






“A study on the impacts of safety and security on consumer’s intention to use electronic wallets in Hanoi”

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ARTICLE INFO	Mi Vu Ha Cong, Cuong Hung Nguyen, Lien Thuy Nhu and The Tuan Tran (2024). A study on the impacts of safety and security on consumer’s intention to use electronic wallets in Hanoi. <i>Innovative Marketing</i> , 20(4), 85-99. doi: 10.21511/im.20(4).2024.08
DOI	http://dx.doi.org/10.21511/im.20(4).2024.08
RELEASED ON	Monday, 11 November 2024
RECEIVED ON	Wednesday, 01 May 2024
ACCEPTED ON	Wednesday, 16 October 2024
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Innovative Marketing "
ISSN PRINT	1814-2427
ISSN ONLINE	1816-6326
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

54



NUMBER OF FIGURES

3



NUMBER OF TABLES

7

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 1st of May, 2024
Accepted on: 16th of October, 2024
Published on: 11th of November, 2024

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Tran, 2024

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Conflict of interest statement:
Author(s) reported no conflict of interest

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A STUDY ON THE IMPACTS OF SAFETY AND SECURITY ON CONSUMER'S INTENTION TO USE ELECTRONIC WALLETS IN HANOI

Abstract

This article seeks to investigate how safety and security affect consumers' tendency to use electronic wallets in Hanoi. The study was conducted based on data using Google Forms, with a total of 237 valid responses. For data analysis, this research employs quantitative techniques using SPSS 22 and AMOS 25 software. The results demonstrate that safety and security positively impact four factors in the following order: financial benefits ($\beta = 0.853$; $p = 0.000$), brand image ($\beta = 0.830$; $p = 0.000$), technology function ($\beta = 0.708$; $p = 0.000$), social influence ($\beta = 0.589$; $p = 0.000$). Particularly risk perception ($\beta = -0.192$; $p = 0.013$) is a factor that is inversely affected, whereby greater safety and security result in reduced perceived risk. The results also show that only social influence ($\beta = 0.408$; $p = 0.000$) and brand image ($\beta = 0.172$; $p = 0.000$) influence the willingness to adopt e-wallets. Therefore, the safety and security only indirectly influence the tendency to use e-wallets through two variables: social influence and brand image. The study provides recommendations for e-wallet service providers, identifies limitations, and suggests future research directions.

Keywords

consumer behavior, consumer attitudes, digital payment, electronic wallet, trust, Hanoi

JEL Classification

C01, G41, M21

INTRODUCTION

Instead of using physical wallets in payment transactions, today consumers can pay with non-cash payment methods, including electronic wallets. Electronic wallets provide users with a tool to pay for various payment needs such as paying for phone bills, electricity, water, airline tickets, online shopping.

In recent years, payment by electronic wallets has become increasingly popular thanks to the benefits it brings. Using electronic wallets helps customers participate in transactions freely, promptly, and effectively (Karim et al., 2020) without facing any limitations on time and location (Qasim & Abu-Shanab, 2016). In contrast to other electronic payment systems, electronic wallets do not require logging in all the time and are a flexible system. Therefore, it helps save time for payment (Junadi, 2015).

The utilization of electronic wallets is contingent not only on technological advancements, but also on consumers' perceptions of its safety, security, and potential advantages. Enhancing customers' perceptions of security requires both technical security measures and security statements (Kim et al., 2010). Consumers' perceptions of safety have

positive impacts on trust and intention to adopt electronic payments. The development of e-wallets in a country depends largely on people's level of trust and sense of security when using it. Therefore, clarifying the impact of safety and security factors on consumers' intention to use e-wallets in Hanoi is important for e-wallet providers in expanding their business, and at the same time supporting authorities in formulating policies to promote the use of e-wallets in the future.

1. LITERATURE REVIEW AND HYPOTHESES

Electronic wallet is an application in electronic devices or phones that enables users to perform online transactions by holding payment information, cash, credit cards, or other payment methods. Electronic wallets are a virtual version of a traditional wallet. The safety and security of electronic wallets are crucial essential factors in user confidence and adoption.

Safety and security are one of the important topics that have been widely researched in the field of electronic payments. Many studies have shown the effect of safety and security on consumers' willingness to adopt. Safety is a condition or set of situations in which there is a low chance of having negative impacts on subjects (Blokland & Reniers, 2017). This means that a secure system needs to minimize risks and ensure that financial transactions are conducted without encountering incidents that result in financial loss or compromise of personal information. Safety is a state where dangers caused by natural factors or human negligence are avoided (Nas, 2015). In the realm of digital payments and electronic wallets, systems must protect users from risks arising from both natural disasters (such as power outages, natural disasters) and human errors (such as programming or usage mistakes). Safety often involves safeguarding users against financial risks and various forms of fraud. Security relates to protecting personal information and financial data from compromise. Security is an integral component of safety, focusing on safeguarding information and assets from unauthorized access and intrusive behaviors. Security, in a technical context, refers to a system's guarantee of integrity, safety, authenticity, and confidentiality of information (Flavián & Guinaliú, 2006). If a product lacks safety features and customers are not assured of its security, they will be hesitant to use the product and will choose not to utilize it (Milberg et al., 2000). This is particularly critical for electronic wallets, where users must have confidence that their financial and personal informa-

tion is safeguarded. The lack of security functions in payments through electronic wallets will facilitate only identity thieves to steal personal information to commit cybercrimes (Kaur et al., 2018). Attacks such as phishing, malware, and man-in-the-middle attacks can cause serious damage if security measures are not implemented properly.

