



Empowering mobile money users: The role of financial literacy and trust in Vietnam

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ABSTRACT

While other countries have implemented mobile money very early with promising results, Vietnam, a bank-based country, only started the pilot implementation in November 2021. By the end of the pilot period, the percentage of people with mobile money accounts still needs to reach expectations. In this respect, our study focuses on financial literacy and perceived trust by analyzing consumers' intention to use mobile money. The results of the analysis show that six factors affect the intention to use mobile money, including (1) Perceived Usefulness, (2) Perceived Ease of Use, (3) Perceived Risk, (4) Perceived Value, (5) Financial Literacy, and (6) Perceived Trust. Although perceived trust does not have the most decisive direct impact, it plays a mediating role in promoting the intention to use mobile money. Perceived Trust helps users significantly increase their perceived usefulness and intention to use. Perceived Trust also indirectly increases the Perceived Value in the intention to use mobile money. In addition, the newly constructed financial literacy factor also significantly impacts the intention to use mobile money. The research results help clarify the role and mechanism of perceived trust in the intention to use mobile money. At the same time, it helps managers consider increasing the capacity of mobile money through perceived trust and financial literacy in a country where the banking system has been relatively expanded.

1. Introduction

Mobile money has become a popular method of accessing financial services, especially in countries with relatively less developed financial systems and low infrastructure coverage. In developing countries like Kenya, the Philippines, and Indonesia, mobile money has brought significant changes by providing rural areas access to safe, fast, and cost-effective money transfer and payment services compared to using cash. Overall, studies on mobile money worldwide focus on developing countries or countries with distinct and remote regions.

Many review articles have been published in the literature review, including delivery, environmental factors, and the impact of mobile money (Kim et al., 2018) and empirical studies on the impact of mobile money on development (Ahmad et al., 2020) and socioeconomic outcomes (Nan et al., 2021) in Sub-Saharan Africa.

Concerning the determinants of consumer behaviour perspective, there are numerous studies on the determinants of mobile money in

individual countries such as Ghana (Narteh et al., 2017; Penney et al., 2021), the Philippines (Pickens, 2009), and Kenya (Buku & Meredith, 2012), one of the first and most successful cases. Financial literacy has been mentioned in a few of these studies, but it has been measured using numeric rating scales (Balasubramanian et al., 2020; Hasan et al., 2020; Morgan & Trinh, 2020). Similarly, a few studies have examined perceived trust (Baganzi & Lau, 2017; Kim & Jones, 2009; Noreen et al., 2021; Penny et al., 2021), but none have investigated these factors in the context of pilot programs or the growing threat of cybercrime.

In this study, we develop a model to explain the critical role of trust in the behavioural intention of users to adopt mobile money services. The study also examines how financial literacy, as measured on a perceived scale, actually affects the adoption of mobile money. In addition, Vietnam was chosen as the research sample because it is surprising to see that, while many countries around the world (according to (GSMA, 2022) have nearly 100 countries) have implemented mobile money for a long time, Vietnam has just implemented this in 2021 and is

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still in the pilot phase.

Our study contributes to the literature by (1) explaining the details about the pilot mobile money in Vietnam, a bank-based country with domestic credit to the private sector (% of GDP) of 155.5%; (2) introducing a multidimensional perception scale based on theories, previous studies, and experts' adjustments to measure financial literacy based on the perspectives of attitude, skills, and knowledge; (3) building a model that combines the two variables of financial literacy and perceived trust, in which perceived trust is a mediator. The results of this model provide lessons for the advantage of latecomers. They also suggest many lessons for countries worldwide in their efforts to promote financial inclusion by strengthening financial literacy and perceived trust.

The rest of the study is as follows: Section 2 overviews the pilot mobile money in Vietnam. Sections 3 and 4 provide the theoretical reviews of the conceptual framework and hypotheses development. Section 5 includes the research methodology which involves data analysis using AMOS 22 and structural equation modelling (SEM). Section 6 describes the current situation of mobile money in Vietnam, along with previous research. Finally, Section 7 is devoted to conclusions, recommendations, limitations, and future study suggestions.

2. Pilot mobile money in Vietnam

2.1. Vietnam before the pilot implementation

Vietnam is a bank-based country where the primary source of capital for economic development is based on banks rather than the stock market. The banking sector has also made great efforts to provide cashless payment services: (1) Most banks know the importance of electronic banking services with payment methods via mobile phones, the internet, QR codes, and connections with many e-wallets. Vietnam also allows 50 non-bank organizations to provide payment intermediary services (e-wallets-linked to bank accounts) (SBV, 2023); (2) The Vietnam Bank for Agriculture and Rural Development (Agribank) - a 100% state-owned bank and has the largest network in the country (nearly 2300 branches and transaction offices across all regions).

However, according to statistics from the World Bank (2022), Vietnam has a high proportion of unbanked populations who do not have bank accounts compared to countries in the region and the world (Table 1).

The banking network has not yet covered all communes (Agribank is only present in 9 out of 13 island districts and concentrated mainly in urban areas), and there are transaction points in communes (such as the Social Policy Bank but does not provide payment services for people and only serves policy customers). In all provinces/cities across the country, the proportion of communes without transaction points is still relatively high, such as Hòa Bình, Yên Bái, Điện Biên, Quảng Bình, Bến Tre, only 22.2% of the number of communes/towns have financial service supply points, and in Vĩnh Phúc 25% of communes have the activity of the People's Credit Fund. Many provinces and cities have a lower

Table 1
Percentage of people without a bank account (%).

Year	2011	2014	2017	2021
Vietnam	79	69	70	44
Thailand	27	22	19	6
Singapore	2	4	2	3
Philippines	73	72	68	54
Myanmar	77		74	64
Malaysia	34	19	15	12
Laos	73		71	63
Indonesia	80	64	52	49
Cambodia	96	87	82	67
ASEAN	60	48	50	40
World	49	39	33	26

Source: World Bank (2022)

percentage of adults with bank transaction accounts than the national average, such as Bắc Kạn 57.1% (Bank Strategy Institute, 2023).

It can be seen that Vietnam's access to banking services still needs to improve due to the following reasons: (1) There are still many remote areas with sparse populations, difficult transportation, and uneven educational levels. The proportion of the population living in rural areas accounts for over 80%, and the percentage of poor and near-poor households is still high, especially in remote, ethnic minority areas; (2) Many commercial banks also do not want to open branches in communes because of high costs and low profitability.

To promote financial inclusion, the Vietnamese Government has decided to pilot mobile money services (Decision 316/QĐ-TTg) to achieve the following goals: (1) Develop cashless payments and increase access to financial services in rural areas; (2) Reduce social costs for the development of cashless payment channels and bring benefits to users; (3) Use the results of the mobile money pilot to build formal regulations on the provision of mobile money services in Vietnam.

According to the assignment of the Government, the State Bank of Vietnam signed Decisions No. 1818, 1819, and 1820, dated November 18, 2021, approving the implementation of the pilot mobile money service for two years (from November 18, 2021, to November 18, 2023) for the three most significant telecommunications service providers in Vietnam, VNPT - Media, Viettel, and MobiFone. These three businesses hold 95% of the mobile market share and 77% of the fixed broadband market share in Vietnam.

