DOI: 10.31276/VMOSTJOSSH.66(1).29-44

Factors affecting Vietnamese consumers' intention to continue using e-wallet: A case study of MoMo

Phuong Thanh Nguyen[1], Minh Tuan Phung[1*], Thi Minh Ly Pham[1], Tan Lac Thien Vo[1], Le Bao Tran Tran[2]

[1]Faculty of Business Administration, Ton Duc Thang University, 19 Nguyen Huu Tho Street, Tan Phong Ward, District 7, Ho Chi Minh City, Vietnam
[2]Faculty of Economics and Finance, The Guido Carli Free International University for Social Studies, 32, 00197 Roma, Italy

Received 19 July 2023; revised 5 September 2023; accepted 19 February 2024

Abstract:

MoMo stands as a leading e-wallet in Vietnam. Amidst the backdrop of intensified market competition, e-wallets are urged to transcend the reliance solely on sales promotions for user retention. This paper aims to investigate the key factors that elucidate the intention to continue using MoMo e-wallet services, which is essential for acquiring strategic insights that enable organizations to leverage their competitive advantages. The authors incorporate a framework comprising Technology Continuance Theory (TCT) factors and four additional variables to explore this phenomenon in a novel context: price benefit, trust, habit, and operational constraints, which may influence users' intention to persist in using e-wallets. Research data was obtained by distributing questionnaire to 310 respondents and then analyzed using Partial Least Square Structural Equation Modelling. The findings indicate that users' behavioural intention to continue using e-wallets hinges upon attitude and habit, which are identified as pivotal factors in predicting users' desire to sustain e-wallet usage. Conversely, these findings are poised to aid service providers in comprehending user behaviour and devising more apt business strategies, thereby enabling them to leverage and uphold their competitive advantage in retaining users.

Keywords: **e-wallet, intention to continue to use, MoMo, Technology Continuance Theory (TCT), Vietnamese.**

Classification number: **2.2**

1. Introduction

The utilisation of electronic payment services in urban areas of Vietnam saw a notable increase, with at least 50% of families adopting such services by 2020, as per a survey conducted by the World Bank. By 2021, Vietnam had secured a significant position among the leading Asian nations, boasting 29.1% of mobile payment users [1]. A surge in mobile wallet transactions, estimated to increase over sevenfold, was anticipated by fintech experts. Moreover, both the user base and transaction value were projected to grow by more than threefold [2]. The proliferation of mobile and digital payment systems has propelled Vietnam to the forefront of electronic payment growth globally. Allied Market Research (2021) [3] reported an impressive annual growth rate of 30.2% in electronic payments from 2020 to 2027. Visa research further underlined this trend, revealing that presently, 76% of Vietnamese individuals utilise e-wallets [4]. Following the COVID-19 pandemic, 65% of users reported carrying less physical cash, with 32% expressing intentions to discontinue cash usage altogether. Thus, Vietnam presents a substantial e-wallet market ripe for exploitation and development.

Over a span of six years, the number of e-wallet options in Vietnam has expanded significantly, surging from a mere five to over 43 [5]. Some e-wallet providers capitalise on early market entry by forming exclusive alliances with super-apps, while others leverage connections with financial institutions to tap into a shared customer base [5]. MoMo, ShopeePay (AirPay), and ZaloPay have emerged as the top three e-wallets, primarily due to their penetration rates [5]. Notably, these e-wallets differentiate themselves, enhancing their appeal among consumers. Among them, MoMo stands out as the most recognised name, maintaining its leadership position with an active customer base of 86% and being the preferred e-wallet for 56% of users [6]. Furthermore, MoMo has extended its services to small and medium enterprises (SMEs), which constitute 98% of businesses in Vietnam. Keeping pace with global development, MoMo has continuously expanded its portfolio with services contributing to its robust business

*Corresponding author: Email: phungminhtuan@tdtu.edu.vn

performance in recent years. However, only a minority of e-wallet enterprises have turned a profit, with the majority recording losses for several years [7, 8].

In the burgeoning e-wallet market in Vietnam, users may hesitate to continue using existing e-wallets as competitors offer more attractive promotions. A survey focused on mobile application performance revealed that only 24% of users continued using an app after three months, with this figure decreasing to 14% after six months and plummeting to 4% after a single installation [9]. Prior research has shown that acquiring new customers can cost up to five times more than retaining existing ones [10]. Furthermore, a 5% improvement in customer retention can increase company profits by 25 to 95% [11]. Consequently, e-wallet providers must focus on customer retention. However, research on e-wallets in Vietnam often centres on the acceptance stage rather than usage retention [12]. To gain insights into users' acceptance and sustained usage of information systems, the TCT has been instrumental. TCT comprises six key constructs derived from earlier models: confirmation, perceived usefulness, perceived ease of use, satisfaction, attitude, and continuous intention. Its comprehensive nature enables effective explanation of post-adoption behaviour [13]. Thus, employing this integrated model can significantly enhance our understanding of the motivational factors, attitudes, and behaviours influencing users' continued utilisation of e-wallet services.

Additionally, it is pertinent to note that users incur no additional expenses when employing digital payment methods such as e-wallets. Instead, they may experience financial benefits through cost savings facilitated by conducting online transactions via e-wallets. Consequently, the concept of "cost" has transformed into "price benefit" in academic literature [14]. Moreover, trust in the system is crucial when using e-wallets for transactions. The secure connection between users' bank accounts and mobile payment service providers ensures a high level of trust in financial transactions. Trust is a critical component in mobile payment systems, directly influencing users' perception of system safety [15]. Therefore, trust aligns well with the current research methodology. Additionally, users may develop an intention to use such payment systems after gaining experience with mobile payments [16]. Hence, habit becomes a crucial variable in this study. However, it's essential to acknowledge existing limitations in global digital literacy, which present operational barriers hindering effective utilisation of mobile applications [17]. Therefore, the author has constructed a model by adapting TCT factors along with four variables to extend TCT, including price benefit, habit, trust, and operational constraints.

Despite numerous studies on e-wallet users' continuance intentions globally, the number of such studies, particularly in Vietnam, has increased remarkably, especially after the COVID-19 pandemic. The TCT has been widely used as the primary theoretical framework for investigating factors influencing users' continued usage of e-wallets. TCT has been the subject of numerous prior research [18-20] employing various empirical data and application scenarios. However, results have not been consistently uniform across different studies. In Vietnam, although some researchers have explored this topic, the number of studies remains relatively limited, with most focusing on the stage of user acceptance rather than continued usage. Given these challenges and gaps, this study aims to analyse and verify which components have a significant impact on users' continuance intention towards MoMo, a leading e-wallet in Vietnam. This analysis incorporates extended variables of price benefit, trust, habit, and operational constraints in influencing users' intention to continue using e-wallets.

2. Relevant literature and hypothesis development

2.1. E-wallet

An electronic wallet, also known as a digital wallet, serves as the digital counterpart of a physical wallet, containing monetary assets and various cards such as membership, debit, or credit cards [21]. Technology utilises the internet to establish a secure connection between users and suppliers, facilitating financial transactions for the purchase of goods or services [22, 23]. Therefore, e-wallets function as mobile payment solutions, enabling users to initiate, approve, and authenticate transactions conveniently [24].

K.K. Eswaran (2019) [25] highlighted the escalating adoption of e-wallets as an alternative mode for online transactions, attributing their growing prominence to the increasing prevalence of online business activities. The adoption of non-cash methods has gained traction in numerous countries, with the fear of the coronavirus pandemic further influencing confidence. The survival of the coronavirus on card or paper media has led to increased e-wallet usage and a rise in the overall number of e-wallet users [26]. Government initiatives have also been shown to spur the use of e-wallets in some nations, as evidenced by India's demonetisation program [25].

Although mobile wallets, mobile banking, and mobile money all enable users to conduct financial transactions via mobile devices, their design and implementation differ due to varying approaches and contexts. N. Iman (2018) [22] demonstrated that mobile banking is typically tied to bank procedures and has a narrower scope. Similarly, mobile banking, often referred to as Internet banking, is an application developed by banks to provide consumers with various channels for accessing their savings and conducting transactions available in bank systems, including account transfers, deposits, bill payments, withdrawals, and balance inquiries [27, 28]. On the other hand, according to P.M. Tun (2020) [29], a mobile wallet is an extension of mobile banking and mobile money, allowing users to store personal information and payment method details. An electronic wallet or e-wallet encompasses a broader concept involving the digital storage of money and the execution of payments through desktop computers, laptops, or smartphones [28].

MoMo currently stands as the number one super app platform in Vietnam and one of the largest and fastest-growing fintech companies [30]. With a market share of 68%, it dominates the market, facilitating transactions for almost all online and offline payments in major Vietnamese cities [30]. MoMo acts as a one-stop shop for digital payments, financial services, and a wide range of daily life services. Therefore, MoMo, as one of the most popular e-wallets in the Vietnamese market, serves as the primary focus of this research.

