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Continuance Intention to Use E-Wallets: The Role of Online Factors in Consumer Distribution Channels

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Abstract

Purpose: This work investigates determinants of users' continuance intention to use e-wallets in Vietnam, a rapidly growing digital payment market, and examines how online service factors interact with consumer attitudes and e-satisfaction to affect continuance, and how this influences consumer purchase behavior at the point of sale and channel power dynamics, with implications for retail distribution and supply chain management. **Research Design, Methodology, and Approach:** An extended Technology Continuance Theory (TCT) model incorporating perceived security, online customer service, e-trust, and merchant network was tested. Data were collected via an online survey of 197 e-wallet users in Ho Chi Minh City, Vietnam. Structural Equation Modeling (SEM) assessed measurement properties and tested hypothesized relationships. **Results:** Perceived security, e-trust, and merchant network significantly influence attitudes and e-satisfaction, which in turn drive continuance intention to use. Online customer service did not have a significant effect, indicating contextual variation in markets characterized by young, digitally literate users and relatively standardized service quality. **Conclusions:** The findings refine TCT by identifying boundary conditions for online service factors in emerging economies and offer practical guidance for retailers, distributors, payment providers, and policymakers on prioritizing security, trust-building, and merchant coverage to strengthen channel coordination and operational efficiency.

Keywords: Channel Management, Consumer Behavior, Continuance Intention to Use, Distribution Channels, E-Wallet, Online Customer Service.

JEL Classification Code: C30, G23, L86, O33

1. Introduction

The adoption of e-wallets is reshaping consumer payment behaviors at the point of sale, a critical junction in the distribution channels. The e-wallet market in Vietnam has experienced significant growth in recent years. According to the State Bank of Vietnam's 2023 report, by the end of 2023, approximately 57.31 million e-wallets had been activated nationwide, of which 36.23 million were active, accounting for 63.23% (Tung Thu, 2024). It is forecasted that by the end of 2024, the number of active e-wallets will reach 50 million, representing a nearly 40% increase from 2023 (Telecommunications, 2024). The popularity of digital payments via smartphones is increasing, with the number of smartphone users in Vietnam expected to reach about 82.2 million by 2025 (Khanh Linh, 2024). This creates favorable conditions for the future expansion and development of e-wallet services. As of July 1, 2025, e-

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wallets will be officially recognized as a means of payment equivalent to cash, bank cards, and bank accounts (Duong Nguyen, 2025). However, along with the development, e-wallets are also facing challenges related to operating costs and fierce competition. Many leading e-wallets, such as MoMo and ZaloPay, have recorded losses of hundreds of billions of VND in recent years due to heavy investments in promotional programs and incentives to attract users (Ngo Huyen, 2024). Therefore, seeking new directions, such as integrating additional financial services, is being considered by e-wallet providers to maintain and expand their market share.

From a business distribution perspective, the growing use of e-wallets is reshaping traditional channel structures and retail operations. Digital payment systems reduce transaction friction between retailers, wholesalers, and consumers, enabling more efficient supply chain coordination and omnichannel retailing. The integration of e-wallets into physical stores, shopping centers, and online retail platforms enhances channel power balance, reduces dependence on intermediaries, and creates new data-driven opportunities for distribution management (Reinartz et al., 2019; Pantano et al., 2020; Kumar et al., 2022). Hence, understanding users' continuance intention toward e-wallets not only advances consumer behavior research but also provides strategic implications for retail distribution and supply chain management. The Technology Continuance Theory (TCT) proposed by Liao et al. (2009) is employed to identify the factors influencing the continued use of e-wallets, including confirmation, perceived usefulness, perceived ease of use, attitude, satisfaction, and continuance intention. The model is further extended to incorporate additional factors such as price benefits, habit, trust, and operational constraints. In the context of the increasing adoption of e-wallets, the Technology Acceptance Model (TAM) developed by Davis (1989) serves to predict and explain users' acceptance or rejection of technology through the process of usage and interaction. Moreover, the Unified Theory of Acceptance and Use of Technology (UTAUT) formulated by Venkatesh et al. (2003) provides a comprehensive framework for explaining technology acceptance through constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Slade et al. (2015) applied the extended TAM to gain deeper insights into the factors influencing mobile payment adoption. In the case of e-wallet usage, perceived risk can diminish performance expectancy while increasing perceived effort, thereby affecting the decision to continue usage. Kapoor et al. (2022) applied the UTAUT model to examine the factors influencing e-wallet adoption during the COVID-19 pandemic. Investigating the impact of perceived risk can contribute to improving user experience and promoting technology adoption.

From a market perspective, the Vietnamese e-wallet industry has undergone remarkable expansion in recent years. Between 2018 and 2023, both the number and value of e-wallet transactions consistently recorded double-digit growth, with annual rates of 80.4% and 83.5%, respectively (Khanh Linh, 2024). In Vietnam, the number of e-wallet payment transactions increased by 95% compared to the previous year, exceeding 400 million transactions-underscoring the growing importance of this payment method in ensuring national financial stability (Tung Thu, 2024). In terms of market share, MoMo currently dominates with 69% of online payment users, followed by ZaloPay with 42% and ViettelPay with 27% (Statista, 2024). These platforms are engaged in intense competition through aggressive promotional campaigns and continuous user experience enhancements. However, persistent concerns remain regarding the security and reliability of e-wallets. A Nielsen (2024) survey indicates that 57% of Vietnamese consumers are still apprehensive about potential personal information leakage when using online payment platforms. Concerns over security and trust are critical for e-wallet users. This highlights the need to study the relationship between perceived security and e-trust. Understanding this relationship is crucial for shaping a user's continuance intention. Ultimately, this knowledge allows service providers to develop effective strategies that alleviate user worries and promote sustainable e-wallet adoption. Hence, understanding the continuance intention of e-wallet users is vital for retailers and distribution service providers to integrate seamless payment solutions into their ecosystems.