2.2. The pilot implementation of mobile money in vietnam

After nearly two years of pilot implementation, the number of mobile subscribers registered for mobile money, merchant points, and payment acceptance units has all increased (Table 2). The number of people registered and using the Mobile Money service reached nearly 3.9

Table 2
Mobile money activities in Vietnam.

Criteria	December 2021	Feb 2022	March 2022	August 2022	March 2023
Number of Viettel mobile money subscribers	402,000	569,815	721,760	2,000,000	3,900,000
Number of VNPT mobile money subscribers	61,280	260,548	366,574		
Number of Mobifone mobile money subscribers	–	4015	6586		
Total transaction points of 3 providers	2262	2642	3000	8100	9953
transaction points in rural, mountainous, remote, border and island areas	537	900			2,700,000
Total payment acceptance units	–	11,254	12,800	14,500	15,326
Number of transactions (millions)				13	26.1
Total transaction value (billion VND)				740	1683

Source: Ha & Phung, 2022, Minh Son (2023).

million, an increase of 929% from the end of 2021, of which the number of people registered and using in rural, mountainous, deep, remote, border, and island areas is more than 2.7 million, accounting for 69% of the total number of people registered and using the service. However, the number of mobile subscribers registered to use mobile money tends to decrease over the months, and the number of Mobile Money accounts compared to 156 million mobile subscribers is relatively low, only about 1.28%.

The development of mobile money in Vietnam has yet to meet expectations like other countries worldwide, such as Kenya, the Philippines, Indonesia, et cetera. It has yet to reach its full potential, and it has yet to meet the Government's goal of bringing financial services to consumers in remote areas. It is also similar to the assessment of [Andersson-Manjang \(2021\)](#), which ranks Vietnam in the low group of countries that have implemented mobile money in the world, with a mobile money penetration rate (MMPI) of 0.2–0.39.

This result contrasts the favourable factors for the development of mobile money. The unexpected reality of the mobile money pilot, along with the fact that researchers, managers, and providers have identified weaknesses and want to continue the pilot, has led to the practical need for research on consumer behaviour ([Appendix 1](#)).

3. Theoretical reviews

3.1. Mobile money

In the world, mobile money is understood differently depending on the level of technological development and the application of technology to financial and telecommunications services. Mobile money has been mentioned in many studies, such as [Tobbin \(2011\)](#), [Baganzi and Lau \(2017\)](#), [Suri \(2017\)](#), [Abor et al. \(2018\)](#) because they share similar external expressions of using mobile phones to perform services, mobile money is easily confused with e-wallets ([Ha & Phung, 2022](#)). Currently, to standardize statistics, understanding of transactions, and monitoring of participating countries in the Global Mobile Information Association, mobile money is defined as financial services connecting users through mobile networks. Mobile money services include mobile payment services (individual transactions and bill payment), mobile money transfers, transfers between subscribers, small credit transactions, account management through mobile phones, and similar services ([GSMA, 2010](#)). This article also uses this definition of mobile money because it is similar to Vietnam's legal regulations, especially Decision No. 316/QĐ-TTg issued on March 9, 2021, Article 13 and Article 3 of the draft decree regulating E-commerce transactions (replacing Decree 16/2019/ND-CP and 101/2012/ND-CP dated November 22, 2012, on non-cash payments).

3.2. Financial knowledge, financial literacy definition and measurement

Financial literacy, an individual's money management ability, was first mentioned in the United States in the 1900s. It has been defined in various ways, depending on the individual's and the researcher's perspectives. For example, [Atkinson and Messy \(2012\)](#) define financial literacy as a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual well-being. [Lusardi and Mitchell \(2011\)](#) defines it as the knowledge of basic financial concepts, such as the working of interest compounding, the difference between nominal and real values, and the basics of risk diversification. The [ANZ \(2008\)](#) defines it as the ability to make informed judgments and to make effective decisions regarding the use and management of money. Financial literacy is a broad term, and research focuses on analyzing financial literacy outcomes, assessing levels among various population cohorts, factors impacting financial literacy, and the impact of financial education on enhancing financial literacy ([Goyal & Kumar, 2020](#)). Financial literacy has different interpretations, with some studies defining it as knowledge

([Huston, 2010](#); [Świecka, 2019](#)), skills, and knowledge ([Lusardi & Mitchell, 2011](#)), while others include attitudes ([Messy, 2014](#); [Sahadeo, 2018](#); [Santini et al., 2019](#)). The [OECD \(2012\)](#) and [World Bank \(2014\)](#), two of the world's largest organizations with comparable statistics on financial literacy between countries, also agree that financial literacy is the combination of awareness, knowledge, abilities, attitudes, and habits that empower individuals to understand and effectively manage their financial resources, make informed decisions, and navigate various financial contexts. Regardless of the definition, financial literacy is essential for individuals to make sound financial decisions and achieve their financial goals.

In terms of measurement, previous studies have typically quantified financial literacy through financial knowledge and measured financial literacy through the percentage of correct answers to questions related to knowledge, mathematical skills, basic financial concepts, knowledge of fundamental risk and benefits, inflation, interest rates, basic discounting, et cetera. For instance, [Lusardi and Mitchell \(2007\)](#), [Klapper et al. \(2012\)](#), [Van Rooij et al. \(2011\)](#) evaluated financial knowledge through 13 questions. The respondents were considered to have financial knowledge if they answered at least seven questions correctly. Most studies quantify financial literacy through financial knowledge, meaning they treat it interchangeably ([Allgood & Walstad, 2016](#); [Atkinson & Messy, 2012](#); [Klapper et al., 2012](#))).

3.3. Behavioural intention in mobile money

The intention is a factor used to assess an individual's behavioural ability, which is the planned action or plan to be implemented. According to [Ajzen \(1991\)](#), the intention is motivational and reflects the individual's willingness to perform a specific behaviour, a process of action that an individual wants to achieve ([Zhao & Othman, 2010](#)). From the individual behaviour perspective, the technology acceptance theories could explain the individual decision to use technology to access financial services. Initiated by [Fishbein and Ajzen \(1977\)](#) and [Bagozzi \(1982\)](#), the theory of reasoned action (TRA) emphasizes the rationality of end-users by evaluating all possible consequences of their actions before utilizing a new technology. The Technology Acceptance Model (TAM) developed by [Davis \(1989\)](#) as an extension of TRA, considering the functionality and ease of technology, has become the primary theoretical foundation for technology diffusion ([Coffie et al., 2021](#)). Moreover, the theory of planned behaviour (TPB) by [Ajzen \(1991\)](#) indicates that the decision to use fintech comes from individual intentions, which are affected by their behaviour, norms, and perceived behavioural control. Furthermore, in order to fully understand how technology is adopted, [Venkatesh et al. \(2003\)](#) combine eight theoretical models, namely the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Combined TAM and TPB (C-TAM-TPB), Innovation Diffusion Theory (IDT), and Social Cognitive Theory, to develop the Unified theory of acceptance and usage of technology (UTAUT). This model comprises four main factors: behavioural intention, effort expectancy, facilitating conditions, and social influence. [Venkatesh et al. \(2012\)](#) expand UTAUT by including habit, hedonic motivation, and price value to establish the Unified theory of technology acceptance and usage 2 (UTAUT2). UTAUT has become a crucial model to explain the application of Information & Communications Technologies in different areas ([Rahman et al., 2020](#)), such as mobile banking ([Zhou et al., 2010](#)) and mobile payment ([Yang et al., 2012](#)).