2.2. Theoretical framework

The TCT initially developed by C. Liao, et al. (2009) [13], has proven effective in predicting individuals' intentions to utilise technology. TCT amalgamates three well-known information system models: the Technology Acceptance Model (TAM), Expectation-Confirmation Model (ECM), and Cognitive Dissonance Theory (COG). N.A.A. Halim, et al. (2022) [31] utilised the TCT framework to examine the variables impacting Malaysians' ongoing use of e-wallets. According to existing literature, consumers' intentions to continue using e-wallets were significantly influenced by satisfaction, attitude, price advantage, habit, and operational restrictions [32]. However, it was demonstrated that within this framework, perceived utility and trust had no significant influence. Nevertheless, trust may play a crucial role when consumers choose to use an e-wallet for the first time [33]. According to D. Chatterjee, et al. (2019) [34], trust is considered a psychological condition, referring to the customer's belief in the service provider's moral character and readiness to rely on the provider's services Additionally, numerous studies have shown that perceived usefulness directly impacts continuance intention [10, 35]. According to Bhattacherjee's ECM, satisfaction with the use of information systems (IS) emerged as the most influential predictor of users' intention to continue, while perceived usefulness played a significant but comparatively weaker role. Similarly, in the TAM, extensive research has validated perceived usefulness as a key antecedent influencing consumers' intention to persist with the service [36]. Recognising the gap in existing research, the author aims to conduct a study applying the TCT model with four extended variables to elucidate users' continuous usage intention of MoMo - E-wallet application in the Vietnamese context.

2.3. Hypothesis development

Drawing upon an extensive literature review of previous relevant studies, the author proposed a research model that explores the impact of TCT alongside four extended variables - price benefit, trust, habit, and operational constraint - on individuals' intention to continue using e-wallets. The model is depicted in Fig. 1.

2.3.1. Continuance intention (CI)

The term "Continuance intention" refers to an individual's desire to persist in using a service once they

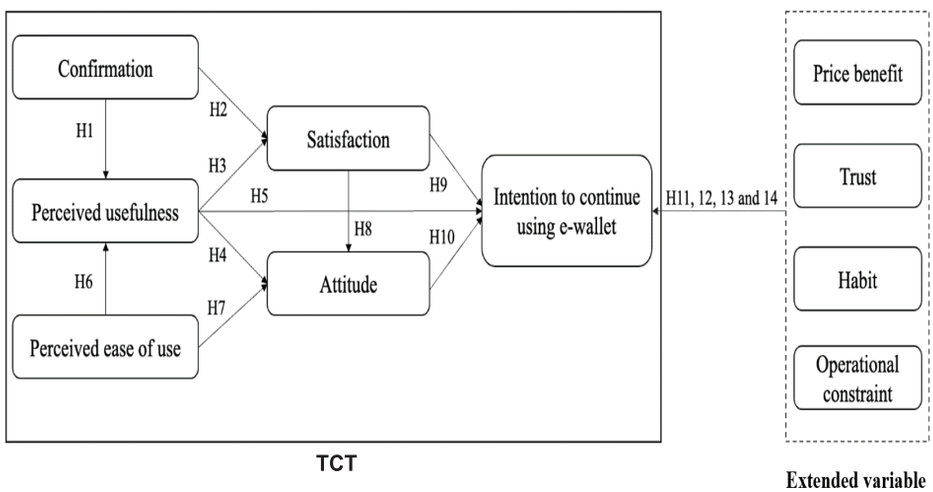

Fig. 1. The research model [31].

have accepted it, as described by A. Bhattacherjee (2001) [10]. Since 2001, continuation intention has been studied in various scenarios including electronic technologies such as smartphone applications [18, 37], e-learning [38], online banking [10, 39], and online self-service [40].

Psychological factors, such as personal experiences and cognitive processes encompassing ideas, emotions, and beliefs, influence user behaviour [41]. Satisfaction and attitude consistently emerge as key elements frequently identified in research on continuance intention. The results of this research show, in summary, how users' opinions of social connections, mindsets, and emotions may be influenced by continuation intention, which in turn can affect their likelihood of engaging in a specific behaviour [42].

2.3.2. Confirmation (CONF)

Confirmation refers to users' perception that the actual performance of a specific IT system aligns with their expectations [10]. A. Bhattacherjee (2001) [10] proposes that users may use their confirmation experience to adjust their impression of usefulness when doubt arises over what may be anticipated from system operation beyond the users' initial perceived utility. More specifically, the level of perceived usefulness is enhanced by confirmation, while disconfirmation diminishes it.

Past studies examining continuous usage behaviour have established a noteworthy association between confirmation and user satisfaction [13, 43]. Satisfaction is defined as "a positive affective state that results from a global judgment of performance based on previous purchasing and consumption experience" [44]. Prior research by X.M. Fu, et al. (2018) [45] found that confirmation was connected to satisfaction. Additionally, A. Susanto, et al. (2016) [46] found that user's confirmation after initial service usage had a significant impact on their level of satisfaction. In the context of this study, where initial expectations for using MoMo align with actual experiences, it is anticipated that satisfaction levels will be positively affected. Users' expectations may vary as they gain more experience using an e-wallet. As a result, the following theories were developed:

H1: A more favourable confirmation will lead to higher perceived usefulness.

H2: A more favourable confirmation will lead to higher satisfaction.

2.3.3. Perceived usefulness (PU)

Perceived usefulness refers to users' perception of the expected benefits of information system use. Users can gain from information systems in several ways, such as by ensuring greater accuracy, efficiency, and speed in work fulfilment [47]. Earlier research has demonstrated a direct link between perceived usefulness and satisfaction, as well as between perceived usefulness and intention to continue using the service [10, 48]. W. Zhou, et al. (2018) [49] found that confirmation greatly affects users' desire to keep using e-finance when studying e-finance persistence. Similar to this, research has shown that confirmation and perceived usefulness have a substantial impact on whether or not people continue the use of technology [10, 13, 19, 49].

Within the scope of this study, it can be referred to as users' expectations regarding the performance of the e-wallet. Users consistently anticipate obtaining beneficial mobile services, such as ubiquity and convenience [50]. Users will be satisfied when their expectation is met [17]. Numerous studies have established a favourable correlation between perceived usefulness (PU) and user satisfaction [51]. The influence of PU on individuals' attitudes and intentions to use mobile banking services has been well-established [52]. B. Foroughi, et al. (2019) [19] found that consumers' future attitudes towards the adoption of mobile banking were predicted by their levels of perceived usefulness and satisfaction. In the context of e-wallets, perceived usefulness plays a significant role in predicting behavioural intention to continue using them [53]. Moreover, PU has been identified as a crucial factor in shaping individuals' mindset and decision to persist with e-wallet services [19]. Hence, the following hypotheses were developed:

H3: A more favourable perceived usefulness will lead to higher satisfaction.

H4: A more favourable perceived usefulness will lead to a higher attitude.

H5: A more favourable perceived usefulness will lead to a higher intention to continue using e-wallets.

2.3.4. Perceived ease of use (PEU)

Perceived ease of use pertains to the level of convenience associated with utilising an information system and the comprehensibility of the system [54]. Within the context of this study, ease of use refers to the minimal effort required by users to comprehend, learn, and operate the mobile payment system. Users are more

likely to embrace new technology if they find it effortless to integrate into their daily routines. Previous research [55] has established a significant association between perceived ease of use and perceived usefulness, as well as attitude, in the adoption of technology.

If modern technologies are user-friendly, people will use them [31]. According to C. Liao, et al. (2009) [13], PEU describes how much prospective users anticipate this target system to be simple. In regards to using an e-wallet, a person's perceptions influence their emotions, which subsequently impact their acceptance of and engagement with e-wallet usage [19]. Additionally, it is argued that perceived ease of use (PEU) acts as a determining factor for perceived usefulness (PU) in online transactions, thereby playing a significant role in the readiness to continue using e-wallets and establishing a strong association with PU [16]. Hence, it is logical to assume that PEU has a substantial influence on an individual's decision to continue or discontinue the use of an e-wallet [31]. Thus, we suggested that:

H6: A more favourable perceived ease of use will lead to higher perceived usefulness.

H7: A more favourable perceived ease of use will lead to a higher attitude.

2.3.5. Satisfaction (SAT)

Satisfaction can be defined as the retrospective assessment of users' initial experience with a service, encompassing positive feelings and overall contentment. In marketing literature, consumer satisfaction is recognised as a vital factor in cultivating and sustaining loyalty [56]. This principle extends to the realm of information systems, where user satisfaction tends to enhance their intention to repeatedly utilise the system. Customer happiness is a critical factor that affects post-adoption habits, especially continuation intention, according to A. Bhattacherjee (2001) [10].