Vietnam represents a distinctive context for studying e-wallet continuance. The market is highly competitive, with leading providers such as MoMo and ZaloPay actively expanding their services, while new regulations in 2025 officially recognize e-wallets as legal payment instruments (Vietnamnet, 2025). Adoption is particularly strong among young and digitally literate users, reflecting a demographic profile different from more mature markets (Statista, 2024). At the same time, a research gap exists regarding the role of Online Customer Service (OCS). Although prior studies found OCS to be a significant predictor of satisfaction and continuance intention (Ashiq et al., 2025), preliminary evidence suggests that in Vietnam, where transactions are routine and service quality relatively homogeneous, OCS may play a weaker role (Miao et al., 2024). This gap highlights the need to re-examine established continuance models in the Vietnamese context.

From these studies, it is evident that understanding user behavior and intentions toward e-wallet usage is essential. The present study aims to clarify the factors influencing long-term e-wallet usage intentions and to propose

managerial implications for improving e-wallet services in a more suitable and effective manner. The study identifies factors perceived by users when using e-wallets, such as online-related factors (perceived security, online customer service, e-trust, merchant network, attitudes toward e-wallets, and e-satisfaction) in their structural relationship with continuance intention to use e-wallet. Based on this general objective, three specific research objectives are proposed as follows: (1) To determine the influence of online factors on users' intention to continue using e-wallets; (2) To validate the structural model of the impact of online factors on users' intention to continue using e-wallets; and (3) To propose managerial implications aimed at enhancing users' intention to continue using e-wallets in Vietnam.

2. Literature Review and Research Model

2.1. Literature Review

Electronic Wallet (e-wallet) is a form of prepaid account that enables users to store monetary value for future online transactions (Johan et al., 2022). According to Nguyen Huong (2023), an e-wallet is an electronic financial service that allows users to store financial information, credit card details, and digital cash on mobile devices or computers. The distinguishing feature of e-wallets lies in their ability to facilitate payment and fund transfer transactions in a convenient and expedient manner without the need for physical interaction (Truong, 2025). E-wallets are typically equipped with robust security measures, including data encryption and user authentication, to safeguard the confidentiality and integrity of users' financial information. Furthermore, many e-wallets incorporate advanced payment technologies such as Near Field Communication (NFC), which enables contactless transactions through simple tap gestures (Johan et al., 2022).

According to Mobifone Money (2022), e-wallets offer numerous advantages, including convenience and flexibility, enabling users to conduct transactions anytime and anywhere with only an Internet-connected device. Security and safety are ensured through data encryption technologies, biometric authentication, or PIN codes, minimizing the risk of information theft. Moreover, e-wallets save time by allowing users to make payments and transfer funds instantly without visiting a physical bank (Johan et al., 2022). Financial management is also enhanced through features that enable balance checks and transaction history tracking at any time, with continuously updated information. In addition, many e-wallet providers frequently offer attractive promotions such as discount vouchers, cashback, and purchase discounts, while integrating a wide range of utilities, including mobile top-ups, bill payments, and online shopping (Kaur et al., 2025). However, e-wallets also present certain limitations, including security risks if personal information and passwords are not well protected, potential technical issues such as system errors or Internet disconnections disrupting transactions, and service fees on certain platforms. Their convenience may also lead to overuse, causing excessive spending (Mobifone Money, 2022). Furthermore, transaction errors, such as being charged for failed transactions, may still occur, requiring users to promptly contact customer support for reimbursement.

Technology Acceptance Model (TAM) proposed by Davis (1989), explains how perceived usefulness and perceived ease of use shape user attitudes and intentions toward technology adoption. While TAM has proven effective in predicting initial adoption behaviors, it is less comprehensive in capturing post-adoption dynamics. In this study, TAM constructs are employed in combination with TCT, providing a stronger theoretical foundation for analyzing continuance intention among e-wallet users.

Technology Continuance Theory (TCT) developed by Liao et al. (2009), provides a comprehensive framework for explaining users' post-adoption behaviors. It integrates constructs such as confirmation, perceived usefulness, perceived ease of use, satisfaction, and continuance intention, thereby extending the Technology Acceptance Model (TAM). TCT has been widely applied in digital services research, especially in contexts where repeated use is critical, such as mobile payments and e-wallets (Miao et al., 2024). Its emphasis on continuance intention makes it particularly suitable for investigating long-term e-wallet usage.

Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003), integrates constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions. UTAUT has been widely adopted to explain user acceptance of emerging technologies, including financial technology services (Kapoor et al., 2022). However, as with TAM, UTAUT primarily focuses on initial adoption. This study therefore uses UTAUT mainly as a reference point to highlight the role of contextual factors in shaping user behavior.

2.2. Related Works

Perceived security and e-trust are consistently emphasized as critical factors in shaping user confidence and reducing perceived risks in digital financial services. Strong security measures build trust, which in turn fosters positive attitudes and satisfaction (Miao et al., 2024). Trust is also recognized as a central driver of both continuance intention and loyalty in online contexts (Reza et al., 2025).