4. Conceptual framework and hypothesis development

Based on the abovementioned theory of behaviour and previous studies on planned behaviour, the authors found that financial literacy and perceived trust have yet to be studied much. Therefore, this study researches these two variables and uses seven constructs ([Fig. 1](#)) to explore their relationship.

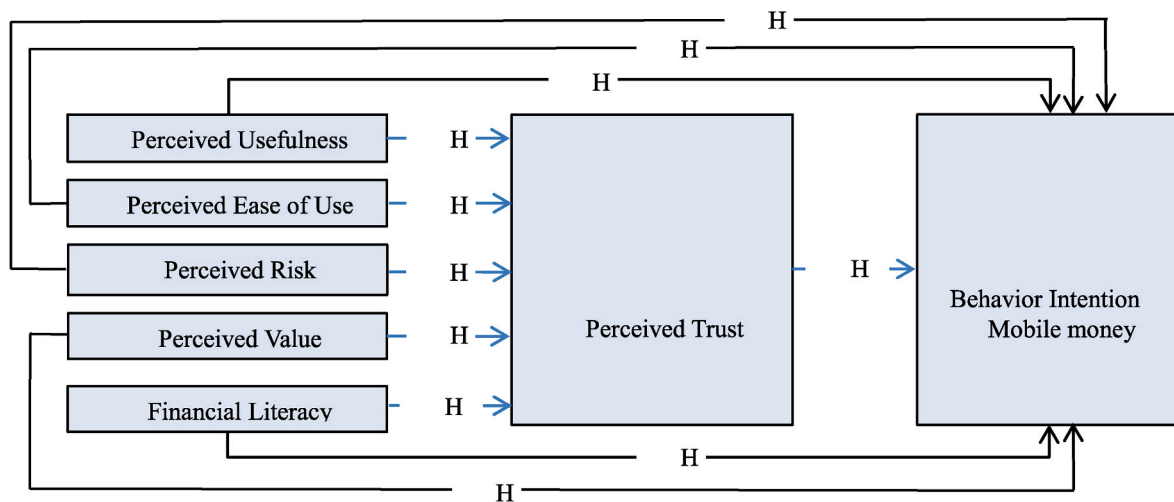


Fig. 1. Research model.

4.1. Perceived usefulness in mobile money

Perceived usefulness is "the extent to which a person believes a system will enhance their job performance." Perceived usefulness is the most prominent factor in TAM and clarifies the user's perception of the potential benefits of using a technology product, creating a positive sensation for it (Davis, 1989). Users' behavioural intention to use an information system is driven by the perception of usefulness at a high level (Davis, 1989; Park et al., 2007). In addition, there is extensive empirical evidence supporting the significant impact of perceived usefulness on behavioural intention (Chauhan, 2015; Davis, 1989; Marumbwa & Mutsikiwa, 2013; Narteh et al., 2017; Nguyen & Hoang, 2021; Okeke & Eze, 2018; Osei-Assibey, 2015; Park et al., 2007; Venkatesh, 1999). In mobile money payments, perceived usefulness is also interpreted as the extent to which consumers believe that mobile money will improve their transactions (Gede et al., 2022). As a logical consequence, perceived usefulness significantly impacts user attitudes toward improving performance using mobile money services, including convenient payments, fast response, and service efficiency. Besides, if people trust that mobile money is a secure and reliable way to send and receive money, they are more likely to believe it is functional. In other words, trust acts as a mediator in this relationship, indicating that when users perceive a higher level of trust in the mobile money system, they are more likely to find it helpful and subsequently intend to use it (Al-Somali et al., 2009; Rahmayanti & Rahyuda, 2020; Singh & Sinha, 2020). Therefore, the following hypotheses were proposed.

H1. Perceived usefulness has a positive direct effect on the intention to use mobile money.

H2. Trust mediates the effect of perceived usefulness on the intention to use mobile money.

4.2. Perceived ease of use in mobile money

Perceived ease of use is the extent to which a person believes that using a particular system will not require effort (Davis, 1989). Many studies in the past decade have identified evidence of the vital influence of perceived ease of use on intention to use: Chauhan (2015); Marumbwa and Mutsikiwa (2013); Narteh et al. (2017); Okeke and Eze (2018); Osei-Assibey (2015); Penney et al. (2021). In mobile payment, perceived ease of use is assessed through the registration process, payment procedures, accessing method to customer services, and necessary payment processes. When a system is not complex, easy to use, and easy to operate, users will perceive that the service provider provides them convenience, increasing their trust in the system (Gefen et al., 2003).

Trust also plays a mediating role here, indicating that higher levels of trust enhance users' perceptions of ease of use, increasing their intention to use mobile money services (Wang & Liao, 2007). Zhou and Lu (2010), Luo et al., 2010; Shaikh & Karjaluo, 2015; Mustika & Puspita, 2020; Gede et al., 2022; Gefen et al., 2003). Based on this, the research article tests the hypothesis.

H3. Perceived ease of use has a positive direct effect on the intention to use mobile money.

H4. Trust mediates the effect of perceived ease of use on the intention to use mobile money.

4.3. Perceived risk in mobile money

The perceived risks associated with using a new service are a consumer's concern and an obstacle to developing mobile payment services. Perceived risks are influenced by economic, security, time, and social risks. The risk perception theory suggests that consumer behaviour towards technology products involves risk perception related to the product/service and risk perception related to online transactions (Bauer, 1960). Many studies have identified risk perception as a barrier to using any system (Chiu et al., 2014; Gefen et al., 2003; Jack & Suri, 2014; Malaquias et al., 2018; Martins et al., 2014; Narteh et al., 2017; Noreen et al., 2021; Osei-Assibey, 2015; Penney et al., 2021). Higher levels of trust in the mobile money system can mitigate these perceived risks, leading to a higher intention to use. If people trust that mobile money providers are trustworthy and will not misuse their personal information, they are less likely to perceive it as a risky financial product. Studies have shown that when individuals trust the security and reliability of mobile money services, they are less concerned about potential risks, resulting in a greater intention to use (Jayantari & Seminari, 2018; Mustika & Puspita, 2020; Turel et al., 2010). Mobile technology users are affected by concerns about security and the possibility of hacking, which is hypothesized to hurt usage intention.

H5. Perceived risk has a negative direct effect on the intention to use mobile money.

H6. Trust mediates the effect of perceived risk on the intention to use mobile money.