B. Foroughi, et al. (2019) [19] claim that satisfaction has a favourable impact on people's attitudes toward various technology applications. According to reports, satisfaction may easily affect the reason for continuing to use an e-wallet [18]. This also applies to the setting of information systems, where user satisfaction tends to increase a user's intention to use the system repeatedly. According to the literature, the choice to reuse the application may have been motivated primarily by the degree of customer satisfaction with the e-wallet [57]. Consequently, we hypothesised that:

H8: A more favourable satisfaction will lead to a higher attitude.

H9: A more favourable satisfaction will lead to a higher intention to continue using e-wallets.

2.3.6. Attitude (ATT)

While satisfaction deals with how people view e-wallet applications, attitude refers to the user's evaluation of e-wallet services [58]. The relationship between attitude and intent to act in the context of mobile payments has been the subject of numerous studies [59].

Previous studies conducted within this research context have consistently demonstrated a confident connection between attitude and the desire to keep using e-wallet applications [60]. As a result, attitude is thought to be a key factor in predicting the desire of users to continue using e-wallets [19]. Consumers who hold favourable perceptions of e-wallets exhibit enthusiasm towards adopting and utilising them [18]. However, perceived ease of use (PEU), perceived usefulness (PU), and satisfaction play influential roles in shaping users' attitudes towards e-wallets, ultimately impacting their intention to continue using them. Accordingly, we formulated the following hypothesis:

H10: A more favourable attitude will lead to a higher intention to continue using e-wallets.

2.3.7. Price benefit (PB)

In comparison to available alternatives, information and communication technology (ICT) has brought about various advantages, including cost reduction. However, economically disadvantaged segments in emerging economies may not be willing to incur additional charges for a technology when a low-cost alternative such as cash is readily accessible [61]. When there is an economic benefit, the dynamics change because banking programs and other e-commerce platforms around the world offer discounts to encourage the use of these payment methods, leading to increased adoption [62]. This financial benefit directly impacts consumers. Given the high price sensitivity among less privileged sections of society [63], users are more likely to continue using mobile payment services that offer cost advantages. Consequently, due to the significant price sensitivity of marginalised groups, customers may expect to continue utilising programs like e-wallets that provide such price benefits [14]. Therefore, this study hypothesised that:

H11: A more favourable price benefit will lead to a higher intention to continue using e-wallets.

2.3.8. Trust (TRU)

Trust is the expression of one party's willingness to expose themselves to the actions of another party [64]. It is widely regarded as a crucial factor for successful business transactions [65]. Previous research [17, 59] has established trust as a key determinant influencing perceived usefulness, perceived ease of use, satisfaction, and usage intention among mobile payment consumers. The significance of trust in the context of mobile payments has been consistently demonstrated through various studies.

P. Gerrad, et al. (2003) [66] found that consumers in banking contexts were worrying that their profiles and information may be shared across the banking group to improve the sales for other banking products. Consequently, trust serves as a vital component for increasing users' intention to continue using e-wallets and ensuring satisfaction in conducting e-wallet activities. Therefore, we proposed the following hypothesis:

H12: A more favourable trust will lead to a higher intention to continue using e-wallets.

2.3.9. Habit (HAB)

Habit refers to the extent to which users engage in behaviour unintentionally as a result of the learning process [58, 67]. Previous research has consistently demonstrated a strong correlation between habit and both usage and intention to continue using a specific technology [68].

A recent study conducted by D.C. Herting, et al. (2023) [69] emphasised the significance of habit as a critical factor in influencing repeated use of technology, considering its impact on decision-making and the perceived usefulness or functionality of applications. Consequently, individuals who have been using e-wallets for an extended period develop a habit and find it easy to utilise these systems for their transactions [70]. As a result, it is anticipated that the habitual use of e-wallets would lead users to have intentions to continue utilising them [31]. In this vein, we set the following hypothesis:

H13: A more favourable habit will lead to a higher intention to continue using e-wallets.

2.3.10. Operational constraint (OC)

The pervasive issue of inadequate digital literacy worldwide [71] poses a significant obstacle to the adoption of mobile phones, as citizens may struggle to utilise these devices proficiently, presenting a noteworthy challenge. According to D. Ma, et al. (2016) [72], mobile application technologies significantly contribute to their inaccessibility, leading to various obstacles and issues. These restrictions include those brought on by constrained mobile data allowances and outside obstacles that are connected to mobile services, such as security worries, difficult internet-based lessons, pointless pop-ups, and a lack of flexible selections.

In the case of e-wallets, the limited scope of mobile applications, including constrained displays and underperforming apps, can prove arduous and impede application responsiveness, thus presenting additional challenges. Users normally expect applications to run smoothly and efficiently and when they don't, their patience is notoriously thin. That is why we proposed the hypothesis:

H14: A more unfavourable operational constraint will lead to a higher intention to continue using e-wallets.

3. Methodology

3.1. Measure

TCT is important to this study model. The construct of A. Bhattacherjee (2001) [10], V. Venkatesh, et al. (2000) [58], and P.G. Schierz, et al. (2010) [73], which includes five factors: confirmations, perceived utility, perceived ease of use, satisfaction, and attitude are used in this study to measure TCT. Three indicators form the structure of confirmations and attitudes. There are five indicators used to structure perceived usefulness and perceived ease of use. Four indicators make up the structure of satisfaction.

Besides these, price benefit is one of the most important factors in this investigation. Price benefit and habit were developed by V. Venkatesh, et al. (2012) [74]. Price benefit is built on two indicators, while habit has four indicators. The scale for trust was drawn by A. Pal, et al. (2020) [32]. Trust constructs have three indicators. Operational constraints also have a significant impact on whether people decide to keep using e-wallets. The scale for this factor is adapted from Y. Song (2011) [75]. Operational constraints have four indicators. On the other hand, the intention to keep using e-wallets is taken from K.M. Alraimi, et al. (2015) [76]. In the present study, a 7-point Likert scale was utilised to assess the responses to all inquiries included in the questionnaire. This scale ranged from 1, representing a disposition of strong disagreement, to 7, indicating a stance of strong agreement (Table 1).

Table 1. Measurement items of the survey.

Items	Description	Sources
	Demographic	
GEN	What is your gender?	[31]
AGE	What is your age?	
EDU	What is your education level?	
EUT	E-wallet usage to make transactions?	
EUS	Sector-specific usage of e-wallets	
	Confirmations	
CONF1	I had a better e-wallet experience than I had anticipated	[10]
CONF2	I was pleasantly surprised by the level of service offered by the e-wallet	
CONF3	Overall, using the e-wallet confirmed the majority of my expectations	
	Perceived usefulness	
PU1	I can complete transactions more quickly by using the e-wallet	[58]
PU2	Making transactions is simpler when using the e-wallet	
PU3	My transactions are more effective when I use the e-wallet	
PU4	The quality of the transactions would increase with the use of the e-wallet	
PU5	My transactions would benefit from using the e-wallet	
	Perceived ease of use	
PEU1	I become proficient at using the e-wallet	[58]
PEU2	I find using the e-wallet simple	
PEU3	It does not take much mental effort to interact with the e-wallet	
PEU4	My interaction with the e-wallet is understandable	
PEU5	I find using the e-wallet convenient	
	Satisfaction	
SAT1	I am satisfied with e-wallet	[10]
SAT2	I am pleased with e-wallet	
SAT3	I am happy with the e-wallet	
SAT4	I am delighted with e-wallet	

Items	Description	Sources
	Attitude	
ATT1	Using e-wallet services is a good idea	[73]
ATT2	Using e-wallet services is a beneficial	
ATT3	Using e-wallet services is a wise idea	
	Price benefit	
PB1	E-wallet apps or offer discounts and cash back	[74]
PB2	I save money when I pay through e-wallet apps	
	Trust	
TRU1	E-wallet apps meet my interests	[32]
TRU2	My needs are met by my e-wallet apps	
TRU3	The e-wallet apps have features as promised by the providers	
	Habit	
HAB1	Using e-wallet apps has become a habit for me	[74]
HAB2	I am used to apply e- wallet apps	
HAB3	I automatically use e- wallet apps	
HAB4	Using e-wallet apps is natural to me	
	Operational constraints	
OC1	E-wallet app's display and screen make it difficult to use	[75]
OC2	E-wallet apps often freeze or malfunction	
OC3	The buttons and options of the e-wallet apps are difficult to find	
OC4	The features provided by the e-wallet apps are not sufficient for my needs	
	Intention to continue use e-wallet	
CI1	I intend to continue using e-wallet in the future	[76]
CI2	I will continue using e-wallet in the future	
CI3	I will strongly recommend e-wallet for others to use it	
CI4	I will keep using e-wallet as regularly as I do now	

3.1.1. Population

The study's target audience comprises individuals who have used MoMo at least once in Vietnam. This selection criterion ensures that participants possess updated knowledge of MoMo, aligning with the research objective of understanding reasons for continued e-wallet usage.