One of the pivotal factors shaping the behavior in utilizing electronic wallets is trust. Users need to feel assured of the security and safety of the electronic wallet they are utilizing. When the level of safety and security is guaranteed, users are more inclined to trust the system, leading to a heightened intention to use it. There is a correlation and causal relation between elements in the research model, including the antecedents of trust (transaction security, website attributes, search functions and variables related to personality), outcome (intention to buy), and mediating variables (website – perception of location) (Yoon, 2002). The positive relationship between transaction processes, technical protection and security protection can be used for statistics. Customers rely on this relationship to shape their perception of security and trust. From there, customers develop a desire to utilize the service. The intention to use is understood as the ability to predict certain behaviors based on the intention to perform them (Fishbein & Ajzen, 1973). Therefore, the correlation between transaction processes, technical safeguards and security measures positively and significantly influences customers' intention to adopt digital payments (Gupta & Hakhu, 2021). Customers who better perceived their security would use more online shopping and payments. This is because they feel reassured that their personal information is securely safeguarded and not vulnerable to exposure online (Fornell & Larcker, 1981). The perception of trust also serves as an intermediary in linking the sense of safety and the behavior in utilizing digital wallets. When users have confidence in the system's security, they feel at ease and are more inclined to utilize electronic wallets (Prasetya & Shuhidan, 2023). Customers' intention to buy and the perceived utility and convenience of

electronic payment systems has a stronger mediation effect (Ardiansah et al., 2020). Transaction security significantly influences customers' behaviors toward mobile payment usage. Empirical evidence suggests that transaction security may influence consumers' decisions to adopt payments via mobile devices (Tsai et al., 2022). When individuals perceive that their transactions are secure, they tend to have more trust in the system and therefore, will use mobile payment services more actively. Trust in security holds the greatest sway over consumers' electronic wallet usage behavior, whereas the awareness of security risk, social impacts and sensitivity to information exert a comparatively smaller effect on the decision to utilize digital wallets. The study showed that security regulations, as well as users' understanding and evaluation of security, influenced how consumers used digital wallets. By giving users a sense of security and a legal framework, these factors promote the utilization of digital wallets. Negative experiences, such as fraud or financial loss, can decrease the willingness to utilize digital wallets. Conversely, if users have positive experiences with safety and security measures of electronic wallets, they are inclined to use them more (Huong et al., 2023).

Many studies were conducted to analyze the variables that influence customers' electronic wallet usage behavior, such as Madan and Yadav (2016), Venkatesh et al. (2003), Latupeirissa et al. (2020), Trivedi (2016), Trang and Thanh (2021), Vuong (2021). However, these studies mainly focus on customers' perception of behavioral intention, and a lack of research on the significant effect of security on the trend of using electronic wallets. Therefore, a study on impacts of safety, security on consumers' intention to use electronic wallets in Hanoi will help bridge a re-

search gap. As it sheds light on the significance and function of safety and security elements concerning consumers' inclination to adopt electronic wallets, this study aids in further comprehension, it will be a useful resource for reference in other future studies.

The theoretical overview has elucidated the complex relationship between trust and ensuring safety and security in using electronic payment services and electronic wallets. Studies have underscored the importance of fostering trust and confidence in consumers by providing a secure environment for electronic transactions.

Researchers have skillfully applied theoretical frameworks to understand consumers' intentions in using electronic wallets, for example, Pham et al. (2021), Harishanthan and Neruja (2022), Dang and Nguyen (2021), Nguyen and Ao (2022) utilized the TAM theoretical framework for investigation; Hoang et al. (2021), To (2021), Pharot and Chutima (2018), Tusyanah et al. (2021), Vuong (2021) employed the UTAUT model for research; Ariffin et al. (2021), Nguyen and Ao (2022), Nguyen et al. (2021) investigated using the TPB model. However, studies examining the impact of safety and security factors on the behavior to use electronic wallets through other variables are still limited in terms of subjects, scope, and diversity of topics.

The study examines to consider the indirect impact of safety and security through intermediate variables on customers' adoption of e-wallet technology. Based on theoretical models and relevant studies, the research model is proposed to evaluate the impact of safety and security on consumers' intention to utilize e-wallets (see Figure 1).