Online customer service has been widely studied as an antecedent of satisfaction and loyalty. Prior research suggests that reliable and responsive service enhances user trust and encourages long-term usage (Halim et al., 2023). However, the strength of this relationship appears to vary across markets, raising questions about its universality (Baxi et al., 2025).

Merchant network coverage has emerged as a practical factor affecting user decisions. A broader merchant base increases convenience, reduces switching costs, and strengthens satisfaction, making it a decisive element in the competitive e-wallet industry (Nguyen & Pham, 2023).

E-satisfaction plays a mediating role between online-related factors and continuance intention. Users who are satisfied with their e-wallet experience are more likely to develop favorable attitudes and maintain long-term usage (Kapoor et al., 2022).

Despite these extensive findings, there remains a research gap in understanding why online customer service, which has been strongly validated in other contexts, may not significantly affect continuance intention in Vietnam. This study therefore re-examines the structural relationships among perceived security, online customer service, e-trust, merchant network, attitude, e-satisfaction, and continuance intention to provide contextual insights into the Vietnamese e-wallet market.

2.3. Research Model

Based on the Technology Acceptance Model (TAM) proposed by Davis (1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003), and related studies by Liao et al. (2009), Nguyen & Huynh (2019), Mew & Millan (2021), Johan et al. (2022), Miao et al. (2024), Baxi et al. (2025), Halim et al. (2025), Kilani et al. (2025), and Reza et al. (2025), the research model is proposed by the authors as shown in Figure 1.

Perceived Security (PES) is defined as the extent to which users feel assured and protected when using online services or products (Flavián et al., 2006). In the study of Miao et al. (2021), the concept is understood as the degree of customer information security and protection, which strengthens online trust and, in turn, fosters repurchase intention in e-commerce. According to Kaur et al. (2025), users' belief that the use of an online system or service is secure and free from risks related to the loss of personal or financial information is also a factor in determining the security of a product or service.

Online Customer Service (OCS) is defined as services provided through internet-based platforms to meet customers' needs for products, information, or technical support without requiring physical presence (Zeng et al., 2009). Online services encompass factors such as accuracy, timeliness of response, and service quality, all of which are determinants of user satisfaction (Maidiana & Hidayat, 2021). In the study of Reza et al. (2024), online customer service is defined as the level of online support provided by e-wallet providers to customers, including prompt responses and timely problem resolution. This factor enhances customer satisfaction, reinforces trust, and promotes the continuance usage intention of e-wallets. This study re-examines whether this relationship holds in the Vietnamese context.

E-Trust (TRU) is defined as the willingness to accept vulnerability to another party's actions, based on the expectation that the party will act in a manner beneficial to oneself, even without the ability to monitor or control them (Mayer et al., 1995). Besides, Taddeo (2009) sought to explain online trust, arguing that it arises in environments without direct physical contact, where ethical and social factors may be perceived differently and interactions occur primarily through electronic means. Although meaningful, this definition is relatively broad as it encompasses all digital environments without focusing on a specific context.

Merchant Network (MEN) is defined as the system of individuals, organizations, distribution channels, and supporting platforms established to reach potential customers and deliver products or services effectively, refers to the range and diversity of merchants or sellers available in an e-wallet platform, which increases customer convenience and choices, thereby enhancing satisfaction and the intention to continue using the service (Johan et al., 2022). According to the study by Chiu et al. (2014), an extensive and diverse supplier network enhances convenience and choice for customers, thereby promoting satisfaction and the intention to continue using e-commerce platforms.

Attitudes Toward E-wallet (ATE) are defined as the degree of a user's positive or negative evaluation of using e-wallets in online transactions (Davis, 1989). According to Ajzen (1991), attitude is one of the core factors influencing behavioral intention, including the adoption of new technologies such as e-wallets in the modern context. In Miao et al. (2021), attitudes toward e-wallets are understood as customers' positive or negative evaluations and feelings toward using e-wallets, which play a crucial role in shaping their continuance usage intention.

E-Satisfaction (ESA) is defined as the overall level of customer satisfaction based on online shopping experiences, reflecting positive or negative perceptions when engaging in e-commerce (Anderson & Srinivasan, 2003). According to Oliver (1980), satisfaction is the result of a comparison between a customer's prior expectations and the actual experience when using a product or service.