3.1.2. Sampling method

According to J.J.F. Hair (2010) [77], the minimum sample size required is five times the number of research indicators. Thus, the study necessitates a minimum sample size of 185. Employing convenience sampling, a non-probability sampling technique, from a population requiring a sample size between 100 and 200 respondents for Structural Equation Model (SEM) interpretation, the author aimed to gather at least 200 responses. Primary data collection was conducted via an online survey using Google Forms.

3.2. Analytical method

3.2.1. Descriptive analysis

Descriptive statistics in SPSS 25.0 software were utilised by the author to present basic characteristics of the research sample, such as frequency (%) of sex, age, and education level, through statistical tables.

3.2.2. Independence testing

To assess nonresponse bias, the authors examined whether the sample was representative of the population. A t-test was conducted to compare differences between genders. The non-significant t-values (ranging from 1.08 to 1.16, $p>0.05$) indicated no statistically significant differences in means, allaying concerns of nonresponse bias. Harman's one-factor test was employed to address the possibility of common-method variance (CMV), revealing that the largest factor explained 49.90% of the total variance (<50%), suggesting minimal common method bias threat.

3.2.3. Partial Least Square Structural Equation Modelling (PLS-SEM)

The author adopted the partial least squares (PLS) technique for model measurement and hypothesis testing using SmartPLS (v. 3.0) software. PLS is suitable for maximising the explanation of dependent constructs and is widely applied. Given the study's small sample size (n=200) and complex structural model (10 variables and 37 indicators), PLS is a powerful modelling method. As per J.J.F. Hair, et al. (2014) [78], PLS is appropriate for examining structural models when the primary objective is not theory confirmation.

4. Results

4.1. Respondent demographics

Table 2. Sample profile.

	Item	Frequency	Percent
Gender	Male	152	49.03
	Female	158	50.97
Age	Less than 25	46	14.84
	25-30	66	21.29
	31-40	117	37.74
	41-50	75	24.19
	Above 50	6	1.94
Education	College and under college	33	10.65
	Bachelor	212	68.39
	Master and higher	65	20.97
MoMo usage to make payment	Once in a while	71	22.90
	Often	30	9.68
	Always	209	67.42
Sector-specific usage of e-wallets	Food delivery	56	18.06
	Groceries	35	11.29
	Bill payment	160	51.61
	Food & beverage	59	19.03

The sample (Table 2) comprises 310 responses from the online survey, with 152 male respondents (49.03%) and 158 female respondents (50.97%). In terms of age distribution, respondents under the age of 25 accounted for 14.84%. The age groups of 25-30, 31-40, and 41-50 represented 21.29, 37.74, and 24.19% respectively. Approximately 1.94% of respondents were aged 50 and above. Respondents with college and below college education constituted 10.65% of the sample, while those with higher education qualifications, including diploma and master's degrees, comprised 68.39 and 20.97% respectively. Regarding payment frequency, 67.42% of respondents exhibited constant usage behaviour, while 9.68 and 22.90% reported frequent and occasional usage, respectively.

4.2. Results

Table 3. Convergent validity.

Construct	Item	Loading	CR	AVE
Confirmation	CONF1	0.836	0.910	0.771
	CONF2	0.897		
	CONF3	0.900		
Perceived usefulness	PU1	0.847	0.947	0.781
	PU2	0.880		
	PU3	0.916		
	PU4	0.891		
	PU5	0.885		
Perceived ease of use	PEU1	0.856	0.945	0.774
	PEU2	0.899		
	PEU3	0.839		
	PEU4	0.913		
	PEU5	0.890		
Satisfaction	SAT1	0.946	0.965	0.872
	SAT2	0.948		
	SAT3	0.939		
	SAT4	0.900		
Attitude	ATT1	0.914	0.947	0.856
	ATT2	0.939		
	ATT3	0.923		
Price benefit	PB1	0.953	0.947	0.898
	PB2	0.943		
Trust	TRU1	0.872	0.934	0.826
	TRU2	0.936		
	TRU3	0.917		
Habit	HAB1	0.932	0.944	0.807
	HAB2	0.944		
	HAB3	0.826		
	HAB4	0.887		
Operation constraint	OC1	0.893	0.930	0.770
	OC2	0.860		
	OC3	0.894		
	OC4	0.863		
Intention to continual usage	CI1	0.929	0.932	0.774
	CI2	0.921		
	CI3	0.825		
	CI4	0.839		

Using factor loading, average variance extracted (AVE), and composite reliability (CR), the model was evaluated for convergent validity analyses. All item loading values are higher than 0.707 as demonstrated by the PLS algorithm results, and all AVE values are higher than 0.50, indicating convergent validity at the construct level [78]. Additionally, all the CR values surpassed 0.70, thereby confirming the convergent validity of the measures (Table 3). Table 4 displays heterotrait-monotrait ratio of correlations (HTMT.85) values below 0.85. Therefore, the acceptable discriminant validity of the measurement model is achieved [79].

Table 4. Discriminant validity.

	ATT	CONF	HAB	CI	OC	PEU	PU	PB	SAT	TRU
ATT	**0.925**									
CONF	0.592	**0.878**								
HAB	0.596	0.598	**0.898**							
CI	0.753	0.596	0.682	**0.880**						
OC	0.230	0.174	0.357	0.247	**0.877**					
PEU	0.704	0.622	0.560	0.583	0.085	**0.880**				
PU	0.699	0.710	0.650	0.680	0.138	0.613	**0.884**			
PB	0.579	0.484	0.627	0.590	0.238	0.523	0.500	**0.948**		
SAT	0.717	0.737	0.693	0.718	0.168	0.758	0.759	0.594	**0.934**	
TRU	0.727	0.657	0.770	0.722	0.217	0.690	0.692	0.714	0.786	**0.909**

According to the findings of this study, confirmation and perceived ease of use (PEU) have an impact on perceived usefulness (PU) and satisfaction. Additionally, perceived usefulness significantly influences satisfaction and attitude, while also slightly increasing the intention to continue using e-wallets. Perceived ease of use, perceived usefulness, and satisfaction exert substantial influences on attitude, consequently influencing the intention to continue using e-wallets. Furthermore, attitude, price benefit, habit, and operational constraints play significant roles, whereas trust exhibits a relatively lower sensitivity. Utilising a blindfolding technique, the results indicated that the Q2 values for attitude, perceived usefulness, satisfaction, and intention to continue using the e-wallet were equal to or greater than 0, indicating an acceptable level of predictive value (Table 5).

According to Table 5, confirmation (H1, β=0.537, t=10.223, and p=0.000) and perceived ease of use (H6, β=0.279, t=4.596 and p=0.000) positively affect perceived usefulness has a significant impact on continuing use of e-wallet applications. Confirmation (H2,

Table 5. Summary of hypothesis testing.

Hypothesis	β	Std. Dev	t-value	p-value	Q^2	R^2	f^2	VIF	Supported
H1	0.537	0.052	10.223	0.000	0.542	0.552	0.394	1.633	YES
H2	0.399	0.063	6.283	0.000	0.605	0.655	0.228	2.019	YES
H3	0.476	0.058	8.192	0.000			0.325	2.019	YES
H4	0.334	0.062	5.367	0.000	0.521	0.621	0.123	2.379	YES
H5	0.106	0.065	1.646	0.100	0.532	0.677	0.012	2.858	NO
H6	0.279	0.061	4.596	0.000			0.107	1.633	YES
H7	0.347	0.077	4.504	0.000			0.134	2.367	YES
H8	0.200	0.103	1.953	0.051			0.030	3.484	NO
H9	0.144	0.078	1.839	0.066			0.018	3.607	NO
H10	0.369	0.072	5.106	0.000			0.156	2.702	YES
H11	0.063	0.056	1.125	0.261			0.006	2.155	NO
H12	0.070	0.072	0.969	0.333			0.003	4.510	NO
H13	0.191	0.067	2.838	0.005			0.037	3.063	YES
H14	0.025	0.033	0.751	0.453			0.002	1.201	NO

β=0.399, t=6.283 and p=0.000) and perceived usefulness (H3, β=0.476, t=8.192 and p=0.000) have a positive impact on satisfaction. Both perceived usefulness (H4, β=0.334, t=5.367 and p=0.000), perceived ease of use (H7, β=0.347, t=4.504 and p=0.000) have a positive impact on attitude. On the other hand, satisfaction (H8, β=0.200, t=1.953 and p=0.051) has no impact on attitude. Perceived usefulness (H5, β=0.106, t=1.646 and p=0.100) and satisfaction (H9, β=0.144, t=1.839 and p=0.066), price benefit (H11, β=0.063, t=1.125 and p=0.261), trust (H12, β=0.070, t=0.969 and p=0.333), and operational constraint (H14, β=0.025, t=0.751 and p=0.453) with a marginal impact, in contrast to attitude (H10, β=0.369, t=5.106 and p=0.000), and habit (H13, β=0.317, t=6.132 and p=0.000) have a positive impact on intention to continue to use the e-wallet.

