, which all completes the financial transaction through mobile devices. The adoption pattern of mobile wallet more or less share similarity with the findings in Nguyen & Pham's research. The research model is illustrated in Figure 3.

According to Nguyen & Pham's research model, the factors of the study include Perceived Usefulness and Perceived Ease of Use, Social Influence, Perceived Credibility, Perceived Costs, Variety of Services. In the following section, the author will respectively introduce the factors of relevance.
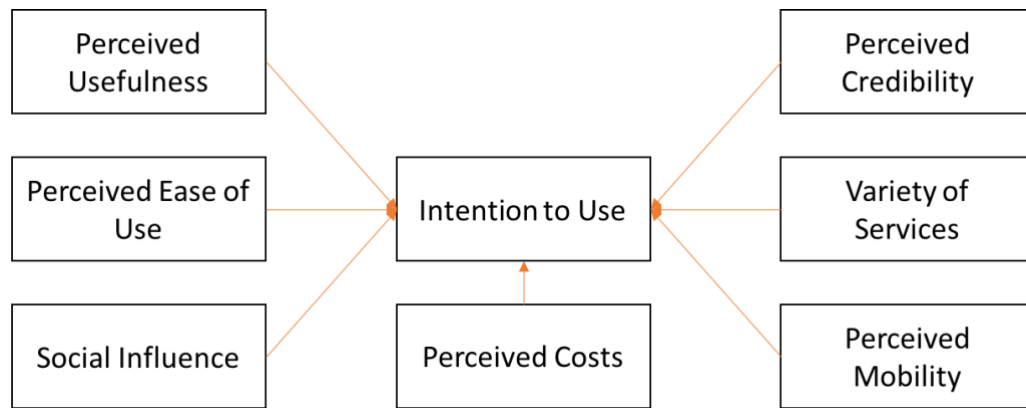
Figure 5 *Research model of this study (Source: Nguyen & Pham, 2014)*

3.1.1. Perceived Usefulness (PU)

Perceived usefulness refers to "the degree to which a person believes that his/her performance would become more efficient by using a particular system" (Davis 1989). According to Tandon et al. (2017), a person relies on his cognitive appraisal of how a technology product, in this case, the mobile wallet, will enahnce his job/task performance, to decide whether he intends to use or to reject it. The factor is an important predictor of technology acceptance belief. It was found in previous studies that usefulness associated with time-saving and speed (Nguyen & Pham, 2016; Tandon et al., 2017; Aydin & Burnaz, 2016). The adapted hypothesis stated as the following:

H1: *The higher the perceived usefulness, the higher the intention to use mobile wallet.*

3.1.2. Perceived Ease of Use (PEU)

Perceived ease of use is defined as "the degree to which a person believes that using a particular system is free of effort" (Davis, 1989). The factor is the second key determinant in the technology acceptance model. Davis further explained that users would want to get acquainted with the new application if it seems user-friendly. Dai & Palvia via Nguyen & Pham (2014) made a simiar statement that the usability and learnability of the mobile commerce service are of great importance, regardless the users are technology-savvy or technology-inexperienced. In the context of this thesis, the wallet payment service shall be as simple to use as the users' current payment

method that they begin to consider switching to the wallet in their future transactions. Tandon et al. (2017) suggested that the aspects of ease of use include:

- The user-friendly structure, interface of the technology product;
- The free-of-effort user experience with the product in the initial stages;
- The speed of locating the needed features;
- The simplicity of the set of required actions and the rapidity in navigating and making purchase.
- The controllability of the users while using the technology product.

The related hypothesis here is:

H2: *The higher the perceived ease of use, the higher the intention to use mobile wallet.*

3.1.1. Social Influence

As mentioned above, the concept of social influence derived from the ToRA of Azjen and Fishbein (1975), it is understood as "one's perception of the social pressure to engage or not to engage in a behviour". The person's own opinion is influenced by the individual or group of reference such as family members, friends, colleague, celebrities and the means of mass communication. Vietnam as a collectivist society, where people belong to groups, and place emphasis on strong relationships and loyalty (Hofstede). Loyalty means showing firm and constant support to a group, a person. In other words, the person prioritizes the favor, interest and opinion of his/her group, relatives or friends over his/her own. The implication of this cultural trait in the thesis is that Vietnamese's intention to use a mobile wallet will increase if their closed ones encourage or pursue them to. Dai & Palvia via Nguyen & Pham (2014) also found that social influence is influential to Chinese and Malaysia consumers, who also share the collectivism culture. The adapted hypothesis was developed as the following:

H3: *The higher the social influence, the higher the intention to use mobile wallet.*

3.1.2. Perceived Credibility (PCr)

Zhao & Kurnia (2014) described perceived credibility (or perceived trust) as "the willingness of the consumers to take a risk to fulfil their demands based on the

expectation towards the service provider". In other words, if the provider of the service is able to give the consumers an impression that their personal details, payment credentials, behavior are protected in a safe and secure manner, the consumers will have more confidence to use the service to perform their demand. The adapted hypothesis of perceived credibility stated that credibility has a positive effect on the intention to use of the customers. It was explored that credibility was correlated to security and privacy. Both of the features are the major concerns among the Vietnamese, as Bui & Pham (2012), in their study, found that the data privacy protection in Vietnam remained modest. For that reason, it is presumed that building credibility of the e-wallet is crucial to influence customes' use intention. The hypothesis concerncing perceived credibility is as under:

H4: *The higher the perceived credibility,, the higher the intention to use mobile wallet.*

3.1.3. Perceived Costs (PC)

Luarn & Lin (2005) via Nguyen (2013) defined perceived costs as the costs that an individual believes he/she must pay in order to use a technology product. It can be transaction costs, the service provider's monthly or annual fee, mobile device costs, mobile data plan. While in the research of Nguyen & Pham, the impact of costs was found to be insignificant, Kurnia & Zhao (2014) pointed out that the extra money would make the consumers reconsider whether or not to adopt the mobile payment option The partipants of Pham & Bui research said that mobile commerce products were relatively expensive compared to their financial capacity. The respondents also said the inexplicit data charges also acted as a barrier to mobile app usage. The adapted hypothesis was formulated as under:

H5: *The higher the perceived costs, the lower the intention to use mobile wallet.*

3.1.4. Mobility

Kalinic & Marinkovic (2015) defines mobility as the ability to access the service and perform the financial transaction anytime and anywhere, even on the go. Mobile commerce service is apparently developed for a range of mobile devices, and the

transmission of information is completed by wireless internet access such as Wifi or data. This gives the users an advantage of time and place independence, thus enabling them to send and receive time-sensitive payment information, whose value depends on its timely use (Wang & Li, 2011). This emphasizes that if the users, using the mobile wallet, can initiate and complete transaction from anywhere, as long as they have network connection and their portable devices at hand, they will be motivated to continue to use this payment method in the future. The related hypothesis stated:

H6: *The higher the mobility, the higher the intention to use mobile wallet.*

3.1.5.   Variety of services

The hypothesis of variety of services aims to explore whether or not integreating more payment services into the mobile wallet develops customer's positive attitude towards using it. Nguyen & Pham (2014) pointed out that Vietnamese customers were not satisfied with the existing mobile commerce services. Vietnamese are open to experience new services, at the same time, they are not hesitant to remove services that are not up to their needs or expectations (Appota, 2018). It was measured that a Vietnamese on average download 5 applications every month, and uninstall 3 applications during the same period.

In efforts to attract users to a mobile wallet, the Vietnamese wallet providers do not simply digitize the leather wallet. Today, the e-wallets provide more than storage of funds and general payment functions, they offer specific payment products such as paying for movie/flight tickets, utility bills, credit card, reminding friends to pay back, spliting bills. Most recently, during Vietnam traditional Tet holiday, e-wallets such as Momo and ZaloPay enabled users to exchange lucky money via their platforms. It was hypothesized that:

H7*: The higher the variety of services, the higher the intention to use mobile wallet.*

3.1.6.   Behavioural Intention

As stated above, behavioral intention is the proximate cause of behavior. Behavioral intention is understood as "a person's subjective probability that he will engage in a given behavior" (Fishbein & Azjen, 1975). The greater the intention, the higher the probability the behavior is performed. Azjen, in his later research on Theory of Planned Behavior in 1991, further noted that behavioral intention reflects the extent a person is willing to go, and the effort he plans to make, to perform the behavior. Nguyen & Pham's research proposed seven factors which possibly have an effect on the formation of behavioral intention to adopt mobile wallet.

Chapter 3 has presented the theoretical framework on which the research will be based. The Technology Acceptance Model (TAM) of Fred Davis, the TAM extension of Nguyen & Pham and the elements of the TAM extension were respectively introduced. In the next chapter, the research method and the process of collection of data will be explained.

4. RESEARCH METHODOLOGY

The fourth chapter firstly presents the research method of analysis which the author employed. Following that is a detailed description the process of collecting data for both the theoretical framework and empirical framework. The chapter will end with argumentation for the reliability and validity of the research.

4.1. Research Methods

Quantitative research was the chosen method for this research. The plan was to to collect and process statistical data from the respondents and thence present the results about the adoption of mobile wallet in the studied area. Quantitative research works with numerical values, analyses the values using mathematical or statisical treatment and inteprets them in the form of charts, tables or diagrams (White & Reynard, 2014). Doan (2014) stated that the method focused on facts and/or reasoned for social events. Quantitative method will enable the author to identifying the factors influencing the adoption, and learning about the current situation of mobile wallet adoption.

4.2. Collection of data

In this section, the author will discuss the process of collecting data for both the theoretical and empirical framework. In order to answer to the research question(s) and achieve the research objective(s), it is important that the research stand on two pillars: secondary data and primary data. Saunder et al. (2012) defines the former as "data that has already been collected by other previous researchers". The purpose of gathering data from different sources is to provide perspectives, by offering additional or different knowledge. On the other hand, primary data is new data which the researcher collect from first-hand experience, through method including survey, interview, observation.

4.2.1. Secondary data

As mentioned in section 3.2, the objective of this research is to understand the current status of consumer's adoption of the mobile wallet, and recommend course of action to improve the wallet service in the future. In order to avoid confusion in the empirical research, the author finds it is essential that the readers understand the concepts and terms associated with the objective before moving forward to the later part. Therefore, in the two previous chapters, related literature reviewed included: the mobile wallet, the stakeholders, the Technology Acceptance Model (TAM), the factors influencing the adoption.

The literature was gathered from a variety of sources such as online theses, online articles, electronic academic journals, electronic market research reports, electronic white papers, and books. Aside from the publicly available sources of information, there was a number of sources whose access is granted at a fee. During the process of searching and applying the literature, the literature was cross-checked with other used sources of similar subject.

4.2.2. Primary data

Survey is the technique of data collection of this research. The survey was carried out by an online questionnaire, because a questionnaire records responses in a systematic and structured manner (White & Reynard, 2014). The questionnaire was created on the online survey tool of Google Drive – Google Form, due to its sufficient level of customization, its organized documentation of data and its real-time intepretation of data.

The survey was designed to have two separate parts. The first part asks eight general questions (demographics, smartphone usage, experience with mobile transaction, awareness of e-wallet app, where the first contact with mobile wallet occured) to study the characteristics of the group of respondents, and to introduce the respondents to the topic of mobile wallet. To ensure that respondents are not mistaken 'mobile wallet' for 'mobile payment', a question about mobile payment was placed before the questions

about mobile wallet. At the end of the first part, the respondents are separated into twwo groups:

- The User (respondents who know and have experienced mobile wallet)
- The Non-user (respondents who know but have not exprienced or who have never heard of mobile wallet).