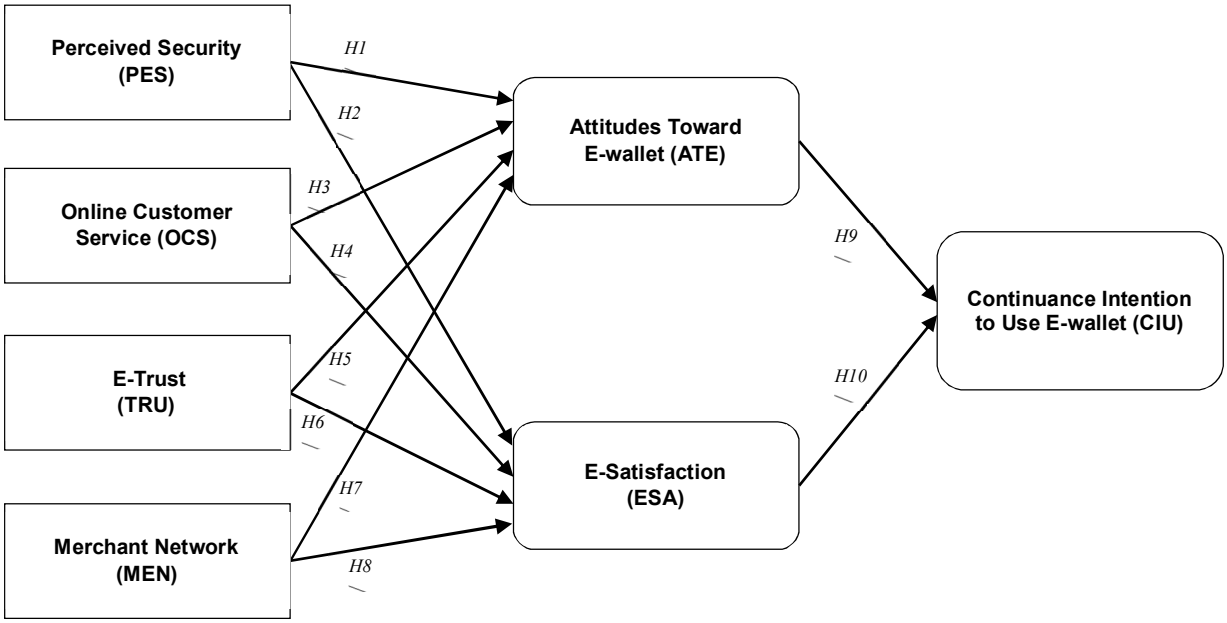

Figure. 1: Research Model

In Miao et al. (2021), e-satisfaction is defined as customers' overall satisfaction with their e-commerce experience, including transaction processes, service quality, convenience, and fulfillment of expectations, thereby reinforcing trust and fostering repurchase intention in the B2C e-commerce context.

Continuance Intention to Use E-wallet (CIU) is defined as the extent to which customers are willing to continue making purchases from an online provider or brand in the future, based on their prior experiences and satisfaction. It reflects the desire to maintain a long-term relationship with the provider and is often influenced by factors such as trust, perceived value, and customer satisfaction (Miao et al., 2024). According to Johan et al. (2022), it refers to users' intention to keep using an e-wallet, grounded in their previous experiences and satisfaction levels. This intention demonstrates a commitment to continued use of the service, shaped by factors such as usefulness, ease of use, reliability, and the distinctive features of the e-wallet.

2.4. Research Hypotheses

Drawing from the above theories, this study develops a research model that emphasizes four online-related factors, perceived security (PES), online customer service (OCS), e-trust (TRU), and merchant network (MEN), as antecedents of attitudes toward e-wallets (ATE) and e-satisfaction (ESA). In turn, ATE and ESA are hypothesized to influence continuance intention to use e-wallets (CIU). Based on these relationships, the study proposes ten hypotheses (H1–H10), which are consistently applied across the text, tables, and research model (Figure 1).

Nguyen and Huynh (2019) indicated that consumers remain concerned about the risks of online payment and the reliability of electronic payment systems. Their study clarified and confirmed that trust has a positive influence, whereas perceived risk has a negative influence on the acceptance of electronic payments. This finding underscores the critical role of perceived risk and trust in determining the decision to use e-wallets. Based on the literature review, the following hypotheses are proposed:

H1: Perceived Security has a positive effect on Attitude Toward E-wallets.

H2: Perceived Security has a positive effect on E-Satisfaction.

Reza et al. (2024) integrated the UTAUT and ECM models to identify the factors influencing the continuance intention to use e-wallets, examining the perspective of merchants-key stakeholders in expanding the digital payment ecosystem. The findings reveal that satisfaction is the most critical factor, while perception, performance expectancy, effort expectancy, and network externalities also play significant roles. Based on these results, the following hypotheses are proposed:

H3: Online Customer Service has a positive effect on Attitude Toward E-wallets.

H4: Online Customer Service has a positive effect on E-Satisfaction.

Miao et al. (2024) examined the factors influencing consumers' online repurchase behavior in the B2C e-commerce sector. Specifically, the study found that e-satisfaction, online trust, and perceived value play central roles in driving repurchase intention. Factors such as website design, information quality, delivery service, security, and reasonable pricing indirectly affect repurchase behavior by enhancing these psychological factors. Moreover, consumers' prior online shopping experience was shown to have a moderating role, strengthening the impact of satisfaction and trust on repurchase intention.

H5: E-Trust has a positive effect on Attitude Toward E-Wallet.

H6: E-Trust has a positive effect on E-Satisfaction.

Johan et al. (2022) focused on the factors influencing the continuance intention to use e-wallets by adapting the Technology Continuance Theory (TCT) with specific elements such as provider network, reward programs, perceived security, and service compatibility. The findings revealed that user attitude and satisfaction are the most critical factors, while provider network and reward programs have a direct impact on continuance intention.

H7: Merchant Network has a positive effect on Attitude Toward E-Wallet.

H8: Merchant Network has a positive effect on E-Satisfaction.

Kilani et al. (2025) focused on extending the UTAUT2 model to analyze the factors influencing continuance intention and continuance behavior in e-wallet usage, while adding trust as an additional construct in the model. The study employed Structural Equation Modeling (SEM) using Smart-PLS to test the hypotheses. The results indicated that trust is the most significant factor, followed by performance expectancy, habit, and cost. Accordingly, for the continuance intention to use e-wallets, the following hypotheses were proposed:

H9: Attitude Toward E-wallet has a positive effect on Continuance Intention to Use E-Wallet.