5. Discussion

The research results are expounded upon through a discussion of the associations among Technology Continuance Theory (TCT), price benefit, trust, habit, operational constraint, and the intention to continue using the MoMo e-wallet, derived from responses of 310 existing MoMo users via an online questionnaire. As observed in section 4.2, perceived usefulness (PU) and satisfaction are influenced by confirmation and perceived ease of use (PEU). While PU has a modest effect on the intention to continue using e-wallets, it significantly affects satisfaction and attitude. Attitude, in turn, influenced by PEU, PU, and satisfaction, greatly influences the likelihood of continued e-wallet usage. Furthermore, attitude, price benefit, habit, and operational constraints significantly impact the intention to continue using e-wallets, unlike trust, which lacks significant evidence of effects.

5.1. Confirmation and perceived usefulness

Confirmation shows a significant positive correlation with PU to a large extent (f^2=0.394), consistent with the findings of N.A.A. Halim, et al. (2022) [31]. Confirmation towards MoMo reflects users' satisfaction after using it, implying that e-wallet application developers should invest in features that enhance user satisfaction and comfort, thereby increasing PU and the likelihood of continued e-wallet usage.

5.2. Confirmation and satisfaction

Confirmation has a moderately positive impact on satisfaction (f^2=0.228), indicating that higher confirmation levels on the e-wallet application correspond to increased satisfaction levels. This finding aligns with previous research by N.A.A. Halim, et al. (2022) [31]. Service providers should design applications catering to general user preferences to bolster satisfaction levels towards the system.

5.3. Perceived usefulness and satisfaction

According to the findings, user satisfaction is significantly influenced by perceived usefulness, which is in line with those of N.A.A. Halim, et al. (2022) [31] and

G.S. Weng, et al. (2017) [48]. Due to technology's utility, more tasks may be completed quickly and easily. These results also indicate that emphasising the utility of the e-wallet application could lead to greater happiness. In this scenario, MoMo must establish and maintain strong relationships with users to address their demands and preferences for e-wallet applications. Therefore, it is reasonable to infer that cultivating robust relationships with users and fostering mutual understanding will lead to an improvement in user happiness.

5.4. Perceived usefulness and attitude

In agreement with N.A.A. Halim, et al. (2022) [31] and D. Chatterjee, et al. (2019) [34], this study also confirms the associated hypothesis that perceived usefulness can largely impact attitude. Adapted to the context of e-wallet application systems, users' attitude toward them is influenced by the PU of such applications. When making online and offline payments, users perceive the means of payment as more useful and comfortable to them when the time spent on transaction completion is reduced, which can be achieved when e-wallets improve their job performances.

5.5. Perceived usefulness and intention to continue using e-wallet

In contrast, perceived usefulness was found not to significantly influence the intention to continue using e-wallets, with a modest effect size (f^2=0.012), consistent with previous research [13, 31]. One potential explanation for this phenomenon is that perceived usefulness (PU) is typically established during the initial introduction of e-wallet features to users. The awareness and assessment of the perceived usefulness level of e-wallet applications prompt users to initiate their usage. Unless e-wallets introduce new features, users generally develop expectations regarding the functionalities of e-wallet applications and how they can enhance their daily activities with improved efficiency. MoMo, for instance, is recognised for its ability to assist users in managing various financial aspects using multiple funding sources such as credit cards, savings accounts, and credit-line accounts. As users interact with MoMo for the first time, they are required to review and agree to the terms and conditions, as is customary with any e-wallet application. This initial interaction ensures that users are well-informed and educated about the utility of e-wallets. Consequently, the direct influence of PU on the intention to use may be more pronounced during the early stages of adoption. Given that users already possess general concepts of e-wallets and their expected functionalities, service providers must differentiate themselves effectively to maintain attractiveness and shape customers' perceptions of usefulness. This underscores the importance of continuous innovation and differentiation strategies to sustain user engagement and satisfaction over time.

5.6. Perceived ease of use and perceived usefulness

Perceived ease of use was observed to significantly influence perceived usefulness, corroborating the findings of N.A.A. Halim, et al. (2022) [31]. Fundamental functions such as transactional activities are deeply ingrained in users' daily routines, and the assistance provided by e-wallets is perceived as greatly supportive. Therefore, for e-wallet users to continue using them, especially for core services, service providers and policymakers must prioritise ensuring optimal system performance [53].

5.7. Perceived ease of use and attitude

Consistent with previous research [80], this study also confirms the related hypothesis that users perceive e-wallets as applications that streamline their lives and tasks, leading to a positive attitude towards them as this characteristic becomes more pronounced. Users' perceptions of an e-wallet application's usability often engender positive sentiments. Consequently, service providers should strive to create user-friendly applications that simplify daily activities, thereby increasing user appreciation for e-wallet apps.

5.8. Satisfaction and attitude

Surprisingly, satisfaction was found to have minimal to no impact on attitude. In this regard, the findings of this study diverge from existing literature. One possible explanation is that satisfaction typically arises in the later stage of usage, once users have somewhat assessed the level of usefulness, whereas an individual's attitude is generally shaped by their initial perception and overall experience upon encountering a new service. Nonetheless, the discrepancies in the results may simply stem from differences in research contexts.

5.9. Satisfaction and intention to continue using e-wallet

The findings of this study suggest that satisfaction does not influence the intention to continue using e-wallets, which contrasts with the results of N.A.A. Halim, et al. (2022) [31]. This may be attributed to the highly competitive e-wallet services market in Vietnam. With e-wallets widely accessible and available, the

impact of satisfaction on fostering intentions to continue use becomes diluted. Users may already find satisfaction in switching between service providers, as indicated by previous research [81].

5.10. Attitude and intention to continue using e-wallet

In alignment with the literature G.S. Weng, et al. (2017) [48], this study concludes that attitude positively affects the intention to continue using e-wallets. When users have a positive perception of an e-wallet, they are more inclined to continue using the application. Therefore, service providers should prioritise enhancements that address operational issues and cater more effectively to users' needs to garner positive evaluations of the applications.

5.11. Price benefit and intention to continue using e-wallet

Contrary to the findings of N.A.A. Halim, et al. (2022) [31], this study discovered that price benefit did not significantly influence intentions to continue using e-wallets. The underlying explanation for this response could be that as users' habits become well-established, the impact of price benefits diminishes. In a competitive market like Vietnam, where numerous e-wallets operate, offering special offers and coupons to attract users is common. While this may be an effective strategy to initially attract consumers, this study suggests that other factors are more critical for sustaining continued usage behaviour. This implies a fascinating tactic among market participants to offer pricing discounts only during the early adoption stage, such as offers valid only for the first few uses, as supported by previous findings [32].

5.12. Trust and intention to continue using e-wallet

Despite being consistent with the results of N.A.A. Halim, et al. (2022) [31], the effect of trust on the intention to continue using e-wallets was found to be insignificant, contrary to the researcher's expectations and contradicting the study of H. Qasim, et al. (2016) [15]. Initially, the research considered fraud, data risk, and personal data piracy issues as common concerns regarding e-wallets and investigated the variable of trust. Upon examining users' characteristics, it became apparent that survey participants are predominantly young consumers who may lack knowledge of e-wallet risks or be sufficiently IT-savvy to be aware of them. In either case, trust becomes less significant in their decision to continue using an e-wallet.

5.13. Habit and intention to continue using e-wallet

Habit has been found to heavily influence the intention to continue using e-wallets, aligning with the results of N.A.A. Halim, et al. (2022) [31]. Users are more likely to make subsequent payments using an e-wallet when they are already accustomed to the application. As transactions have become a routine yet recurring activity in the modern world, using e-wallets for transactions seamlessly merges into users' daily habits.

5.14. Operational constraint and intention to continue using e-wallet

The study suggests that operational constraints did not significantly impact intentions for continued use. Considering that all respondents had the digital infrastructure, such as smartphones, personal computers, and well-supported online networks, to participate in the survey, the insignificance can be explained. On the other hand, this could also be understood in parallel with the backgrounds of the respondents, who are current users of mobile payment apps and are inherently accustomed to operational features and infrastructure requirements. However, it is not advisable to generalise this finding to contexts in low-income countries where smartphones are not widely distributed, as operational constraints may hold greater importance in such scenarios. This presents a limitation of this study.

