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Research on the Role of the Attitudes of Vietnamese Consumers Towards their Intentions to Use Mobile Money

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A B S T R A C T

Purpose: The research was conducted to determine the role of the attitudes of Vietnamese consumers towards the intention to use mobile money to make recommendations for solutions to improve the effectiveness of this activity.
Design/methodology/approach: It analyzed 307 surveys from consumers living and working in Vietnam. A research model was built that was based on the theory of technology acceptance model (TAM) and the theory of planned behavior (TPB). The author considered six constructs, including self-efficacy, perceived ease-of-use, technology anxiety, perceived usefulness, attitude toward mobile money, and intention to use mobile money. The data is analyzed with a partial least squares structural equation model (PLS-SEM) using SmartPLS 3.0 software.
Findings: The result indicated that self-efficacy (SE) significantly and directly affects the perceived ease of use (PEOU), indirectly affects the attitude toward mobile money (AT), and intention to use mobile money of Vietnamese consumers (IU). The PEOU and perceived usefulness (PU) significantly and directly affect the AT, and indirectly affect IU. In contrast, technology anxiety (TA) showed no effect on the PU. In addition, the AT has a strong effect on the IU.
Research limitations/implications: This paper presents significant implications, particularly for the digital economy, which is currently permeating every facet of human existence. The article also suggested future research directions, including expand the scope of the research, the sample size, and the addition of other factors to supplement and complete the model.
Originality/value: The article closes a perceived gap in the mobile money literature by using model measurement to demonstrate the mobile money intention of Vietnamese consumers.

Keywords: Mobile money, Role of attitude, Intention to use, Vietnamese consumer

I. Introduction

The development of financial services is increasingly necessary to support and assess the accomplishment of the strategic objectives of electronic commerce. In particular, electronic payment services are widely used, traders exchange quickly and frequently, and transaction tasks involving trading partners are carried out and coordinated in real-time (Choe, 2018). Along with the development of mobile commerce, mobile payment is becoming an inevitable global trend. Instead of paying with cash, checks, or credit cards, consumers can use mobile phones to pay for services and goods (European Central Bank, 2020).

The term "e-money products" refers to prepaid or stored value goods where the consumer keeps

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a record of the monies or value they have access to on a device they own. Prepaid software products that use computer networks like the internet are included in this definition, as are prepaid cards (also known as electronic purses) and digital currency. These goods are not the same as "access products," which let users access conventional payment services through electronic communication (such as using the internet to pay with a credit card or for basic online banking). In 2017, the World Bank defined mobile money. The provision of financial services via a mobile device is the most fundamental definition of mobile money. A variety of services are covered by this broad definition, such as account balance inquiries, insurance products, and payments, like P2P transfers (Aker & Mbiti, 2010), (Jack & Suri, 2011), (Donovan, 2012). In reality, a number of methods can be employed, like texting money transfers or using a mobile internet connection to retrieve bank account information. There are specific "contactless" technologies that enable phones to send money to contactless cash registers.

In Vietnam, the speed of mobile payment development is not commensurate with the potential. According to Vietnam Digital 2022 (We are Social, 2022), although about 73% of the Vietnamese population has a mobile network connection, only about 29% use mobile phones. The reason was that people's habits of using and paying in cash were still prevalent. In addition, low-income users often lived far away from central areas, and the cost of accessing financial services was quite high, reducing access opportunities. Previously, in his Decision No. 316/QD-TTg of Vietnam, the Prime Minister approved the pilot implementation of mobile money service for 2 years, starting on March 9, 2021, nationwide. The mobile money service allows customers to use telecommunications accounts to perform many different transactions, such as payment for goods and services of small value, transfer money, deposit money, and withdraw money directly at the network's stores and transaction points nationwide without a bank account. People without a smartphone can carry out these transactions, and they also don't need to have an internet connection.

According to data from the Ministry of Information and Communications in Vietnam, in the first six months of 2022, the number of mobile subscribers using the mobile money service had increased by four times compared to the first month of implementation. The average monthly growth was about 20%. The total number of accounts with at least one transaction in six months reached 1.7 million accounts, accounting for 97.3% of the total customers registering and using the service (The Ministry of Information and Telecommunications, 2022). As of July 2022, approximately two million mobile subscribers were using mobile money services in Vietnam (Statista Research Department, 2023). In Vietnam, the percentage of people using mobile money payment methods is not high, but it is still highly appreciated for its applicability and development prospects because more than 60% of Vietnam's population lives in rural and mountainous areas. According to information from the Government Electronic Newspaper, experimenting with the mobile money telecommunication payment method, by October 2022, there were 2.2 million accounts in use in Vietnam, or 440% higher compared with the end of 2021. More than 1.3 million people who registered and used it were in rural and remote areas, borders and islands, which accounted for 68% of the total number of people registering and using the service, more than 14,000 units accepting payment, and more than 50% of business locations were located in rural areas (Government Electronic Newspaper, 2022), (The Ministry of Information and Telecommunications, 2022). According to information from the Saigon Giaiphong Newspaper, by early May 2023, the number of mobile money service users in Vietnam had reached more than 3.9 million, three times higher than in 2022 (Saigon Giaiphong News, 2023). Moreover, more than 2.7 million customers in rural, mountainous, remote, and mountainous areas have been using the service, accounting for 69 percent of customers using the service. The total number of transactions, including deposits, withdrawals, money transfers, and payments using mobile money, is more than 26.1 million, with a total value of about VND1,683 billion (US$69,567,684).