The second part concentrates on examining factors that influence the respondents' adoption decision of a mobile wallet. The adapted research model and hypotheses from Nguyen & Pham (2016) were the underlying basis to form the series of statements. However, half of the statements, in each factor, retain the original meaning from Nguyen & Pham's; the other half was completely changed since the original statements did not reflect the theories written in section 3, thus did not explore the aspects of the desire of the authors. As a result, the factors and the corresponding observed variables were created and presented in the **Appendix 1**.

The two groups of respondents would answer to slightly different set of questions in the second part, so that The User had a total of fourteen questions and The Non-User had ten questions. Both group have eight matrix grids which corresponds to seven factors and a matrix grid examining the behavioral intention. In the matrix grids, the respondents were asked to specify their level of agreement of disagreement on a 5-point Likert Scale (1="Totally Disagree"; 2="Disagree"; 3="No opinion"; 4="Agree"; 5=Totally Agree"). The questionnaire was written in Vietnamese, but a translated version of the survey is enclosed in the **Appendix 2.**

Before publising the survey, it was pilot-tested on six people to get feedback on the spelling, grammar, accuracy and clarity of the questions. The people who took part in the pilot test are colleagues and family members, who belong to different age groups, and are either users and non-users of e-wallet. Following that, the author used two methosd of primary data collection. First, the survey was linked to a post in the Facebook group of students of the University of Economics Ho Chi Minh City (UEH),

who were admitted to the university in the academic year of 2017-2018. Second, a former colleague who was admitted to UEH in the academic year of 2016-2017 was contacted to ask him to distribute the online survey to people with whom he studies.

In order to encourage the group members to participate in the survey, in the Facebook post, a small contest was lauched which asked the respondents to comment a screenscap of the confirmation page after they submitted their answers and a random numbers with the promise that seven lucky respondents would receive a phone card of 200.000 VND (€7.71). Each of the respondents found by the former colleague was also gifted a phone card of 20.000 VND (€0.77). The time accepting responses took place from 25th February 2019 to the 13th of March 2019. After the due date, the survey was closed, the phone cards were distributed to the winners, and collected data was imported to Excel for analysis.

There were a total of 160 respondents participating in the survey, 23 of which were disqualified because the respondents gave conflicting, invalid data. Therefore, there were 137 qualified responses that was used in the analysis.

4.3. Validity and reliability of the research

Reliability means that the results of the research remain consistent if it is repeated by different individuals under the same conditions. In this research, there are a total of 137 qualified respondents participate in the survey, a relatively small sample size. For that reason, the reliability of the research is limited.

Validity refers to the extent to which a research accurately measures the phenomena it aims to measure. The theoretical framework is based on influential academic literature which is widely used in the community of researchers who wish to explore customer's acceptance of technological innovations. Additionally, the hypotheses which are the antecedent basis to create the questionnaire, were adapted from a previous academic research also conducted in Vietnam. Moreover, in order to ensure that respondents do

not understand the questions and statements differently from the author, the questionnaire was given to 6 people for feedback, additional explanation and examples were added to certain statements to enable respondents to understand the key message of the statements. Another argument for validity of the research is the responses that are conflicting and illogical were eliminated.

Chapter 4 has informed the readers of the quantitative method that would be used in the empirical framework, the process of finding and collecting primary and secondary data, as well as the reliability and validity of the research. In chapter 5, primary data obtained from the online survey will be reported and discussed.

5. EMPIRICAL FRAMEWORK

Chapter 5 deals with data collected from empirical research. Firstly, the results are reported and analysed. As described in section 4.2.2, the questionnaire consists of 2 main parts. In the first part, the results of the questions were reported one after another. In the second part, data were sorted and reported by hypotheses. The chapter will end with a discussion of the findings, which provides answers to the research questions.

5.1. Results of the empirical research

5.1.1.   General Information

The section of general information was designed to obtain answers for the first research questions – the current state of mobile wallet in Ho Chi Minh City. Firstly, the demographic profile of the respondents was collected. The following questions gradually led the respondents into the topic of the mobile wallet. The respondents were divided into groups of users and non-users before they were invited to answer more detailed questions.

1.   Question 1, 2, 3 and 4: Demographics

This section potrays the respondents' personal background including gender, age, education level and monthly income. Table 1 presents the demographic profile of the 137 respondents, which was collected from the first four questions of the survey.

Demographic	Value	Frequency	Percentage
	Male	50	36.5%
Gender	Female	82	59.9%
	Other	5	3.6%
	18-23	66	48.2%
	24-29	29	21.2%
Age	30-35	25	18.2%
	36-41	5	3.6%
	Above 41	12	8.8%

Education	University student	100	73%
	University graduate	23	16.8%
	Postgraduate degree	14	10.2%
Monthly income	<5 million VND	52	38%
	5 - 10 million VND	19	13.9%
	10 - 15 million VND	17	12.4%
	15 - 20 million VND	15	10.9%
	>20 million VND	34	24.8%

Table 1 *Main characteristics of the sample*

Regarding gender, females accounts for 59.85% of the respondents, while males occupy 36.5%. Due to the fact that the survey was conducted on the student community of UEH, the sample of the research is young and well-educated. First, the most common ages of the respondents are from 18 to 23, which takes up 48.2% of the total sample. Similarly, the respondents of Nguyen & Pham's research mainly come from the age group of 18-24 (64.9%). Second, the respondents either are completing or have completed higher education, with 73% currently studying in some Bachelor's degree program; 16.8% have graduated from the program; 10.2% are pursuing postgraduate course at UEH. Wang & Li (2011) argued that a well-educated sample implies that the respondents have the capability to learn about and to use the mobile value-added services, in this context, the mobile wallet.

In addition, 85 respondents earn more than 5 million VND monthly (€192), which is close to or surpasses the monthly average income per capita in Vietnam, measured by the General Statistics Office of Vietnam of 6.5 million VND (€250) (Thang, 2017), and the minimum cost of living in HCMC of 6.4 million VND (€246) (Tuoi Tre, 2017). This means that a majority of the respondents are able to maintain a standard of living in HCMC. In the following, statistics about the respondents' mobile payment experience will be shown.

2. Question 5: Daily time spent on mobile internet

Figure 4 below represents the amount of time the respondents spend everyday on mobile internet. The respondents were asked to choose from six answers: "Below 1 hour/day", "1-2 hours/day", "2-3 hours/day", 3-4 hours/day", "above 4 hours/day", and "I don't access the Internet using mobile phone/device".

Please Indicate Your Daily Time Spent Online via Mobile Phone/ Mobile Device
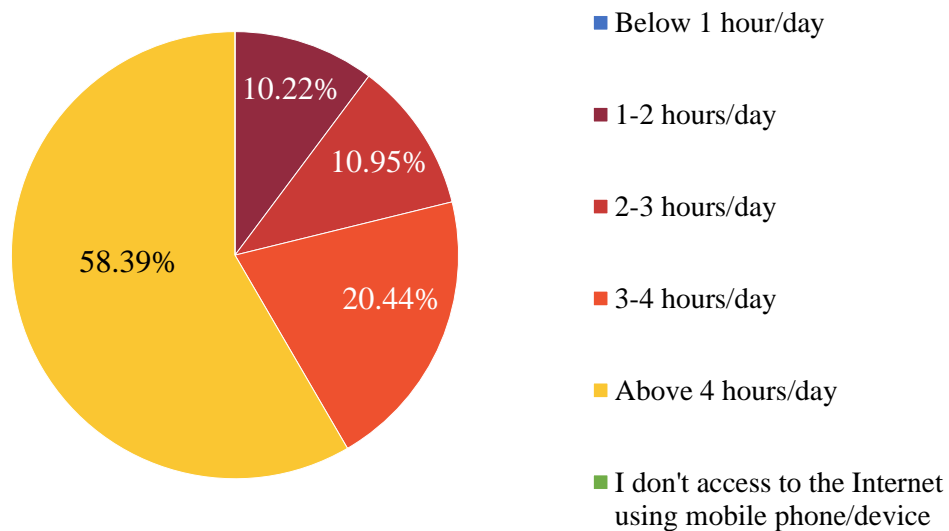
Figure 6 *Hours spent on mobile internet by respondents*

The fact that the value "I don't access the Internet using a mobile phone/ mobile device" did not receive any votes, and so it is absent from the result. It indicates that all the respondents are familiar with accessing to the internet using their mobile device. Another value that did not reflect the current mobile usage habit of the respondents is "below 1 hour/day", all of the answers show that the respondents spend at least 1 or more hours online on their phones/ devices. The smallest value (number of hours) presented in Figure 6 also has the smallest proportion, as the value increases, the percentage of the value also increases. Noticeably, 58.39% of the respondents said that they spent more than four hours in a day on mobile internet.

3. Question 6: Experience with mobile payment

In question 6, the respondents were asked if they have used any applications on their mobile device to pay for a purchase or to make a transfer of money. The question invites the respondents to recollect the mobile activities that they have done in the past. Question 6 also aims to help the respodents differentiate mobile payment and mobile wallet.
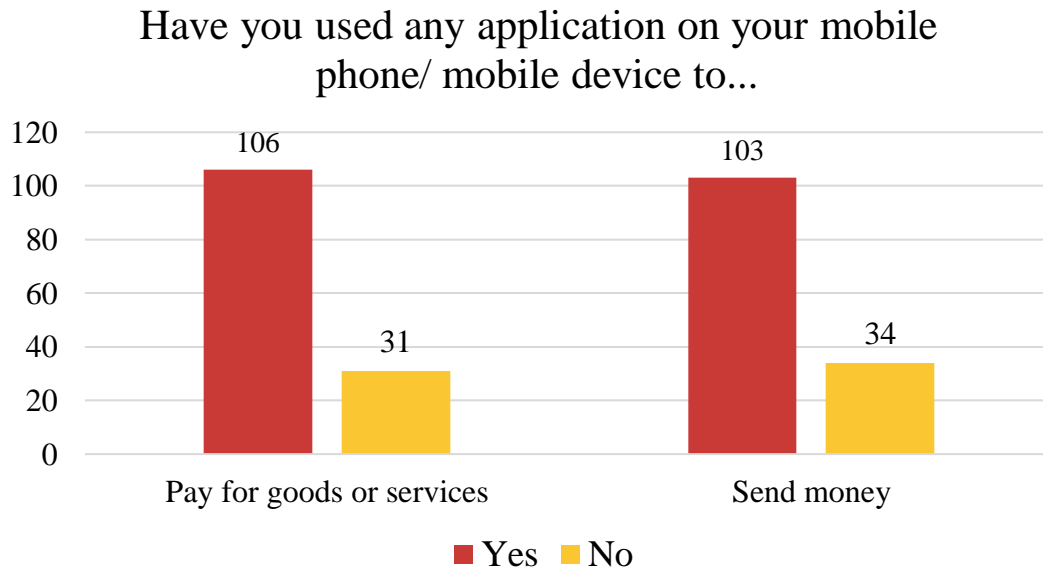
Figure 7 Mobile financial services used by respondents

A majority of the respondents has used mobile application to conduct transaction. Particularly, 106 responded that they have used one or more application installed on their phone to pay for goods or services; 103 respondents recalled that they have sent money via their mobile application, which respectively accounts for 77% and 75% of the sample. There are 16 respondents who have previous experience with neither of the acitivities, which accounts for 11.67% of the total sample. This means that there are 11.67% of the respondents who have not engaged in any of the listed transactional activities via the mobile application, the other 88.3% is familiar with either of the activities, and have installed at least one application in their mobile phone that performs one of the two activities.