6. Conclusions

6.1. Theoretical implications

Previous research has primarily focused on the adoption and usage of mobile payment systems, overlooking post-adoption retention [15, 43]. Understanding users' intentions for continued usage of mobile payments can offer valuable insights into the economic sustainability of mobile service providers. By empirically investigating users' post-adoption usage and motivations for continuing to use e-wallets, this study addresses this research gap and enhances our understanding of e-wallet continuance usage behaviour.

Continuous enhancements and protection of e-wallet applications emerge as critical influences impacting e-wallet usage. Consumer preferences are continually evolving [13], necessitating that service providers and developers invest in understanding and addressing users' uncertainties to maintain user loyalty. Changes need to be promptly captured and responded to. The findings of this study can provide valuable insights applicable to other countries, particularly those where e-wallets are

widely adopted and where there is a growing interest among service providers and policymakers to expand the user base. Furthermore, the increasing number of e-wallet users in Vietnam will directly impact and reinforce Vietnam's vision towards a cashless economy.

6.2. Managerial implications

Ensuring attraction, retention, and facilitation of users in actively generating continued usage is fundamental for mobile service providers to achieve success [49]. With rapid developments in e-wallet and various technologies maturing, user experience needs to be prioritised. Firstly, the current findings demonstrate that users' satisfaction and attitude are driven by confirmation and perceived usefulness. This observation underscores the importance of providing users with a seamless system that simplifies their daily transactions, thereby enhancing overall satisfaction. Consequently, e-wallet service providers should strive to offer not only a swift and efficient user experience but also a practical one that facilitates their customers' day-to-day transactions. To achieve this, it becomes imperative to expand the range of services offered by e-wallets to encompass a wider array of essential daily transactions, including incorporating additional merchants into the e-wallet payment network. Additionally, service providers must focus on upgrading app performance, ensuring that transaction processing speed exceeds that of traditional payment methods, directly addressing customers' aversion to wasting time on mundane tasks. Moreover, as critical as daily transactions are to the core service of payments, technical and informational support should not be overlooked and must be readily accessible to ensure that customers can receive assistance whenever needed. Furthermore, e-wallets should collaborate with financial institutions to offer refinancing options such as "buy now, pay later" and instalment payments, empowering customers' purchasing power to complete payments even when funds are insufficient. In summary, the perceived usefulness of e-wallet hinges on its ability to perform a multitude of functions, including but not limited to money transfers, utility bill payments, and completing online/offline transactions.

Secondly, the significant influence of confirmation and perceived ease of use on perceived usefulness implies that when an e-wallet system is considered easy to use, its usefulness is also perceived to be heightened. Designers of e-wallet systems should acknowledge that these systems serve a diverse population of users with varying backgrounds, including age and education levels. Therefore, it is crucial to recognise that there is no one-size-fits-all definition of an easy-to-use system; instead, the focus should be on increasing its perceived usefulness, leading to user satisfaction. Consequently, users will opt for an e-wallet application that they perceive as reliable in terms of ease of use.

Additionally, while users' decisions to continue using e-wallets largely depend on their attitude towards the applications, it is the user's perception of e-wallets that shapes the degree of attitude. Innovations are needed in designing service quality models to identify the range of attitudes that influence consumer opinions and drive decisions, particularly in competitive environments. Fortunately, the consequential relationship between "importance versus satisfaction" can offer a solution to the development direction of e-wallets. Providers of e-wallets should invest their time, efforts, and resources in pinpointing features that are most important to users, thus generating a higher level of satisfaction. Moreover, with the aim of satisfying users, system developers must ensure that their applications are perceived as "simple to use" and "useful", ensuring that the benefits of ease of use, usefulness, and confirmation are well executed. This study's insights are beneficial not only for business owners and application developers but also for the Vietnamese government, which is striving towards a safe, contact-free economy powered by e-wallet usage. A notable benefit of such a strategy is that cashless transactions can help the government avoid catastrophes as physical cards, wallets, and cash have the potential to facilitate the transmission of viruses, particularly during unprecedented events such as the COVID-19 pandemic. Naturally, both the adoption and continued use of e-wallets are vital stages in achieving the goal of a cashless society, and this study contributes to the latter.

6.3. Limitations and future research

This research has several limitations, particularly concerning the sample characteristics and variables investigated. Regarding sample-related issues, this research only collected feedback from MoMo users, and most participants are young consumers, which may affect the experiment's results. Regarding the insignificant impacts of perceived usefulness, satisfaction, price benefit, trust, and operational constraint, which differ from past studies, it is noteworthy that the respondents are current users of mobile payment apps, and their familiarity with them could explain the results. Therefore, it would be premature to infer that these factors are less important in countries where e-wallets are less prevalent. As a recommendation, future studies with larger sample

sizes and participants with diverse characteristics could provide a more comprehensive picture, allowing for more control variables and thereby increasing the reliability of research results. Moreover, since this research was conducted in Vietnam - a developing country, the results may not precisely explain the reasons for the continued use of e-wallets in nations with different socioeconomic contexts. To enhance the generalisability of their findings, researchers should exercise caution when generalising their findings and consider conducting cross-national studies.

CRediT author statement

Minh Tuan Phung and Thi Minh Ly Pham: Providing guidance, context, and defining the research objective; Phuong Thanh Nguyen, Tan Lac Thien Vo and Le Bao Tran Tran: Data collection, Writing.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

[1] Vietnamnet (2021), "Mobile payment users in Vietnam rank third in the world", https://vietnamnet.vn/en/mobile-payment-users-in-vietnam-rank-third-in-the-world-766721.html, accessed 15 July 2023.

[2] Boku (2021), *Mobile Wallets Report 2021*, https://wp-boku-2020.s3.eu-west-2.amazonaws.com/media/2021/09/18175330/2021-Mobile-Wallets-Report.pdf?utm_campaign=Mobile+Wallets+Report+2021+Download&utm_medium=email&utm_source=autopilot, accessed 15 July 2023.

[3] Allied Market Research (2021), *Vietnam Mobile Payment Market*, https://www.alliedmarketresearch.com/vietnam-mobile-payment-market, accessed 15 July 2023.

[4] VISA (2022), "Consumer payment attitudes study 2022", https://www.visa.com.vn/dam/VCOM/regional/ap/documents/visa-cpa-report-ipvmc-2022.pdf, accessed 15 July 2023.

[5] Ministry of Information and Communications of the Socialist Republic of Vietnam (2022), "E-wallets: New competition emerges amid pandemic", https://english.mic.gov.vn/e-wallets-new-competition-emerges-amid-pandemic-197153302.htm, accessed 15 July 2023.

[6] Mai Trinh (2021), "Demystifying the rise of E-wallets in Vietnam", *Decision Lab,* https://www.decisionlab.co/blog/demystifying-the-rise-of-e-wallets-in-vietnam, accessed 15 July 2023.

[7] Vietdata (2022), "Vietnamese E-wallet market and the fierce war for market share", https://www.vietdata.vn/post/vietnamese-e-wallet-market, accessed 15 July 2023 (in Vietnamese).

[8] S. Thai (2022), "It is difficult to 'live' with only e-wallets, what is unicorn MoMo's ambition in the fierce race of fintech in Vietnam"?, https://vietnambiz.vn/kho-song-duoc-chi-bang-vi-dien-tu-ky-lan-momo-tham-vong-gi-trong-cuoc-dua-khoc-liet-cua-fintech-tai-viet-nam-20220302210805727.htm, accessed 15 July 2023 (in Vietnamese).

[9] Y. Ding, K.H. Chai (2015), "Emotions and continued usage of mobile applications", *Industrial Management & Data Systems*, **115(5)**, pp.833-852, DOI: 10.1108/imds-11-2014-0338.

[10] A. Bhattacherjee (2001), "Understanding information systems continuance: An expectation-confirmation model", *MIS Quarterly*, **25(3)**, pp.351-370, DOI: 10.2307/3250921.

[11] S. Hong, J.Y.L. Thong, K.Y. Tam (2006), "Understanding continued information technology usage behaviour: A comparison of three models in the context of mobile internet", *Decision Support Systems*, **42(3)**, pp.1819-1834, DOI: 10.1016/j.dss.2006.03.009.

[12] C. Nguyen, T. Nguyen, T. Tran (2020), "The determinants of consumer's intention to use e-wallet: The case study of MoMo in Vietnam", *International Journal of Advanced Science and Technology*, **29(3)**, pp.14284-14293.

[13] C. Liao, P. Palvia, J.L. Chen (2009), "Information technology adoption behaviour life cycle: Toward a Technology Continuance Theory (TCT)", *International Journal of Information Management*, **29(4)**, pp.309-320, DOI: 10.1016/j.ijinfomgt.2009.03.004.