4.4. Perceived Value in mobile money

Perceived Value is studied by Penney et al. (2021), Venkatesh et al. (2012), and Ismail et al. (2017). In some cases, interchangeable and easily misunderstandable terminology is also used, such as perceived

cost in Narteh et al. (2017), Nguyen and Hoang (2021), the perceived financial cost (Go, 2018; Zmijewska et al., 2004), transaction cost (Micheni et al., 2013). These studies highlight the cost compared to the benefits received (Micheni et al., 2013; Penney et al., 2021; Venkatesh et al., 2012) or the cost of using existing services (Luarn & Lin, 2005). Perceived Value as a concept has been added to many previous research models on the intention to accept technology to provide a fuller explanation of user behaviour in using financial services on technology platforms (Luarn & Lin, 2005), particularly in developing countries where low income is a barrier to access services. In the case of mobile money, users will consider the transaction costs (cost of buying a phone, buying a sim, registration fees, service fees incurred when using, and even transportation and waiting costs) in comparison to the utility (Alalwan et al., 2017; Venkatesh et al., 2012). When there is a high degree of adaptation to new technology (Penney et al., 2021), users may switch to safer and more efficient payment methods, such as mobile money, which saves time and transportation costs and reduces the risk of theft (GSMA, 2017). Additionally, various incentives (such as free trials and discounts) may prompt users to switch to mobile money. Users may be willing to pay for better services when the benefits and convenience reach a certain threshold. Previous research has had various debates on whether an increase in perceived Value will lead to an increase or decrease in the use of mobile money. Some studies show that perceived Value has a positive impact, such as Go (2018), Ismail et al. (2017), and Penney et al. (2021), while others show no significance (Micheni et al., 2013) or even an inverse effect (Zmijewska et al., 2004). In the case of Vietnam, telecommunication service providers have offered many attractive packages to attract consumers. Trust mediates this relationship, as users who trust the system are more likely to perceive Value regarding the benefits and convenience offered by mobile money services (Raza et al., 2018). Yousafzai et al. (2009). Based on this, the study tests the hypothesis.

H7. Perceived Value has a positive direct effect on the intention to use mobile money.

H8. Trust mediates the effect of perceived price value on the intention to use.

4.5. Financial literacy in mobile money

Previous studies have shown that financial knowledge positively influences mobile payment apps and cryptocurrencies (Balasubramnian & Sargent, 2020; Finscope, 2009; Morgan & Trinh, 2020; Yoshino et al., 2020). However, low-income individuals face barriers to mobile money usage, such as fear of losing hard-earned money (Balasubramnian & Sargent, 2020; Mirzoyants, 2013), perception of insecurity, lack of trust, difficulty in using financial technology, and limited financial knowledge (Oliveira et al., 2016; Ozili, 2018). Higher financial literacy is often associated with better financial decision-making, as individuals are better equipped to assess risks and make informed choices). Individuals' intentions regarding their financial behaviour often predict their actual financial decisions and actions. Besides, trust plays a crucial role in financial decision-making. People are more likely to engage in financial transactions and investments when they trust the individuals or institutions involved (Kim et al., 2011). Trust can mediate the relationship between financial literacy and mobile money adoption. Users with higher financial literacy levels may be more confident using mobile money if they trust the technology and its providers to handle their transactions securely. Based on prior research, the authors expect to test the hypothesis.

H9. Financial literacy has a positive direct effect on the intention to use mobile money.

H10. Trust mediates the effect of financial literacy on the intention to use mobile money.

4.6. Perceived trust in mobile money

Trust plays a pivotal role in the adoption of mobile money services, as emphasized by Kim and Jones (2009), who note that it measures consumers' assurance when using a service and is reflected in both trust in mobile technology and trust in service providers. This concept is further supported by previous studies (Fishbein & Ajzen, 1977; Marumbwa & Mutsikiwa, 2013; Narteh et al., 2017; Nguyen & Hoang, 2021), which underscore trust as an essential and significant factor influencing users' intention to use mobile money services. These findings collectively reinforce the crucial role of trust in shaping users' attitudes and behaviours toward the adoption and usage of mobile money technologies, aligning with the insights provided by McKnight et al. (1998) on trust-related behaviours and vendor trustworthiness assessment in digital-based channels, the impact of various factors on consumer trust in mobile money services, and the significance of trust in enhancing financial inclusion for MSMEs in developing countries. Additionally, trust remains vital in addressing cybersecurity risks and promoting user confidence in the safety and integrity of mobile money services (Kasekende, 2014).

H11. Trust has a positive direct effect on the intention to use mobile money.

In summary, constructs that can affect the intention to use mobile money are summarized in Table 3.

In addition, demographic variables are also of interest. In terms of gender, the lifestyle theory emphasizes that gender is a demographic variable often mentioned in connection with differences in lifestyle (Choi, 2008; Colfer, 2007; Li, 2008; Ngo & Paternoster, 2011; Reynolds, 2010; Wolak et al., 2006) and cognition (Titi, 2003). Chawla and Joshi (2018) revealed that gender, age, income, occupation, and educational level are prominent demographic variables that adjust the impact of independent factors on users' intentions. Regarding age, Choi (2008); Neiss et al. (2009); Ngo and Paternoster (2011); Reynolds (2010); Wolak et al. (2006) stated that perceptions differ between age groups therefore, these lifestyle differences have led individuals of different ages to perceive the use of different services. Regarding income, low-income customers, those less likely to recover from losses, those who have just opened bank accounts, and those who trust financial services may face risks when using services. These risks are usually prevalent in developing countries, where customers often conduct financial transactions via unsafe mobile transmission lines. Among the demographic questions in this study, the authors evaluated financial knowledge through 13

Table 3
Summary of factors affecting the intention to use.

Determinants	Author, year, impact
Perceived Usefulness (PU)	Davis (1989) (+), Marumbwa and Mutsikiwa (2013) (+), Okeke and Eze (2018) (+), Chauhan (2015) (+), Nguyen and Hoang (2021) (+), Narteh et al. (2017) (+), Go (2018) (+)
Perceived Ease of Use (PE)	Davis (1989) (+), Marumbwa and Mutsikiwa (2013) (+), Okeke and Eze (2018) (+), Luarn and Lin (2005) (+), Chauhan (2015) (0), Nguyen and Hoang (2021) (0), Penney et al. (2021) (+), Narteh et al. (2017) (+), Go (2018) (0)
Perceived Trust (PT)	Marumbwa and Mutsikiwa (2013) (+), Okeke and Eze (2018) (+), Penney et al. (2021) (+), Chauhan (2015) (+), Nguyen and Hoang (2021) (+), Narteh et al. (2017) (+), Fishbein and Ajzen (1977) (+)
Perceived Risk (PR)	Penney et al. (2021) (-), Noreen et al. (2021) (+), Bauer (1960) (-), Narteh et al. (2017) (0), Go (2018) (-)
Perceived Value (PC)	Go (2018) (+), Micheni et al. (2013) (0), Ismail et al. (2017) (+); Venkatesh et al. (2012) (+); Nguyen and Hoang (2021) (-), Zmijewska et al. (2004) (-); Narteh et al. (2017) (+), Penney et al. (2021) (+)
Financial Literacy (FL)	Hasan et al. (2020) (+), Balasubramnian et al. (2020) (+), Morgan and Trinh (2020) (+)

Source: Compiled by the author; Impact sign (+): positive relation; (-): negative relation; (0): no effect

questions which are built based on [Lusardi and Mitchell \(2007\)](#), [Klapper et al. \(2012\)](#), [Van Rooij et al. \(2011\)](#) research, referring to basic calculations of interest rates, inflation, optimal choice, cash flow, discounting, and so forth. The expectation was that financial knowledge would differ in mobile money usage intentions, along with the combined knowledge of the education level of the survey respondents.

5. Research methodology

5.1. Research design

This study uses a mixed methods research design, with qualitative research used to explore the content of the semi-structured questionnaire and quantitative research based on variables included in the model based on the explanations in the underlying theories and previous studies.

Qualitative research uses in-depth interviews with experts and qualitative data from the semi-structured questionnaire to build a financial literacy scale, standardize other scales, and use content analysis to explore the content of the answers of the semi-structured questionnaire in order to gain a deeper understanding of the participants' perspectives and experiences.