4. Question 7: Respondents' awareness of mobile wallet

Question 7 examines the knowledge of the respondents regarding the mobile wallet applications. The respondents were invited to choose from 3 expressions: "Don't Know", "Know", "Using". The results are presented in Figuure 8 below.

Do you know or use any of the application listed below?

	Apple Pay	Samsung Pay	Momo	ZaloPay	Moca	Payoo	Ngân Lượng	AirPay
■ Using	6	6	54	32	23	8	6	20
■ Know	49	67	52	56	22	29	19	22
■ Don't Know	52	37	22	26	30	35	47	30

■ Don't Know   ■ Know   ■ Using
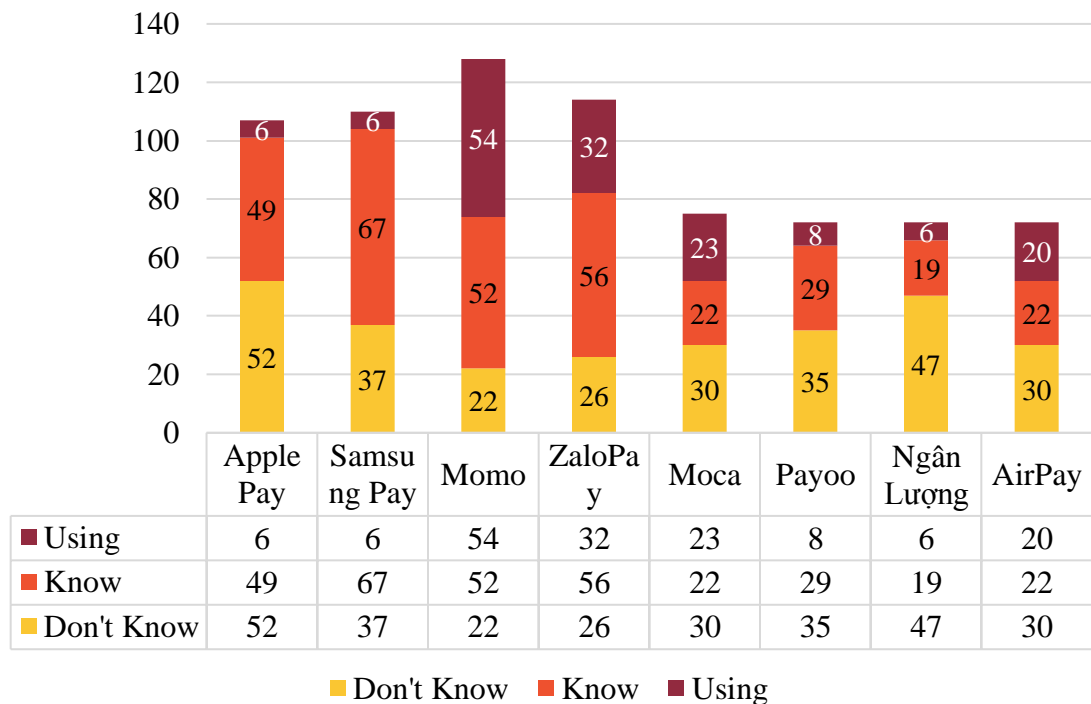
Figure 8 Awareness of mobile payment solutions

The awareness of current mobile wallet application included foreign wallet applications (Apple Pay and Samsung Pay), which are developed by handset manufacturers (Apple, Samsung) and are also available in other markets beside Vietnam; the other six wallet applications are developed by Vietnamese banks or financial technology companies and are exclusively available in Vietnam market. As mentioned, Samsung Pay and Apple Pay are wallets built by device manufacturers. The two brands have the leading market shares in the Vietnamese mobile market. In September 2018, GFK market research institute reported that Samsung held the largest market share in the mobile market in Vietnam, 41.4%; while Apple came third with

6.3% (Dantri, 2018). Despite the global brand and large market share, the Vietnamese consumers do not have the tendency to use Apple Pay and Samsung Pay just because they are using an Apple or Samsung product.

Many respondents answered that they have heard about Apple Pay and Samsung Pay (49 and 67). However, Apple Pay and Samsung Pay each had six users only, which respectively are 8.2 and 11.2 times lower than the number of respondents acknowledging the applications. Moreover, Apple Pay received 52 "Don't Know" votes, the highest number of votes in the "Don't Know" category, followed by Ngan Luong.

The results shown that Momo was the mobile wallet that were already in use by 54 the respondents, making it the most-used wallet application among the respondents. ZaloPay, Moca and AirPay respectively came second, third and fourth in term of users (42, 23 and 20). Besides, five respondents reported that they did not know the 8 listed mobile wallets. It is possible that the five respondents know another wallet application or they have not heard of this service before. On the other hand, there are 20 respondents who reported that they had tried more than one mobile wallet application, 14 of whom experienced more than three of the listed mobile wallets.

5. Question 8: Group classification

Question 8 is designed to separate the respondents into two groups: The User and The Non-user. As explained in section 6.2, the respondents who have interacted with the wallet service are regarded as users, and the respondents who have not had any interactions with the wallet application at all are counted as non-users. Results are showed in Figure 9 below.

Are you familiar with the mobile wallet payment method? (mobile wallet is applications mentioned in question 7 or similar)

5; 3.6%

56; 40.9%   76; 55.5%

- I know about mobile wallet and I used/ am using this payment method

- I know about mobile wallet and I have not used this payment method

- I have never heard of this payment method
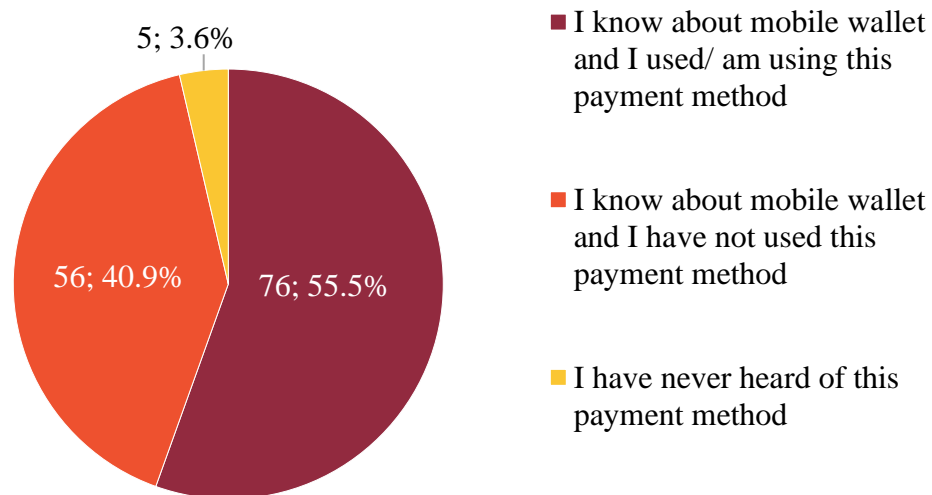
Figure 9 *Group classification*

As shown in Figure 9, 55.5% of the studied population reported to be users of mobile wallet, 44.5% of the sample are non-users of mobile wallet. However, only 3.6% are entirely new to this concept of payment, while 40.9% have already known the mobile wwallet but have not adopted it. This thesis examines the impact of seven factors, which were introduced above. In the later sections, the assessment of the respondents will be analyzed to determine which factors are concerns to them.

Demographic	Value	The User		The Non-user	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Gender	Male	34	68%	16	32%
	Female	39	48%	43	52%
	Other	3	60%	2	40%
Age	18-23	29	44%	37	56%
	24-29	18	62%	11	38%
	30-35	18	72%	7	28%
	36-41	3	60%	2	40%

	Above 41	8	67%	4	33%
Education	University student	55	55%	45	45%
	University graduate	13	57%	10	43%
	Postgraduate degree	8	57%	6	43%
Monthly income	<5 million VND	19	37%	33	63%
	5 - 10 million VND	11	58%	8	42%
	10 - 15 million VND	14	82%	3	18%
	15 - 20 million VND	10	67%	5	33%
	>20 million VND	22	65%	12	35%

Table 2 *Demographics by groups of respondents*

Table 2 shows the distribution of users and non-users of mobile wallets in the demographic profile of this survey. It was found that male had a higher percentage of users than female users. Specifically, 68% of the male respondents reported to have used the mobile wallet, equivalent to 34 people. Regarding the male non-user group, there was only one respondents who had never heard of the mobile wallet. On the other hand, 47.6% of the female taking part in the survey reported to have used the m-service, while the other 52% had not. There is also a connection between income level and the number of users and non-users . As reported above, there are 85 respondents who earn more than 5 million VND (€192) on a monthly basis. 67% of the respondents are users of mobile wallet, while 63% of the respondents whose income is below 5 million VND (€192) reported to have not experienced the mobile wallet.

6. Question 9: Communication channel

Question 9 asked the communication channels where information of the mobile wallet reached the respondents.

On which channel did you hear about the mobile wallet?
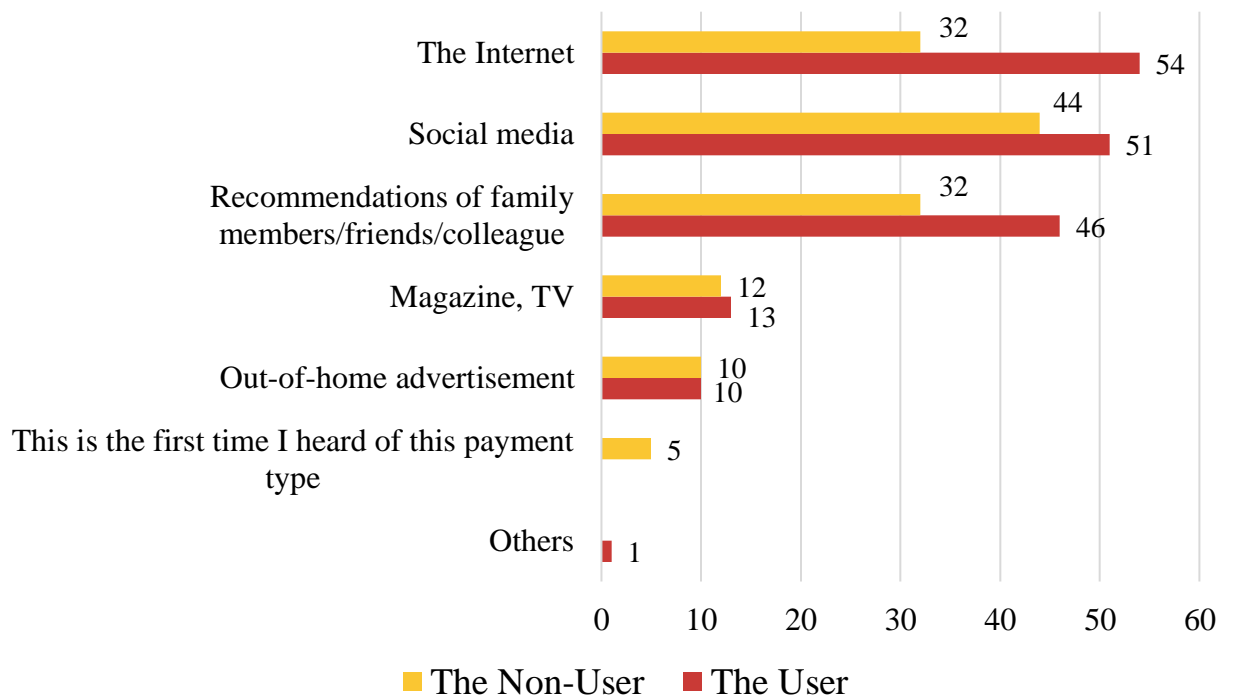
Figure 10 *Communication channels which the respondents see/hear about mobile wallet*

The results shown that the Internet and the social media platforms received the most votes from both the users and non-users as the channel where they saw the information about the mobile wallet. "Recommendations of family members/friends/colleague" is the third channel that reaches a large number of respondents in this survey. A total of 78 respondents including both the users and non-users selected this item, which mean that mobile wallet was discussed in their conversation with family, friends or co-workers, people who share common things with them (habits, lifestyle, work).