[14] A. Pal, R. De', T. Herath, et al. (2019), "A review of contextual factors affecting mobile payment adoption and use", *Journal of Banking and Financial Technology*, **3**, pp.43-57, DOI: 10.1007/s42786-018-00005-3.

[15] H. Qasim, E.A. Shanab (2016), "Drivers of mobile payment acceptance: The impact of network externalities", *Information Systems Frontiers*, **18(5)**, pp.1021-1034, DOI: 10.1007/s10796-015-9598-6.

[16] M. Sinha, H. Majra, J. Hutchins, et al. (2019), "Mobile payments in India: The privacy factor", *International Journal of Bank Marketing*, **37(1)**, pp.192-209, DOI: 10.1108/ijbm-05-2017-0099.

[17] T. Zhou (2011), "The effect of initial trust on user adoption of mobile payment", *Information Development*, **27(4)**, pp.290-300, DOI: 10.1177/0266666911424075.

[18] P. Cheng, Z. OuYang, Y. Liu (2019), "Understanding bike sharing use over time by employing extended technology continuance theory", *Transportation Research Part A: Policy and Practice*, **124**, pp.433-443, DOI: 10.1016/j.tra.2019.04.013.

[19] B. Foroughi, M. Iranmanesh, S.S. Hyun (2019), "Understanding the determinants of mobile banking continuance usage intention", *Journal of Enterprise Information Management*, **32(6)**, pp.1015-1033, DOI: 10.1108/jeim-10-2018-0237.

[20] A. Daragmeh, J. Sági, Z. Zéman (2021), "Continuous intention to use e-wallet in the context of the COVID-19 pandemic: Integrating the Health Belief Model (HBM) and Technology Continuous Theory (TCT)", *Journal of Open Innovation: Technology, Market, and Complexity*, **7(2)**, DOI: 10.3390/joitmc7020132.

[21] B.U.I. Khan, R.F. Olanrewaju, A.M. Baba, et al. (2017), "A compendious study of online payment systems: Past developments, present impact, and future considerations", *International Journal of Advanced Computer Science and Applications*, **8(5)**, DOI: 10.14569/ijacsa.2017.080532.

[22] N. Iman (2018), "Is mobile payment still relevant in the fintech era?", *Electronic Commerce Research and Applications*, **30**, pp.72-82, DOI: 10.1016/j.elerap.2018.05.009.

[23] Z. Shao, L. Zhang, X. Li, et al. (2019), "Antecedents of trust and continuance intention in mobile payment platforms: The moderating effect of gender", *Electronic Commerce Research and Applications*, **33**, DOI: 10.1016/j.elerap.2018.100823.

[24] L. Gao, K.A. Waechter (2017), "Examining the role of initial trust in user adoption of mobile payment services: An empirical investigation", *Information Systems Frontiers*, **19**, pp.525-548, DOI: 10.1007/s10796-015-9611-0.

[25] K.K. Eswaran (2019), "Consumer perception towards digital payment mode with special reference to digital wallets", *Research Explorer*, **7(2)**, pp13-20.

[26] H. Todd (2022), "Going cashless to prevent COVID-19 was useless, new BYU microbiology study finds", https://news.byu.edu/going-cashless-to-prevent-covid-19-was-useless-new-byu-study-finds, accessed 15 July 2023.

[27] Y.U. Chandra, B.S. Abbas, A. Trisetyarso, et al. (2020), "Comparison analysis between mobile banking and mobile payment as determinant factors of customer privacy", *Advanced Science Technology English System*, **5(2)**, pp.469-475, DOI: 10.25046/aj050260.

[28] D. Chawla, H. Joshi (2019), "Consumer attitude and intention to adopt mobile wallet in India - An empirical study", *International Journal of Bank Marketing*, **37(7)**, pp.1590-1618, DOI: 10.1108/ijbm-09-2018-0256.

[29] P.M. Tun (2020), "An investigation of factors influencing intention to use mobile wallets of mobile financial services providers in Myanmar", *The Asian Journal of Technology Management*, **13(2)**, pp.129-144, DOI: 10.12695/ajtm.2020.13.2.3.

[30] Decision Lab (2023), *The Connected Consumer Q1 2023*, https://www.decisionlab.co/download-the-connected-consumer-q1-2023, accessed 15 July 2023.

[31] N.A.A. Halim, A.V. Zadeh, H. Hanifah, et al. (2022), "Understanding the determinants of e-wallet continuance usage intention in Malaysia", *Quality & Quantity*, **56(5)**, pp.3413-3439, DOI: 10.1007/s11135-021-01276-7.

[32] A. Pal, T. Herath, R. De, et al. (2020), "Contextual facilitators and barriers influencing the continued use of mobile payment services in a developing country: Insights from adopters in India". *Information Technology for Development*, **26(2)**, pp.394-420, DOI: 10.1080/02681102.2019.1701969.

[33] G.M.M. Dewi, L. Joshua, R.B. Ikhsan, et al. (2021), "Perceived risk and trust in adoption E-wallet: The role of perceived usefulness and ease of use", *2021 International Conference on Information Management and Technology (ICIMTech)*, **1**, pp.120-124, DOI: 10.1109/icimtech53080.2021.9535033.

[34] D. Chatterjee, K. Bolar (2019), "Determinants of mobile wallet intentions to use: The mental cost perspective", *International Journal of Human-Computer Interaction*, **35(10)**, pp.859-869, DOI: 10.1080/10447318.2018.1505697.

[35] C.H. Hsiao, J.J. Chang, K.Y. Tang (2016), "Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives", *Telematics and Informatics*, **33(2)**, pp.342-355, DOI: 10.1016/j.tele.2015.08.014.

[36] S.S. Kim, N.K. Malhotra (2005), "A longitudinal model of continued IS use: An integrative view of four mechanisms underlying postadoption phenomena", *Management Science*, **51(5)**, pp.741-755, DOI: 10.1287/mnsc.1040.0326.

[37] W.T. Wang, W.M. Ou, W.Y. Chen (2019), "The impact of inertia and user satisfaction on the continuance intentions to use mobile communication applications: A mobile service quality perspective", *International Journal of Information Management*, **44**, pp.178-193, DOI: 10.1016/j.ijinfomgt.2018.10.011.

[38] G. Dağhan, B. Akkoyunlu (2016), "Modeling the continuance usage intention of online learning environments", *Computers in Human Behaviour*, **60**, pp.198-211, DOI: 10.1016/j.chb.2016.02.066.

[39] D. Amoroso, R. Lim (2017), "The mediating effects of habit on continuance intention", *International Journal of Information Management*, **37(6)**, pp.693-702, DOI: 10.1016/j.ijinfomgt.2017.05.003.

[40] Z. Lin, R. Filieri (2015), "Airline passengers' continuance intention towards online check-in services: The role of personal innovativeness and subjective knowledge", *Transportation Research Part E: Logistics and Transportation Review*, **81**, pp.158-168, DOI: 10.1016/j.tre.2015.07.001.

[41] D. Upton (2013), *Introducing Psychology for Nurses and Healthcare Professionals*, Routledge, 424pp, DOI: 10.4324/9781315846972.

[42] M. Yan, R. Filieri, M. Gorton (2021), "Continuance intention of online technologies: A systematic literature review", *International Journal of Information Management*, **58**, DOI: 10.1016/j.ijinfomgt.2021.102315.

[43] B. Nascimento, T. Oliveira, C. Tam (2018), "Wearable technology: What explains continuance intention in smartwatches?", *Journal of Retailing and Consumer Services*, **43**, pp.157-169, DOI: 10.1016/j.jretconser.2018.03.017.

[44] D.M. Szymanski, D.H. Henard (2001), "Customer satisfaction: A meta-analysis of the empirical evidence", *Journal of The Academy of Marketing Science*, **29(1)**, pp.16-35, DOI: 10.1177/009207030102900102.

[45] X.M. Fu, J.H. Zhang, F.T. Chan (2018), "Determinants of loyalty to public transit: A model integrating Satisfaction-Loyalty Theory and Expectation-Confirmation Theory", *Transportation Research Part A: Policy and Practice*, **113**, pp.476-490, DOI: 10.1016/j.tra.2018.05.012.

[46] A. Susanto, Y. Chang, Y. Ha (2016), "Determinants of continuance intention to use the smartphone banking services: An extension to the expectation-confirmation model", *Industrial Management & Data Systems*, **116(3)**, pp.508-525, DOI: 10.1108/imds-05-2015-0195.

[47] C.H. Yang, K. Motohashi, J.R. Chen (2009), "Are new technology-based firms located on science parks really more innovative? Evidence from Taiwan", *Research Policy*, **38(1)**, pp.77-85, DOI: 10.1016/j.respol.2008.09.001.