Quantitative research uses SEM to analyze the impact of cognitive factors such as perceived ease of use, perceived usefulness, perceived Value, and financial literacy on intention to use mobile money. The research is also interested in the mediating role of perceived trust.

5.2. Data

Data was collected through a semi-structured questionnaire using an online survey tool or face-to-face interviews. For quantitative research, a convenient sampling method was used to collect data through direct interviews with customers at transaction points of telecommunications companies - Viettel, Vinaphone, and Mobifone. The survey was conducted with customers waiting to be served at these points. For online surveys, the research team designed a questionnaire on Google Forms and distributed it through social media (Messenger, Facebook and Zalo) to respondents through their relatives, friends, colleagues, students, and customers and acquaintances working in Lam Dong. Lam Dong was selected to represent Vietnam based on the following factors: (1) In terms of bank distribution density for comparison, Lam Dong is a province with an average level of bank distribution; (2) Located in the Central Highlands of Vietnam, it is a famous tourist destination but has a mountainous terrain and a relatively large proportion of people living in remote, mountainous, and rural areas ([General Statistics, 2023](#)), making it suitable for the goal of promoting the use of mobile money; (3) Has an above-average readiness index for the development and application of ICT ([Ministry of Information and Communications, 2022](#)).

The survey included 1128 participants, of which 231 votes passed the screening questions and did not leave the information blank. The remaining sample is 231, which satisfies the requirement to perform Exploratory Factor Analysis (EFA) ([Hair et al., 2014](#)) and meets the requirement for SEM as proposed by [Comrey and Lee \(2013\)](#).

The research scale used for the model is a 5-point Likert scale, ranging from 1 (completely disagree) to 5 (totally agree), in addition to the factors influencing the intention to use mobile money. The information was collected through a semi-structured questionnaire consisting of three parts: (1) general information, (2) information related to financial literacy, and (3) information related to the research problem. The questionnaire is designed to collect data from users and potential mobile money users. Adoption is defined as using a product or service by those with a deep understanding of it and the skills to use it effectively. Vietnam still in pilot phase and it still needs to be made clear whether all users have the necessary understanding and skills to be considered adopters.

5.3. Measurement and development

All items were developed based on previous research and adapted to the context of mobile money usage in Vietnam. The adjustments were made by examining eight experts in mobile money, direct sales staff from telecommunications service suppliers, and a ten-respondent pilot survey sample. The final semi-structured questionnaire consists of 2 sections comprising seven variables. These variables are usefulness (with five observed variables), ease of use (with five items), which were adapted from [Davis \(1989\)](#), perceived trust (with five items) developed by [Fishbein and Ajzen \(1977\)](#), risk perception (with five items) developed by [Bauer \(1960\)](#), perceived (with four items) developed by [Venkatesh et al. \(2012\)](#) ([Appendix 2](#)).

Financial literacy was constructed to ensure the following: (1) To fully reflect all aspects of financial literacy according to conceptual definitions; (2) To reflect the perception of users with all of its subjectivity in the context of mobile money being piloted in Vietnam, so the services are still relatively simple; (3) To be compatible with the perception scale of the intention to use model being constructed. The scale was constructed in the following steps:

Step 1: Based on the knowledge-based, skills-based, and attitude-based definitions of financial literacy ([Grant, 1996](#); [Schmitt, 1999](#); [Simon, 1987](#)), and previous studies ([Huston, 2010](#); [Ouachani et al., 2020](#); [Świecka, 2019](#); [Chaulagain, 2021](#)), which define the components of financial literacy to reflect the aspects of comprehensive understanding. Based on this definition, it can be seen that financial literacy includes knowledge, skills, attitudes, and behaviour. Knowledge and skills are formed from financial education and experience; from knowledge and skills, each individual accumulates in different economic and social conditions will form behaviour. Theoretically, this process takes a long time; however, mobile money was only actually implemented to users in late November 2021, so the accumulation process to transform into behaviour may not have been formed in such a short time. Therefore, the study only considers skills and attitudes in the form of potential or perceived by consumers and the perception scale of three components: knowledge, skills, and attitudes which customers perceive. These scales are also adjusted to be suitable for the context of the mobile money pilot in Vietnam.

Step 2: Based on the uni-dimensional variables mentioned in previous studies by [Hasan et al. \(2020\)](#), [Balasubramnian et al. \(2020\)](#), [Morgan and Trinh \(2020\)](#), [Hasan et al., 2020](#); [Noreen et al. \(2021\)](#), [Mirzoyants \(2013\)](#), [Chiwaula et al. \(2020, p. 2020\)](#), the study constructed questions and perception statements related to financial literacy, which are presented in [Appendix 2](#).

Step 3: The authors conducted in-depth interviews with six heads of transaction departments from 3 telecommunications companies. The authors also conducted expert interviews with two banking experts and two university lecturers studying financial literacy and financial inclusion, using a semi-structured questionnaire to ensure that the questions were written, easily understandable, and did not cause confusion to the survey participants. The authors then conducted content validity testing of the scale by ensuring that the questions accurately reflect the essential aspects of financial literacy.

Step 4: The authors surveyed ten people to test the clarity and validity of the questions and revised the questionnaire to the final version of the perception scale with the adjusted and improved questions. The authors conducted reliability testing of the scale using Cronbach's alpha to ensure that the scale measures consistently and stably over time. The authors received a newly developed multidimensional scaled financial literacy (with four items).

6. Discussion of research results

6.1. Descriptive statistics

[Table 4](#) presents the descriptive statistics of the study sample, which

Table 4
Respondent demographic profile.

Characteristics	Description	Frequency	%	Test	Sig. (Levene)	Sig.(2-tailed)
	Total	231	100			
Gender	Male	117	50.6	T-test	0.000	0.054
	Female	114	49.4			
Age	14–25	83	35.9	Anova	0.324	0.388
	26–35	119	51.5			
	36–45	19	8.2			
	46–56	7	3			
	>56	3	1.3			
Occupation	Finance, Banking	51	22.1	Anova	0.486	0.083
	Office staff	42	18.2			
	Workers, Farmers	17	7.4			
	Student, Pupils	22	9.5			
	Teacher	7	3			
	Armed Forces	22	9.5			
	Freelance labor	65	28.1			
	Other	5	2.2			
Location	Urban	90	39	T-test	0.014	0.016
	Rural	141	61			
Income	< million	87	37.7	Anova	0.388	0.363
	5 - 10 million	98	42.4			
	10 - 18 million	40	17.3			
	18 - 32 million	3	1.3			
	≥32 million	3	1.3			
Educational level	High school	80	34.6	Anova	0.522	0.079
	Intermediate, college	51	22.1			
	Undergraduate, graduate	100	43.3			
	Correct answer ≥ 50% of the questions	133	57.6			

Source: Compiled from the survey

outlines the features of mobile money users. Most respondents fall in the age bracket of 26–35, possess a university degree or higher, and predominantly work as freelancers, office workers, or in the banking sector. These characteristics suggest they have easy access to technology and are relevant to the industry. Owing to their young age, the sample primarily resides in rural areas (61%, similar to the Statistical Yearbook 2021 data with 62.9% (General Statistics Office, 2023). Most earn a monthly income between 5 and 10 million VND (equivalent to 210–420 USD). The statistical results regarding their financial knowledge reveal that 57.6% answered seven or more questions correctly, highlighting a positive correlation between educational attainment and financial knowledge. The sample is representative of the population of Vietnam and is diverse enough to be used for statistical tests as proposed by (Calder et al., 1981).