The potential of the Vietnamese market is huge. By the end of 2023, Vietnam will reach 100.3 million people (Government News, 2024). Compared to Vietnam's population size, the number of mobile money users is still low and the Government's goal of bringing financial services to remote areas has not been guaranteed.

The thrive of mobile money in the financial and technology world and the research in

academic is unsynchronized (Bakri et al., 2023). How would the Vietnam mobile money provider ensure that the user adoption is at its highest rate when they studied the consumer behaviour in the apps? It is therefore thought to be crucial to investigate the connection between the attitudes of Vietnamese consumers and their propensity to accept mobile money. This article aims to investigate the variables that affect Vietnamese consumers' behavioral intention to use mobile money. Examining the tools used to gauge Vietnamese consumers' inclinations toward mobile money usage is another goal of this research.

II. Literature Review and Hypotheses Development

A. Mobile Money

Depending on the degree of technological advancement and the integration of technology into financial and telecommunications services, there are variations in the global understanding of mobile money. Numerous studies have discussed mobile money because it is frequently confused with e-wallets due to their similar external expressions of using mobile phones to perform services (Tobbin, P., & Kuwornu, 2011), (Baganzi & Lau, 2017), (Jack & Suri, 2011). Mobile money characteristics, according to Sunduzwayo Madise (Madise, 2019), mobile money has six characteristics, which are utility and value, unit of account, portability, consistency, recognition, and legal tender.

Mobile money promotes financial inclusion (Donovan, 2012), promotes economic growth and has a significant impact on macro outcomes, such as interest rate and inflation (Mawejje & Lakuma, 2019). For the micro-economy, mobile money facilitates the safe storage and transfer of money, makes it easy for people to pay for goods and services, and facilitates trade (Jack & Suri, 2011). Many researchers also point out that mobile money brings convenience and flexibility to money users because they can transact anytime, anywhere (Bisht & Mishra, 2016). Studies also revealed that mobile money usage can promote access to and use of financial services, especially among the rural population (Jack & Suri, 2011), (Aker & Mbiti, 2010), (Aker & Mbiti, 2010). This has promoted the commercialisation of agriculture, rural development and poverty alleviation (Kikulwe et al., 2014). However, using mobile money have also disadvantages (Gutierrez Eva & Choi Tony, 2014). The first is a security issue. Customer data can be compromised, there is the possibility of users losing personal information due to the use of mobile transactions. There are also many legal risks that mobile money fraud will increase if there is a lack of supervision of state management agencies.

B. Behavioural Intention in Mobile Money

The technology acceptance model (TAM) is a very well-liked and widely used theoretical framework that has drawn attention from users in information system (IS) and mobile banking research (Lai, 2017). The TAM model had an overall 40% evidence of effectiveness in predicting the system use (Legris et al., 2003). The main theoretical framework for technology diffusion is the TAM, which was created by Davis (1989) as an extension of the theory of reasoned action (TRA) and takes into account the usability and functionality of technology (Coffie et al., 2021). Furthermore, theory of planned behavior (TPB), an individual's intention is influenced by their behavior, social norms, and perceived behavioral control (Ajzen, 1991b). The intended action or plan to be carried out is called an intention, and it is

one of the factors used to evaluate a person's behavioral ability. Ajzen (1991) asserts that an individual's intention is driven by motivation and signifies their willingness to engage in a particular behavior or course of action that they hope to accomplish.

This model comprises four six factors: behavioural intention, attitude, self-efficacy, perceived ease-of-use, technology anxiety, perceived usefulness. TAM and TPB have become crucial model to explain the application of Information & Communications Technologies in different area, such as mobile banking (Muzurura & Chigora, 2019) and mobile payment (Jack & Suri, 2011).

