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Factors Influencing E-Wallet Usage Among Generations X and Y

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ABSTRACT
Digital transformation has changed people's preferences in transactions, especially in choosing e-wallet-based payment methods. Although the growth potential of e-wallets in Indonesia is quite large, the adoption rate remains below expectations among Generation X and Y, who have greater purchasing power compared to Generation Z. While younger users tend to adopt e-wallets more easily, older generations still show inconsistent usage behavior, indicating that achieving sustainable adoption remains a challenge. This study aims to analyze the factors that influence continuance intention in the use of e-wallet services among Generations X and Y in Batam City. A total of 155 respondents from both generations were involved through the distribution of online questionnaires. The sampling technique used was non-probability sampling with a purposive sampling approach. Data analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with the help of the SmartPLS application. The results of this study indicate that perceived security and utilitarian value significantly influence continuance intention. Meanwhile, utilitarian value and continuance intention significantly influence e-wallet usage. Additionally, continuance intention is proven to mediate the relationship between perceived security and e-wallet usage. Generation X users tend to prioritize security and personal data protection when deciding to continue using e-wallets, whereas Generation Y users focus more on convenience and functional benefits. Therefore, these findings are expected to contribute to e-wallet service providers and policymakers in designing strategies to address these generational differences to strengthen long-term adoption.

Keywords: E-Wallet Usage, Continuance Intention, TAM, Generation X, Generation Y, Digital Payment.
JEL Code: D12, D83, G53, O33, L86, E42.

I. Introduction

Financial technology has become an integral part of modern society, especially with the emergence of innovations that facilitate various financial transaction activities (Lakshmanan & Shanmugavel, 2025; Marheni et al., 2023; Mew & Millan, 2021; Zaidan et al., 2024). One that is currently being talked about is digital wallets, also known as e-wallets. E-wallets are smartphone-based applications that allow users to store funds electronically and perform various financial transactions, such as payments, money transfers, and online purchases (Okonkwo et al., 2023). E-wallets store various payment instruments, including electronic money, credit cards, and debit cards, and record the users' entire transaction history (Radzi et al., 2025). This innovation

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offers a faster, safer, and more efficient way of transacting, thus making e-wallets an alternative in the cashless payment system, replacing the function of physical wallets (Ha et al., 2023), especially through platforms such as GoPay, ShopeePay, OVO, and DANA that are popular in Indonesia.

In line with this phenomenon, the adoption of digital payment technology in Indonesia has shown rapid growth. Technological advancements and increased awareness of the importance of efficiency are driving people to switch to non-cash payment methods (Tian et al., 2023). Bank Indonesia (2025) reports that digital payment transactions in 2024 reached 34.5 billion, with a growth rate of 36.1% over the previous year. However, this increase does not fully reflect long-term loyalty as there are still gaps, challenges, and issues that require further research (Lim et al., 2024). Competition among e-wallet service providers is intensifying due to market growth estimated at 12-15% annually until 2025 (Chaudhuri et al., 2022). This situation encourages users to switch platforms, particularly due to inconsistent usage experiences, low levels of trust, security concerns, and personal data protection (Financemagnates, 2023). These circumstances indicate that the main research problem is why users hesitate to continue using e-wallets, given the growing market potential. Users have different preferences regarding access to information, so the positive or negative impact of e-wallet use depends on their experience or how they perceive the information provided by the system (Truc, 2024).

This research is motivated by the low adoption rate of e-wallets in Indonesia, despite the market showing significant growth potential for digital payment solutions. Pymnts (2024) notes that the majority of active users are still dominated by Generation Z, individuals born between 1997 and 2012, with a percentage of 79%. However, the upper-middle-class segment with greater purchasing power is dominated by Generation X and Y, with more than 46% of users in Indonesia (Benaicha, 2020). Most studies focus on Generation Z, known for being more "tech-savvy" and familiar with technological developments from a young age (Benaicha, 2020; Gómez-Hurtado et al., 2024; Kelly, 2024; Shetu et al., 2022). In contrast, Generation X and Y show slower adoption rates (Gómez-Hurtado et al., 2024), primarily due to concerns about security and financial sustainability. They are more cautious in managing assets and prioritize protection against potential risks (Kartika & Ambarwati, 2024), thus preferring traditional payment methods such as bank transfers or credit cards that are considered safer. This decision has the potential to have a negative impact in the long term because it can hinder the utilization of digital technology that offers convenience and opportunities for financial management optimization. Thus, financial literacy plays an important role in helping Generation X and Y manage their finances wisely, avoid unnecessary debt, and use digital technology effectively in their financial activities. It also helps them build financial awareness and anticipate potential risks, which in turn supports their financial independence in the digital era (Febiastini et al., 2025). Based on these conditions, this study aims to identify the factors that influence Generation X and Y in using e-wallets.