6.2. Testing reliability and validity

The SPSS software analysis showed that Cronbach's alpha coefficients of the scales ranged from 0.902 for Perceived Risks to 0.933 for Perceived Trust, which meets the requirement of Cronbach's alpha ≥ 0.7 (Hair et al., 2014). In addition, the Value of the total variance of each observed variable is more significant than 0.3. The results of the exploratory factor analysis (EFA) showed that the standardized factor loadings meet the condition of being more significant than 0.5 (Hair et al., 2014), the composite reliability coefficient (CR) ranges from 0.905 to 0.935 (meets the condition of $CR > 0.7$), and the average variance extracted (AVE) of the scales ranges from 0.657 to 0.746 (meets the condition of $AVE > 0.5$). Therefore, it can be concluded that the scales are reliable and ensure the best convergent validity.

Next, the study used the AMOS 22 software to perform confirmatory factor analysis (CFA) with 33 variables measuring six first-order concepts. The results of the CFA analysis showed that the scales are reliable and valid; the model chosen is appropriate according to (Hair et al., 2014) because with ML estimation, the indicators are as follows: Chi-square = 895.818; $df = 474$; Chi-square/ $df = 1.890 (<2)$; GFI = 0.802 (>0.90); TLI = 0.927 (>0.90); RMSEA = 0.062 (<0.08).

Finally, the measurement scales of SEM were evaluated for reliability

(CR), variance (AVE), the correlation between scales (MSV), and correlation between observed variables and scales (Max (H)). All of these critical tests for assessing convergence and discrimination in SEM analysis exceeded the recommended thresholds: $CR \geq 0.7$, $AVE \geq 0.5$, $MSV < AVE$, $Max (H) \geq 0.7$, as reported by Hair et al. (2014), (Hu & Bentler, 1999) and Kline (2016) (Table 5).

6.3. Results and discussions

The SEM was run with bootstrapping parameters = 1000. SEM structural model with ML estimation through AMOS 22 software. The results show that the research model is consistent with the market research data through the indicators with Chi-square = 963.208; $P = 0.000$, $df = 484$; Chi-square/ $df = 1.990 (<2)$ according to (Carmines & McIver, 1983; Hair et al. (2014); CFI = 0.925 (>0.90) according to (Bentler & Bonett, 1980)); TLI = 0.918 (>0.90 according to (Bentler & Bonett, 1980)); RMSEA = 0.066 (<0.08 according to Steiger, 1990; Hair et al. (2014); Hu and Bentler (1999)). The model results show three hypotheses - H4, H6, and H10 - are rejected because the p-value is > 0.05 . The remaining hypotheses are all accepted because the p-value is < 0.05 . The variable RISK has a negative standardized coefficient, which has an inverse effect on BI. The rest all have a positive standardized coefficient, so they have the same direction, consistent with the direction of the hypotheses proposed in the research model (Table 6).

Squared Multiple Correlation (BI) = 0.716 và R - squared (PT) = 0.319 estimated that the predictors of behavioural intention explain 71.6 per cent of its variance and predictors of perceived trust explain 31.9 per cent of its variance. Perceived trust mediates two relationships between usefulness perception and value perception and has the highest total impact value (Table 7).

Perceived Usefulness and Perceived Value are the direct factors influencing the behavioural intention to use mobile money. Perceived usefulness reflects the degree to which consumers trust that mobile money services can help them achieve their desired benefits. Perceived Value reflects the degree to which consumers trust that mobile money services are worth their cost. The direct effect of perceived usefulness on intention to use mobile money is consistent with many previous studies,

Table 5
The CR, AVE, MSV, MaxR(H) and Fornell and Larcker indices.

	CR > 0.7	AVE >0.5	MSV < AVE	MaxR(H) > 0.7	PT	PU	PE	PR	FL	PV	IB
PT	0.935	0.743	0.367	0.941	0.862						
PU	0.922	0.703	0.331	0.925	0.575	0.838					
PE	0.920	0.699	0.379	0.933	0.311	0.326	0.836				
PR	0.905	0.657	0.151	0.914	−0.005	0.037	−0.148	0.810			
FL	0.922	0.746	0.045	0.924	0.132	0.081	0.175	−0.010	0.864		
PV	0.914	0.728	0.333	0.923	0.382	0.320	0.319	−0.048	0.051	0.853	
IB	0.932	0.733	0.379	0.941	0.606	0.566	0.616	−0.388	0.212	0.577	0.856

Source: Extracted from AMOS

Table 6
Hypothesis testing results.

Impact	Hypothesis	Hypothesis path	Estimate	Sig. (p-Value)	Conclusion
Direct	H1	BI < - PU	0.281	0.003	Supported
	H3	BI < - PE	0.366	0.001	Supported
	H5	BI < - PR	−0.390	0.001	Supported
	H7	BI < - PV	0.342	0.001	Supported
	H9	BI < - FL	0.107	0.026	Supported
	H11	BI < -PT	0.278	0.001	Supported
Indirect	H2	BI < - PT < - PU	0.140	0.001	Supported
	H4	BI < - PT < - PE		0.219	Not Supported
	H6	BI < - PT < - PR		0.865	Not Supported
	H8	BI < - PT < - PV	0.061	0.004	Supported
	H10	BI < - PT < - FL		0.161	Not Supported
					Supported

*PU-Perceived Usefulness, PE- Perceived Ease of Use, PR - Perceived Risks, PV- Perceived Value, FL- Financial Literacy, PT- Perceived Trust.
Source: Extracted from AMOS

Table 7
The mediating role of perceived trust.

Path	Standardized beta			Rank
	Direct effects	Indirect effects	Total Effects	
Perceived Usefulness	0.281	0.140	0.421	1
Perceived Value	0.342	0.061	0.403	2

Source: Extracted from AMOS

such as those by Davis (1989), Marumbwa and Mutsikiwa (2013), Okeke and Eze (2018), Chauhan (2015), Nguyen and Hoang (2021), Narteh et al. (2017), Go (2018). The effect of perceived Value on intention to use mobile money is similar to the studies of Go (2018); Ismail et al. (2017); Narteh et al. (2017); Penney et al. (2021) and is supported by the survey opinions of participants responding with typical answers in (Appendix 3). This result provides additional experimental evidence for the perception that perceived Value positively affects the decision to use mobile money and is consistent with the qualitative research supplement to this quantitative result.

Additionally, perceived trust is the fifth most vital direct driver of the intention to use mobile money, which is also consistent with several previous studies by Luarn and Lin (2005), Marumbwa and Mutsikiwa (2013), Narteh et al. (2017); Nguyen and Hoang (2021) where perceived trust was rated highest in their research model. Perceived trust has been essential in promoting the intention to use mobile money. The results show that although perceived usefulness only has a direct impact ranked fifth, when having the mediating effect of Perceived trust, it becomes the most substantial total effect among the six factors studied that have a counteracting effect on intention to use mobile money—similarly, Perceived Value from third to second. In Vietnam, trust is even more critical as the information related to cybercrime is increasing.