C. Conceptual Framework and Hypothesis Development

The research team built the model based on the studies of (Aker & Mbiti, 2010), (Jack & Suri, 2011), (Aker & Mbiti, 2010), (Donovan, 2012), (Gutierrez Eva & Choi Tony, 2014), (Davis, 1989), (Ajzen, 1991b). There will be six variables including self-efficacy, perceived ease-of-use, technology anxiety, perceived usefulness, attitude toward mobile money and intention to use mobile money. Figure 1 summarises our proposed model and hypotheses.

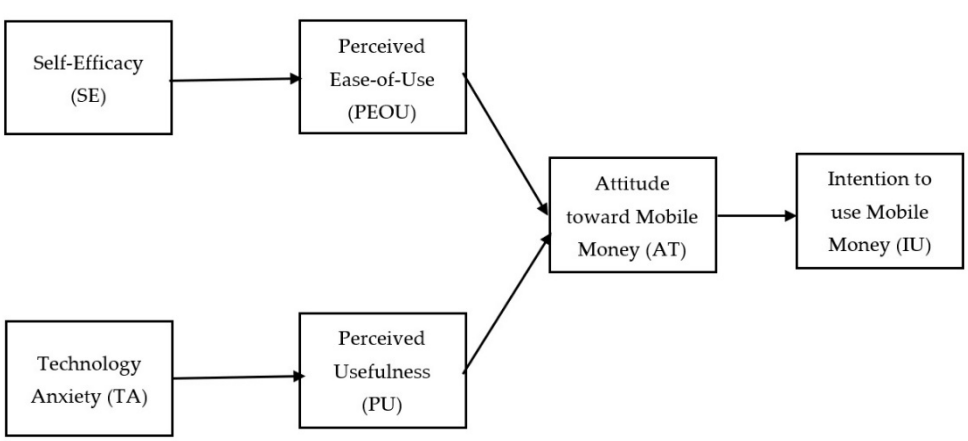
The research hypotheses were formulated as follows:

Self-efficacy (SE) is considered to be a major factor in the intrinsic motivation of individual consumers (Davis, 1989) and was found to have an indirect influence on behavioural intention (Bandura, 1994).

Specifically, SE has long been associated with ease-of-use as seen in the literature on technology adoption (Pavlou & Fygenson, 2006). Several empirical studies support the effect of effectiveness on technology adoption behaviour (Ellen et al., 1991). Consumers with high levels of SE are more motivated to perform certain tasks than consumers with low levels of SE because they are more confident in achieving task-positive outcomes (Noe & Wilk, 1993). Consumers with high levels of technological SE were more engaged in the use of technology-based services (Dabholkar & Bagozzi, 2002). This research concurs with this idea of Lim & Qi and posits that PEOU leads to positive attitudes toward using and SE encourages higher intention (Lim & Qi, 2023). Therefore, consumer's self-efficacy can predict consumer adoption of mobile money. Based on this, the research tests the hypothesis:

H1. SE has a positive direct effect on the perceived ease of use (PEOU).

H2. SE mediates the effect of perceived ease of



Source: Author's recommendation based on literature review

Figure 1. Research model

use on the attitudes toward mobile money (AT).

H3. SE mediates the effect of the attitudes toward mobile money on the intentions to use mobile money (IU).

Technology anxiety (TA) can be evoked in consumers (Meuter et al., 2003) and influence their attitudes and behaviours towards the use of technology. Similarly, Parasuraman suggests that these consumers' positive or negative feelings towards technology are closely related to their behaviours (Parasuraman, A, Ziethaml, V. and Berry, 1985).

Technological anxiety can cause consumer discomfort with technology itself (Liljander et al., 2006). Research by Meuter et al. has shown that technology anxiety is an important indicator of consumers' intentions to use technology-based services (Meuter et al., 2003).

Gelbrich and Sattler find that anxiety about technology reduces mental acceptance of technology (Gelbrich & Sattler, 2014); consumers feel nervous about using a new technology, which leads to a negative impact on their intentions to use it. Similarly, anxiety about technology has a negative effect on the adoption of new forms of technology (Chen & Chang, 2013). Hence, herefore, the following hypothesis was proposed:

H4. TA has a negative direct effect on perceived usefulness (PU).

H5. TA mediates the effect of perceived usefulness on AT.

H6. TA mediates the effect of the attitudes toward mobile money on IU.

Perceived ease-of-use (PEOU) is the extent to which a person believes that using a particular system will not require effort (Davis, 1989). This means that little effort should be needed for the user to use a particular form of technology. This effort can be physical and mental (Taylor & Todd, 1995). Extensive research has documented evidence on the significant effect of PEOU on AT (Adams et al., 1992), (Davis, 1989), (Guriting & Oly Ndubisi, 2006), (Ramayah Jantan et al, 2003). PEOU in mobile payments is evaluated based on the registration process, payment methods, customer service access methods, and required payment processes. Users will feel that the service provider is providing them with convenience when a system is simple to use, straightforward, and easy to operate (Gefen et al., 2003), (Ha et al., 2023). The ease of use of the payment method, the simplicity of the registration process, the ease of access to customer support, the number of steps required to make a payment, the availability of mobile money transfer agents, and the ease of use of the service on smartphones with basic features and software are all considered PEOUs in the context of mobile money services. With these considerations, the research hypothesised that:

H7. PEOU has a positive direct effect on AT.

