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## Article

# A study of user's m-wallet usage behavior: The role of long-term orientation and perceived value

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## MARKETING | RESEARCH ARTICLE

# A study of user's m-wallet usage behavior: The role of long-term orientation and perceived value

Nguyen Tran Le Na<sup>1</sup> and Nguyen Ngoc Hien<sup>1\*</sup>

**Abstract:** Understanding which factors are important to consumers when deciding to use a mobile wallet and how these factors influence users' commitment and recommendation is important because the demand for cashless transactions has increased worldwide in recent years, especially developing countries like Vietnam. This study develops a research model and tests hypotheses related to the antecedents (personal innovativeness, perceived risk, perceived ease of use and long-term orientation) and the outcomes (commitment and recommendation) of perceived value. The technology acceptance model (TAM), the diffusion of innovation theory (DOI), the theory of perceived risk (TPB) and the perceived value model (PERVAL) were used to build the research model. With a sample of 320 consumers using mobile wallets in Vietnam, a Structural Equation Model (SEM) was used to test the hypotheses. The findings show that personal innovativeness, perceived risk, perceived ease of use and long-term orientation are the factors that significantly influence the perceived value of mobile wallet users. Also, the findings show that perceived value has positive impacts on user's commitment and recommendation to use a m-wallet. The study supports m-wallet service providers to understand how to increase mobile wallet user's commitment and recommendation to others.

**Subjects:** Services Marketing; Marketing Research; Consumer Behaviour; Internet / Digital Marketing / e-Marketing



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## PUBLIC INTEREST STATEMENT

Mobile wallet technology appeared in Vietnam about a decade ago, but only really exploded a few years ago. This technology really brings many benefits to users, especially in developing countries like Vietnam. Hence, research on user response is really important to m-wallet service providers. We believe that user's commitment and recommendation are two important factors for businesses to survive and succeed. So, we study how perceived value (functional value, social value and emotional value) affects them. From there, helping the m-wallet service providers bring suitable values to increase user's commitment and recommendation to others. Each country has different cultures, so there are great cultural differences between countries. However, few studies have reviewed this issue. Therefore, the factor related to cultural issue (long-term orientation) is also considered in this study.

**Keywords:** Commitment; Emotional value; Functional value; Social value; Recommendation to use

**JEL Classification:** M30; L86; L81; G41

## 1. Introduction

Mobile phones have changed the lifestyles of many people. In addition, they have also contributed to the development of nations. Accordingly, services from mobile phones appeared. The increase in demand for cashless transactions worldwide has significantly changed the attitude and acceptance of users regarding m-wallets (Leong et al., 2013). The acceptance of electronic payments have increased in many countries (Flood et al., 2013). According to the study of Solidiance (2018), Vietnam's transaction value in the financial technology market reached USD 4.4 billion in 2017 and was estimated to increase to USD 7.8 billion in 2020. In 2019, Vietnam's population reached nearly 97 million. In addition, the number of Internet users was 64 million and 72% of population using smartphones were adults (Quy, 2019). There were more than 4.2 million bank accounts linked to m-wallets as of the end of 2018 (Thuy, 2019). Therefore, Vietnam is a potential country to develop electronic payment services. The explosive growth in mobile technology in developing countries has taken place over the past decade (Madan & Yadav, 2016). Many opportunities for companies to get involved are created due to the increase of businesses based on the mobile technology. By early 2020, there were more than 20 m-wallet providers in Vietnamese market such as Momo, Payoo, Moca, Samsung Pay, Zalo Pay, Viettel Pay, etc., which has led to the rapid development of different types of e-commerce, prominent among them is the exciting race of m-wallets in recent years. Vietnamese people are gradually choosing mobile wallets instead of cash payments because of its flexibility and security in transactions.

Due to the importance and increasing use of m-wallets worldwide, checking consumer responses to accept and use m-wallets is a main research topic of many authors (Karjaluoto et al., 2019; Madan & Yadav, 2016; Singh et al., 2020). To measure the pre-usage behavior of m-wallet users, the TAM and the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) are the main theories that researchers used (Amoroso & Magnier-Watanabe, 2012; Oliveira et al., 2016; Rakhi; Thakur & Srivastava, 2014). Previous studies showed that perceived ease of use, personal innovativeness and perceived risk are the factors that strongly influence users' adoption of a new technology (Karjaluoto et al., 2019; Lu et al., 2005; Singh et al., 2020; Wang et al., 2020). However, there are very few studies that research user's behavior after using a m-wallet (commitment and recommendation to others). Besides, researchers have not studied much about the elements of perceived value and the role of perceived value influencing user's acceptance and recommendation of a m-wallet. Only the research of Karjaluoto et al. (2019) studied the impact of personal innovation on the perceived value of m-wallet users. In addition, cultural factors (such as long-term orientation) have not been considered in the context of using m-wallets. Therefore, this study determines the impact of the long-term orientation factor on perceived value, thereby promoting commitment and recommendation to others m-wallet users.