H10: E-Satisfaction has a positive effect on Continuance Intention to Use E-Wallet.

3. Research Methods

3.1. Measurement Development

The measurement scales in this study were systematically selected and adapted from reputable sources in the fields of consumer behavior and financial technology, including Ashiq et al. (2025), Miao et al. (2024), Reza et al. (2024), and Johan et al. (2022). The adaptation of these scales provided a strong foundation for ensuring both reliability and validity.

The research model employed seven core constructs: perceived security and privacy (PES), online customer service (OCS), e-trust (TRU), merchant network (MEN), attitudes toward e-wallets (ATE), e-satisfaction (ESA), and continuance intention to use e-wallets (CIU). Each construct was measured using three to four observed variables, consistent with best practices in Likert-scale development for quantitative research. All items were measured on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

3.2. Sample and Data Collection

Data were collected using a convenience sampling method. The target respondents were individuals who were either current users of e-wallets or intended to continue using them in Ho Chi Minh City, Vietnam. The survey was administered via Google Forms and distributed online. The data collection period lasted for one month. A total of 300 responses were received, of which 197 valid responses were retained after data screening.

The final sample consisted predominantly of young, well-educated, urban respondents. This demographic structure aligns with the actual profile of Vietnam's e-wallet users, who are concentrated in metropolitan areas and possess higher levels of digital literacy. Although the sample size (n = 197) is relatively modest, it is sufficient for Structural Equation Modeling (SEM), given the model complexity and recommended minimum sample-to-parameter ratios (Hair et al., 2019). Moreover, the demographic composition enhances the validity of the study, as young, urban, and educated users represent the main drivers of e-wallet adoption and continuance in Vietnam. The geographic concentration in Ho Chi Minh City may limit generalizability to other populations, such as older adults, rural residents, or individuals with lower education levels. The collected data were coded and analyzed using SPSS and AMOS software. Reliability analysis (Cronbach's Alpha), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) were employed to test the validity and relationships of the constructs.

3.3. Descriptive Statistics

The descriptive statistics indicate that the total number of valid survey respondents was 197. In terms of gender, females accounted for the majority with 64.0%, followed by males at 35.0%, and other genders at 1.0%, reflecting diversity while still being concentrated among female participants. Regarding age, the largest proportion of

respondents fell within the 21–30 age group (71.6%), followed by those under 20 years old (21.3%), while the groups aged 31–40 and over 40 represented smaller proportions of 5.1% and 2.0%, respectively. This highlights that the surveyed population was predominantly young individuals, the primary users of e-wallets today. In terms of income, most respondents reported a monthly income below 10 million VND (40.6%), followed by the 10–20 million VND range (32.0%). The groups earning 21–30 million and above 30 million accounted for 15.7% and 11.7%, respectively. This indicates that the majority of participants fell into the medium-to-upper income segments. Concerning educational background, most respondents held a university degree (77.7%), followed by postgraduate qualifications (15.2%), while those with vocational/college degrees and other qualifications represented smaller proportions of 5.1% and 2.0%. With respect to occupation, office employees constituted the largest group (47.2%), followed by students (37.6%), freelancers (9.1%), business owners (2.5%), and others (3.6%). This suggests that the sample largely comprised individuals with professional backgrounds or those currently pursuing education. Regarding e-wallet platforms, Momo was the most widely used application with a usage rate of 85.3%, followed by ZaloPay (46.2%), ShopeePay (32.0%), and VNPay (31.0%), reflecting both the popularity and competitive dynamics among e-wallet providers. Finally, in terms of frequency of use, most respondents demonstrated high usage intensity, with 31.0% using e-wallets 3–4 times per week and 25.9% using them seven times or more. Meanwhile, 23.9% reported using them 1–2 times, and 19.3% used them 5–6 times weekly. These findings suggest that e-wallets have become an integral part of consumers' regular payment habits.

4. Research Results

4.1. Measurement Model Assessment

Before conducting Exploratory Factor Analysis (EFA), it is necessary to evaluate the suitability of the data through the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test. The results indicate that the KMO value is 0.777, exceeding the minimum threshold of 0.6, which demonstrates that the survey sample is sufficiently adequate for factor analysis. In addition, Bartlett's Test produced an approximate Chi-Square value of 2951.574, with a significance level of $p < 0.000$, indicating that the observed variables are correlated within the population, thereby confirming that the data meet the conditions required for EFA.

Table 1: Assessment of Measurement Model

Construct	Item	Factor Loading		CR	AVE
		EFA	CFA		
Perceived Security	PES1	0.729	0.611	0.810	0.592
	PES2	0.864	0.895		
	PES3	0.842	0.775		
Online Customer Service	OCS1	0.632	*Dropped*	0.813	0.594
	OCS2	0.836	0.841		
	OCS3	0.877	0.800		
	OCS4	0.687	0.658		
E-Trust	TRU1	0.809	0.644	0.784	0.556
	TRU2	0.775	0.930		
	TRU3	0.571	0.623		
Merchant Network	MEN1	0.696	0.740	0.875	0.704
	MEN2	0.762	0.766		
	MEN3	*Dropped*	-		
	MEN4	0.913	0.968		
Attitude Toward E-wallet	ATE1	0.639	*Dropped*	0.795	0.661
	ATE2	0.793	0.732		
	ATE3	0.803	0.887		
	ATE4	0.894	*Dropped*		
E-Satisfaction	ESA1	0.814	0.734	0.678	0.513
	ESA2	0.703	0.698		
	ESA3	0.881	*Dropped*		
Continuance Intention to Use E-wallet	CIU1	0.517	*Dropped*	0.725	0.570
	CIU2	0.794	0.711		
	CIU3	0.770	0.796		