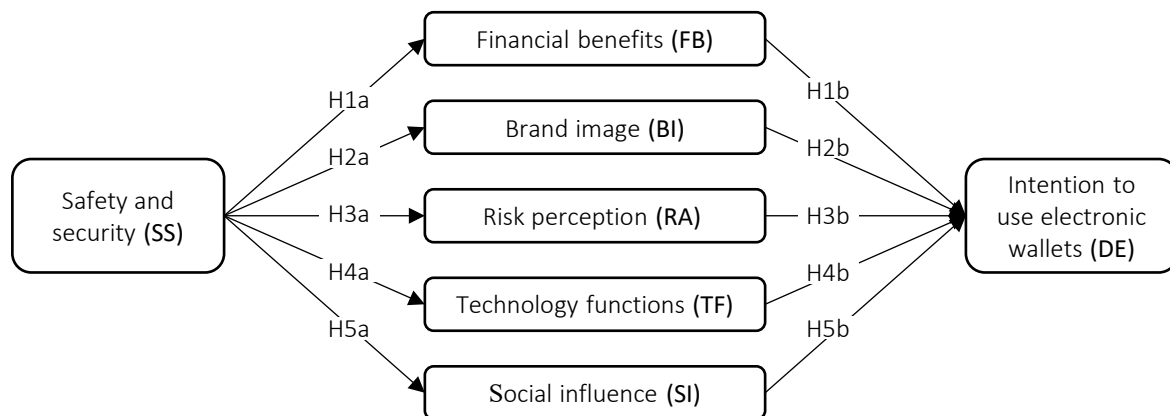


Figure 1. Research model

The model’s hypotheses are outlined as follows:

- H1a: Safety and security impact financial benefits.*
- H1b: Financial benefits impact the intention to use electronic wallets.*
- H2a: Safety and security impact brand image.*
- H2b: Brand image impact the intention to use electronic wallets.*
- H3a: Safety and security impact risk perception.*
- H3b: Risk perception impact the intention to use electronic wallets.*
- H4a: Safety and security impact technology functions.*
- H4b: Technology functions impact the intention to use electronic wallets.*
- H5a: Safety and security impact social influence.*
- H5b: Social influence impact the intention to use electronic wallets.*

2. METHODOLOGY

This study is carried out based on a comprehensive database, including academic journals, specialized reports, and government documents that reflect the global and regional trends in the deployment of digital finance. This study will collect data through face-to-face and online surveys to have sufficient respondents. Additionally, descriptive statistical methods (including mean

value, standard deviation, and frequency distribution) will be used to summarize the data. Inferential statistical methods will be used to analyze relationships in this study.

Group discussions were held in Hanoi with eight experts, including two Doctors of Business, one Doctor of IT and 05 consumers, to understand electronic wallets (Viettel Pay, ZaloPay, ShopeePay, Momo...). Besides, this study designed and developed its measurement scale in correspondence to Vietnam’s market by adopting and amending the scales of measurement introduced in the previous study related to the intention to utilize electronic wallets. Out of the total 28 variables, including 25 observed independent variables, and 3 observed dependent variables. The safety and security scale consists of 4 observations; the financial benefits scale comprises 05 observations; the brand image scale includes 4 observations; the risk perception scale comprises 04 measurements; the technology function scale includes 4 measurements; the social impacts scale comprises 04 observations; the intention to use scale consists of 3 observations. The respondents’ agreement levels are categorized into seven levels for each scale. Level 1 represents “strongly disagree,” followed by ascending levels up to 7, indicating “completely agree.”

The subjects of the survey are consumers using electronic wallets in Hanoi. Table 1 delineates the traits of the sample involved in the survey. Three hundred eight surveys were distributed to respondents in January 2023 to collect information on whether the respondents knew about electronic wallets. By the end, 237 responses were received. The survey data was encoded and inputted into data processing utilizing SPSS version 22 and AMOS version 25 for analysis.

Table 1. Characteristics of survey respondents

	Criteria	Number	Percentage (%)
Gender	Female	134	56.5
	Male	103	43.5
Age	18-25 years old	151	63.7
	25-30 years old	86	36.3
Family income	Under 15 million VND	127	53.6
	From 15 to 30 million VND	69	29.1
	From 30 to 50 million VND	28	11.8
	Above 50 million VND	13	5.5
Total		237	100

From the data presented in Table 1, it can be inferred that in term of gender, 56.5% survey respondents are female, while 43.5% are male. In terms of age distribution, 63.7% of survey participants fall within the bracket of 18 to 25, the remaining 36.3% were between 23 and 30 years old. This suggests that a significant majority of survey participants are quite young, which is also the age that is easy to accept and use technology. More than 53.6% of survey participants earn less than 15 million Vietnamese dong, while 29,1% have an income of 15 to 23 million Vietnamese dong, and 17,3% have an income of above 30 million Vietnamese dong. The predominant portion of survey participants aged between 18 and 25 years earn less than 15 million dong.