The main objective of this research is to build and test hypotheses relating to the antecedents and outcomes of perceived value in context of using m-wallets in Vietnam. To accomplish this objective, the research developed a model that combines many theories such as TAM, TPB and DOI with variables (personal innovation, perceived risk and perceived ease of use). These factors affect the perceived value which affects m-mobile user's commitment and recommendation to others. In addition, the novelty of this study is to find out how the role of long-term orientation affects the perceived value and orientate users' use and recommendation to others.

## 2. Literature review

### 2.1. Mobile wallet (m-wallet)

A mobile phone equipped with functions from bank cards, credit cards, membership cards, etc. is considered as a m-wallet, which is the replacement of a regular wallet (Shin, 2009). In addition, a m-wallet processes fast at the point of sale and increases the chance of impulse purchase. Unlike credit or debit cards, transactions using a m-wallet are performed without the participation of financial intermediaries and the high costs of these organizations (M'Chirgui & Chanel, 2008). M-wallet is often used for financial transactions. It is suitable for many different types of businesses and integrates many payment methods to help users (Singh et al., 2020). They suppose that any payment service performed through a mobile device is considered a mobile payment. In addition, m-wallet is a mobile application that contains information related to personal information such as membership cards, credit cards, PINs and encrypted online shopping accounts (Hepola et al., 2016). Countries offer widely different versions of m-wallets depending on their country regulations (Shaw, 2014). Because of the convenience of paying and using related services anytime, anywhere, m-wallets are becoming more and more popular, especially in developing countries like Vietnam.

### 2.2. Perceived value (PV)

The trade-off between what a customer receives and what a customer spends is considered as PV (Amoroso & Magnier-Watanabe, 2012). PV helps to understand consumer behavior using electronic services (Karjalainen et al., 2019). PV is a consumer's overall assessment of the product utility regarding a perception of what to spend in exchange for what to receive (Zeithaml, 1988). PV represents the benefits that customers seek, expect or experience (Kumar & Reinartz, 2016). PV is an essential characteristic for the development of long-term customer relationships in many industries (Shapiro et al., 2019). PV varies depending on the type of service or product, and the individual characteristics of each consumer (Zeithaml, 1988).

The scales of PV that are widely used include functional value, social value and emotional value (Sweeney & Soutar, 2001). They suppose that functional value refers to two different aspects: value for money and performance/quality. In addition, functional value refers to consumers' perceptions of the function of a product or a service (Toufani et al., 2017). Functional value is considered as the main driver for the choice of customer (Sheth et al., 1991). Secondly, social value refers to social acceptance and self-image enhancement with other individuals (Bearden & Netemeyer, 1999). We can reinforce one's social perceptions of one's society based on its perceptions of product appreciation (Sweeney & Soutar, 2001). The perception of a product that elicits a person's emotions or feelings is emotional value (Sheth et al., 1991). They discussed that emotional responses are often related to products and services (for example, the romance triggered by a candlelight dinner, the fear that comes from watching horror movies). They supposed the tangible and handy products are also of emotional value. For example, some foods elicit comfortable emotions through their connection to childhood sensations. In addition, the aesthetic features of an object often create emotional responses (Toufani et al., 2017).

### 2.3. Antecedents of perceived value

#### 2.3.1. Personal innovativeness (PI)

PI is derived from DOI Theory (Rogers, 1962). It is one of the most influential theories in the information system industry and has been widely used to investigate the factors influencing a person's decision in adopting a new technology or an innovation. According to this theory, when a consumer perceives innovations with related benefits, monitoring capabilities, testing capabilities and compatibility, along with less complexity, the level of technological acceptance will increase.

PI is the degree to which a person early adopts a new idea compared to the society's average member (Leicht et al., 2018). Thakur et al. (2016) defines PI as a risk-taking trend expressed in

some individuals that others do not. These individuals are willing to take advantage of opportunities to try new things and are likely to cope with high levels of uncertainty. In addition, they considered PI as a personal trait associated with taking risks when trying new innovative services, such as m-wallets.

### 2.3.2. *Perceived risk (PR)*

The dimensions of PR were first used by Bauer (1960) to explore different aspects of consumer behavior. PR theory discussed that consumer behavioral benefits are often associated with risks. There are five types of PR extracted from Bauer's original study, which include: financial, performance, physical, psychological and social risk. Recent years, it has shown a significant increase in the frequency of publications of empirical researches in this area. Models or theories of consumer behavior that are widely associated with these PR structures. PR is related to a negative consequence perceived by individuals arising from purchasing a product or service (Karjaluoto et al., 2014). In the context of technology adoption, risks affect user's confidence in their intentions and behaviors, and this unsureness increases when the probability of results is not yet determined (Im et al., 2008). PR is the main research topic in the context of information and marketing systems which affects many aspects of consumer behavior (accept and use a technology). It has been studied in the context of m-wallets (Amoroso & Magnier-Watanabe, 2012).