H8. PEOU mediates the effect of the attitudes toward mobile money on IU.

Perceived usefulness (PU): the most important component of TAM, perceived usefulness (PU), defines how users see the possible advantages of utilizing a technological product and fosters a favorable impression of it (Davis, 1989). Perceived usefulness in mobile money payments is also defined as the degree to which users think that using mobile money will make their transactions easier (Prayudi et al., 2022). Therefore, PU has a significant impact on user attitudes toward improving performance through the use of mobile money services, such as simple payments, fast response times, and effective services. Furthermore, people are more likely to think mobile money works if they think it's a safe and dependable way to send and receive money. Previous research also confirmed that PU plays a significant role in maintaining the use of mobile payment technologies (Daragmeh et al., 2021), (Puriwat & Tripopsakul, 2021), (Rahi et al., 2023). Hence, the next hypothesis has been constructed:

H9. PU has a positive direct effect on AT.

H10. PU mediates the effect of the attitudes toward mobile money on IU.

Attitude toward mobile money (AT), according to the Theory of Reasoned Action (TRA) developed by (Ajzen, 1991a), indicates that the behavioural intention can be explained by the attitude toward behaviour that is defined as an individual's positive and negative feelings about behaving in a particular way. Additionally, in the TAM proposed by Davis, a system's attitude can explain a behavior's intention (Davis, 1989). Lin discovered a strong and favorable relationship between behavioral intention and attitude to explain the uptake or continuous use of mobile banking (Lin, 2011). Deb and David provided empirical evidence for the beneficial impact of attitude on behavioral intention (Deb & Lomo-David, 2014). Thus, the following hypothesis is formulated:

H11. AT have a positive direct effect on IU.

Intention to use (IU) is a familiar research topic in marketing. Intention to use can be found in research on the Theory of Intended Behaviour (TPB) (Ajzen, 1991b). Intention to use is considered the best predictor of the actual behaviour of adoption and use of any new technology (Davis, 1989), (Liébana-Cabanillas et al., 2015), (Venkatesh et al., 2003). Therefore, when determining the degree to which consumers accept using mobile commerce, the intention to use it is chosen as a dependent variable.

In summary, Table 1 provides an overview of the constructs that may influence the intention to use mobile money (scales are shown in detail in Appendix).

III. Research Methodology

A. Population and Sample

A purposive sampling technique was applied to select the various research areas, and simple random sampling. Survey participants were consumers in eight regions of Vietnam, including the Northeast, Northwest, Red River Delta, North Central, Central Highlands, South Central Coast, Southeast and Mekong River Delta regions. Samples were guaranteed in all areas with uniform proportions. According to Hinkin, the right sample size should have an item-to-response proportion ranging from as low as 1:4 to as high as 1:10 for each set of scales to be factor examined. In this research, there were 25 items to be assessed; hence, an ideal sample size should be between 100 and 250 respondents for adequate factor analysis (Hinkin, 1998). From this perspective, 307 responses in all—whether from the demographic or scale sections—were determined to be useable from the data that was gathered after partial returns and missing responses were eliminated. Based on the results of

Table 1. Summary of factors affecting the intention to use

Variable	Author, Year, Impact
Self-efficacy (SE)	(Davis, 1989) (+), (Ellen et al., 1991) (+), (Noe & Wilk, 1993) (+), (Bandura, 1994) (+), (Dabholkar & Bagozzi, 2002) (+), (Pavlou & Fygenson, 2006) (+)
Technology anxiety (TA)	(Parasuraman et al., 1985) (-), (Meuter et al., 2003) (-), (Liljander et al., 2006) (-), (Chen & Chang, 2013) (-), (Gelbrich & Sattler, 2014) (-)
Perceived Ease of Use (PEOU)	(Davis, 1989) (+), (Taylor & Todd, 1995) (+), (Adams et al., 1992) (+), (Ramayah Jantan et al, 2003) (+), (Gefen et al., 2003) (+), (Guriting & Oly Ndubisi, 2006) (+), (Ha et al., 2023) (+)
Perceived Usefulness (PU)	(Davis, 1989) (+), (Daragmeh et al., 2021) (+), (Puriwat & Tripopsakul, 2021) (+), (Prayudi et al., 2022) (+), (Rahi et al., 2023) (+)
Attitude toward mobile money (AT)	(Ajzen, 1991b) (+), (Davis, 1989) (+), (Lin, 2011) (+), (Deb & Lomo-David, 2014) (+)
Intention to use (IU)	(Davis, 1989) (+), (Ajzen, 1991b) (+), (Venkatesh et al., 2003) (+), (Liébana-Cabanillas et al., 2015) (+)

Source: Compiled by the author (+ positive - negative)

the literature review, the research team built a scale and questionnaire to conduct research directly and online through Google Forms for consumers in Vietnam. The data collected are for quantitative research.