3. RESULTS

The outcomes regarding the distribution values, mean values, and standard deviations of the variables are depicted in Table 2.

In terms of a mean value, variables such as RA1, RA2, RA3, and RA4 exhibit a mean value surpassing 3, suggesting that the respondents maintain a neutral standpoint on the matter; while others have a mean value greater than 5, implying that the respondents tend to endorse with the viewpoints. This indicates that most electronic wallet users evaluated these variables from average of 5 or higher.

Overall, these results show that most respondents agree that these factors influence their willingness to use electronic wallets.

Table 2. Descriptive statistics

Variable	Code	No. of surveys	Minimum	Maximum	Mean	Standard deviation
Safety and security	SS1	237	1	7	5.56	1.198
	SS2	237	1	7	5.28	1.311
	SS3	237	1	7	5.38	1.232
	SS4	237	1	7	5.29	1.205
Financial benefits	FB1	237	2	7	6.04	1.096
	FB2	237	1	7	5.16	1.323
	FB3	237	2	7	5.85	1.154
	FB4	237	1	7	5.54	1.250
	FB5	237	1	7	5.68	1.214
Brand image	BI1	237	2	7	5.81	1.098
	BI2	237	2	7	5.47	1.122
	BI3	237	2	7	5.20	1.026
	BI4	237	2	7	5.60	1.035
Risk perception	RP1	237	1	7	3.87	1.673
	RP2	237	1	7	3.64	1.448
	RP3	237	1	7	3.92	1.485
	RP4	237	1	7	3.83	1.564
Technology function	TF1	237	1	7	6.15	1.113
	TF2	237	1	7	5.90	1.178
	TF3	237	1	7	5.79	1.198
	TF4	237	1	7	5.68	1.175
Social influence	SI1	237	2	7	5.46	1.055
	SI2	237	2	7	5.23	1.135
	SI3	237	1	7	4.74	1.399
	SI4	237	1	7	5.59	1.149
Intention to use	DE1	237	2	7	5.68	1.068
	DE2	237	3	7	5.46	1.118
	DE3	237	1	7	5.57	1.168
Valid N (listwise)		237				

Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.

Table 3. Reliability test

No.	Variables	No. of observed variables	Cronbach's alpha
1	Safety and security	4	0.766
2	Financial benefits	5	0.799
3	Brand image	4	0.781
4	Risk perception	4	0.846
5	Technology function	4	0.865
6	Social influence	4	0.766
7	Intention to use	3	0.807

The outcomes of assessing the scale's reliability are depicted in Table 3. This table demonstrates the level of strong correlation between the observed variables included to evaluate the 7 independent variables within the model, thereby reflecting the scale's reliability.

The findings of assessing the scale's reliability are shown in Table 3. The Cronbach's alpha coefficient of the scales varies from 0.766 to 0.865 (exceeding 0.6), indicating the scale's reliability (Hair et al., 2006). The observations hold significance. Consequently, all observed variables in the research fulfil reliability criteria.

In the process of evaluating the value of the scale, Exploratory Factor Analysis (EFA) in SPSS 22 software was used to preliminarily eliminate inappropriate variables. The KMO coefficient and Bartlett's test aid in assessing the suitability of factor analysis, while the factor loading coefficient assists in identifying and removing unsuitable observed variables.

The EFA analysis revealed that SI4 has its factor loading under 0.5. Consequently, this variable will be excluded from the model. From the 28 observed variables in the first EFA analysis, the removal of SI4 leaves 27 observed variables for inclusion in the subsequent EFA analysis.

The outcomes of the KMO test, along with the Rotated Component Matrix from the subsequent EFA analysis, depicted in Table 4 and Table 5, correspondingly.

Table 4. KMO and Barlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy		0.891
Bartlett's test of sphericity	Approx. Chi-squared	3241.070
	df	378
	Sig.	0.000

Derived from the outcomes in Table 4, KMO test shows the value of 0.891 (exceeding 0.5). Bartlett's