Consumers still have concerns about the risk of losing money, being scammed, and the risk of personal information security when using mobile payment services, as mentioned in Appendix 1. Therefore, selecting the three leading telecommunications companies with the best market share, networks, and credibility to provide services has reduced users’ concerns and promoted mobile money use.

Finally, financial literacy is the weakest factor positively impacting the intention to use mobile money. Previous studies have also investigated financial literacy, but the impact was not significant, such as Hasan et al. (2020), Mirzoyants (2013), Morgan and Trinh (2020), and Zhao and Othman (2010). The fact that financial literacy has the weakest impact and financial knowledge has no difference in impact on user behaviour intention is also strange.

7. Conclusion and policy implications

The findings have contributed a small part to enriching new research sources on mobile money in Vietnam while identifying some factors affecting individual customers’ intention to use mobile money. From the regression model results, the achieved results can be summarized as follows:

First, perceived cost, ease of use, trust, and usefulness have a decreasing positive impact on mobile money usage. Among variables, the perceived cost has a confirmed impact in this pilot phase when telecom operators introduce various promotional packages.

Second, perceived risk is a significant barrier to user access to mobile money, especially with increasing fraud via messages, phone calls, and channels like Facebook and Zalo.

Third, financial literacy also positively impacts mobile money usage, but insignificantly.

Fourth, mobile money services are still relatively simple and small-scale during the pilot phase.

The study results are expected to provide valuable documents for researchers and managers, contributing to further enriching and improving the mobile money pilot model. The management implications that can be drawn from the model are as follows:

First, enhancing effective marketing communication about the features and benefits of mobile money is crucial for its usefulness. The focus should be on building a team of professionally trained staff with good knowledge and skills to advise and quickly answer customer queries. At the same time, timely attention should also be paid to the difficulties and expectations of customers regarding the new features of mobile money to create more new services that attract users. In addition, telecommunications companies and related agencies should regularly launch campaigns to improve financial literacy and enhance financial skills and capabilities training for people in rural and remote areas. This is because these are where banking services are often neglected and where users need mobile money the most. It is also wholly consistent with the mobile money’s target of enhancing access and use of financial services, especially in rural areas, mountainous areas, remote areas, border areas, and islands of Vietnam.

Second, for ease of use, emphasis should be placed on designing a user-friendly interface that is simple, clear, and easy to see, even for older people. Simplifying payment processes so that consumers do not

waste time using mobile money and "holding hands" to guide customers in using the service.

Third, leveraging the existing trust in the reputation of telecommunications companies, businesses must always comply with customer commitments and take responsibility for the products and services they provide to foster trust with customers and form the habit of using mobile money.

Fourth, for the risk management aspect, more emphasis should be placed on minimizing consumer risks when using mobile money, as it is assessed to have the most decisive impact on the intention to use it. Strengthening security authentication with all transactions to limit the risk of fraudulent intrusion into phones and reminding customers not to provide their passwords, OTP codes, or access any non-official links that lead to unjustified loss of money in regular transactions.

Fifth, from the customer's perspective, the perceived cost can be seen that customer expectations play an essential role in the decision-making process of using mobile money. Users accept that the cost of transactions, such as withdrawal, registration, and deposit fees, is considered negligible compared to the benefits of mobile money, such as time and cost savings and facilitating the use of more valuable services. This finding implies that if the level of benefits and convenience of using mobile money is increased, it will encourage more people to use this service. In addition, qualitative information shows that special discounts or free-of-charge services are also an effective way to increase the acceptance intention of users.

Finally, it is essential to improve awareness and financial knowledge for users. The improvement is also in line with the recommendation of [Buku and Mazer \(2017\)](#): equipping users with the knowledge to empower them as financial consumers through financial literacy leads to the ability to access and widely use mobile money services, as well as

being compatible with user opinions on areas for improvement ([Appendix 4](#)).

8. Limitations and future research

This study only analyzed quantitative and qualitative aspects based on the responses of mobile money users without considering non-users perspectives. The study's sample size was only 231 valid questionnaires collected through convenient sampling because mobile money is a newly introduced concept in Vietnam, and only a few people know about it. The survey participants are people living in Lam Dong, so the research results represent the population in this region and Vietnam. Future studies could overcome these limitations and expand the research to understand better the customers' perspectives, as well as enlarge the survey area, for example, explicitly focusing on the agricultural sector to gain a more diverse view.

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Appendix 1. : Pros and cons of the development of mobile money in Vietnam

Pros:

- Vietnam has favourable conditions for the development of mobile money following the theory of the process of technological innovation ([Tornatzky and Fleischer \(1990\)](#)): (1) The legal framework for the development of mobile money has been issued by the Government and licensed by the State Bank of Vietnam; (2) There are three financial service providers with the operating networks of three telecommunications providers (VNPT, Viettel, and Mobifone covering the whole country, especially Viettel, and almost the entire area of Vietnam's island districts); (3) The business model for mobile money services has been shaped through pilot programs; (4) Coordination between stakeholders involved in mobile money services.
- Vietnam has a significant advantage in developing financial services connected to telecommunications services: (1) 65.67% of the population use smartphones, ranking 14th in the world ([Statista, 2023](#)); (2) The population coverage rate for mobile phones reached 99.7%, higher than the world at 88.7% ([Ministry of Information and Communication, 2023](#)); (3) Telecommunications transaction points are widely distributed throughout the country, especially Viettel, which has covered the whole country and the island districts with 11,000 communes and 200,000 customer access points, more significant than the network of the largest bank, Agribank.

Cons:

- The number of payment intermediaries is large but is concentrated in five large companies with 94% market share.
- The legal framework for mobile money pilot operations still needs some critical content related to agents, deposit insurance, user identification, and sandbox mechanisms.
- According to [GSMA \(2022\)](#), the index on the legal environment for mobile payment services (Mobile Money Regulatory Index) reached 73.6 points, equivalent to the average of the world and ranked seventh in ASEAN in 2021 (followed by Cambodia and Laos). Each specific component index has no change in data with 2020; Authorization and Transaction Limits scored perfect (100 points); Investment and Infrastructure Environment scored 68 points; Consumer Protection scored 80 points (due to the item related to Vietnamese deposit insurance being rated 0 points). Significantly, customer identification (52 points) and Agent reached 24 points. Regarding customer identification, Vietnam has the component points of permitted personal identifications, KYC requirements, and reasonable proportionality in personal identification (KYC Proportionality) of 0, 80, and 100, respectively. Vietnam's KYC Proportionality gets 100 points when the identification requirement for a mobile money account is more relaxed than opening a bank account. The permitted personal identification point does not meet any of the two requirements: (1) At least 90% of the adult population has a national identification code, and (2) In addition to government-issued identification codes (identity card, citizen ID card, passport), there are regulations on other alternative documents (social security number, confirmation from the ward, commune where the resident lives) that can be used to register for using mobile money services. Regarding agents, Vietnam scored 80/100 points on agent activity, while the remaining components scored 0. Vietnam still needs regulations on the conditions of agents, agent authorization and agent responsibilities.
- In recent years, the number of high-tech fraud cases perpetrated by criminals has become increasingly widespread, with increasingly sophisticated and complex methods that cause anxiety for the public, as many have become victims of this type of crime. In the first six months of 2022, the police discovered and dealt with 840 cases related to network fraud