Furthermore, it is noteable that only a small number of the respondents had been reached through traditional advertisement platforms such as magazine, TV, Out-of-home advertisement (OOH). Another traditional channel mentioned by one respondent in "Others" is indoor display frame. Overall, it was recorded that 43 non-users and 54 users of mobile wallet have seen information about mobile wallet on more than one channel. The number of respondents selecting "This is the first time I heard of this payment type" matches the number of respondents that previously stated that they have never heard of mobile wallet.

7. Question 10: Payment methods of users and non-users

Question 7 was designed to discover which other payment methods used by the users and non-users are.

What are the payment methods that you use?

	Cash	Debit/Credit Card	Mobile banking	Others
Non-Users	51	29	11	0
Users	49	65	29	0
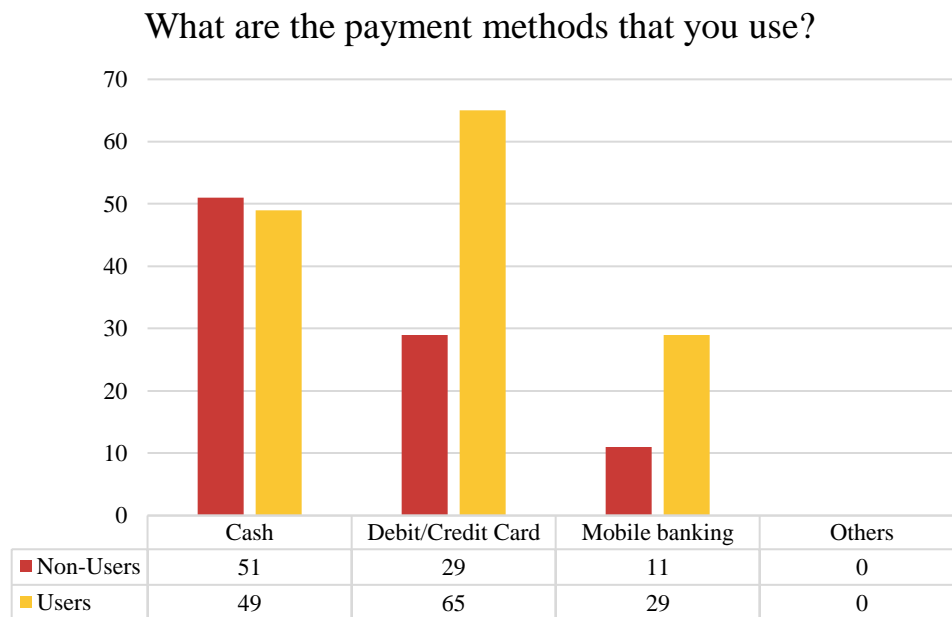
Figure 11. *Payment methods used by respondents*

According to the results, while debit/credit card was the most preferred payment method among the users, with which 65 out of 76 people selected; cash was the more popular means of payment to the non-users. The users have the tendency to use more than one payment method concurrently, apart from mobile wallet, 25 users reported to

be using cash and payment card; 13 users picked cash, debit/credit card and mobile banking as their payment method; another 13 respondents are using bank card and mobile banking.

For the non-users, credit/debit card was chosen by 29 people, accounting for 47.5% of the non-users. Six of whom have completely switched to credit/debit card and only use this payment type. Mobile banking is the least popular payment option to both groups, a total of 11 non-users reported to be using this payment option, mobile banking was adopted by more users, 29 of whom reported to use mobile banking application to facilitate payment. The respondents did not report any other ways of making payment.

8. Question 11a: Usage of mobile wallet's services

Question 11a was designed only for the group of users, the question asked the types of activities in which the users engage using the mobile wallet.
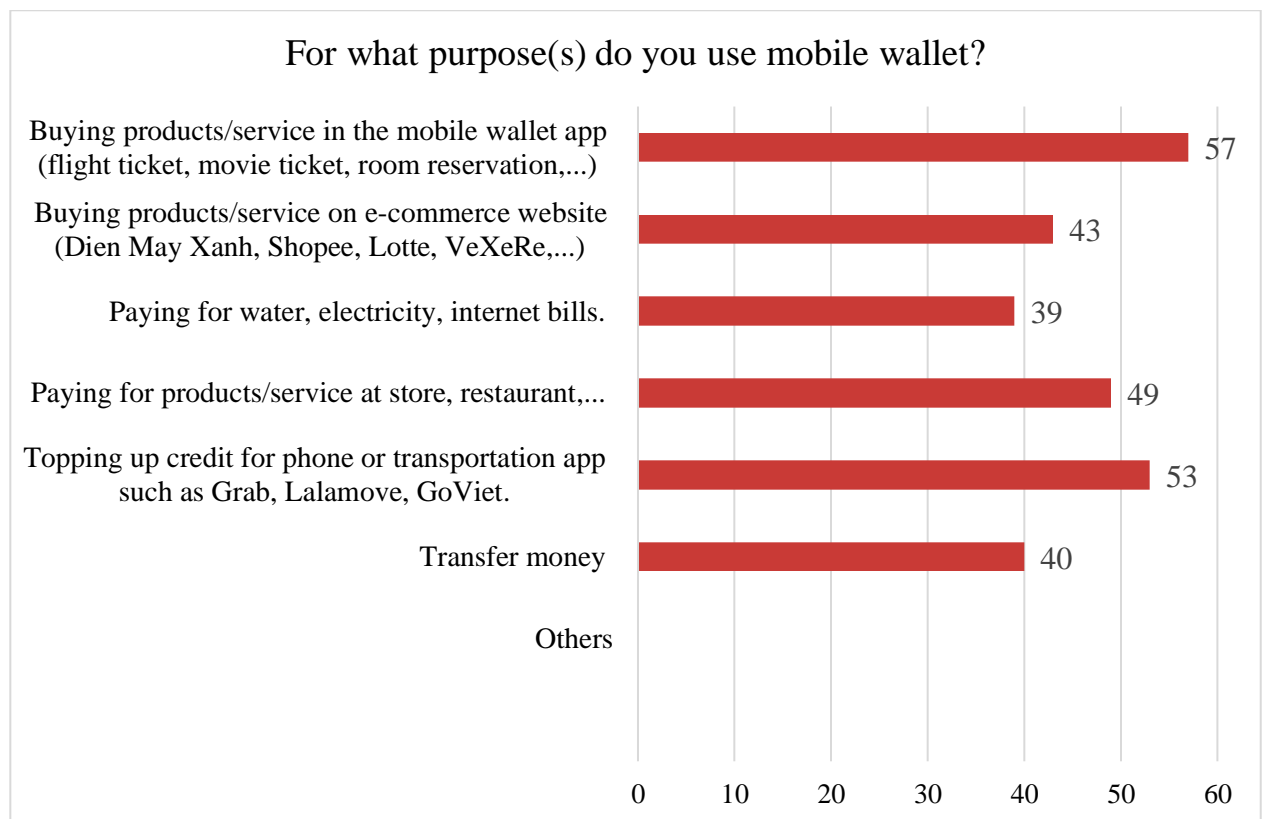
Figure 12 *Purposes of using mobile wallet by users*

The services of mobile wallet have been used at a relatively equal frequency, this means that the users have explored the services of the mobile wallet. While eight people reported to only use one of the listed services of the mobile wallet, there are 68 respondents who performed more than one of the listed services of the mobile walet, which accounts for 89% of the total sample. The service that has been performed by most of the respondents are buying products/services within the mobile wallet app (57 respondents), following by topping up phone balance or topping credits for transportation app (53 respondents). The survey did not record any other services in the "Others" item. Consumer loan and insurance were not mentioned on the list and there were no respondents in this survey who reported usin these two services.

9. Question 12a: Frequency of mobile wallet usage

Question 12 was designed to examine the frequency the respondents use the mobie wallet on a monthly basis.

How often do you use mobile wallet?
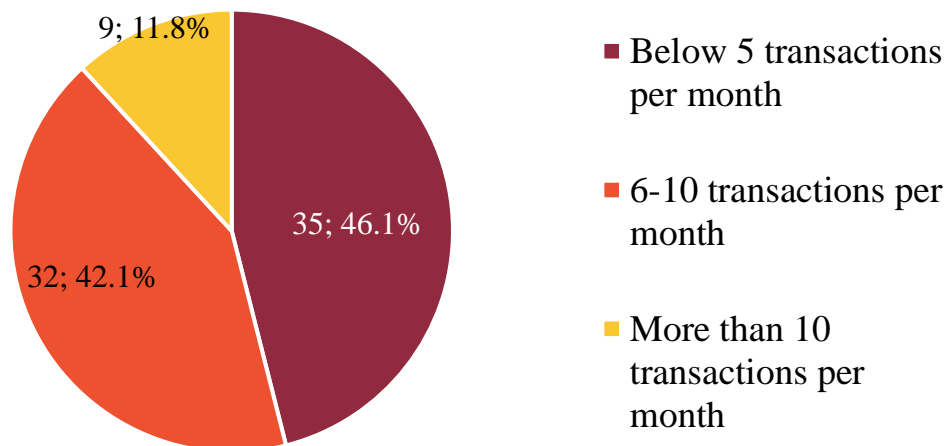
Figure 13 *Frequency of mobile wallet usage by users*

On average, a user who transacts more than ten times a month, on average, will use the mobile wallet 2 times per week or more. Using the same logic, a user with a frequency

of 6 to 10 transactions will use the mobile wallet from 1 to 2 times a week. Finally, below 5 transactions per month, a user will, use the mobile wallet one time per week; or some weeks the wallet service is not used at all.

Overall, the respondents of this research have not used the mobile wallet at a high frequency. The proportion of users who use mobile wallet less than 5 times per month is the highest (46.1%). Following that, users who conduct from 6 to 10 transactions per month via mobile wallet accounts for 42.1%. The group of respondents that use mobile wallet more than 10 times only account for 11.8%.

10. Question 13a & 14a: Transaction value to be paid with mobile wallet

Question 13 and 14 invites the users to specify the minimum and maximum value of transactions that they consider paying with mobile wallet.

The minimum value of transaction that you will choose to pay with mobile payment
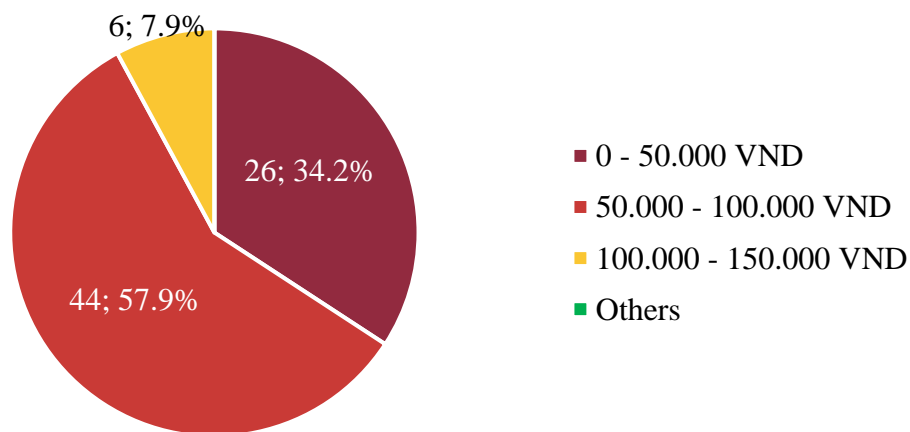
Figure 14 *Minimum value to be paid with mobile wallet*

Regarding the minimum price the respondents would consider paying with mobile wallet, 32.9% the users respondend that they would pay with mobile wallet when the price started in the range 0 – 50.000 VND (0 – €1.93). Although this does not emphasize that the respondents use mobile wallet for all small-valued purchase they

make, providing the frequency of usage in section 7.3.3. However, it shows that the respondents of this group are flexible with payment options regarding purchases of small value.