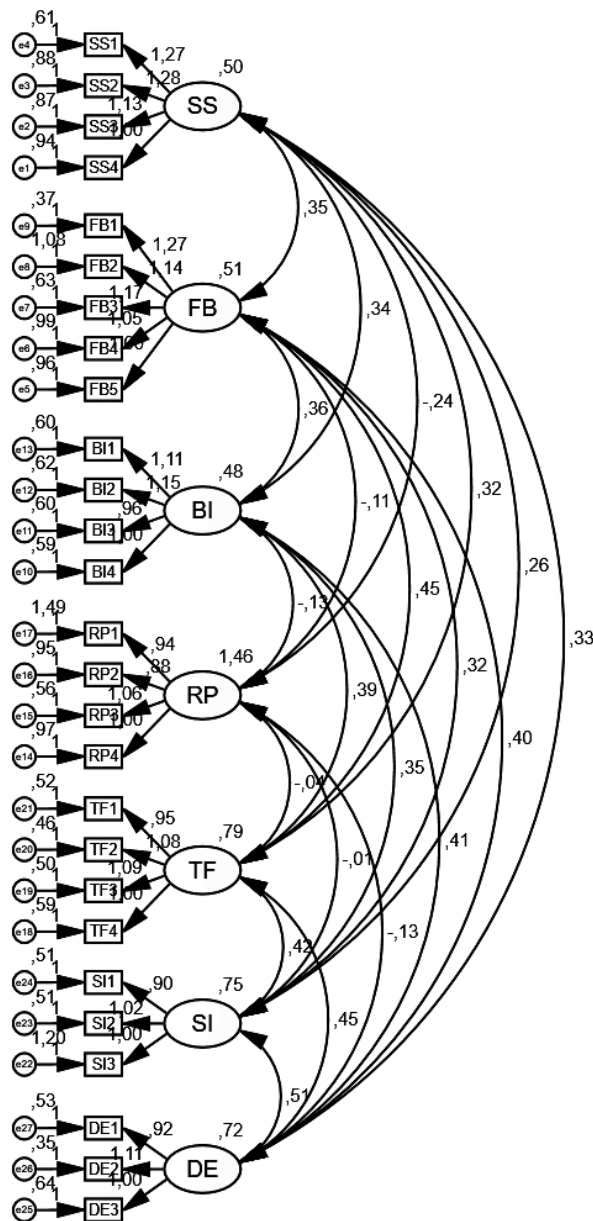
test yields a noteworthy outcome as its significance is 0.000, falling below 0.05. Therefore, it can be concluded that the EFA analysis shows that observed variables have a high correlation with the collected data (Hair et al., 2006).

Table 5. Rotated components

Variables	Matrix						
	Components						
	1	2	3	4	5	6	7
SS1	0.667						
SS2	0.676						
SS3	0.733						
SS4	0.598						
FB1		0.568					
FB2		0.510					
FB3		0.736					
FB4		0.681					
FB5		0.549					
BI1			0.672				
BI2			0.615				
BI3			0.663				
BI4			0.655				
RP1				0.775			
RP2				0.792			
RP3				0.872			
RP4				0.841			
TF1					0.772		
TF2					0.749		
TF3					0.729		
TF4					0.754		
SI1						0.706	
SI2						0.713	
SI3						0.805	
DE1							0.621
DE2							0.610
DE3							0.546

Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.

The outcomes of the rotated matrix reveal that 27 measured variables are categorized into 6 components. All recorded variables exhibit a



Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.