As described in Figure 1, the conceptual model was built with details of eleven constructs. The measurement scale was built by referring to previous studies. The seven-point Likert measurement scale ranges from 1 for "strongly disagree" to 7 for "strongly agree" (Likert, 1932).

B. Analysis Techniques

The Structural Equation Model (SEM) was chosen for this research in order to test the hypothesis and facilitate the simultaneous testing of a number of relatively complex relationships (F. Hair Jr et al, 2014).

Confirmatory factor analysis (CFA) was used in the first stage of SEM to confirm the accuracy and dependability of the data collected. Factor loading is a component of CFA testing; reliability indicators include Cronbach's Alpha (CA), composite reliability (CR), and extracted average variance (AVE). To test the hypothesis, full model testing is the second step (Hair et al., 2016). Among the tests needed for SEM are structural relationships (F. Hair Jr et al, 2014). SEM calculations using Smart PLS 3.0 software which allows testing of larger models to gain new insights from the data.

IV. Results and Discussion

A. Respondent Demographics

Based on the results of distributing questionnairesto 307 respondents, the percentage of women's Vietnam (56.03%) who participated in using mobile money was higher than that of men (43.97%). Age of the respondents is Gen X (1965-1980) accounted for 30.29%, Gen Y (1981-1996) was 38.11% and Gen Z (1997-2012) was 31.6%. Respondent residences distributed in the regions with a rate of 14.66% in the Northwest, 13.68% in the Mekong Delta, 13.03% in the Northeast, 12.7% in the Central Highlands, 12.38% in the North Central, 12.05% in the Southeast, 11.4% in the Red River Delta and 10.1% in the South Central Coast of Vietnam. The respondents mainly graduated from universities/colleges (40.07%), and high school/vocational intermediate education was 33.88%. Another 14.1% were comprised of those with postgraduate qualifications, 9.77% graduated from lower secondary schools and 2.28% only achieved elementary level educations. The majority of the interviewees (37.13%) had an average monthly income of 4-9 million VND (equivalent 164USD - 369.13USD), and individuals with incomes in the range of 9-14 million VND (equivalent 369.13USD - 574.03USD) accounted for 28.66%. The remaining income levels accounted for 10.75% of the interviewees, with incomes in the range of 14-19 million VND (equivalent 574.03USD - 782.86USD), 10.75% had incomes from 19 million VND and more, 8.47% had incomes below 4 million VND and 4.23% of the survey respondents had no income.

The data obtained showed that Viettel's mobile money users were the highest with 144 people (42.1%). The second was VNPT, with 112 people (32.7%) and the last was MobiFone with 86 people, accounting for 25.1% (Viettel, VNPT, MobiPhone are mobile money service providers in Vietnam). The majority of the users (64.6%) used the services when there was a need for telecommunications services (to top up phone cards, scratch cards, buy packages). Money transfers and receipts accounted for 61.4%; bill payments (electricity, water, internet) accounted for 55.3%, shopping and entertainment (Lotto) accounted for 28.9%, finances and insurance (borrowing money, savings) accounted for 23.1%, travel and tourism (hotel bookings) accounted for 13.5% and other purposes accounted for 16.1%. The majority of the people used mobile commerce because friends referred them (55.0%). Advertising on television and social networks was 45.8%, referred by relatives

was 43.6%, colleague referrals was 33.9%, mobile money dealers was 21.1%, means of transport (bus, taxi) was 20.9% and other reasons/options was 5.7%.

B. Confirmatory Factor Analysis

A research with an external loading factor (outer loading) > 0.6 was accepted. An exploratory research accepted an external factor loading factor > 0.4 (Moores & Chang, 2006) ≥ 0.7 (Joseph F. Hair et al., 2019). In the stuty, the outer loadings of the variables AT4 and TA2,3,4 are eliminated because the outer loading coefficient is less than 0.7, specifically 0.667 and 0.457; 0.241; 0.129. In other variables with outer loading coefficients were high [0.739 - 0.859] > 0.6. The quality of observed variables is guaranteed (Table 2).