The range of 50.000 – 100.000 VND (€1.93 – €3.85) was the most selected in this question, 57.9% users have selected this range. There were 6 respondents selecteing the range 100.000 – 150.000 VND (€3.85 – €5.78), all of these respondents were found to have monthly income over 10 million VND (€385).

What is the highest value of transaction that you will choose to pay with mobile payment
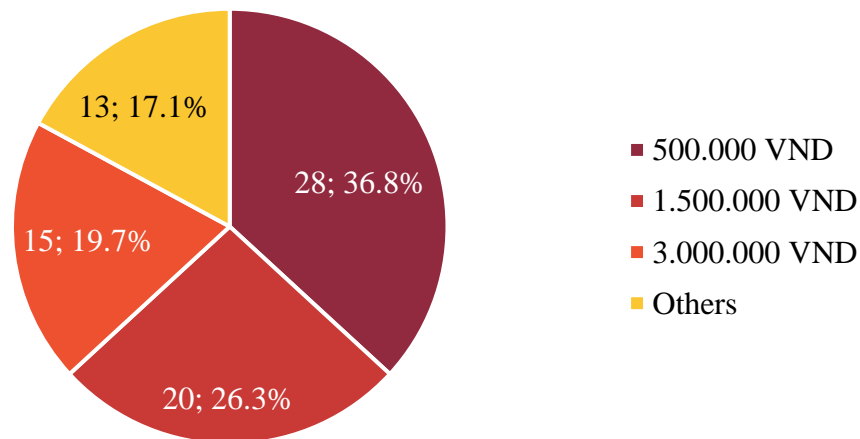
Figure 15 *Maximum value to be paid with mobile wallet*

Regarding the highest value of a transaction that the respondents would pay with mobile wallet, 28 users answered that 500.000 VND (€19) was the highest amount they would pay with the wallet service. Respondents from all level of income presented in this category. While there is no significant trend in the connection between income level and this group, it was discovered that 19 of whom conduct less than 5 mobile wallet transactions in a month, accounting for 67.8%.

Besides, 20 users who selected 1.500.000 VND (€57) as the maximum value to pay with mobile wallet al.so come from all level of income, the group was dominated by users using mobile wallet less than 5 times per month (60%). There was no users selecting 3.000.000 VND (€115) as the highest value earn less than 5 million VND monthly (€192). 12 out of 15 users in this group also use mobile wallet from 6 to 10 times/ month. The 13 respondents who chose "Others" mostly specified value of their estimate that is higher than the listed options. 12 of the 13 answered their maximum price from 4.000.000 to 7.000.000 VND (€154 -€269). 11 of 13 respondents use mobile wallet over 6 times a month. There is one respodent specified that his maximum value to pay with mobile wallet was 400.000 VND (€15.4).

5.1.2. Analysis of the adapted hypotheses

The section of the adapted hypotheses was designed to answer two latter research questions: identification of influential factors and making recommendations. The factors were analysed in the same order as they were introduced in section 3.1.

1. Hypothesis 1: Perceived Usefulness

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
Using mobile wallet saves me time.	11.8%	3.3%	2.6%	13.1%	11.8%	27.9%	32.9%	41.0%	40.8%	14.8%
Mobile wallet is a practical option in making payment	9.2%	4.9%	5.3%	19.7%	19.7%	21.3%	40.8%	47.5%	25.0%	6.6%
Using mobile wallet makes it easier for me to carry out my day-to-day tasks	5.3%	1.6%	6.6%	16.4%	17.1%	24.6%	42.1%	44.3%	28.9%	13.1%

Using mobile wallet is the trend of the modern lifestyle	6.6%	4.9%	7.9%	19.7%	19.7%	19.7%	35.5%	42.6%	30.3%	13.1%

Table 3 *Percentage of overall opinion toward usefulness of mobile wallet*

This variable aims to explore the role of usefulness of the mobile wallet on customer's behavioral intention. As introduced in 5.1.1, if a person perceives that there is professional or personal improvement in their performance when using mobile wallet, the perception will create positive impact on the person's behavioral intention. In order to scale this factor, four statements were designed to examine usefulness in terms of time-saving, practicality, job/task fit, modernity.

Overall, the results show that perceived usefulness exerts positive effect on behavioral intention of both the users and non-users. Regarding the users, the usefulness of mobile wallet is recognized by a large percentage of the users. The 4 statements received a high degree of positive agreement from over 60% of the population of the users. 56 users shown a similar opinion toward the first statement "Using mobile wallet saves me time". Particularly, 32.9% of the users chose "agree" and 40.8% chose "totally agree" over the statement. Following that, the practicality of the m-service was approved by 31 "agree" responses and 19 "totally agree" responses (represent 40.8% and 25% of the users respectively)

Next, 42.1% of the users agreed that their daily tasks were positively supported by the mobile wallet; another 28.9% totally agreed to have seen greater applicability of the wallet service in assisting their job assignment or personal tasks. Finally, a total of 65.8% gave positive agreement to the 4th statement which mentioned mobile wallet's modernity.

Regarding the non-users, job/task fit was perceived as influential by the highest percentage of non-users (44.3% "agree" and 13.1% "totally agree"). Furthermore, the

time aspect of the usefulness gained 41% "agree" and 14.8% "totally agree" from the non-users. The similar amount of responses applied to the other two statements (practicality: 42.6% "agree" and 11.5%% "totally agree"; modern lifestyle: 42.6% "agree" and 13.1% "totally agree").

2. Hypothesis 2: Perceived Ease of Use

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
I can easily learn to use the mobile wallet	11.8%	6.6%	5.3%	18.0%	13.2%	29.5%	36.8%	36.1%	32.9%	9.8%
I can quickly become proficient in using services of the mobile wallet	10.5%	6.6%	6.6%	16.4%	11.8%	27.9%	39.5%	39.3%	31.6%	9.8%
The procedures of mobile wallet (steps of making payment, deposit, transfer fund) are simple to me	6.6%	4.9%	7.9%	14.8%	14.5%	24.6%	44.7%	44.3%	26.3%	11.5%
The interface of the mobile wallet is user-friendly and easy to understand	6.6%	3.3%	9.2%	16.4%	14.5%	23.0%	47.4%	47.5%	22.4%	9.8%

Table 4 *Percentage of overall opinion toward ease of use of mobile wallet*

Perceiving a technology as complex and difficult to use impedes the acceptance of that particular innovation. The second factor aims to explore whether, on the opposite, simplicity and ease of use positively affect people's behavioral intention. Four aspects were suggested to examine the factor: ease of learning, speed of learning, simplicity of procedure, clarity and comprehensibility of the services.

Overall, perceived ease of use is positively influential to the intention of the respondents. Regarding the users, a majority of the users show approval for the ease of use characteristic of the wallet service. 53 users agreed that they could learn to use the wallet app with minimal effort, which means that most of the users do not experience confusion with the mobile wallet. In the next statement "I can quickly become proficient in using services of the mobile wallet", 39.5% agreed and 31.6% strongly agreed that reaching proficiency in using mobile wallet within a short time frame is possible to them. This implies that the users, after getting to know about the wallet service and using it, can: navigate the needed features, set up and authorize NFC/QR code payment at POS, maximize card reward and take advantage of discount opportunities.

The third and fourth statement received a high amount of positive responses (44 to 47% for "agree"; 22 to 26% for "totally agree". These statements discussed the ease of use on a more specified level: simple procedures and user-friendly interface.

Regarding the non-users, the responses shown that this population also paid attention to the ease of use characteristic to make adoption decision. In the first two statements, whose meanings are broad, the statements received 36-39% answers that stated "agree". In the two later statements which are more specific, the positive responses increased. 44.7% of the non-users agreed that the simplicity of the transactional procedures, would drive their intention to use the m-service. In the section 7.2.1, it could be seen that the non-users value time, practicality, therefore, simple, simple procedures are highly appreciated by this population. In the last statement, user-friendliness of the interface was perceived as significant by 41% "agree" and 9.8% "totally agree" responses.

3. Hypothesis 3: Social Influence

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
Family and people who are important to me affects my intention to use the mobile wallet	13.2%	11.5%	28.9%	21.3%	23.7%	29.5%	26.3%	37.7%	7.9%	0.0%
Friends and colleagues affect my intention to use the mobile wallet	9.2%	11.5%	27.6%	24.6%	22.4%	24.6%	34.2%	39.3%	6.6%	0.0%
The media and advertisement affect my intention to use the mobile wallet	11.8%	9.8%	19.7%	24.6%	19.7%	34.4%	40.8%	26.2%	7.9%	4.9%
I use mobile wallet because the people I know also use it.	13.2%	6.6%	25.0%	23.0%	15.8%	26.2%	36.8%	36.1%	9.2%	8.2%

Table 5 *Percentage of overall opinion toward social influence on mobile wallet*

The hypothesis of social influence suggested that opinion of family, friend(s), colleague(s), celebrities and means of mass communication are influential to the own opinion of individual. To explore the effect of this factor on behavioral intention, four statements were designed which examine the influence of the following groups: family and closed people; friends and colleagues; the media; community.

Overall, social influence has a positive impact on the intention to use mobile wallet. Regarding the users, there are mixed responses in the statements. On a descending order, the media and advertisement were perceived as impactful by a total of 48.7% of the users. At the second place, the statement "I use mobile wallet because the people around me also use it" gained agreement from a total of 46% of the users. This implies that the widespread acceptance of the mobile wallet in the community is a part of the

adoption motivation. Influence of friends and colleagues gained 34.2% of "agree". This shows that people have the tendency to seek information and advice regarding technological innovations from people who are of the same generation, share the same interests and lifestyle. Influence of family members on the intention was disputable, however, there was a higher number of users who denied the effect of their family (28.9% of "disagree"; 13.2% of "totally disagree")

It seems that non-users highly evaluate the influence of people who are in their social circle (family, friends, colleagues, community). Unlike the group of users, the influence of family members gained positive responses from a large percentage of non-users (37.7%). Similar percentage of non-users agreed that they would feel eager to learn about mobile wallet if friends, colleagues or the society recommend it. Lastly, advertisement and public communication channels gained 26.2% of "agree".

4. Hypothesis 4: Perceived Credibility

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
Payments through mobile wallet are processed accurately.	0.0%	11.5%	7.9%	21.3%	18.4%	27.9%	51.3%	32.8%	22.4%	6.6%
The mobile wallet will not share my information (e.g. personal details, bank account data, payment history, mobile wallet usage behavior) to third parties without my permission.	6.6%	9.8%	14.5%	11.5%	21.1%	23.0%	47.4%	50.8%	10.5%	4.9%
The risk of data theft of the mobile wallet is low.	6.6%	3.3%	28.9%	9.8%	21.1%	29.5%	32.9%	49.2%	10.5%	8.2%

The capability of the wallet providers and their partners in protecting my data is good.	9.2%	6.6%	5.3%	8.2%	25.0%	31.1%	46.1%	45.9%	14.5%	8.2%

Table 6 *Percentage of overall opinion toward perceived credibility of mobile wallet*

Most of the time, customers do not know whether their information is being recorded and used for unwanted motives. For that reason, safety and security of information is an important characteristic of a financial technology solution. Four statements were designed to explore how individual perceives credibility protection of data, protection of data from outside parties, data theft, capability service provider to protect data.