Currently, most studies have mainly explored how technical aspects and external factors affect users' intention to keep using e-wallet services, especially in terms of saving money and making transactions more efficiently (Kelly, 2024; Windasari et al., 2022). Although these findings are important, the aspect of continuance intention has not been thoroughly examined, despite its significant role in building user trust and loyalty toward e-wallet services (Shukri et al., 2024). Amidst the growing preference for cashless transactions, e-wallets are considered superior because they offer convenience, efficiency, and security (Al-Omoush et al., 2020). This study aims to fill this gap by identifying the specific reasons that make Generation X and Y still reluctant to adopt e-wallets on an ongoing basis, despite their high purchasing power. By adopting the Technology Acceptance Model (TAM), this research emphasizes the need for a more in-depth analysis of user perceptions, such as perceived ease of use, perceived risk, perceived security, and utilitarian value, which influence the continuance intention in using e-wallets. Therefore, understanding continuance intention is a crucial step in explaining long-term commitment to digital technology (Rahman et al., 2024).

By exploring continuance intention in e-wallet usage, this study seeks to make a significant contribution across various aspects. First, this research fills an important gap in the literature related to the continuance of e-wallet use, while also providing strategic insights for service providers in attracting the interest of Generations X and Y. Second, the findings in this study are expected to broaden the understanding

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of the factors that hinder the adoption of digital technology among Generations X and Y. Third, this research presents empirical evidence regarding perceived ease of use (PEU), perceived risk (PR), perceived security (PS), and utilitarian value (UV) on continuance intention (CI) and e-wallet usage (USAGE). Exploring these factors is important given the challenges in expanding e-wallet adoption evenly as a crucial part of the transition toward a cashless society. Thus, this study is expected to provide practical recommendations for service providers and policymakers in designing strategies that align with the preferences of Generation X and Y, aiming to strengthen long-term adoption by building user trust, simplifying regulations, and creating a digital financial system that is inclusive and sustainable.

II. Literature Review and Hypothesis Development

2.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the models frequently used to explain the acceptance of information technology, including in studies related to e-wallet usage (Ariffin et al., 2021; Karim et al., 2022). This model helps identify the specific factors that influence whether a technology is considered acceptable or not by its users (García-Merino et al., 2025). TAM has been widely recognized as a robust theoretical model for explaining the factors influencing individuals' intentions to adopt technology (Azman et al., 2021; Gómez-Hurtado et al., 2024; Khan & Abideen, 2023; Kelly, 2024; Marheni et al., 2023; Raj et al., 2024). These studies confirm that TAM remains a reliable framework for analyzing user behavior across various technologies and different user groups. However, TAM has limitations as it does not cover all aspects that may influence user decisions. Previous studies also pointed out that additional factors can further improve its ability to explain user behavior in technology adoption (Almegbel & Aloud, 2021). Perceived ease of use (PEU) is often used in TAM to enhance the model's relevance and ability to predict users' continuance intention in using e-wallets (Ruslim et al., 2024).

To improve TAM's ability to explain continuance intention, this study integrates several additional relevant variables, namely perceived risk (PR), perceived security (PS), and utilitarian value (UV). Perceived risk refers to users' concerns about the potential of financial loss or undesirable outcome of personal data information (Gómez-Hurtado et al., 2024), perceived security reflects users' confidence in how e-wallet services protect their data and ensure secure transactions (Azman et al., 2021), and utilitarian value represents users' perception of e-wallet services as practical, convenient, and effective in their daily financial needs (Kelly, 2024). By combining these variables, the TAM framework offers a more comprehensive explanation of the factors that shape users' intentions to adopt and continue using e-wallets. It also explains how users generate perceptions of digital payment systems and how those perceptions lead to continuance intention.