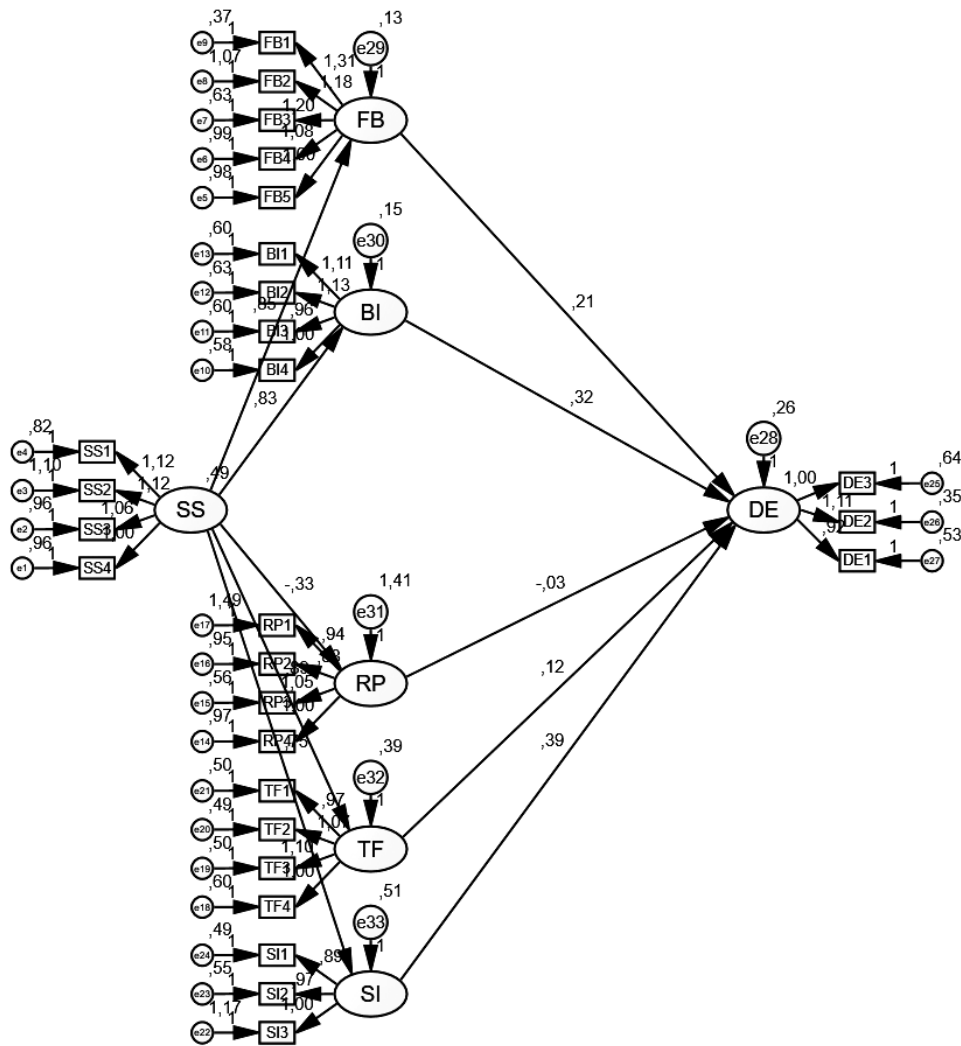
Figure 2. CFA analysis results

factor loading exceeding 0.5, with no poor variables remaining.

Figure 2 illustrates the outcomes of the confirmatory analysis to assess the overall compatibility of the data using the model fit indices. Exploratory Factor Analysis (EFA) was conducted on AMOS 25.

The outcomes of the CFA examination presented indicators within the standardised model, gauging the fitness of the model, exhibiting the

subsequent values: CMIN/DF = 1.656 < 2; CFI = 0.933 > 0.9; TLI = 0.920 > 0.9; RMSEA = 0.053 < 0.06. These values meet the requirements (Hair et al., 2010). Besides, the GFI index = 0.870 > 0.8, this value can be considered to meet the required threshold (Baumgartner & Homburg, 1995). Therefore, the outcomes of the CFA analysis ensure the required degree of significance. This means that the observed variables are grouped into factors of the model, which is reasonable.



Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.

Figure 3. Structural equation modeling

The outcomes of the structural equation modeling (SEM) examination are presented in Figure 3.

The SEM study confirmed that the following values are indicators of the model’s fit: CMIN/DF = 1.795 < 3; GFI = 0.854 > 0.8; TLI = 0.903 > 0.9; CFI = 0.914 > 0.9; and RMSEA = 0.058 < 0.080. All of these numbers meet the expectations (Hair et al., 2006). In this way, the findings from the structural equation modeling study reach the required level of significance. This means that the scales are reliable.

Table 6 displays the outcomes of testing the model’s assumptions.

The p-values in the analysis of the impact of safety and security on five factors, namely financial benefits, brand image, technological functionality, social impact, and risk perception, are 0.000, 0.000, 0.000, 0.000, and 0.013, respectively, have p-values below 5%. This means that the levels of safety and security exert a statistically considerable influence on these five factors. Therefore, the hypotheses *H1a*, *H2a*, *H3a*, *H4a*, and *H5a* are all accepted. Accordingly, the safety and security factor has a positive relationship with four factors in the following order: financial benefits (*H1a*: $\beta = 0.853$; $p = 0.000$), brand image (*H2a*: $\beta = 0.830$; $p = 0.000$), technological functionality (*H4a*: $\beta = 0.708$; $p = 0.000$), and social influence (*H5a*: $\beta = 0.589$; $p =$

Table 6. Regression analysis

Hypothesis	Relationship	Standardized estimate	p-value	Test result
<i>H1a</i>	SS → FB	0.853	***	Accepted
<i>H2a</i>	SS → BI	0.830	***	Accepted
<i>H3a</i>	SS → RP	-0.192	0.013	Accepted
<i>H4a</i>	SS → TF	0.708	***	Accepted
<i>H5a</i>	SS → SI	0.589	***	Accepted
<i>H1b</i>	FB → DE	0.262	0.101	Rejected
<i>H2b</i>	BI → DE	0.172	0.014	Accepted
<i>H3b</i>	RP → DE	-0.039	0.489	Rejected
<i>H4b</i>	TF → DE	0.125	0.119	Rejected
<i>H5b</i>	SI → DE	0.408	***	Accepted

Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.

0.000); and it has a negative relationship with risk perception (*H3a*: $\beta = -0.192$; $p = 0.013$).

Research on the impact of financial benefits, technological function and risk perception on the intention to adopt e-wallets, with p values of 0.101; 0.119, and 0.489, respectively, all greater than 0.05. This indicates that these variables lack statistical significance. Consequently, these three variables are eliminated, leading to the rejection of hypotheses *H1b*, *H3b*, and *H4b*. The remaining two factors, including social impacts ($p = 0.000$) and brand image ($p = 0.014$), have p-values below 5%. Therefore, these two variables are statistically significant. The hypotheses *H2b* and *H5b* are accepted. Thus, two factors: social influence (*H5b*: $\beta = 0.408$; $p = 0.000$), brand image (*H2b*: $\beta = 0.172$; $p = 0.000$) affect e-wallet usage behavior.