Overall, both users and non-users give prominence to perceived credibility. Regarding the users, the statistics show that a majority of the users trust the service providers and the mobile wallet have been performing sufficiently to protect and prevent customers' information from being exposed. When the respondents were invited to give a general assessment about payment procedure security, a total of 73.7% of the users expressed their satisfactory past experience with mobile wallet by agreeing that the application has been processing their transaction correctly. In the second statement, the number of people trusted that their privacy was respected and their information would not be shared with outside parties without their permission represents more than half of the users' population. Particularly, the statement counted 47.4% of "agree" and 10.5% of "totally agree".

Nevertheless, when the users were asked to assess the risk of data theft of mobile wallet, the ratio of positive responses decreased to 32.9% of "agree", against the 28.9% of the negative responses. The tie between the two responses emphasizes that despite the confidence in the mobile wallet, users remains skeptical about the safety of information, as the sophistication of the technique of data breach increases over time. In the fourth statement, 46.1% chose "agree" and 14.5% chose "totally agree" showing

their approval to the technical and financial capability of the service providers in protecting sensitive information of the customers.

Regarding the non-users, the importance of security and privacy was also highlighted by a large number of this population. In the first statement, 32.8% of the non-users held the opinion that the ability process data accurately would attract their attention, while 27.9% stood between opinions. An explanation to this is that their current payment options also handle payment accurately. When mentioning data sharing and third parties, the number of agreed responses increased to 50.8%. Furthermore, 49.2% non-users agreed that if the risk of data is low, in other words, the risk of data theft is under control and can be dealt with accordingly, it would drive their intention to use the service. The capability of the service providers in taking measures to protect data was also perceived as impactful by 45.9% of the non-users.

5. Hypothesis 5: Perceived Costs

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
The costs of the internet service to use the mobile wallet (3G, 4G, LTE) is expensive	26.3%	8.2%	25.0%	36.1%	17.1%	21.3%	18.4%	27.9%	13.2%	6.6%
The service fees of the mobile wallet are expensive	21.1%	9.8%	32.9%	32.8%	18.4%	34.4%	22.4%	18.0%	5.3%	4.9%
I will not use/stop using the mobile wallet because of the charges increase.	23.7%	13.1%	26.3%	16.4%	23.7%	29.5%	22.4%	41.0%	3.9%	0.0%

Table 7 *Percentage of overall opinion toward perceived costs of mobile wallet*

In exchange for the financial services of the mobile wallet, customers have to pay for the costs associated with it. This adapted hypothesis focuses on the behavioural intention of the customers after becoming aware of the costs of using mobile wallet. Three statements were designed to test the hypothesis.

Overall, costs of using mobile wallets do not have negative impact on respondents' intentions. Regarding the users, the first statement "The cost of internet service (3G, 4G) is expensive" gained 25% of "disagree" and 26.3% of "totally disagree". Internet service in Vietnam offers large data allowance and is available at competitive and accessible price. Competition forces mobile network operators in Vietnam often adjust the mobile data plan from time to time. Last year, Viettel, VinaPhone, MobiFone and other carriers increased the data allowance of their existing internet packages, while the costs of the datapackages remained the same (Nguyen, 2018).

Similarly, a total of 54% of the users show their disagreement to the second statement. At the moment, most wallets have not begun collecting annual fees, account opening fees or security fees. For instance, most of ZaloPay's financial services are currently free of charge; Moca does not collect fees from fund transfer, deposits if source of fund is bank's account or ATM card. Next, there was a total of 38 users who denied that they would abandon a mobile wallet because of its service charges. It could be explained that after getting used to the mobile wallet, the users have the tendency to continue using the wallet app even without the reduced price.

Similar to the users, a large percentage of non-users did not feel that internet service was expensive (36.1% of "disagree"; 8.2% of "totally disagree"). In the second statement, a table was included to show the service charges of different mobile wallets. The result was disputable, 34.4% of the non-users stood in between the opinions as they were not certain whether the charges were expensive or not, while 32.8% felt the charges were not expensive. However, 41% of non-users agreed that increased charges and extra costs might make them reconsider using mobile wallet.

6. Hypothesis 6: Variety of services

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
The mobile wallet has many partners (banks, internet providers, network carriers, e-commerce businesses, etc)	7.9%	3.3%	5.3%	29.5%	18.4%	24.6%	51.3%	37.7%	17.1%	4.9%
The mobile wallet is accepted at many shopping and entertainment locations	6.6%	1.6%	9.2%	8.2%	17.1%	26.2%	53.9%	54.1%	13.2%	9.8%
Various services of mobile wallet fulfill my needs in different situations.	5.3%	3.3%	10.5%	13.1%	27.6%	31.1%	43.4%	49.2%	13.2%	3.3%

Table 8 *Percentage of overall opinion toward variety of services of mobile wallet*

The following statements were designed to support the adapted hypothesis that variety of services would create positive impact on the use intention of the customers, thence lead to the decision. The more services being offered in a mobile wallet, the fewer occasion customers have to switch between the payment methods. In order to test this hypothesis, three statements were designed to examine the opinion of the respondents.

Overall, variety of services has a postive effect on behavioural intention. Regarding the users, this population acknowledged that the mobile wallet which they use partnered with many public and private businesses (51.3% of agree and 17.1% of totally agree). Each and every partnership contributes to the diversification of the services. For instances, collaboration with internet providers offers a broader selection of providers to the customers to choose and pay their bills. In the second statement, the widespread merchant acceptance of mobile wallet gained 53.9% of "agree". Merchants have the capability to drive change in customers' paying habit, since they are the one interacting with the customers at the checkout. The more restaurants, convenient stores and other

shops offer mobile wallet payment, the more situations ther are in which customers can use the application.

The third statement "Various services of mobile wallet fulfill my needs in different situations" gained 43.4% of "agree" and 13.2% of "totally agree". It is worth-mentioning that in 7.1.7, 89% of the users were found to have used more than one service of a mobile wallet, However, there is a total of 56.6% of the users feel satisfy with the available services, whereas the other 43.4% either is uncertain or disagree. Nevertheless, the research does not explore if the reason is because some services need to be added, fixed or because of the users' habits.

Regarding the non-users, this group also perceives variety of services as an important factor. The three statements gained a high percentage of "agree" response (37-54%). The widespread merchant acceptance of the application was most-valued by the non-user in this category, it had the agreement of 54.1% non-users.

7. Hypothesis 7: Mobility

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
I can use mobile wallet anytime, and anywhere	10.5%	6.6%	6.6%	9.8%	15.8%	24.6%	50.0%	47.5%	17.1%	11.5%
I can use mobile wallet even when I am travelling	11.8%	0.0%	11.8%	13.1%	14.5%	27.9%	39.5%	45.9%	22.4%	13.1%
Mobile wallet suits my lifestyle because I always carry my mobile phone with me.	13.2%	1.6%	13.2%	34.4%	10.5%	24.6%	42.1%	29.5%	21.1%	9.8%

Table 9 *Percentage of overall opinion toward mobility of mobile wallet*

A mobile wallet requires a wireless connection to operate, for that reason, if the customers cannot access or use the mobile wallet, it loses an advantage that payment methods such as cash and payment card offer – mobility. For that reason, the 7th adapted hypothesis stated that the ability to access to the service and perform transaction on the go affect the intention to use of the customers. Three statements were designed to explore the perception of the respondents about mobility

In general, mobility has a positive effect on the intention of the respondents. Regarding the users, a large number of users have shown their agreement, of different intensity, to mobility of the mobile wallet. The first statement gained 50% of "agree" and 17.1% of "totally agree", confirming that they can use the application whenever and wherever they have a need for it. In the second statement, 39.5% agreed that they were able to access and use the wallet app while traveling. The last statement implies that mobile wallet is a viable payment option as modern smartphone users always carry their phone with them. The statement received the agreement of over 60% of the users (42.1% "agree", 26.3% "totally agree").

Regarding the non-users, the first two statements received similar amount of positive responses (47.5% and 44.3% respectively). The third statement, which concerns the suitability of the mobile wallet to the fact that smartphones always accompany their owners, was disagreed by 34.4%. However, the sum of people responding positively remains higher than the number of non-users who responded contrarily.

8. Behavioural Intention

	Totally disagree		Disagree		No opinion		Agree		Totally agree	
	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users	Users	Non-users
I believe that will need/use the services of mobile	10.5%	4.9%	6.6%	21.3%	15.8%	27.9%	44.7%	39.3%	22.4%	6.6%

wallet more in the future.										
I believe that I will use/continue to use mobile wallet in the next 6 months	11.8%	8.2%	5.3%	37.7%	13.2%	26.2%	48.7%	24.6%	21.1%	3.3%
2 years from now, I intend to pay for purchases with mobile wallet	7.9%	8.2%	10.5%	19.7%	27.6%	29.5%	39.5%	36.1%	14.5%	6.6%

Table 10 *Percentage of overall opinion toward the intention to use mobile wallet*

Regarding the users, a marjority of this population holds the belief that they will use the wallet service more frequent in the future (44.7% of "agree"; 22.4% of "totally agree"). The similar percentage of users shows the intention to continue using the service wallet in the near future (48.7% of "agree"; 21.1% of "totally agree"). Comapring to the third statement, there was 5-6% less users who think they might still use mobile wallet in the next 2 years (39.5% of "agree" and 14.5% of "totally agree").

Non-users receive a set of statements which was reworded to suit this group of respondents. Although 39.3% of the non-users believed that they would need the services of the mobile wallet in the future, the readiness to adopt the mobile wallet within 6-month time were only found among 17 people (15 chose agree and 2 chose totally agree). In the next statement where the time till the adoption of mobile wallet was two years, the number of people who expect to be using it increased to 24 people (respectively represent 36.1% of "agree" and 6.6% of "totally agree").

5.2. Discussion of the findings

From the analysis above, this section summarizes and gives answers to the research questions. The first research question is answered in section 5.2.1, while the second and third research question are answered in section 5.2.2.

5.2.1. The current state of mobile wallet

Overall, it was found that none of the respondents were unfamiliar with mobile internet, 78.83% of the respondents spend over 3 hours a day online via their mobile devices. In addition, since 121 respondents (88.3%) have made at least an online transfer of money and/or a payment to an online purchase. It can be deducted that a majority of the respondents are aware that their mobile devices can facilitate payments, either through finance applications or e-commerce websites that have a responsive mobile version.

It seems that Vietnamese are more receptive to mobile wallets developed by Vietnamese. The most popular and most-used wallets in the survey were Momo, followed by ZaloPay and Moca. Despite the reputation of Samsung and Apple, few users reported to use Samsung Pay or Apple Pay.

Most of the total respondents have learnt about the mobile wallet. The users of mobile wallet account for over half of the surveyed population (55.5%), amongst the non-users, there were only five people having no previous knowledge of mobile wallet. This implies that the marketing efforts of mobile wallet have been able to reached a large number of customers. However, it is possible that the marketing activities have not appealed to the interests and likings of the population of the non-users. The factors that are of the interest of both the users and non-users will be discussed in the next section. The online platforms: Internet, social media sites receved the most votes from both the users and non-users as the communication channels where they have seen content about mobile wallets.