[48] G.S. Weng, S. Zailani, M. Iranmanesh, et al. (2017), "Mobile taxi booking application service's continuance usage intention by users", *Transportation Research Part D: Transport and Environment*, **57**, pp.207-216, DOI: 10.1016/j.trd.2017.07.023.

[49] W. Zhou, Z. Tsiga, B. Li, et al. (2018), "What influence users' e-finance continuance intention? The moderating role of trust", *Industrial Management & Data Systems*, **118(8)**, pp.1647-1670, DOI: 10.1108/imds-12-2017-0602.

[50] Y.C. Shen, C.Y. Huang, C.H. Chu, et al. (2010), "A benefit-cost perspective of the consumer adoption of the mobile banking system", *Behaviour & Information Technology*, **29(5)**, pp.497-511, DOI: 10.1080/01449290903490658.

[51] S.H. Lim, D.J. Kim, Y. Hur, et al. (2019), "An empirical study of the impacts of perceived security and knowledge on continuous intention to use mobile fintech payment services", *International Journal of Human-Computer Interaction*, **35(10)**, pp.886-898, DOI: 10.1080/10447318.2018.1507132.

[52] A.A. Shaikh, H. Karjaluoto (2015), "Mobile banking adoption: A literature review" *Telematics and Informatics*, **32(1)**, pp.129-142, DOI: 10.1016/j.tele.2014.05.003.

[53] N. Shaw, K. Sergueeva (2019), "The non-monetary benefits of mobile commerce: Extending UTAUT2 with perceived value", *International Journal of Information Management*, **45**, pp.44-55, DOI: 10.1016/j.ijinfomgt.2018.10.024.

[54] A.S. Ghazali, J. Ham, E. Barakova, et al. (2018), "The influence of social cues in persuasive social robots on psychological reactance and compliance", *Computers in Human Behaviour*, **87**, pp.58-65, DOI: 10.1016/j.chb.2018.05.016.

[55] A.A. Bailey, I. Pentina, A.S. Mishra, et al. (2017), "Mobile payments adoption by US consumers: An extended TAM", *International Journal of Retail & Distribution Management*, **45(6)**, pp.626-640, DOI: 10.1108/ijrdm-08-2016-0144.

[56] S.H.W. Chuah, M. Marimuthu, J. Kandampully, et al. (2017), "What drives gen Y loyalty? Understanding the mediated moderating roles of switching costs and alternative attractiveness in the value-satisfaction-loyalty chain", *Journal of Retailing and Consumer Services*, **36**, pp.124-136, DOI: 10.1016/j.jretconser.2017.01.010.

[57] L.T.T. Tran, L.M.T. Pham, L.T. Le (2019), "E-satisfaction and continuance intention: The moderator role of online ratings", *International Journal of Hospitality Management*, **77**, pp.311-322, DOI: 10.1016/j.ijhm.2018.07.011.

[58] V. Venkatesh, F.D. Davis (2000), "A theoretical extension of the technology acceptance model: Four longitudinal field studies", *Management Science*, **46(2)**, pp.186-204, DOI: 10.1287/mnsc.46.2.186.11926.

[59] F.L. Cabanillas, J.S. Fernández, F.M. Leiva (2014), "Antecedents of the adoption of the new mobile payment systems: The moderating effect of age", *Computers in Human Behaviour*, **35**, pp.464-478, DOI: 10.1016/j.chb.2014.03.022.

[60] B. Wu, X. Chen (2017), "Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model", *Computers in Human Behaviour*, **67**, pp.221-232, DOI: 10.1016/j.chb.2016.10.028.

[61] R. Heeks, C. Kenny (2001), *Is The Internet a Technology of Convergence or Divergence?* Mimeo, World Bank, Washington, DC.

[62] D.B. Humphrey, M. Kim, B. Vale (2001), "Realizing the gains from electronic payments: Costs, pricing, and payment choice", *Journal of Money, Credit and Banking*, **33(2)**, pp.216-234, DOI: 10.2307/2673882.

[63] N. Nargis, U.H. Ruthbah, A.K.M.G. Hussain, et al. (2014), "The price sensitivity of cigarette consumption in Bangladesh: Evidence from the International Tobacco Control (ITC) Bangladesh wave 1 (2009) and wave 2 (2010) surveys", *Tobacco Control*, **23(1)**, pp.39-47, DOI: 10.1136/tobaccocontrol-2012-050835.

[64] R.C. Mayer, J.H. Davis, F.D. Schoorman (1995), "An integrative model of organizational trust", *Academy of Management Review*, **20(3)**, pp.709-734, DOI: 10.5465/amr.1995.9508080335.

[65] G. Sharma, W. Lijuan (2014), "Ethical perspectives on e-commerce: An empirical investigation", *Internet Research*, **24(4)**, pp.414-435, DOI: 10.1108/intr-07-2013-0162.

[66] P. Gerrard, J.B. Cunningham (2003), "The diffusion of internet banking among Singapore consumers", *International Journal of Bank Marketing*, **21(1)**, pp.16-28, DOI: 10.1108/02652320310457776.

[67] M. Limayem, S.G. Hirt, C.M. Cheung (2007), "How habit limits the predictive power of intention: The case of information systems continuance", *MIS Quarterly*, **31(4)**, pp.705-737, DOI: 10.2307/25148817.

[68] W. Zhanyou, H. Dongmei, Z. Yaopei (2020), "How to improve users' intentions to continued usage of shared bicycles: A mixed method approach", *PLOS ONE*, **15(2)**, DOI: 10.1371/journal.pone.0229458.

[69] D.C. Herting, R.C. Pros, A.C. Tarrida (2023), "Habit and social influence as determinants of PowerPoint use in higher education: A study from a technology acceptance approach", *Interactive Learning Environments*, **31(1)**, pp.497-513, DOI: 10.1080/10494820.2020.1799021.

[70] H. Karjaluoto, A.A. Shaikh, M. Leppäniemi, et al. (2020), "Examining consumers' usage intention of contactless payment systems", *International Journal of Bank Marketing*, **38(2)**, pp.332-351, DOI: 10.1108/ijbm-04-2019-0155.

[71] J. Coiro (2017), "Advancing reading engagement and achievement through personal digital inquiry, critical literacy, and skilful argumentation", *Improving Reading and Reading Engagement in The 21st Century: International Research and Innovation*, pp.49-76, DOI: 10.1007/978-981-10-4331-4_3.

[72] D. Ma, J.T. Du, Y. Cen, et al. (2016), "Exploring the adoption of mobile internet services by socioeconomically disadvantaged people: A qualitative user study", *Aslib Journal of Information Management*, **68(6)**, pp.670-693, DOI: 10.1108/ajim-03-2016-0027.

[73] P.G. Schierz, O. Schilke, B.W. Wirtz (2010), "Understanding consumer acceptance of mobile payment services: An empirical analysis", *Electronic Commerce Research and Applications*, **9(3)**, pp.209-216, DOI: 10.1016/j.elerap.2009.07.005.

[74] V. Venkatesh, J.Y. Thong, X. Xu (2012), "Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology", *MIS Quarterly*, **36(1)**, pp.157-178, DOI: 10.2307/41410412.

[75] Y. Song (2011), "What are the affordances and constraints of handheld devices for learning in higher education", *British Journal of Educational Technology*, **42(6)**, pp.163-166, DOI: 10.1111/j.1467-8535.2011.01233.x.

[76] K.M. Alraimi, H. Zo, A.P. Ciganek (2015), "Understanding the MOOCs continuance: The role of openness and reputation", *Computers & Education*, **80**, pp.28-38, DOI: 10.1016/j.compedu.2014.08.006.

[77] J.J.F. Hair (2010), *Multivariate Data Analysis, 7th Edition*, Englewood Cliffs, New Jersey: Prentice Hall.

[78] J.J.F. Hair, M. Sarstedt, L. Hopkins, et al. (2014), "Partial least squares structural equation modeling (PLS-SEM)", *European Business Review*, **26(2)**, pp.106-121, DOI: 10.1108/ebr-10-2013-0128.

[79] A.V. Zadeh, R. Thurasamy, H. Hanifah (2019), "Modeling anti-malware use intention of university students in a developing country using the theory of planned behaviour", *Kybernetes*, **48(8)**, pp.1565-1585, DOI: 10.1108/k-05-2018-0226.

[80] C.L. Hung (2021), "The research of factors influencing advanced medical robot use", *Quality & Quantity*, **55(2)**, pp.385-393, DOI: 10.1007/s11135-020-01007-4

[81] I.G.A.E.T. Kusuma, N.N.W. Yasmari, A.A.P. Agung, et al. (2021), "When satisfaction is not enough to build a word of mouth and repurchase intention", *Asia - Pacific Management and Business Application*, **10(1)**, DOI: 10.21776/ub.apmba.2021.010.01.1.