In the total variance analysis, the results show that seven factors with Eigenvalues greater than 1 were extracted, meeting the standard criteria for factor analysis. These seven factors collectively explain 73.131% of the variance, surpassing the minimum threshold of 50%, which demonstrates that the factors have strong explanatory power for the data structure. The first factor contributes 32.436%, followed by 9.497%, 8.427%, 6.845%, 6.099%, 5.619%, and 4.208%, respectively. Factor loadings ranged from 0.517 to 0.913, and Cronbach's Alpha coefficients for all factors ranged from 0.730 to 0.870, indicating good internal consistency (Table 1).

CFA revealed that all standardized factor loadings exceeded 0.5, ranging from 0.611 to 0.968, and were statistically significant ($p < 0.05$), indicating convergent validity. The Composite Reliability (CR) values ranged from 0.678 to 0.875, confirming scale reliability (Table 1). Model fit indices met the accepted thresholds: CMIN/dF = 1.628 (< 3.0); TLI = 0.938; CFI = 0.959; GFI = 0.915 (> 0.9); RMSEA = 0.057 (< 0.06), and $p < 0.001$. Average Variance Extracted (AVE) values exceeded the squared correlations (r^2) for all constructs, indicating discriminant validity (Table 2).

4.2. Structural Model Assessment

Structural Equation Modeling (SEM) was conducted using Maximum Likelihood estimation. The model fit indices were acceptable: CMIN/DF = 1.709 (< 3.0); TLI = 0.932 CFI = 0.950; GFI = 0.904 (> 0.9); and RMSEA = 0.060 (< 0.06), and $p < 0.001$. Furthermore, out of the ten proposed hypotheses, seven were accepted: Security (PES) → Attitude Toward E-wallet (ATE); E-Trust (TRU) → Attitude Toward E-wallet (ATE); Merchant Network (MEN) → Attitude Toward E-wallet (ATE), Security (PES) → E-Satisfaction (ESA), E-Trust (TRU) → E-Satisfaction (ESA), Merchant Network (MEN) → E-Satisfaction (ESA), Attitude Toward E-wallet (ATE) → Continuance Intention to Use E-wallet (CIU), E-Satisfaction (ESA) → Continuance Intention to Use E-wallet (CIU). Meanwhile, Online Customer Service (OCS) → Attitude Toward E-wallet (ATE) and Customer Service (OCS) → E-Satisfaction (ESA) was not supported by the data.

Table 2: CFA Results

	CR	AVE	PES	OCS	TRU	MEN	ATE	ESA	CIU
PES	0.810	0.592	0.769						
OCS	0.813	0.594	0.325	0.770					
TRU	0.784	0.556	0.250	0.350	0.746				
MEN	0.875	0.704	0.171	0.205	0.354	0.839			
ATE	0.795	0.661	0.354	0.269	0.396	0.464	0.813		
ESA	0.678	0.513	0.304	0.325	0.417	0.483	0.340	0.717	
CIU	0.725	0.570	0.159	0.280	0.495	0.456	0.472	0.621	0.755

CR: Composite Reliability; AVE: Average Variance Extracted

These findings are illustrated in Fig. 2. The SEM analysis showed that the coefficient of determination (R^2) values: 0.314 for ESA (E-Satisfaction), 0.311 for ATE (Attitude Toward E-wallet), and 0.505 for CIU (Continuance Intention to Use E-wallet). This indicates that the independent variables-security, online customer service, e-trust, and merchant network-explained about 31% of the variance in ESA and ATE, reflecting moderate explanatory power. Meanwhile, 50.5% of the variance in CIU was explained by ESA and ATE, demonstrating the model's relatively strong predictive ability for continuance usage behavior. Overall, these results validate most hypotheses and confirm the model's robustness (Table 3 and Fig. 2).

Table 3: SEM and Hypothesis Testing Results

H	Path	Estimate	SE	p-value	Result
H1	ATE ← PES	0.227	0.077	0.003	*Accepted*
H2	ESA ← PES	0.154	0.075	0.040	*Accepted*
H3	ATE ← OCS	0.104	0.096	0.279	*Rejected*
H4	ESA ← OCS	0.090	0.100	0.368	*Rejected*
H5	ATE ← TRU	0.245	0.084	0.004	*Accepted*
H6	ESA ← TRU	0.235	0.085	0.006	*Accepted*
H7	ATE ← MEN	0.314	0.067	***	*Accepted*
H8	ESA ← MEN	0.305	0.067	***	*Accepted*
H9	CIU ← ATE	0.396	0.106	***	*Accepted*
H10	CIU ← ESA	0.617	0.139	***	*Accepted*