### 2.3.3. *Perceived ease of use (PEOU)*

Consumer acceptance is a barrier to the new information technology success. Davis (1989) introduced the TAM model, which is based on attitude behavior to explain this relationship. The TAM model proposed two main factors for adopting a technology including perceived useful and perceived easy of use. This model discussed the relationship between belief—attitude—intention—behavior, which is responsible for adopting a technology of consumers. This is the most widely used information system acceptance model in the context of e-commerce, e-banking and e-payment (Slade et al., 2013). PEOU is the degree to which an individual believes that using a system or technology will help him or her achieve their goals easily (Davis, 1989). Many researchers suggest that PV should be integrated into the TAM model (Ko et al., 2009). Therefore, this research model has replaced the Intension to Use of the TAM model with PV.

### 2.3.4. *Long-term orientation (LO)*

LO is the nurturing of morality towards future rewards, especially the preservation and saving (Hofstede, 2001). In addition, LO is an outstanding aspect of nationally cultural values and it influences the decision-making process of consumers (Bearden et al., 2006). They defined LO as the cultural value with a holistic view of time, which judges both the past and the future rather than just seeing their effects as important now or in the short term. So, long-term oriented individuals value planning, perseverance, and hard work for the benefits in the future. In addition, individuals who favour long-term oriented values emphasize frugality and perseverance to build relationships, and prioritize future rewards (Chopdar & Sivakumar, 2019).

## 2.4. *Perceived value outcomes: Commitment and recommendation to use*

Commitment is an important element of successful customer relationships because it relates to the degree of engagement between customers and businesses (Karjaluoto et al., 2019). A desire to maintain a valued enduring relationship is seen as commitment (Moorman et al., 1992). This study conceptualizes user commitment as their long-term desire to continue using a m-wallet with the willingness to devote efforts to maintain this relationship. The study argues that PV and user's commitment are interrelated because the more outstanding values customers experience, the greater their commitment.

Recommending a technology shows a user's willingness to recommend a technology to others (Singh et al., 2020). They supposed that social networking has become a place to share ideas about a new technology and it also provides an opportunity to review and share feedback on a technology from everyone. Today, word of mouth and the use of social networking platforms in sharing

ideas about a service are common (Oliveira et al., 2016). Similar to commitment, when customers use the application with features that bring more value, they will be satisfied and recommend to others. Therefore, there is a relationship between PV and recommendation to others.

### **3. Research framework and hypothesis development**

#### **3.1. Personal innovativeness and perceived value**

Customers who want to learn a new information system can perceive a lot of value from service innovations, such as mobile applications (Karjaluoto et al., 2019). Hence, understanding the relationship between PV and PI is necessary. However, there have not been many studies on how this factor affects PV. Venkatesh et al. (2003) found that innovative users have more interesting perceptions to use a technology system. Hepola et al. (2016) supposed that PI is a key factor in driving users to accept new mobile applications. A highly innovative user will support a new technology and will be more pleased than a lower innovation user (Oliveira et al., 2016). Besides, they believe that the higher the level of user creativity, the more they are likely to realize the benefits of technology. Therefore, there are the following hypotheses:

**H1a.** Personal innovativeness positively affects functional value.

**H1b.** Personal innovativeness positively affects social value.

**H1c.** Personal innovativeness positively affects emotional value.

#### **3.2. Perceived risk and perceived value**

Shaikh et al. (2015) discussed that PR negatively affects PV for e-banking payments. Snij et al. (2004) demonstrated that PR has a significant negative impact on PV in the context of adopting a mobile phone. In a survey of customers repurchase intentions in an online store, Chiu et al. (2014) discussed that a high degree of risk reduces the impact of utilitarian value. In addition, according to the research results of Karjaluoto et al. (2019) PR has a negative effect on PV for using mobile financial service applications. Besides, there are many studies showing that perception risk negatively affects users' technology attitudes and intentions (Aji et al., 2020; Akturan & Tezcan, 2012; Chiu et al., 2014). Thus, there are the following hypotheses:

**H2a.** Perceived risk negatively affects on functional value.

**H2b.** Perceived risk negatively affects on social value.

**H2c.** Perceived risk negatively affects on emotional value.

#### **3.3. Perceived ease of use and Perceived Value**

PEOU has a significant effect on a person's intentions to use a technology (Davis, 1989). Because of the high degree of personalization and customization of mobile devices, m-wallets are handy and can easily be accepted. Therefore, m-wallets can clearly add value and bring benefits to users (Wang, 2014). Ease of use seems to have an impact on PV in the context of value-based adoption of a technology, thereby encouraging practical use (Ko et al., 2009). In particular, PEOU is an important prerequisite for PV in accepting new things (Venkatesh et al., 2003). M-wallets are a relatively new technology, so their ease of use can influence PV to use them. Hence, there are the following hypotheses:



**H3a.** Perceived ease of use positively affects functional value.

**H3b.** Perceived ease of use positively affects on social value.

**H3c.** Perceived ease of use positively affects on emotional value.

### **3.4. Long-term orientation and perceived value**

Bearden et al. (2006) found that the higher an individual's long-term orientation, the more they are economical. Functional value is related to the product-related utility from reducing perceived long-term and short-term costs (Sweeney & Soutar, 2001). In addition, long-term oriented individuals have a positive effect on their subjective social norms. Opinions and supports from others are important to them (Nguyen et al., 2017). In the study of accepting mobile services, social aspects are conceptualized as social norms and values, including those of society that are respected and valued by other when using mobile services (Pihlström, 2008). So, there are the following hypotheses:

**H4a.** Long-term orientation positively affects functional value.

**H4b.** Long-term orientation positively affects social value.

**H4c.** Long-term orientation positively affects emotional value.

### **3.5. Perceived value and commitment**

Pura (2005) found that PV impacts on commitment in the context of location-based mobile services. She discussed that behavioral intention and commitment were positively affected by PV. In addition, according to the research of Karjaluoto et al. (2019), regarding the use of electronic financial services applications, PV positively affects users' commitment to use. Besides, Amoroso and Magnier-Watanabe (2012) found that PV has contributed to a positive impact on user's attitudes in the context of using m-wallets in Japan, thereby increasing the behavioral intention of using them. Thus, there are the following hypotheses:

**H5a.** Functional value positively affects commitment.

**H5b.** Social value positively affects commitment.

**H5c.** Emotional value positively affects commitment.

### **3.6. Perceived value and recommendation to use**

Technology benefits positively affected intention to use e-wallets and customer satisfaction (Aji et al., 2020). The more benefits, the greater the perceived value and the greater the satisfaction (Hsu et al., 2010). Consequently, the more satisfied users are about features of a service, the more likely they will recommend it. In addition, according to a study of Pihlström (2008), emotional value positively affected word of mouth behavior in the mobile service context. Besides, her research also showed that social value positively affects user's word-of-mouth behavior. Based on these, there are the following hypotheses:

**H6a.** Functional value positively affects recommendation to use.

**H6b.** Social value positively affects recommendation to use.

**H6c.** Emotional value positively affects recommendation to use.



### 3.7. Proposed model

(Figure 1) shows the proposed theoretical framework. Based on TAM model, DOI and PR theory, effects of PI, PR, PEOU to PV are examined. In addition, based on the previous studies in different contexts, a new relationship between LO and PV is proposed. The influences of perceived value on commitment and recommendation to use are also considered. Therefore, the model includes such concepts as personal innovativeness, perceived risk, perceived ease of use, long-term orientation, functional value, social value, emotional value, commitment and recommendation to use. Proposed hypotheses are included in the model.

## 4. Methodology

### 4.1. Survey instrument

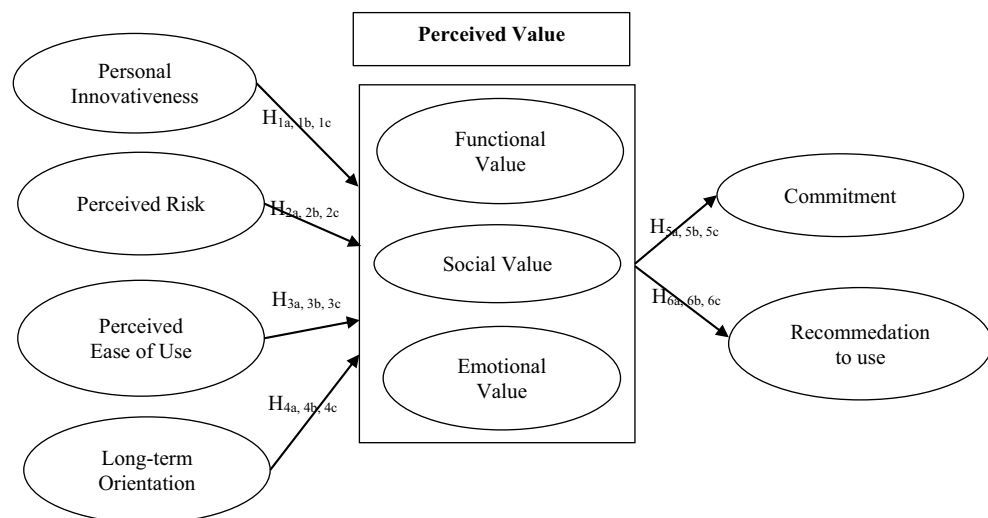
This study used scales based on previous studies. They were tested in different contexts. There were small adjustments to the original scale to better fit the context of this study. After designed, the draft survey was reviewed by experts, whom are 5 lecturers teaching e-commerce. Next, a pilot study was performed with 30 m-wallet users to assess the clarity and level of interest in the observed variables. Several modifications were made to the questions to eliminate ambiguity and confusion and thus improve the observed variables.