There are several reasons for outer loading of TA cannot exceed the limit of papers requirement or standard in the analysis section. Vietnamese culture in money management. The habit of using cash in payment is a barrier to the development of mobile money services in Vietnam. Vietnamese users are familiar with direct payment methods in cash, common online payment methods using bank applications or via QR codes of e-wallets. Besides, other reasons may come from the survey subjects. Nearly 70 percent of respondents come from Gen Y and Gen Z. These generations were born when the internet was widely used. They grew up in a rapidly developing digital environment, with new and unique trends. Based on early and diverse exposure to technology, these generations tend to be creative and innovative in using technology to solve social problems. They also have the ability to use technology to connect and convey their messages to the global community through social networks and digital communication tools. Therefore, they do not appreciate TA factor. They may not be afraid of making mistakes or afraid to use new technology or worry about their data being violated when using mobile money.

C. Structural Model

According to Hair, internal consistency reliability and convergent validity should be established while testing for moderation effect (Hair et al., 2016). The CR and CA were the two metrics used to test the construct's reliability. The construct was deemed reliable if the CR and CA values were more than

Table 2. Outer loadings

Factor		Outer loading	Factor		Outer loading
1. Self-efficacy (SE)	SE1	0.813	4. Perceived usefulness (PE)	PU1	0.784
	SE2	0.798		PU2	0.739
	SE3	0.768		PU3	0.779
	SE4	0.750		PU4	0.799
2. Technology anxiety (TA)	TA1	0.795		PU5	0.770
	TA2	0.457	5. Attitude toward mobile money (AT)	AT1	0.828
	TA3	0.241		AT2	0.762
	TA4	0.129		AT3	0.765
3. Perceived ease-of-use (PEOU)	PEOU1	0.814		AT4	0.667
	PEOU2	0.848	6. Intention to use mobile Money (IU)	IU1	0.743
	PEOU3	0.839		IU2	0.790
	PEOU4	0.859		IU3	0.794
				IU4	0.805

Source: Data processing results using SmartPLS

0.7. The CA results of all variables are greater than 0.7, ensuring reliability. The results of the CR and the validity tests revealed that the variables of AT, IU, PEOU, PU, and SE had reliability coefficients of 0.843, 0.864, 0.906, 0.882, and 0.863, respectively. Additionally, based on the AVE index to evaluate the convergence of the scale, a scale reaches convergence value if the AVE is 0.5 or higher (Höck et al., 2010). The construct validity figures for the variables were 0.574, 0.614, 0.706, 0.600 and 0.612 for AT, IU, PEOU, PU and SE, respectively. The CR result of TA is 0.460 and the AVE result of TA is 0.229, which does not ensure reliability. The results of the CR and validity for the variables are shown in Table 3.

The heterotrait-monotrait ratio (HTMT) was employed in the article to assess the discriminant of the scale. When the HTMT index is less than 0.9, the discriminant value between the two latent variables is assured (Henseler et al., 2015). The research results in Table 4 show that the scale's discriminant is very good, meaning that all HTMT values are significantly below the 0.85 threshold. As a result, every factor satisfies the criteria for discriminant value. Table 4 displays these outcomes.

Prior to assessing the structural model, reliability testing was necessary to enable generalization of the research findings. The author used a recurrent sample size of 5,000 observations (n=5000) when using the bootstrapping approach. The original weights were significant when compared to the mean bootstrapping weights, according to estimation results based on 5,000 observations. All of the weights in the model were within the 95% confidence interval, indicating the reliability of the estimates.

To evaluate the structural model, considerations included the multicollinearity evaluation VIF coefficient, the impact coefficient, the significance of the impact levels, the coefficient R Square, and the f Square. If the VIF is 5 or more, the model is likely to appear multicollinear (Joseph F. Hair et al., 2019). There was no multicollinearity in the SEM model because all of the structures' VIF coefficients were less than 2.

The adjusted R-squared reflected the explanatory level of the independent and dependent variables in the research model. With an adjusted R-squared of IU of 0.232 in Table 5, the research's independent variables could only account for 23.2% of the variance; systematic error and other non-model contributing factors accounted for the remaining 76% of the variance.