*SE: Standard Error; ***: p-value < 0.001*

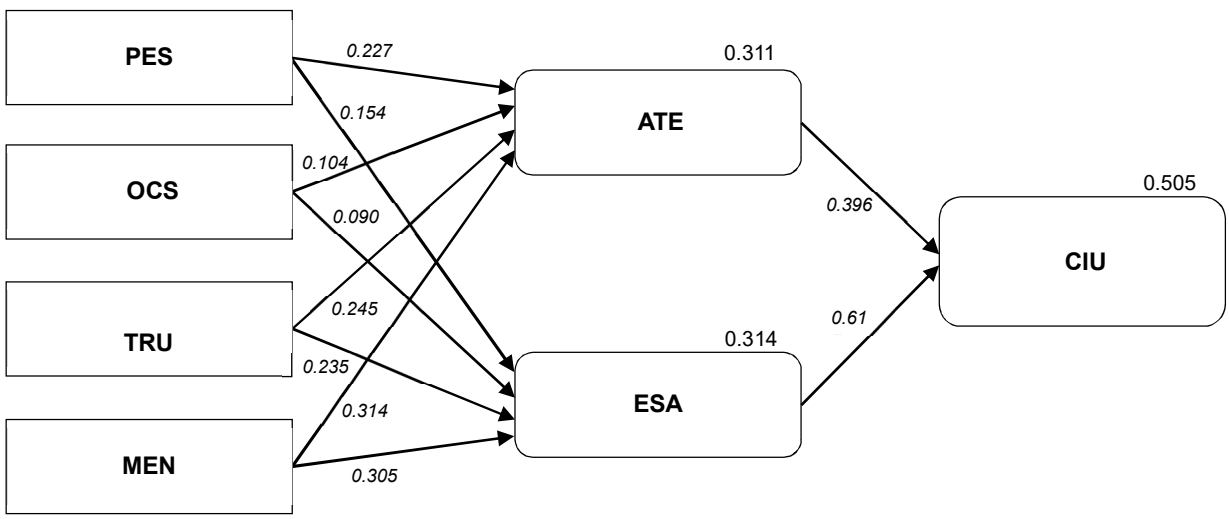

Fig. 2: SEM Results

4.3. Discussion

Table 2 presents the results of hypothesis testing through Structural Equation Modeling (SEM), including standardized regression coefficients (β), standard errors, significance levels, and the acceptance or rejection of each hypothesis.

H1 (PES → ATE) and H2 (PES → ESA): The standardized path coefficients show that perceived security significantly influences both attitudes toward e-wallets ($\beta = 0.227$, $p < 0.01$) and e-satisfaction ($\beta = 0.154$, $p < 0.05$). This is consistent with prior studies, which confirm that security perceptions strengthen user trust and positive evaluations of digital payment systems (Miao et al., 2024).

H3 (OCS → ATE) and H4 (OCS → ESA): Contrary to expectations, Online Customer Service (OCS) showed no significant impact on either attitudes ($\beta = 0.104$, $p = 0.279$) or satisfaction ($\beta = 0.090$, $p = 0.368$). This finding diverges from prior research (e.g., Reza et al., 2024), which highlighted OCS as an important determinant of e-satisfaction. Several contextual explanations may account for this difference. First, e-wallet transactions in Vietnam are typically low-involvement and routine, requiring little or no interaction with service support. Second, the quality of OCS across providers may be uniformly limited, making it a non-differentiating factor. Third, young, urban, and digitally savvy users, who dominate this sample, may prioritize transaction speed, merchant coverage, and security over customer service.

H5 (TRU → ATE) and H6 (TRU → ESA): The results confirm that e-trust positively affects both attitudes ($\beta = 0.245$, $p < 0.01$) and e-satisfaction ($\beta = 0.235$, $p < 0.01$). This supports previous findings that trust plays a central role in fostering loyalty and satisfaction in digital finance (Miao et al., 2024).

H7 (MEN → ATE) and H8 (MEN → ESA): Merchant network exerts a strong positive effect on attitudes ($\beta = 0.314$, $p < 0.001$) and e-satisfaction ($\beta = 0.305$, $p < 0.001$). This reflects the competitive dynamics of Vietnam's e-wallet market, where broad merchant acceptance enhances convenience and becomes a critical driver of continued usage (Johan et al., 2022).

H9 (ATE → CIU) and H10 (ESA → CIU): Both attitudes ($\beta = 0.396$, $p < 0.001$) and e-satisfaction ($\beta = 0.617$, $p < 0.001$) significantly influence continuance intention. This highlights the mediating role of these constructs. Although formal mediation analysis was not conducted, the evidence suggests that attitudes and e-satisfaction act as key mechanisms linking online factors to continuance intention, consistent with the Technology Continuance Theory (Liao et al., 2009).

Overall, these results contribute theoretically by showing that online customer service, often assumed to be a positive determinant, may not universally influence user perceptions in all digital contexts. Its predictive power may depend on market maturity, product involvement, or demographic factors. This finding refines existing models such as TAM, UTAUT, and TCT by identifying boundary conditions for service-related constructs.

5. Conclusion

5.1. Theoretical Implications

This work makes several theoretical contributions to the literature on technology continuance and digital payment adoption.

Extension of Existing Models: By integrating constructs from TAM, UTAUT, and TCT, the study confirms that perceived security, e-trust, and merchant network significantly influence attitudes and e-satisfaction, which subsequently drive continuance intention. This reinforces the validity of established theories in the context of e-wallets. Role of Online Customer Service (OCS): A key theoretical contribution of this study lies in its finding that OCS did not significantly influence either attitudes or satisfaction. This diverges from prior studies that highlighted OCS as an important antecedent. The result suggests that service quality constructs may not always function as expected in low-involvement, routine digital services such as e-wallets. This challenges the assumption of universal applicability of OCS in continuance models and refines theoretical boundaries. Contextualization in Vietnam: The Vietnamese context adds further theoretical value. Unlike developed markets, where service quality often plays a central role, the dominance of young, digitally literate users in Vietnam suggests that convenience, security, and trust outweigh service support in shaping user perceptions. This contextual insight advances comparative understanding of technology continuance in emerging digital economies. Mediating Mechanisms: The findings also highlight the mediating roles of attitudes and satisfaction in driving continuance intention. Although mediation was not formally tested, the findings suggest that these constructs act as cognitive and affective pathways linking antecedents to behavioral outcomes, supporting the theoretical premise of TCT and pointing to opportunities for further refinement through mediation testing.