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Pros:	
	possessing stolen assets (an increase of 42% compared to the last six months of 2021). The technical system of the National Cyber Security Center – NCSC recorded 517,627 IP addresses from Vietnam in botnet networks, meaning users are at risk of information theft or accessing unnatural links that provide OTP codes, leading to wrongful loss of money (NCSC, 2023).
-	The pilot has led to many differences between the actual implementation and the implementation regulations, according to the assessment of the providers: (1) The legal business points (limited liability company or joint stock company) only account for 2.3% and are mainly concentrated in urban areas instead of the telecom service providers (in the case of Viettel); (2) Customers are not yet convinced of the benefits and convenience of Mobile Money over e-wallets or bank cards/accounts. They can only register for a new mobile money service after three months of continuous telecom service, and they are required to authenticate all transactions, even for low-value or recurring payments. Customers have yet to transfer money between Mobile Money accounts of different providers, and they can only use Mobile Money to pay bills and transfer money within the network. Mobile account information is the same as mobile phone registration information but is independent of the mobile subscription account (the mobile subscription account balance is only used to pay for telecommunications charges, and the mobile money account balance is used for transactions like e-wallets (Banking Strategy Institute (2023)).

Appendix 2. Measurement scale

Construct	Items	Measurement	References
Perceived Usefulness	PU1	I find mobile money to be a very useful payment method.	Davis (1989)
	PU2	Using mobile money will increase my work efficiency.	Davis (1989)
	PU3	Mobile money payments saves my time.	Davis (1989)
	PU4	With a vast network of agents, I can quickly go to any agent to deposit and withdraw money.	Davis (1989)
	PU5	Mobile money helps to reduce contact and improve cashless, especially in the pandemic.	Davis (1989)
Perceived Ease of Use	PE1	Mobile money is very easy to use.	Davis (1989)
	PE2	The mobile money interface is simple and easy to understand and make transactions.	Davis (1989)
	PE3	It is easy to access, register, and follow the instructions for using mobile money.	Davis (1989)
	PE4	Mobile money can be used on any mobile phone; 3 g/wifi is unnecessary.	Davis (1989)
	PE5	Mobile money expands the target audience more than e-wallets.	Davis (1989)
Perceived Risks	PR1	Using mobile money, I am concerned about security and the possibility of having my mobile phone hacked by others and accessing my account.	Bauer (1960)
	PR2	The mobile money service may need to be fixed, and errors may occur during transactions.	Bauer (1960)
	PR3	When a transaction fails, I fear the provider will not compensate me because the money was somehow stolen.	Bauer (1960)
	PR4	I am concerned that my personal information may be disclosed when I provide information to mobile money.	Bauer (1960)
	PR5	The increasing trend of cybercrime makes me reluctant to use mobile money.	Bauer (1960)
Perceived Value	PV1	Mobile money has reasonable transaction fees.	Venkatesh et al. (2012);
	PV2	Using mobile money helps me save money.	Venkatesh et al. (2012);
	PV3	I will receive benefits commensurate with the fees I pay when using mobile money.	Venkatesh et al. (2012);
	PV4	Registering for mobile money is free.	Venkatesh et al. (2012);
Financial Literacy	FL1	I think that if lack of financial knowledge, it will be difficult to use mobile money.	<i>Newly constructed</i>
	FL2	I feel that lack of financial knowledge makes it easy to be scammed and reluctant to use mobile money.	<i>Newly constructed</i>
	FL3	I think that repeating mobile money usage will help me be more confident in using mobile money.	<i>Newly constructed</i>
	FL4	I think that financial literacy is one of the reasons that limits me from accessing the use of mobile money.	<i>Newly constructed</i>
Perceived Trust	PT1	I think using mobile money is safer than keeping cash.	Fishbein and Ajzen (1977)
	PT2	I think mobile money is a reliable service with privacy protection.	Fishbein and Ajzen (1977)
	PT3	I believe that mobile money will always fulfil its commitments to customers.	Fishbein and Ajzen (1977)
	PT4	I choose to use mobile money because of the reputation of the provider.	Fishbein and Ajzen (1977)
	PT5	I trust that mobile money will protect my money.	Fishbein and Ajzen (1977)
Behavioural Intention	BI1	I will use mobile money more than cash if I need to pay.	Venkatesh et al. (2012);
	BI2	I want to continue using mobile money as a regular payment method.	Venkatesh et al. (2012);
	BI3	I think mobile money will have many improvements in future.	Venkatesh et al. (2012);
	BI4	I have plans to use mobile money in the future.	Venkatesh et al. (2012);
	BI5	I will introduce mobile money to others in the future.	Venkatesh et al. (2012);

Appendix 3. Users' opinions on perceived Value

-
- Using mobile money will not increase costs because it is integrated into the electronic wallet of the telecommunications company, so it does not increase costs.
 - I can receive many promotions when paying with mobile money. Many promotion programs include Tet gift-giving, gifting gold on 8.3, playing games to win prizes, and earning bonus money, vouchers, or referral points.
 - Using mobile money does not require buying a smartphone or registering for a new network package.
 - With comprehensive coverage, mobile money allows people to transfer money anytime, anywhere, and convenient trading. I only need a phone; I can transfer money to anyone using a mobile money account for free.
 - From my house to the bank in a remote district, since opening a mobile money account, I have just visited the telecommunications transaction acceptance points near my home, where they helped me deposit money into my account. It is convenient to send money to my children who study far away. Therefore, using mobile money saves time and costs compared to sending money outside or using the services of money transfer stores.
 - Registering for mobile money does not cost anything; using it regularly does not require maintenance fees. Transactions with mobile money save on costs compared to bank counters or other money transfer service stores.
-

Source: Interviewees' response

Appendix 4. Consumer recommendations for improvement

-
- The providers should enhance financial literacy for users, regularly warning against scams and cybercrime to raise users' awareness.
 - The increasing cybercrime, fraud, and hackers should have more specific regulations for preventing risks and dealing with suspected fraudulent transactions or transfers between parties.
 - Expand the service to transaction stores in villages and communes, allowing direct cash withdrawal at transaction locations.
 - Viettel Money charges a fee for cash withdrawals and transfers to bank accounts. ViettelPay is also free of charge, with a higher limit of up to 100 million VND/month.
 - As a new product seeking to attract users, should it be offered as a free trial in the pilot period?
 - I want to deposit money into Viettel Money. Still, the communications company staff pushed me to transfer it to ViettelPay, indicating they must fully understand and differentiate between the two products.
 - I did not know about mobile money until this survey, which means the network's marketing channel is not working fully. The network should go directly to schools to register for mobile money, just like when they distributed free SIM cards to first-year students, guided students to experience it, and talked about the utility so that students can introduce friends and family.
 - To advertise loudly, distribute flyers and banners, and offer many bonuses and discounts, such as paying electricity and water bills via mobile money.
 - Verifying subscriber information registration is still tricky and needs facial recognition and ID photo verification. Customers with updated ID card numbers can not fulfil the verification process even at the counters.
 - In addition, the trustworthiness of the network providers is high, so if there are any issues, I can go directly to them for assistance. Although basic transactions such as withdrawals, deposits, and transfers are interesting when using mobile money, I still trust the bank more if I want to borrow or save money.
-

Source: Authors' survey

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