Consequently, it can be inferred that there is no mediating link from safety and security to the behavior to utilize electronic wallets through the factors of financial advantages, technological capability, and risk perception. However, the safety and security variable indirectly influences the behavior to utilize electronic wallets through two mediating variables in the subsequent sequence: brand image and societal influences.

4. DISCUSSION

The study’s findings indicate that safety and security indirectly effect the behavior to utilize electronic wallets through Social Impact and Brand Image, while excluding the mediating role of fi-

ancial benefits, technological functionality, and risk perception. This indicates that consumers prioritize social validation and brand reputation over these factors when considering the usage of electronic wallets.

Safety and security indirectly shape the trend of using electronic wallets through social influence. This is consistent with the assertion that social impact influences users’ intention to adopt digital wallets - which are statements presented in Amit and Bhumiphat (2019), Chandran and Pitchandi (2020), Tusyanah et al. (2021), Jaludin and Nur (2022), Kelvin Lee and Mohamad (2022) and Pham et al. (2021). Recommendations and positive experiences from friends, family or colleagues who are using electronic wallets services can be powerful motivators. Recommendations and positive experiences from friends, family or colleagues who are using digital wallets services can be a powerful motivator. This observation aligns with the findings from by Verkijika (2018) and Yang et al. (2021). Users will use services to achieve equality with their peers (Tusyanah et al., 2021). Customer trust in electronic wallet services is increasingly bolstered as they witness others successfully using them and sharing positive experiences on social media or online review platforms. Especially when these reviews emphasize the safety and security of electronic wallets, customers are more disposed to trust and contemplate utilizing this service. Society influences an individual’s technology usage (Hemchand, 2016). Thus, the credibility and influence of prominent individuals can impact customers’ electronic wallet usage behavior. To attract customers and build

trust, electronic wallets companies often collaborate with Key Opinion Leaders (KOLs) on social networks to promote their services. This fact mirrors the perspective that media has a substantial role in convincing individuals to use digital wallets (Chandran & Pitchandi, 2020). In particular, electronic wallets companies encourage KOLs to emphasize the safety and security of the service when promoting. In particular, e-wallet companies encourage KOLs to emphasize the safety and security of the service when promoting it. These influencers can reach a wide audience and generate interest in electronic wallets services through sponsored content and endorsements. It's evident that societal influences positively impact the behavior to utilize electronic wallets. When consumers receive trust and affirmation regarding the security of electronic wallets from those around them, they tend to have a more positive perception and readiness to use this service.

Social impact represents a factor affecting consumers' behavior in utilizing electronic wallets. In order to take advantages of social impacts, electronic wallets service providers need to have marketing strategies. One of these strategies is that electronic wallets service providers collaborate with people who can have significant impact on others based on their reputation to utilize communication platforms to promote the adoption of electronic wallet services. This strategy can be combined with another strategy which focuses on initiatives to educate the community. By helping people in the community know and understand more about the safety and security of using electronic wallets, electronic wallets service providers can encourage consumers to use more their service. The consumer communication strategy helps clarify the benefits and safety of electronic wallets. It also resolves misunderstanding and worries related to the use of electronic wallets. Moreover, education helps consumers to understand convenience, safety and financial benefits of electronic wallets. Electronic wallets service providers should collaborate with local organizations, educational organization, and community leaders to help more and more people correctly understand electronic wallets service. By doing so, electronic wallets service providers not only empower individuals to access information, but also create an effective channel to support and enhance the adoption of electronic wallets.

Moreover, security also indirectly impacts the behavior to utilize electronic wallets via the intermediary factor of brand image. The scholarly sources also indicate that brand image influences consumers' behavior in utilizing electronic wallets (Hamzah et al., 2023; Hiteshi & Viral, 2020; Pham et al., 2021; Shin, 2013; Sharma et al., 2018; Keller, 1993; Wang & Li, 2012). Electronic wallets services are mainly accessed through mobile applications, components like icons, logos, themes, and user interfaces play a crucial role in molding consumers' perception of the brand, as they represent the primary tangible elements through which consumers construct their mental image of the brand (Zhao & Balague, 2015). The brand image itself reflects the reliability of an organization. The more potent the brand image, the more favorable the users' perspective on the brand will become (Çavuşoğlu et al., 2021). Services with a high level of safety and security will help enhance the brand image with consumers. The more famous a brand is, the more secure and trustworthy consumers feel. Brand image has a close relationship with users' perception of quality and evaluation, leading to the intention to use the product (Wang & Tsai, 2014). A brand's reputation will affect consumers' intention to choose that brand's electronic wallets. Therefore, it is evident that consumers' service usage trends are contingent upon both the brand image of the organization providing electronic wallets services and the strength of its security and safety measures. These factors are pivotal in determining whether individuals opt to use the service or not.