At the moment, the mobile wallet has not been used on a regular basis and this payment method remains a method supporting the main payment alternatives (cash and payment card), rather than substituting them. The former and latter were deduced from the statistics where 67 users (88.2%) reported they use mobile wallet less than 10 times per month. Additionally, it was found that both group of respondents also use cash and credit/debit card. While most of the users use payment cards (85.5%), only half of the non-users' population use debit/credit cards (47.5%). The low usage of payment cards

amongst non-users might be one of the reasons why they do not adopt to using a mobile wallet, which is more convenient with a bank's account or payment card.

The users have a tendency to pay with the mobile wallet for low sum purchases (below €19). The reasons behind this might be the users prefer seeking more secure payment method for high valued transactions; the users mainly use services that offer promotions; merchants/ vendors where high valued transactions occur do not accept mobile wallet. The services of mobile wallet that are most-used by the users are: paying for products/services in the mobile wallet app; topping up prepaid balance for mobile subsription or credits for transportation apps; and making payment at the point-of-sale.

5.2.2.   The influential factors & recommendations

Regarding **perceived usefulness**, the results correspond with the discussion of perceived usefulness, when an individual finds the mobile wallet to be beneficial, a non-user will develop positive impression towards it, a user go a step further by using the wallet to actually gain the benefits. The result is consistent with previous researches (Pham & Bui, 2012; Nguyen & Pham, 2014; Aydin & Burnaz, 2016; Tandon et al., 2017). The users said that the tasks performed in the wallet app has been done in a fast way, with agility, making the people's life easier. The results shown that consumers always have a need for innovative services, which firstly bring improvement to their life quality by providing rapidity and efficiency; and secondly suit the modern lifestyle, which is fast-paced and highly penetrated by mobile devices. People aware that they ought to work more effectively instead of just work more.

For the **recommendations**, service provider shall enable the users to connect their card details by taking picture of the card on both sides, similar to Samsung Pay, alongside with manually connect the card. Apart from constantly delivering features that are time and effort savings and multipurpose, service providers shall also focus efforts in shaping customers' attitude regarding the usefulness of mobile wallet via marketing

and advertising. Shatskihh via Aydyn & Burnaz (2016) affirmed that if consumers are not well-informed about the benefits to which the mobile wallet brings, they are not motivated to use it from the perspective of usefulness. People shall see the value of the mobile payment system and how it gives advantages to them over other payment methods in their professional and/or private life. Advertised contents for example lay emphasis on: completion of transactions via mobile wallet is done within no time, several large retailers, franchises are partners of mobile wallet thus accepting it, mobile wallet is the choice of influencers who lead an active and urban lifestyle.

Regarding **perceived ease of use**, the results were in synchronization with the theories defined in section 3.1.2, the respondents recognized the importance of the ease of learning, using and interacting with the mobile wallet. The result matches the prior researches (Nguyen & Pham, 2014; Aydin & Burnaz, 2016; Tandon et al., 2017). The locality where the survey was conducted, Ho Chi Minh City, a city aiming at developing knowledge-based economy (Vietnamnet, 2016). The fast-paced lifestyle makes the consumers attentive to the product's ease of use. They are interested in products whose installation can be done quick, graphical components, layout are clear and procedures are simple so they can learn and become proficient with least efforts. Difficulties in using the technology may become hindrance as customers may be impatient with it.

For the **recommendations,** service providers shall increase customer satisfaction by keeping the interaction between the customer and the mobile wallet simple and satisfactory. They should use fonts with high readability, icons with high understandability to help users navigate the system easily. Secondly, ensure that consumers are able to locate the services and find the instructions effortlessly; display the most-used services on the most visible positions; allow customers to select and customize their most-used service, similar to configuring iPhone's Home Screen Toolbar; finally, automatically direct the consumers to the correct external links instead

of direct consumers to the homepage or asking the consumers to exit the wallet application and visit the website.

Regarding **social influence**, respondents are affected by the opinions of individuals, group of reference and the mass communication.. The result is contrary to the studies of Nguyen & Pham (2014); Aydin & Burnaz (2016), both found social influence to be of low impact on behavioral intention, the sources concluded that consumers make decision based on their own perception. Mobile wallet, in the recent years, has become a popular payment type to Vietnamese, consumers can phase out their doubts and uncertainty regarding the mobile wallet by seeking opinions from more sources of information instead of making the decision themselves.

While advertisements and the media have greater effect on users, close/ important ones and the society have more impact on non-users. It is also worth-mentioning that the respondents chose the social media and the internet as the commnunication channels where they hear about mobile wallet. The **recommendation** is to focus marketing resources and efforts to the online platforms. Service providers shall be attentive to the capability of these communication channels of triggering electronic word-of-mouth. The ad message will be spread to family members, friends or colleagues of the person who viewed the advertisement. When the customer's social audience see them sharing content related to the mobile wallet, they will feel more inclined to learn about it.

Regarding **perceived credibility**, the results are consistent with the theory of section 3.1.4, when a person finds his information could be precisely, safely protected by a technology, he would feel inclined to use it. Previous studies have found similar results (Nguyen & Pham, 2014; Pham & Bui, 2012; Chong et al., 2012) Mobile commerce and mobile payment are no longer an unfamiliar shopping channel to Viet consumers. According to Appota's market report in 2018, 52% online purchases were made by smartphones. iPrice also reported that Vietnam has a high percentage of website visits

that turn into product purchase. Viet consumers have become familiar with online shopping, many are not reluctant to make purchases that lack physical contact.

For the **recommendations**, it is suggested that service providers emphasize in their marketing strategies the aspects of security and privacy to increase awareness of credibility of mobile wallet. Because customers who have positive attitude toward the tehcnology are likely to use it (Luan et al. via Charles, 2018). The stakeholder shall address customer's fear of data theft to educate customers about encryption and tokenization, OTP, 2FA. Moreover, the service provider shall engage their partners in marketing the mobile wallet instead of marketing it single-handedly. The voice of reputable partners, especially banking institutions, telecommunication operators, will increase the credibility of the application in customers. Besides, the presence of frequently asked questions section and the call center which answer to customers' concerns also infuse confidence in mobile wallet. In addition, the mobile wallet shall publish a statement which defines the liability of the service providers, the banking institutions, the merchants and the customers. Finally, incorporating facial characteristics, fingerprints in the system also increase user's confidence.

Regarding **variety of services,** the results correlate to the discussion in section 3.1.7, the more uses a persons find in a mobile wallet leads to the more likely he intends to use it. Users of the mobile wallet reported that although they acknowledged mobile wallet to have many partners and are accepted at many locations, the application has not been able to fulfill their payment-related needs in all situations. Nguyen & Pham (2014), in their study, made a point that in the area of developed economy, the level of income of the consumers are the reasons leading to the demand for variety. By integrating several payment options such as ultility payment, phone's balance payment, credit repayment, mobile wallet is creating their comparative advantage in a way that it is not only another creative way to pay and to store fund, but an integreated payment solution for customers.

For the **recommendations**, variety of services could be enhanced by the number of partners and the number of the payment services. Service providers shall pay attention to the trends of the spending habit of the target segment, the shopping or entertainment locations of frequent visit, the emerging merchants amongst the customers, and to the special occasions celebrated by Vietnamese in general or by Vietnamese millennials in order to add new services or partners

Regarding **mobility,** the results are consistent with the discussion of theory in section 3.1.6, when a person finds that using mobile wallet would enhance his capability to cope with tasks or activities while away from home/ workplace and one the move, he develops positive intention to use the product. The results match the research on mobile commerce of Nguyen and Pham (2014), however, contradict research of Kalinic & Marinkovic (2015). Kalinic & Marinkovic explained the low impact of mobility was due to the fact customers did not catch the use of m-commerce. However, mobile payment and mobile commerce have become mainstream to Viet customers. As discussed above, 52% of online purchases was made by mobile devices. Customers understand the importance of mobility of a mobile payment service in responding to their time-critical, or spontaneous needs. In a UK- based survey, Strong and Old [35] found that the convenience of having Internet access at any time and place will be the most important incentive for consumers to use mobile Internet applications.

For the **recommendation,** the service provider can enahnce mobility by expanding the network of partners to make the mobile wallet usable at anytime, anywhere. Moreover, offering discount on 3G, 4G data plan subscription in cooperation with telecommunication carriers to encourages customers to stay connected, thus use mobile wallet wherever and whenever needed. In order to avoid incidents where internet connectivity can be unstable, service provider shall consider adding the ability to pay even without the internet connection. Klozest, a startup in India offered the ability to pay without internet connection, where transactions can be reconciled with the wallet later when the users connect to Wi-Fi (Chakraberty, 2017). Likewise, customers of

Paytm wallet can make payment by calling a toll-free phone number, keying in their pre-determined passcode, the amount they wish to pay and the phone number of the recipient (Sathe, 2016).

Although perceived costs is not an influential factor, it was discovered in the analysis of perceived costs in section 5.1.2 that the users reported they could tolerate price increase and would not change the mobile wallet because of price changes. it is suggested that service providers offer tangible or intangible rewards including discount, free trial, gifts for a period of time to encourage customers to use an existing service or try a new one. The objective was to create a customer habit of using the mobile wallet. Once the customers get used to the service, they will tend to continue to use it even without promotion.

6. CONCLUSION

In concluding the results of the previous chapter, this chapter aims to present the outcomes of the research which comprise the current state of mobile wallet adoption and factors influencing customer behavioral intention. The inferences were drawn based on the qualified responses of 137 participants. The participants are students of University of Economics Ho Chi Minh City who were mainly admitted to the school in the academic year of 2016-2017 and 2017-2018.

As aforementioned, mobile wallet is a recent phenomenon, the subject until now receives minimal research. The thesis has implemented the Technology Acceptance Model (TAM) in measuring the behavioral intention of the customers regarding the wallet application. The research has adapted 7 hypotheses from Nguyen & Pham's research on mobile commerce (2014), which include the original factors of TAM and 5 extended factors.

However, collection of primary data did not use the same set of surveyed questions from Nguyen & Pham's. In fact, half of the observed variables were changed to match the pre-defined theories. The results show that the research model is not only suitable for exploring mobile commerce but also mobile payment – the e-wallet. The factors were not only relevant to residents of An Giang region but also to people residing in Ho Chi Minh City, with 6 out of 7 factors were found to be influential except for perceived costs.

The thesis has achieved the objective, which is to gain understanding about the state of mobile wallet in Ho Chi Minh City and measure the behavioral intention of the customers. Results of the thesis support the provision of mobile value to customers. There is a need to inform customers of the useful, secure and private characteristics of the mobile wallet through marketing efforts. Ease of use could be increased by paying attention to the structure and the interface design of the mobile wallet. The effect of

social influence could be optimized by focus on online platform and viral marketing. Variety of services could either be enhanced by the number of the services or the number of the partners offering the service. The number of partners also contribute to the ubiquity of the mobile wallet, the ability to pay without internet connection also significantly improve mobility of the mobile wallet.

The results of the thesis can be used as references for individuals who are in the business of mobile wallet and wish to gain more understandings of customer's expectation including the service provider, marketing specialists, mobile network carriers, banking institutions. The identification of factors influencing customer's behavioral intention enables the stakeholders to develop appropriate solutions and strategies in order to generate new customers and retain existing ones.

For the future research, a larger sample size is needed to gain a more extensive understanding of the mobile wallet. Researchers should examine other factors that were not explored in this thesis, or study the correlation of demography and the factors. It is also helpful to approach the subject with the qualitative research method to understand individual's rationale regarding influential factors and non-influential factors.