5.2. Practical Implications

Based on the findings on continuance intention to use e-wallets in Vietnam, several managerial implications can be drawn for e-wallet providers and stakeholders.

Perceived Security: Providers should further strengthen protection mechanisms at each payment step (e.g., SSL certification, OTP authentication, biometric verification) and ensure transparent data privacy policies. Real-time monitoring and rapid incident response are essential to build long-term user trust and confidence. Online Customer Service (OCS): Although the results indicate that OCS does not significantly affect either attitudes or satisfaction, this does not imply that service support can be neglected. Instead, providers should reassess the quality and relevance of OCS, exploring innovative support channels (e.g., AI chatbots, in-app live help, multi-language assistance) to ensure timely responses when users do need support. E-Trust: Building and maintaining trust should remain a priority. Providers can achieve this by safeguarding user data, maintaining strong partnerships with reputable banks and financial institutions, and implementing transparent policies for refunds and complaints. Merchant Network: Expanding the merchant network remains one of the most effective strategies to increase e-wallet adoption and continuance. Providers should broaden their coverage in both online and offline channels, integrate widely with QR code and POS systems, and target high-frequency payment touchpoints such as supermarkets, cafés, convenience stores, and e-commerce platforms. Attitudes Toward E-wallets: Simplifying key functions, ensuring a smooth and modern user experience, and offering attractive promotional campaigns can enhance users' positive perceptions and strengthen long-term engagement. E-Satisfaction: Stability, reliability, and transaction speed should be prioritized to minimize service disruptions. Providers should also integrate diverse services (e.g., utility bill payments, financial add-ons) into e-wallets to support daily needs, thereby deepening customer satisfaction. Continuance Intention: To secure sustainable usage, providers must emphasize loyalty-building strategies, e.g., such as tiered reward systems, personalized offers, and transparent communication of advantages over traditional payment methods. Importantly, investments should be aligned with the factors proven most influential in the study, security, e-trust, and merchant network, while treating OCS as a long-term area for innovation rather than an immediate driver of user retention.

From a distribution and retailing standpoint, the findings provide valuable insights for channel managers and retailers. The growing use of e-wallets facilitates smoother cashless transactions, enhances consumer convenience at the point of sale, and contributes to more efficient retail logistics and payment reconciliation. By integrating e-wallet systems into retail and wholesale channels, businesses can strengthen customer loyalty, streamline supply chain operations, and improve data visibility across distribution networks. Moreover, the non-significant effect of online customer service suggests that, in emerging markets, firms should focus on strengthening trust, merchant networks, and transaction security to build sustainable competitive advantages within digital distribution ecosystems. Overall, the study enriches distribution and retailing literature by demonstrating how digital payment technologies, such as e-wallets, reshape consumer interaction, retail channel coordination, and supply chain efficiency in emerging economies.

5.3. Limitations and Future Works

This study, while providing important insights into continuance intention to use e-wallets in Vietnam, is subject to several limitations that should be acknowledged.

Sample characteristics: The survey data were collected from 197 respondents, primarily young, well-educated users in Vietnam. This sample composition may limit the generalizability of findings to the broader Vietnamese population. Although this demographic represents the core group of current e-wallet adopters in Vietnam, future research should expand to other age groups, educational backgrounds, and geographic regions, including rural areas, to provide a more representative picture. Cross-sectional design: As the data were collected at a single point in time, causal inferences remain limited. Future research could employ longitudinal designs to examine how user perceptions and continuance intention evolve as the e-wallet market matures. Measurement scope: The study focused on four main antecedents (perceived security, online customer service, e-trust, and merchant network). Future studies may extend the model by including additional variables such as perceived usefulness, ease of use, switching costs, or cultural influences, which may further enrich the understanding of continuance behavior. Non-significant findings: The unexpected non-significance of online customer service suggests potential boundary conditions that deserve deeper exploration. Future research should investigate moderating factors (e.g., age, digital literacy, use frequency) or conduct comparative studies across different countries to examine whether OCS effects vary by market maturity. Analytical approach: While SEM was applied to test the proposed relationships, this study did not conduct mediation or moderation analysis. Future work could test the mediating roles of attitudes and satisfaction formally, as well as explore possible moderators such as income, trust propensity, or competitive intensity among providers.

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Declarations

Ethics Approval and Consent to Participate

All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Participation in the survey was voluntary, and informed consent was obtained from all participants prior to data collection. All responses were collected anonymously and used solely for research purposes.

Competing Interests / Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the research, authorship, and/or publication of this article.

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H.T.N.N.: Conceptualization, Data curation, Formal analysis, Visualization, Investigation, Writing - original draft…
All authors have read and approved the final manuscript.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used Grammarly (https://www.grammarly.com) to improve the clarity and readability of the text. All content was critically reviewed, revised, and verified by the authors. The authors take full responsibility for the integrity, accuracy, and final content of the publication.

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