Firstly, to ensure participants using mobile wallets, a screening question was asked. The questionnaire included two main parts. Part 1 asked about the user's demographics, including gender, age, level, occupation, frequency and experience of using a m-wallet. Part 2 included questions to assess the individual's personal innovativeness, perceived risk, perceived ease of use, long-term orientation, perceived value (function, social, emotional), commitment and recommendation to others. The 5-point Likert scale was used to measure all variables (Strongly Disagree = 1, Strongly Agree = 5). A list of the items appears in (Table 1).

### 4.2. Sampling and data collection

The survey was conducted after editing the questionnaire. Direct surveys were conducted at supermarkets, shopping centers, ... where the use of mobile wallets was popular. The sample consisted of customers going to supermarkets and shopping malls, who used mobile wallets at least once a month, regardless of whether they were male or female. The research sample was from Ho Chi Minh City, one of the two largest cities in Vietnam (Wikipedia, 2020). This is also an important economic, political, cultural and educational center of Vietnam with many technology

**Figure 1. Proposed research framework.**



**Table 1. Confirmatory factor analysis for measurement items**

Factors/Items	Factor loadings
<b>Personal innovativeness (PI) (<math>\alpha = .752</math>, <math>CR = .760</math>, <math>AVE = .515</math>)</b> PI1. I like to experience with new mobile apps PI2. I would look for ways to experience new mobile apps if I heard about it PI3. I am hesitant to try out new mobile apps <i>Source: Adapted from Karjaluoto et al., 2019</i>	621 613 865
<b>Perceived risk (PR) (<math>\alpha = .849</math>, <math>CR = .851</math>, <math>AVE = .536</math>)</b> PR1. It is not completely secure when using a m-wallet PR2. Using m-wallet increases the risk of misusing my information PR3. It is not safe when making transactions with m-wallet PR4. I would worry about the m-wallet's reliability PR5. M-wallet would not provide me the benefits I expected <i>Source: Adapted from Karjaluoto et al., 2019; Singh et al., 2020</i>	805 702 815 656 665
<b>Perceived ease of use (PEOU) (<math>\alpha = .826</math>, <math>CR = .828</math>, <math>AVE = .547</math>)</b> PEOU1. It would be easy to use a m-wallet PEOU2. Using a m-wallet is understandable PEOU3. Using a mobile wallet is as easy as using an actual payment card PEOU4. It would be easy to learn how to use a m-wallet <i>Source: Adapted from Shaw, 2014; Singh et al., 2020</i>	787 763 634 724
<b>Long-term orientation (LO) (<math>\alpha = .854</math>, <math>CR = .856</math>, <math>AVE = .599</math>)</b> LO1. I use my money carefully LO2. I work hard to be successful in the future LO3. I prefer making long-term plans LO4. Careful money management is important to me <i>Source: Adapted from Nguyen et al., 2017; Sreen et al., 2018</i>	681 730 760 892
<b>Functional value (EV) (<math>\alpha = .812</math>, <math>CR = .814</math>, <math>AVE = .524</math>)</b> FV1. This m-wallet is helpful FV2. This m-wallet is necessary FV3. I can save time when I use m-wallet services FV4. I complete my payment more quickly when using m-wallet <i>Source: Adapted from Karjaluoto et al., 2019; Ozturk et al., 2017</i>	590 835 769 627
<b>Social value (SV) (<math>\alpha = .783</math>, <math>CR = .783</math>, <math>AVE = .547</math>)</b> SV1. I make a good impression on others when using m-wallet SV2. I feel accepted by others when using m-wallet SV3. I use m-wallet that my relatives select <i>Source: Adapted from Toufani et al., 2017; Pura, 2005</i>	752 758 695
<b>Emotional value (EV) (<math>\alpha = .857</math>, <math>CR = .858</math>, <math>AVE = .548</math>)</b> EV1. I feel happy when using m-wallet EV2. I feel good when using m-wallet EV3. I feel good that my m-wallet is superior to other m-wallet EV4. I feel my life is better since I used m-wallet EV5. Being noticed by others while using m-wallet is important to me <i>Source: Adapted from Toufani et al., 2017; Pura, 2005</i>	718 832 771 645 689

(Continued)