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APPENDICE

APPENDIX 1. FACTORS AND OBSERVED VARIABLES OF THE THESIS

Factors	Observed variables
Perceived Usefulness	Using mobile wallet saves me time.
	Mobile wallet is a practical option in making payment
	Using mobile wallet makes it easier for me to carry out my day-to-day tasks
	Mobile wallet is the trend of the modern lifestyle
Perceived Ease of Use	I can easily learn to use the mobile wallet
	I can quickly become proficient in using services of the mobile wallet
	Performing the mobile wallet procedures is simple to me.
	The interface of the mobile wallet is user-friendly and easy to understand.
Social Influence	Family affects my intention to use the mobile wallet
	Friends and colleagues affect my intention to use the mobile wallet
	The media and advertisement affect my intention to use the mobile wallet
	I use mobile wallet because the people around me also use it.
Perceived Credibility	Payments through mobile wallet are processed accurately.
	The mobile wallet will not share my information (e.g. personal details, bank account data, payment history, mobile wallet usage behavior) to third parties without my permission
	The risk of data theft of the mobile wallet is low
	The capability of the wallet providers and their partners in protecting my data is good
Perceived Costs	The costs of the internet service to use the mobile wallet (3G, 4G) is expensive
	The service fees of the mobile wallet are expensive
	I will not use/stop using the mobile wallet because of the charges increase
Variety of services	The mobile wallet has many partners (banks, internet providers, network carriers, e-commerce businesses, etc)
	The mobile wallet is accepted at many shopping and entertainment locations
	Various services of mobile wallet fulfill my needs in different situations.
Mobility	I can use mobile wallet anytime, and anywhere

	I can use mobile wallet even when I am travelling
	Mobile wallet suits my lifestyle because I always carry my mobile phone with me.
Behavioral Intention	I believe that I will use/continue to use mobile wallet in the future.
	I believe that will use/ continue to use mobile wallet in the next 6 months.
	2 years from now, I intend to pay for purchases with mobile wallet.

APPENDIX 2. ENGLISH QUESTIONNAIRE
A. GENERAL INFORMATION

1. Gender
   a. Male
   b. Female
   c. Other
2. Age
   a. 18 – 23
   b. 24 – 29
   c. 30 – 35
   d. 36 – 41
   e. Above 41
3. Academic level
   a. University studenet
   b. University graduate
   c. Postgraduate degree
   d. Others
4. How much is your monlty income
   a. Below 5 million VND
   b. 5 – 10 million VND
   c. 10 – 15 million VND
   d. 15 – 20 million VND
   e. Above 20 million VND
5. The frequency you access to the internet on your mobile phone/devices
   a. Below 1 hour/day
   b. 1-2 hour/day
   c. 2-3 hour/day
   d. 3-4 hour/day
   e. Above 4 hour/day
   f. I don't access the Internet using mobile phone/devices
6. Have you used any application on your mobile phone/device to

	Yes	No
Pay for goods or services		
Transfer money		

7. Do you know or use any of the applications below

	Apple Pay	Samsung Pay	Momo	ZaloPay	Moca	Payoo	Ngan Luong	AirPay
Don't know								
Know								
Using								

8. Are you familiar with mobile wallet payment method (mobile wallet includes applications mentioned in question 7 or similar)
   a. I know about mobile wallet and I used/ am using this payment method.
   b. I know about mobile wallet and I have not using this payment method.
   c. I have never heard of this payment method.

B. INFLUENCE FACTORS
NON-USERS
9. On which channel did you hear about the mobile wallet
   a. Social media
   b. Magazine, TV
   c. The Internet
   d. Recommendations of family members/friends/colleague
   e. Out-of-home advertisement
   f. This is the first time I heard of this payment type
   g. Others
10. What is the main payment method that you use
   a. Cash
   b. Debit/credit card
   c. Digital banking
   d. Others

If you are introduced to use mobile wallet, please indicate your opinion about the following statements which could affect your intention by using the assessment below:
1 = Totally Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Totally agree

11. Perceived Usefulness

1. Using mobile wallet saves me time.	1 2 3 4 5
2. Mobile wallet is a practical option in making payment.	1 2 3 4 5
3. Using mobile wallet makes it easier for me to carry out my day-to-day tasks.	1 2 3 4 5
4. Using mobile wallet is the trend of the modern lifestyle.	1 2 3 4 5

12. Perceived Ease of Use

1. I can easily learn to use the mobile wallet.	1 2 3 4 5
2. I can quickly become proficient in using services of the mobile wallet.	1 2 3 4 5
3. Performing the mobile wallet procedures is simple to me.	1 2 3 4 5
4. The interface of the mobile wallet is user-friendly and easy to understand.	1 2 3 4 5

13. Social Influence

1. Family affects my intention to use the mobile wallet	1 2 3 4 5
2. Friends and colleagues affect my intention to use mobile wallet.	1 2 3 4 5
3. The media runs advertisement affect my intention to use the mobile wallet.	1 2 3 4 5

4. I use mobile wallet because the people around me also use it.	1 2 3 4 5

14. Perceived Credibility

1. Payments through mobile wallet are processed accurately.	1 2 3 4 5
2. The mobile wallet will not share my information (e.g. personal details, bank account data, payment history, mobile wallet usage behavior) to third parties without my permission.	1 2 3 4 5
3. The risk of data theft of the mobile wallet is low.	1 2 3 4 5
4. The capability of the wallet providers and their partners in protecting my data is good.	1 2 3 4 5

15. Perceived Costs

Type of fees	Source of fund	Apple Pay	Samsung Pay	Momo	Zalo Pay	Moca	Payoo	Ngân Lượng	Air Pay
Topping up	Bank's account			Free	Free	Free	0.5%-0.8%TV	Free	
	Domestic payment card			0.07 EUR+1.12%TV	Free	Free			Free
	International payment card			0.08 EUR+1.6%TV		2% TV			
	Points of recharge			Free					
Fund transfer	Bank's account		Free	0.04 EUR	Free			0.04 EUR+1%TV	
	Domestic payment card			0.11 EUR+1.12%TV		Free			
	International payment card	0$ if debit card; 3% if credit card		0.12 EUR+1.6%TV		2% TV			
	Wallet's balance			0.04 EUR		Free			
Fund withdrawal	Bank's account			0.13 - 0.19 EUR	Free	0.08 EUR		depending on banks	Free
	Points of recharge			0.31 - 1.35 EUR			0.21 -1.06 EUR		
Payment				0 - 2.12 EUR	Free		0.3%-2.8%TV		0.12 EUR + 2%TV
Other fees (annual fees, account opening fee, OTP SMS fee,...)			Free	Free	Free	Free	Free		

1. The cost of internet service to use the mobile wallet (3G, 4G) is expensive.	1 2 3 4 5
2. The service fees of the mobile wallet (in the cost sheet above) are expensive.	1 2 3 4 5
3. I will not use the mobile wallet because of the charges increase.	1 2 3 4 5

16. Variety of Services

1. The mobile wallet collaborates has many partners (banks, internet providers, network carriers, e-commerce businesses, etc)	1 2 3 4 5
2. The mobile wallet is accepted at many shopping and entertainment locations.	1 2 3 4 5
3. Various services of mobile wallet fulfill my needs in different situations.	1 2 3 4 5

17. Mobility

1. I can use mobile wallet anytime, and anywhere.	1 2 3 4 5
2. I can use mobile wallet even when I am traveling.	1 2 3 4 5
3. Mobile wallet is right for me because I always carry my mobile phone with me.	1 2 3 4 5

18. Behavioral Intention

1. I believe that I will use mobile wallet in the future.	1 2 3 4 5
2. I will need the services of mobile wallet more in the next 6 months.	1 2 3 4 5

3. 2 years from now, I intend to pay for purchases with mobile wallet.	1 2 3 4 5

USERS

9. On which channel did you hear about the mobile wallet
   a. Social media
   b. Magazine, TV
   c. The Internet
   d. Recommendations of family members/friends/colleague
   e. Out-of-home advertisement
   f. This is the first time I heard of this payment type
   g. Others

10. What is the main payment method that you use
    a. Cash
    b. Debit/credit card
    c. Digital banking
    d. Others

11. For what purpose do you use the mobile wallet
    a. Buying products/service on e-commerce website (Dien May Xanh, Shopee, Lotte, VeXeRe,…)
    b. Buying products/service in the mobile wallet app (flight ticket, movie ticket, room reservation,...)
    c. Paying for products/service at store, restaurant,…
    d. Paying for water, electricity, internet bills.
    e. Topping up credit for phone or transportation app such as Grab, Lalamove, GoViet.
    f. Transfer money
    g. Other (please specify)

12. How often do you use mobile wallet
    a. Below 5 transactions per month
    b. 6-10 transactions per month
    c. More than 10 transactions per month

13. The minimum value of transaction that you will choose to pay with mobile wallet
    a. 0 – 50.000 VND
    b. 50.000 – 100.000 VND
    c. 100.000 – 150.000 VND
    d. Others

14. The maximum value of transaction that you will choose to pay with mobile wallet
    a. 500.000 VND
    b. 1.500.000 VND
    c. 3.000.000 VND
    d. Others

Please indicate your opinion about the following statement by using the assessment below:

1 = Totally Disagree

2 = Disagree

3 = Neutral
4 = Agree
5 = Totally agree

11. Perceived Usefulness

1. Using mobile wallet saves me time.	1 2 3 4 5
2. Mobile wallet is a practical option in making payment.	1 2 3 4 5
3. Using mobile wallet makes it easier for me to carry out my day-to-day tasks.	1 2 3 4 5
4. Using mobile wallet is the trend of the modern lifestyle.	1 2 3 4 5

12. Perceived Ease of Use

1. I can easily learn to use the mobile wallet.	1 2 3 4 5
2. I can quickly become proficient in using services of the mobile wallet.	1 2 3 4 5
3. Performing the mobile wallet procedures is simple to me.	1 2 3 4 5
4. The interface of the mobile wallet is user-friendly and easy to understand.	1 2 3 4 5

13. Social Influence

1. Family affects my intention to use the mobile wallet	1 2 3 4 5
2. Friends and colleagues affect my intention to use mobile wallet.	1 2 3 4 5
3. The media runs advertisement affect my intention to use the mobile wallet.	1 2 3 4 5
4. I use mobile wallet because the people around me also use it.	1 2 3 4 5

14. Perceived Credibility

1. Payments through mobile wallet are processed accurately.	1 2 3 4 5
2. The mobile wallet will not share my information (e.g. personal details, bank account data, payment history, mobile wallet usage behavior) to third parties without my permission.	1 2 3 4 5
3. The risk of data theft of the mobile wallet is low.	1 2 3 4 5
4. The capability of the wallet providers and their partners in protecting my data is good.	1 2 3 4 5

15. Perceived Costs

1. The cost of internet service to use the mobile wallet (3G, 4G) is expensive.	1 2 3 4 5
2. The service fees of the mobile wallet are expensive.	1 2 3 4 5
3. I will stop using the mobile wallet because of the charges increase.	1 2 3 4 5

16. Variety of Services

1. The mobile wallet collaborates has many partners (banks, internet providers, network carriers, e-commerce businesses, etc)	1 2 3 4 5
2. The mobile wallet is accepted at many shopping and entertainment locations.	1 2 3 4 5
3. Various services of mobile wallet fulfill my needs in different situations.	1 2 3 4 5

17. Mobility

1. I can use mobile wallet anytime, and anywhere.	1 2 3 4 5
2. I can use mobile wallet even when I am traveling.	1 2 3 4 5
3. Mobile wallet is right for me because I always carry my mobile phone with me.	1 2 3 4 5

18. Behavioral Intention

1.	I believe that I will continue to use mobile wallet in the future.	1 2 3 4 5
2.	I will use the services of mobile wallet more in the next 6 months.	1 2 3 4 5
3.	2 years from now, I intend to pay for purchases with mobile wallet.	1 2 3 4 5