2.2. The linkage between Perceived Ease of Use, Continuance Intention, and E-wallet Usage

Perceived ease of use (PEU) refers to users' perceptions of the ease of use of a technology, which is used to determine the extent to which users believe that the system can be used without experiencing difficulties (Truc, 2024). This variable is included in this research because it plays a key role in determining users' willingness to adopt e-wallet services (Shetu et al., 2022; Sumaya et al., 2025). The easier a system is to use, the higher the likelihood that users will adopt it in the future, especially in financial transactions in the digital age (Kumar et al., 2024). Previous research shows that system ease provides a fast and seamless transaction experience, which in turn reduces reliance on cash or physical cards (Ojo et al., 2022). Moreover, additional features such as transaction history, budgeting tools, and integration with other financial services reinforce the perceived usefulness of e-wallets in daily consumption activities (Shrestha et al., 2025). Although these studies examine different aspects of e-wallet usage, they consistently show that systems that are easy to use tend to increase user satisfaction and encourage ongoing use. However, users are less likely to adopt and tend to avoid systems if they find them complex or difficult to operate (Sumaya et al., 2025). Several

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studies have found that PEU does not always determine continuance intention (Gómez-Hurtado et al., 2024; Herdioko et al., 2021; Lim et al., 2024; Ruslim et al., 2024), especially when users are already familiar with technology or when other factors like perceived usefulness have a stronger impact. Despite these differing findings, previous research has shown a significant positive relationship between PEU and continuance intention in e-wallet usage (Ha et al., 2023; Hesniati & Limgestu, 2023; Irimia-Diéguez et al., 2024; Khan & Abideen, 2023).

2.3. The linkage between Perceived Risk, Continuance Intention, and E-wallet Usage

Perceived risk (PR) is defined as users' perceptions of the possibility of losses or undesirable outcomes when using e-wallet services (Gómez-Hurtado et al., 2024). This risk is often associated with concerns about personal data security, uncertainty of outcomes, and potential financial losses. The higher the level of trust in digital payment systems, the lower the perceived risk, thereby encouraging the intensity of e-wallet use. Previous studies have shown a significant negative relationship between PR and CI to continue using e-wallets (Ha et al., 2023; Khan & Abideen, 2023; Raj et al., 2024). On the other hand, research conducted by Gómez-Hurtado et al (2024) and Ling et al (2024) shows that PR does not always have a significant effect on e-wallet usage. This could be because some users with higher risk awareness may still prefer digital payment systems over traditional methods, which they perceive as less transparent and potentially involving additional charges (Setiawan et al., 2025). When users perceive high levels of risk or believe that risks are not properly managed, they tend to reject or reduce the use of e-wallets, but if they feel that potential risks are well controlled and security systems are reliable, their intention to use e-wallets increases (Truc, 2024). These differing results indicate that although PR is often assumed to be a barrier to technology adoption, it does not always play a consistent role, and its impact may vary depending on user characteristics.

2.4. The linkage between Perceived Security, Continuance Intention, and E-wallet Usage

Perceived security (PS) has been recognized as an important factor influencing consumer decisions to use e-wallets (Lim et al., 2024). This aspect focuses on how e-wallet payment systems can protect personal data and transaction security during the payment process (Azman et al., 2021). User concerns often arise due to the risk of illegal access, misuse of information, and financial losses caused by system errors or fraud. PS is considered the key factor influencing user intention, as it can also be affected by social influence from friends, peers, and relatives (Goyal et al., 2025). Furthermore, several studies have found that PS is related to trust and perceived ease of use, where higher security increases trust and encourages continued use (Karim et al., 2022). However, this finding is not always consistent. Lim et al (2024) and Rana et al (2024) state that PS alone is not necessarily able to convince users to use e-wallet services. Although previous research shows that security is not the primary factor in users' decisions to use e-wallets, this issue remains a significant challenge in e-wallet usage (Azman et al., 2021). Along with the development of security technology, the adoption rate of e-wallets is expected to continue to increase, and users will feel safer conducting transactions. Previous research has shown a significant positive relationship between PS and CI in the use of e-wallets (Azman et al., 2021; Gómez-Hurtado et al., 2024; Ruslim et al., 2024).

2.5. The linkage between Utilitarian Value, Continuance Intention, and E-wallet Usage

The high utilitarian value (UV) of e-wallets makes users feel that this service is practical, convenient, and effective in meeting their various financial needs, such as money transfers, bill payments, and purchases of goods and services (Kelly, 2024). With the ease and flexibility offered, users can make transactions anytime and anywhere, which certainly increases the convenience and accessibility of financial services. UV is believed to reduce transaction costs and financial risks, as well as expand access to financial services that may have previously been difficult to access. There are differing perspectives on whether an increase in UV will lead to greater or lower use of e-wallets. Several studies have found that UV can significantly increase continued use of e-wallets (Jingnan et al., 2023; Kartika & Ambarwati, 2024; Kelly, 2024; Penney et al., 2021). Users who perceive high utilitarian value tend to use e-wallets more frequently and continue using the service over time. However, this positive effect may not apply to all users. Those who believe the service provides low value are less likely to continue using it compared to those who perceive greater benefits (Jingnan et al., 2023). Despite

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these differing findings, the overall literature agrees that UV has a significant positive influence on continuance intention.