Factors/Items	Factor loadings
<b>Commitment (COM) (<math>\alpha = .819</math>, <math>CR = .820</math>, <math>AVE = .534</math>)</b> COM1. Using m-wallet's services makes me proud COM2. I am a loyal patron of m-wallet services COM3. M-wallet services means a lot to me COM4. I consider the m-wallet my first choice to do this type of services <i>Source: Adapted from Karjaluoto et al., 2019; Pura, 2005</i>	740 640 740 688
<b>Recommendation to use (RECOMD) (<math>\alpha = .871</math>, <math>CR = .876</math>, <math>AVE = .639</math>)</b> RECOMD1. I would recommend m-wallet to my friends and family RECOMD2. If I have valueable experiences with m-wallet, I will recommend my relatives to use RECOMD3. If anyone asks me about my m-wallet, I would recommend it RECOMD4. I will talk about the strengths of m-wallets with everyone <i>Source: Adapted from Singh et al., 2020</i>	661 910 825 745

services. There were 320 usable responses. Ratio between the sample size and the number of questions is 8.42, which is more than the minimum threshold for distributing the normal survey (5:1) so the sample size is qualified (Bentler & Chou, 1987).

## 5. Results

### 5.1. Demographics of respondents

Among the 320 usable responses, 44.4% were male and 55.6% were female. Regarding age, 19.7% were 16–20 years old, 28.4% were 21–25 years old, 25% were 26–30 years old, 12.8% were 31–35 years old and over 36 years old were 14.1%. In terms of educational attainment, 35% of participants had bachelor's degree, followed by high school graduates (30.6%), 2-year college graduates (28.1%) and post graduates (6.3%). Participants were mainly students (28.1%), followed by the unemployed (24.7%), employees (20.6%), retired (1.9%), the remaining 24.7% were other occupations.

### 5.2. Measurement model

Firstly, exploratory factor analysis (EFA) was performed to category the 36 items into 9 groups of factors. All items with factor loading less than 0.5 were rejected. In this study, two items from LO and PI scales were rejected because their standardized factor loading were less than 0.5. Other standardized factor loadings ranged from 0.590 to 0.910 were satisfactory (greater than 0.5) (Table 1) and the non-standardized coefficients were statistically significant ( $p = 0.00$ ) (Hair et al., 2010). Thus, the results showed that all items had convergent validity. The KaiserMeyer-Okin value was 0.856, which was higher than the 0.7 value. The barlett value was suitable for a very small level of 0.000 (Bartlett, 1954).

To assess the measurement model, several fit indices were applied. Confirmatory factor analysis (CFA) results showed that, there were 558 degrees of freedom,  $\chi^2/df = 1.060$ , CFI = 0.993, GFI = 0.910, TLI = 0.992, RMSEA = 0.014. The model fit was satisfactory. In addition, the average variance extracted (AVE) of all structures was in the range from 0.515 to 0.639. These results showed the convergent validity of the measures (Anderson & Gerbing, 1988). The reliability test results of the scales showed that Cronbach's alpha in each construct ranged from 0.752 to 0.871, was greater than the minimum threshold of 0.6. Thus, the scales are highly reliable (Nunnally, 1978).

All structures met the condition that the square root of AVE value for each structure must be greater than 0.5 (square roots of AVE ranges from 0.718 to 0.800 in Table 2). In addition, the result showed the appropriate discriminant value since all diagonal values (AVE) are greater than the squared correlation of the coefficients between all pairs of constructs (Fornell & Larcker, 1981). Table 2 presents mean, correlation matrix and square roots of AVE in all structures included in the research model.

### 5.3. Structural model

SPSS 24.0 and AMOS 24.0 were used to process the collected data. To determine the importance of each hypothesis, the standardized coefficients of each hypothesis was estimated using structural equation model (SEM). GFI, TLI, CFI values are all greater than 0.9 and RMSEA values are less than 0.08 (Hair et al., 2010). Specifically,  $X^2/df = 1.125$ ,  $GFI = 0.904$ ,  $CFI = 0.985$ ,  $TLI = 0.983$ ,  $RMSEA = 0.020$ . Thus, the model is consistent with the research data.

The results supported most hypotheses (Table 3). The analysis showed that, among the four antecedents of perceived value, LO had the greatest positive effect on all three elements of perceived value. Therefore, the hypothesis H4 was supported. The results showed that the effect of PEOU on EV was not significant but had an impact on FV and SV. Hence, hypothesis H3a, H3b were supported and hypothesis H3c were not empirically supported. PI had the strongest effect on EV, then FV and finally EV. PR affected negatively on FV and EV but did not affect SV. Therefore, the hypothesis H2b was not supported. Hypotheses 5 and 6 were supported. Specifically, FV and EV affected more significantly on COM than SV did. Meanwhile, FV, SV and EV all had a similar effect on RECOMD. Specifically, FV, SV and EV. (Figure 2). describes the results from the structural model with the parameter path coefficients.