Brand perception, closely tied to company reputation, influences consumers' behavior towards electronic wallets services. Therefore, there is a need to strengthen the brand image in order to build consumers' trust. Electronic wallets service providers should adopt consumer-centered approaches to improve their service. In particular, they should prioritize improving their consumer experience in using their electronic wallets service. To improve the consumer experience, electronic wallets service providers need to have strategies, such as user-friendly interfaces, incorporation of innovative features, implementation of strong security measures, and transparency in communication of fees and policies, to build consumers' trust and their reliability. Formation of strategic partnerships with major brands will also aid in augmenting consumer trust in utilizing electronic wallets. Besides, brand

perception can be positively impacted by strategies such as continuous innovation, social responsibility initiatives and strong consumer support mechanisms. Moreover, financial institutions must ensure the safety of the system by implementing measures such as consistently enhancing security protocols and collaborating with governmental authorities and affiliated organizations. Improvement of system safety helps not only protect consumers from cyberspace threats, but also enhance brand image. Thus, more and more consumers will trust and use electronic wallets.

Breaches and incidents of security can erode trust, but they also provide lessons and strategies to restore trust. This makes it clear that the development of security in electronic wallets is still a need. When

there is a new technology, new threats will emerge. Hence, examinations regarding the influence of safety and security on the consumers' behavior towards electronic wallets will furnish service providers with crucial insights to formulate their strategies and policies to entice consumers.

Ultimately, this research serves not as a fixed conclusion but as a dynamic cornerstone for establishing a secure and user-focused electronic wallets infrastructure. It emphasizes the necessity of integrating inventive security protocols, user awareness initiatives, regulatory adherence, and adaptable strategies to cultivate favorable intentions towards electronic wallets adoption. Digital transactions underpin economic advancement, with enhanced security in digital transactions notably fostering their progression.

CONCLUSION

This study aims to assess how considerations of safety and security impact consumers' readiness to utilize electronic wallets in Hanoi. The study found that the relationship between safety, security and e-wallet adoption is indirectly influenced by two mediating variables: brand image and social influence. These results underscore the significance of social influence and brand recognition in shaping the consumers' behavior towards electronic wallets usage, underscoring the necessity of guaranteeing safety and security to bolster brand image and social acceptance, thereby positively impacting consumers' willingness to adopt electronic wallets.

Despite its theoretical and practical contributions, the study still has limitations. Specifically, this research focused solely on consumers in Hanoi, which may not precisely depict the entirety of the Vietnamese population. Besides, the self-reporting bias of respondents may affect accuracy of results. The next research direction can specifically study the independent impact of factors such as technology function, financial benefits, brand image, social influence, and risk perception affect the Intention to apply e-wallet through mediating variables to see a clear impact of these factors.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Operationalization variable

Variable	Code	Indicator	Reference
Safety and security	SS1	I believe that e-wallet transactions are secure	Pal et al. (2020)
	SS2	I think the security of e-wallets is safe	
	SS3	I find e-wallets offer many security measures	
	SS4	I believe that providing personal information through the e-wallet system is safe	
Financial benefits	FB1	I find that using an e-wallet makes transactions faster and easier	Venkatesh and Davis (2000) Pal et al. (2020)
	FB2	I find that utilizing an e-wallet facilitates effective financial management	
	FB3	I find that utilizing an e-wallet results in time savings	
	FB4	I find that using an e-wallet helps save costs when trading	
	FB5	I found that e-wallet offers many offers and promotions	
Brand image	BI1	I choose the type of e-wallet based on the brand's popularity	Keller (1993)
	BI2	I think others also have a positive impression of the e-wallet brand they use	
	BI3	I care about the e-wallet brand when choosing to use it	
	BI4	A reliable e-wallet brand makes me feel safe when using the service	
Risk perception	RP1	I perceive that e-wallets do not ensure the security of personal information and privacy	Featherman and Pavlou (2003)
	RP2	I think other people can hack the account	
	RP3	I think the technology used in e-wallets is potentially risky	
	RP4	I think it's possible to lose money when using e-wallet services	
Technology function	TF1	I find e-wallet easy to install on my smartphone	Venkatesh and Davis (2000)
	TF2	I find it straightforward to connect to the internet where I live in order to use an e-wallet	
	TF3	I encountered no difficulty in learning to use an e-wallet	
	TF4	I find e-wallets easily connect to e-commerce transactions	
Social influence	SI1	People I know believe I should use an e-wallet service	Venkatesh et al. (2003)
	SI2	Everyone in my circle uses e-wallets	
	SI3	Everyone in the family uses e-wallets	
	SI4	E-wallets are commonly used in the communities I'm part of	
Intention to use	DE1	I believe using an e-wallet is a wise choice	Ojo et al. (2022)
	DE2	I find that using e-wallets aligns with the current trend	
	DE3	I plan to increase my usage of e-wallet services in the future	

Note: SS – safety and security; FB – financial benefits; BI – brand image; RP – risk perception; TF – technology function; SI – social influence; DE – intention to use.