The independent variable's strong and weak effects on the dependent variable were assessed using the coefficient of determination (f Square). The f Square index used to assess the significance of the independent variables: f Square < 0.02 level of impact was extremely small or no impact, 0.02 ≤ f Square <

Table 3. Reliability indicator valid test

	CA	CR	AVE
AT	0.755	0.843	0.574
IU	0.791	0.864	0.614
PEOU	0.861	0.906	0.706
PU	0.834	0.882	0.600
SE	0.790	0.863	0.612
TA	0.915	0.460	0.229

Source: Data processing results using SmartPLS

Table 4. Discriminant validity for the constructs (HTMT)

	AT	IU	PEOU	PU	SE
AT	0.599				
IU	0.558				
PEOU	0.578				
PU	0.556	0.740			
SE	0.150	0.684	0.643		
TA	0.599	0.084	0.048	0.098	

Source: Data processing results using SmartPLS

Table 5. R - Square

	R-square	R-square adjusted
AT	0.271	0.267
IU	0.234	0.232
PEOU	0.324	0.321
PU	0.004	0.001

Source: Data processing results using SmartPLS

0.15 was of small impact, 0.15 ≤ f Square < 0.35 was average impact and f Square ≥ 0.35 was a large impact. According to the obtained data in Table 6, the impact level of variable AT on IU was average with an f Square value of 0.306.

The results of the path coefficients after bootstrap analysis are shown in Table 7. The results showed that five of eleven of the effects had P values equal to 0.000 < 0.05. The Original Sample (O) column shows the direct and indirect relationships between the variables in the SEM model, in which the variable AT is dependent, under the direct influence of two variables, PEOU and PU, with the corresponding standardised regression coefficients (0.255; 0.321). The variable IU is dependent, under the direct influence of the variable AT, with a standardised regression coefficient of 0.484.

The indirect relationships of SE to AT and IU are supported with effect coefficients of 0.145 and 0.070, respectively. The indirect relationships of PEOU and PU to IU are supported with impact coefficients of 0.123 and 0.156, respectively. The direct and indirect relationships of TA to PU, AT and IU are not supported because the P value coefficient is greater than 0.05. The TA variable does not affect the results of PU and IU due to the outer loading, CR, AVE, HTMT, f Square and P-values of TA cannot exceed the limit of papers requirement or standard in the analysis section. And the main reasons are Vietnam's cultural differences in money

Table 6. F-Square

	AT	IU	PEOU	PU	SE	TA
AT		0.306				
IU						
PEOU	0.053					
PU	0.085					
SE			0.478			
TA				0.004		

Source: Data processing results using SmartPLS

Table 7. Path Coefficient

Hypothesis	Hypothesis path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistic (O/STDEV)	P values	Conclusion
Direct							
H1	SE -> PEOU	0.569	0.571	0.058	9.737	0.000	Supported
H4	TA -> PU	-0.062	-0.005	0.091	0.680	0.497	Not Supported
H7	PEOU -> AT	0.255	0.256	0.077	3.294	0.001	Supported
H9	PU -> AT	0.321	0.325	0.073	4.414	0.321	Not Supported
H11	AT -> IU	0.484	0.490	0.050	9.668	0.000	Supported
Indirect							
H2	SE-> AT	0.145	0.148	0.051	2.817	0.005	Supported
H3	SE -> IU	0.070	0.073	0.029	2.440	0.015	Supported
H5	TA->AT	-0.020	-0.002	0.030	0.664	0.507	Not Supported
H6	TA -> IU	-0.010	-0.001	0.015	0.656	0.512	Not Supported
H8	PEOU -> IU	0.123	0.126	0.044	2.823	0.005	Supported
H10	PU -> IU	0.156	0.159	0.039	3.961	0.000	Supported

Source: Data processing results using SmartPLS

management and survey subjects as mentioned in the previous section.

V. Conclusion

A. Policy Implications

Vietnam is full of conditions to approve and develop mobile money payment products and services, contribute to promoting non-cash payments and meeting the increasing needs of the people. However, consumers' attitudes towards the new mobile money service are still not very positive because of the risks in customer authentication, technology and the telecommunications infrastructure. In addition, the reason behind the result is the Vietnamese culture in money management and response to a new technology. Therefore, with the aim of deploying mobile money services effectively, enterprises upgrade and invest in infrastructure and telecommunications networks and promote communication about the beneficial features of mobile money to enhance positive attitudes towards service intentions. Advertising is a powerful tool that bankers and mobile network operators can use to shape consumers' perceptions of financial services, and their intention to use this new payment method. An additional strategy to raise awareness and change attitudes with customers is through personal selling. This can be done through online surveys and/or a discussion forum. Such actions can improve the intention to use mobile money services in particular and cashless payment methods in general.

For the Vietnamese government, the author proposes some implications. Firstly, the government should complete the legal framework and corridor on mobile payments in general and mobile money in particular. Currently, Vietnam's legal regulations are not complete and consistent, which may pose potential risks during implementation. There are many intertwined legal corridors related to mobile money services such as Cyber Security Law, Enterprise Law, Investment Law, Information Technology Law, etc. Therefore, the development trend along with the benefits of mobile money requires a clear, specific, and strict legal framework to institutionalize the government's policy. Secondly, the Vietnamese government further improves regulations on information security in mobile financial transactions. The state needs to make mandatory, specific, and more diverse regulations on advanced security technology options used by many developed countries such as electronic identification technology (eKYC) with higher accuracy, machine learning methods, and contactless payment solutions to help citizens feel more secure in mobile money transfer, deposit, and withdrawal transactions. Finally, the government should change and improve financial policies for mobile money service users. The policy should expand participants and increase payment limits. Increasing the mobile money usage limit is essential because Vietnam's current mobile money testing policy is an obstacle for people who regularly shop online. Especially those living and working in urban areas.