## 6. Discussion

The effects of PI, PEOU, PR and LO on PV as well as the effects of PV on commitment and recommendation to others were examined. Finding out these effects in the context of using m-wallets is crucial because m-wallets have rapidly developed. This is one of the first studies researching the impact of long-term orientation on perceived value, thereby driving the use of m-wallet users. The findings emphasized the two points. Firstly, the factor that most affects PV is LO. Second, FV and EV have strong effects on commitment while social value has a stronger effect on recommendation to others. The study provides additional information that researchers can use for PV-related models. For m-wallet providers, knowledging the key structures is important to design, adapt and deploy product services and functions for m-wallets to achieve high rates in consumer commitment and recommendation to others. This study also provides important theoretical and managerial implications.

The results of this study have two main theoretical contributions. Firstly, it develops the theory of PV and its antecedents. The findings of research related to PI shows that it positively affects perceived value. This result is different from that of Karjaluoto et al. (2019). In their study, PI had a small negative effect on utilitarian value. Perhaps, because the research sample (50%) used m-wallets for over a year and the research was performed in a developed country like Finland. There was a significant difference in this study when performing in a developing country, Viet Nam. The study also contributes to the theory of PEOU. it affects FV and SV but has no effect on EV. The findings suggest that PEOU significantly positively affects the perceived value, which corroborates previous studies conducted in other countries such as China and South Korea (Ko et al., 2009; C. Wang, 2014). Users have some experience with the information systems in the post-acceptance period, so PEOU's influence is not much (Wang, 2014). For PR, this study is consistent with previous results as it confirms the negative effect of PR on perceived values (Karjaluoto et al., 2019; Shaikh et al., 2015; Yu et al., 2017). However, PR only affects FV and EV and has no significance in affecting SV. Secondly, the results of the study provide new insights that LO is the most important driving factor for perceived value in the context of m-wallet usage in Vietnam. The result of Nguyen et al. (2017) is consistent with this, in which, LO negatively affects Perceived Inconvenience (one of the

**Table 2. Mean, correlation matrix and square roots of AVE on the diagonal<sup>a</sup>**

Constructs	Mean	SD	1	2	3	4	5	6	7	8	9
SV	0.783	0.547	<b>0.739<sup>a</sup></b>								
EV	0.814	0.524	0.198	<b>0.724</b>							
PR	0.851	0.536	-0.014	-0.109	<b>0.732</b>						
RECOMD	0.875	0.639	0.273	0.333	-0.020	<b>0.800</b>					
LO	0.856	0.599	0.280	0.254	0.308	0.177	<b>0.774</b>				
PEOU	0.828	0.547	0.264	0.212	-0.071	0.358	0.100	<b>0.739</b>			
FV	0.815	0.526	0.058	0.411	-0.061	0.306	0.302	0.244	<b>0.725</b>		
COM	0.820	0.534	0.255	0.577	0.000	0.271	0.283	0.299	0.501	<b>0.731</b>	
PI	0.760	0.515	0.279	0.275	-0.024	0.254	0.211	0.409	0.277	0.422	<b>0.718</b>

<sup>a</sup>Numbers in bold represent the square roots of AVE

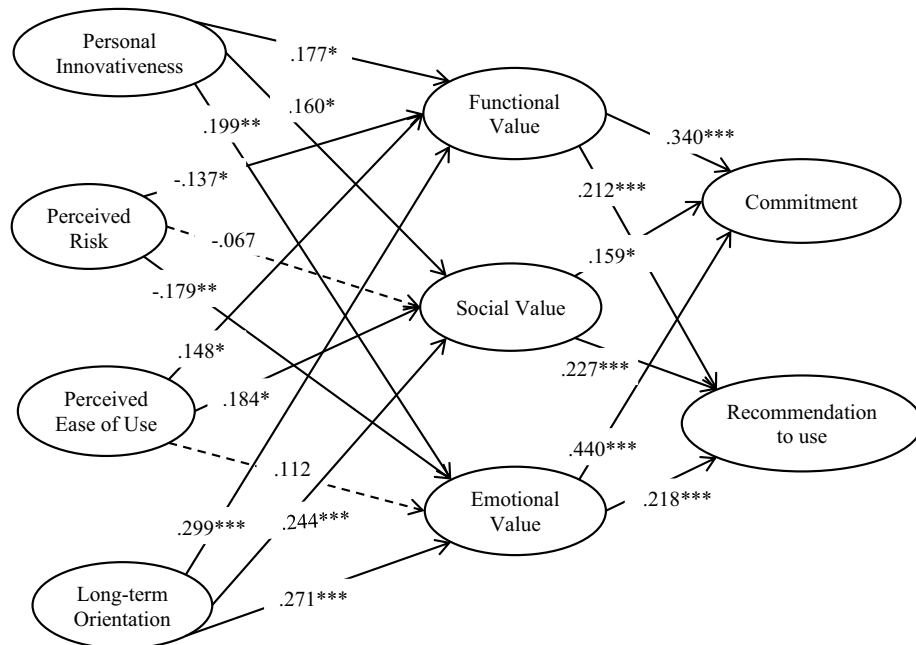
**Table 3. Hypothesis testing results and fit indices of the structural model**

Hypothesized path		Standardized coefficients	Results
H1a	PI -> FV	.177	Supported
H1b	PI -> SV	.160	Supported
H1c	PI -> EV	.199	Supported
H2a	PR -> FV	-.137	Supported
H2b	PR -> SV	-.067	Not supported
H2c	PR -> EV	-.137	Supported
H3a	PEOU -> FV	.148	Supported
H3b	PEOU -> SV	.184	Supported
H3c	PEOU -> EV	.112	Not supported
H4a	LO -> FV	.299	Supported
H4b	LO -> SV	.244	Supported
H4c	LO -> EV	.271	Supported
H5a	FV -> COM	.340	Supported
H6a	FV -> RECOMD	.212	Supported
H5b	SV -> COM	.159	Supported
H6b	SV -> RECOMD	.227	Supported
H5c	EV -> COM	.440	Supported
H6c	EV -> RECOMD	.218	Supported
Model fit indices		Measurement model fit: $\chi^2/df = 1.125$ , GFI = 0.904, CFI = 0.985, TLI = 0.983, RMSEA = 0.020	

Note. Chi-Square ( $\chi^2$ ); df (Degrees of Freedom); Goodness of Fit Index (GFI); Comparative Fit Index (CFI); Tucker-Lewis Index (TLI); Root Mean Square Error Approximation (RMSEA)

**Figure 2. Structural model results.**

--- not significant, \*p < 0.05,  
\*\*p < 0.01, \*\*\*p < 0.001



values of PV). Sreen et al. (2018) discussed that subjective norms were perceived social effects. Their research showed that LO had a significantly positive effect on Subjective norms. Therefore, the results of the study are consistent when LO positively affects on Social Value.

Perceived value is associated with two structures of commitment and recommendation to use. All three elements of perceived value drive m-wallet users' commitment and recommendation to others, which is consistent with previous studies (Karjaluoto et al., 2019; Pihlström, 2008). The elements of perceived value all play a supporting role in fostering relationships: FV and EV anticipate stronger commitment, while SV has a stronger impact on RECOMD. Overall, the results show that the more value users get from m-wallets, the more their commitment, and recommendation. Therefore, the findings of this study verify the previous study (Pura, 2005), which reported that increased PV lead to a direct increase in COM.

## 7. Conclusions

This research has practical implications for m-wallet service providers. This is the first study to examine how long-term orientation affects the behavior of m-wallet users in Vietnam. In addition, the commitment and recommendation of m-wallet users are also considered. These variables are very important for m-wallet service providers and can affect their success. Hence, to help m-wallet providers better understand consumer's behavior, this study provides additional important insights. People know that perceived value is important to create customer commitment. However, a few researches have been done to find out how it affects recommendation to use. RECOMD can increase the number of new customers. The results show that PI and PEOU do not significantly affect the PV. The sample in this study with many experienced m-wallet users may be the cause for this. Thus, PI and PEOU are not important elements in the study. The findings confirm that m-wallets are currently being used by different age groups. Therefore, the adoption of m-wallet is more and more, especially in developing countries like Vietnam. The findings also show that LO has the strongest impact on perceived value. Therefore, m-wallet providers need to offer benefits that users feel economical as well as bring benefits when they use in the long term. In addition, PR has negative effects on perceived values but little. This shows that users are less risk-averse when using a new technology such as m-wallets. Research results are one of the first to show that PV in the context of m-wallets positively affects to RECOMD. The findings note that FV and EV are more important in driving commitment, but all three elements of PV have equal effects on RECOMD. Therefore, m-wallet providers should consider m-wallet features to create more functional and emotional value to improve the degree of user commitment. However, it should be noted that SV is an important factor of recommending to others. So, the m-wallet service providers also need to create values that help increase the social value of users to get more recommendations. From there, help them have more new customers.

The research also has limitations. Several factors that may be considered important for using m-wallets were not included in this study, such as product novelty (Karjaluoto et al., 2019), perceived useful (C. Wang, 2014) and instant connectivity (Ko et al., 2009). Therefore, future research will include other important variables that affect behaviors of m-wallet users. Respondent's age is another limitation of this study, just about 14% at 36 years of age or older. Besides, all respondents live in Ho Chi Minh City. Therefore, future research should address these issues. Additionally, the study focuses on commitment and recommendation to others, but the user activities related to m-wallets are not considered. Future research may assess the importance of the model used in more specific activities related to shopping or eating. Future research can also compare and evaluate user behavior before and after using m-wallet services. In addition, future research should consider how other factors related to PV (value for money, convenience value, etc.) affect user behavior. Finally, a vertical study should be conducted because m-wallet is a new service in Vietnam and can develop over time. Due to the different development of countries on m-wallet services (Shaw, 2014), research in many countries can also provide more insights.



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