B. Limitations

Several limitations were found in this research. First, the research was conducted in Vietnam, and the results may not generalise customer attitudes towards mobile money in other countries. Secondly, future researchers can overcome such limitations by carrying out a cross-country comparative study between developing countries and developed countries. Cultural aspects are also important to highlight in further articles because money management cultures differ from country to country. Thirdly, this research used multiple choice responses, which certainly did not allow as much freedom in the responses as free-form responses would and could lead to unreliable data. Additionally, a survey directed for the use of mobile money could allow more in-depth and specific analysis of the relationship between attitudes and intentions to use mobile money. Finally, there should be an analysis customers' character traits

on customer intentions.

C. Further Research Direction

Digital financial services in the form of mobile money have a positive quantitative and qualitative impact on the development of financial inclusion in developing economies. Basically, future research orientation will beneficially apply the influence of mobile money to the development of non-cash payment activities, enhancing the accessibility and use of specialised financial services in the rural, remote, frontier and island areas of Vietnam. Therefore, future research directions will focus on the correct awareness of customers about the beneficial features of mobile money. When they fully understand mobile money usage information, users will change their beliefs as well as their service usage trends to match their behaviours and social motivations. Additional research should be conducted, as this research does not cover all of the variables that affect the behavior to use mobile money services. With appropriate expansion variables, the additional research should cover a wider range with a larger sample size and higher objectivity and focus on other variables, such as the influence of the social environment, confidentiality, riskiness and legal corridors.

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Appendix

Variable	Items	Source
Self-efficacy (SE)	SE 1. I learn how to use mobile money on my smartphone easily; SE 2. I could use mobile money if someone showed me how to do it; SE 3. I could use mobile money if someone supports me when I am in trouble; SE 4. I can complete a money transfer or pay a bill with mobile money if I have plenty of time.	(Davis, 1989), (Ellen et al., 1991), (Noe & Wilk, 1993), (Bandura, 1994), (Dabholkar & Bagozzi, 2002), (Pavlou & Fygenson, 2006)
Technology anxiety (TA)	TA 1. Mobile money service makes me feel uncomfortable; TA 2. I feel apprehensive about using new technology; TA 3. I fear that I will do the wrong thing when I use new technology; TA 4. I am worried about my data being compromised when using mobile money.	(Parasuraman et al., 1985), (Meuter et al., 2003), (Liljander et al., 2006), (Chen & Chang, 2013), (Gelbrich & Sattler, 2014)
Perceived Ease of Use (PEOU)	PEOU 1. Mobile money allows me to easily control my financial transactions; PEOU 2. Mobile money brings convenience to use; PEOU 3. Steps to use mobile money are easy for me; PEOU 4. Mobile money gives me more freedom of mobility.	(Davis, 1989), (Taylor & Todd, 1995), (Adams et al., 1992), (Ramayah Jantan et al, 2003), (Gefen et al., 2003), (Guriting & Oly Ndubisi, 2006), (Ha et al., 2023)
Perceived Usefulness (PU)	PU 1. In general, the mobile money could be useful for me PU 2. I can use mobile money to easily make financial transactions by phone PU 3. The mobile money service system is a useful mode of payment PU 4. Mobile money saves me time doing transaction service PU 5. Mobile money saves me shopping time	(Davis, 1989), (Daragmeh et al., 2021), (Puriwat & Tripopsakul, 2021), (Prayudi et al., 2022), (Rahi et al., 2023)
Attitude toward mobile money (AT)	AT1. From negative to positive AT2. From inconvenience to convenience AT3. From poor to excellent AT4. From inattractive to attractive	(Ajzen, 1991b), (Davis, 1989), (Lin, 2011), (Deb & Lomo-David, 2014)
Intention to use (IU)	IU1. I intend to use/reuse mobile money in the short or long term IU2. When there are suitable conditions (mobile device or financial capacity or access to mobile money service providers...), I will use mobile money services IU3. I will learn how to use mobile money better IU4. I will utilize mobile money for my transaction activities to the extent possible	(Davis, 1989), (Ajzen, 1991b), (Venkatesh et al., 2003), (Liébana-Cabanillas et al., 2015)

Source: Compiled by the author