2.6. The linkage between Continuance Intention and E-wallet Usage

Continuance intention (CI) refers to an individual's tendency or desire to continue using technology-based services repeatedly and is a key factor in creating effective and sustainable technological innovations (Lim et al., 2024). Given this definition, CI reflects users' intentions to continue engaging with and utilizing e-wallet systems. Understanding users' intentions is essential to support the long-term adoption and success of digital payment technologies (Sumaya et al., 2025). Users typically have certain expectations regarding e-wallet technology before using it. CI is a primary factor influencing the sustainability of e-wallet usage, assuming that the stronger the user's desire to continue using it, the greater the likelihood they will utilize the e-wallet regularly (Lim et al., 2024). This indicates that the initial intention to try and continue using the e-wallet service plays a significant role in determining users' tendency to conduct transactions through the platform. Previous research has shown a significant positive relationship between CI and e-wallet usage, reinforcing the important role of CI in users' decisions to continue using the technology (Raj et al., 2024; Shetu et al., 2022; Tian et al., 2023). Recent studies also suggest that CI is influenced not only by functional factors such as convenience and performance, but also by emotional factors like perceived usefulness and self-efficacy (Sumaya et al., 2025). However, previous studies also suggest that strong continuance intention does not always lead to consistent usage behavior (Lim et al., 2024). Despite these differing findings, most studies agree that CI has a significant positive effect on the actual use of e-wallets.

2.7. Mediational Effect of Continuance Intention towards E-wallet Usage

E-wallet services that offer intuitive interfaces and reliable security systems are believed to create positive user experiences, thereby increasing trust and encouraging long-term usage intentions (Rahman et al., 2024). A satisfying e-wallet usage experience can increase user loyalty and usage frequency, making it an important aspect in technology-based user behavior studies (Mansouri et al., 2022). Kilani et al (2023) revealed that CI acts as a mediator that connects users' perceptions with their actual usage behavior. When users perceive e-wallets as easy to use, secure, and valuable, they tend to form stronger continuance intentions, which in turn increase their likelihood of using e-wallets consistently. Several factors have been identified in a previous study that predict users' intentions to continue using information systems (Chen et al., 2022). This study aims to analyze the factors influencing the intention to continue using e-wallets, using PEU, PR, PS, and UV, which have been proven relevant in measuring the intention to use e-wallets (Shrestha et al., 2025). However, Lim et al (2024) revealed that CI may not always have a lasting effect, suggesting that its mediating role might weaken over time, possibly due to users' infrequent use of e-wallets. Furthermore, Kilani et al (2023) found other influencing factors, such as performance expectancy, effort expectancy, habit, and trust, that also shape users' continuance intentions toward technology adoption. In this study, it is hypothesized that CI will act as a mediator in the relationship between the independent variables (PEU, PR, PS, UV) and the dependent variable, namely e-wallet usage (Shetu et al., 2022).

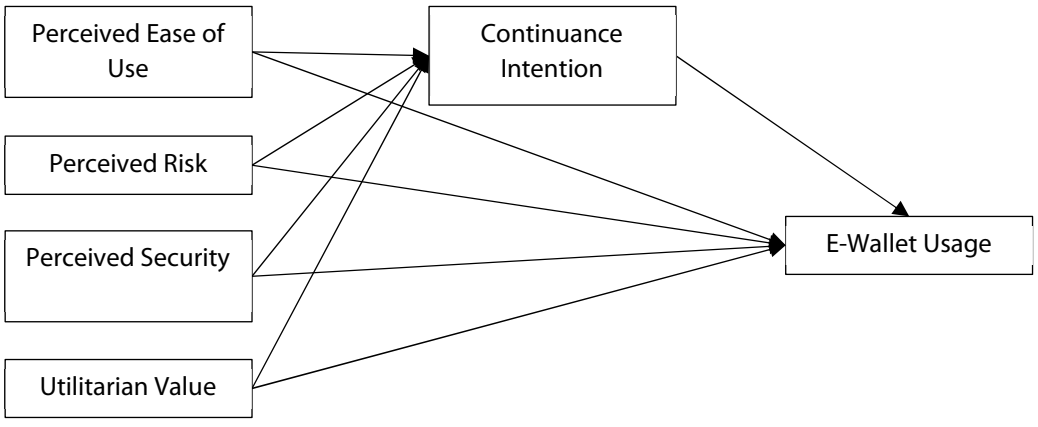

Figure 1. Conceptual Framework

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Based on the theoretical framework and empirical findings discussed in the previous sections, this study formulates several hypotheses as:

H1 : Perceived ease of use will have a significant effect on continuance intention to use e-wallets.
H2 : Perceived ease of use will have a significant effect on the actual use of e-wallets
H3 : Perceived risk will have a significant effect on continuance intention to use e-wallets.
H4 : Perceived risk will have a significant effect on the actual use of e-wallets.
H5 : Perceived security will have a positive significant effect on continuance intention to use e-wallets.
H6 : Perceived security will have a positive significant effect on the actual use of e-wallets.
H7 : Utilitarian value will have a significant effect on continuance intention to use e-wallets.
H8 : Utilitarian value will have a significant positive effect on the actual use of e-wallets.
H9 : Customers' continuance intention will have a significant effect on the actual use of e-wallets.
H10 : Continuance intention positively mediates the relationship between perceived ease of use and the actual use of e-wallets.
H11 : Continuance intention positively mediates the relationship between perceived risk and the actual use of e-wallets.
H12 : Continuance intention positively mediates the relationship between perceived security and the actual use of e-wallets.
H13 : Continuance intention positively mediates the relationship between utilitarian value and the actual use of e-wallets.

III. Research Method

This study was analyzed using quantitative approach based on the Technology Acceptance Model (TAM) to examine the relationships among variables influencing continuance intention and e-wallet usage among Generations X and Y. This study used primary data, which was collected through an online survey distributed via WhatsApp, Line, and Telegram. The measurement instrument was designed in the form of a questionnaire with a 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree." The items were adapted from previous studies (Khan & Abideen, 2023; Kilani et al., 2023; Lim et al., 2024) and slightly wording adjustments to suit the context of e-wallet usage among Generations X and Y in Batam. To ensure clarity and reliability, a pilot test was conducted with 50 respondents before the main data collection.

Once the questionnaire was finalized, the sampling method and respondent criteria were determined. This study uses non-probability sampling through a purposive sampling approach, with respondents aged 28 to 59 years (Generations X and Y) residing in Batam who had experience using at least one e-wallet platform, such as GoPay, ShopeePay, OVO, or DANA, for more than six months to ensure sufficient experience. Given that the sample was limited to Generations X and Y in Batam City and distributed online, the results may not fully represent other populations or generational groups. The selection of this method follows the recommendations of Huyler & McGill (2019), which emphasize efficiency in collecting data from a specific target population within a limited time period.

The minimum sample size of respondents was calculated using the GPower 3.1.9.7 application (Faul et al., 2009), resulting in an estimated minimum of 146 respondents. The number of valid respondents successfully collected in this study was 155. All responses were checked to prevent duplication and eligibility to ensure data consistency and reliability. To analyze the data more deeply, this study will use the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with the assistance of the SmartPLS application. This approach was chosen to effectively analyze the relationships between variables in the causal model, as PLS-SEM can handle relationships between latent constructs and high complexity and is suitable for analysis in technology-based research (Hanafiah, 2020).

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The dependent variable E-wallet Usage consists of five indicators, while perceived Ease of Use, Perceived Risk, and Perceived Security, as independent variables, consist of four questions, and five questions for Utilitarian Value. Continuance Intention served as a mediating variable, consisting of four questions. Overall, this research method was designed to test the proposed hypotheses regarding the influence of perceived ease of use, perceived risk, perceived security, and utilitarian value on continuance intention and e-wallet usage among Generations X and Y.

IV. Result and Discussion

4.1. Demographic Characteristics

Based on demographic data, it can be concluded that this study involved 155 respondents, consisting of 76 male respondents (49.03%) and 79 female respondents (50.97%). Most e-wallet users are 28–43 years old, with 107 respondents (69.68%). Most respondents hold a bachelor's degree in education, with 86 respondents (55.48%). A total of 70 respondents (45.81%) work as private employees, who constitute the majority of respondents in the questionnaire. In terms of income, nearly half of the respondents (49.03%) have a monthly income between 4,000,000 and 10,000,000 IDR. E-wallet usage is at least once a week (37.24%). Additionally, 69 respondents (44.52%) have experience using e-wallet services for approximately 1-3 years. These demographic characteristics provide an explanation for differences in how users view e-wallets in terms of ease of use, risk, security, and utilitarian value. Age and experience may affect their cautiousness toward digital payments, while education and income can influence trust and benefits, offering insight into the continuance intention of Generations X and Y.

Table 1. Demographic Profile of Respondents

Characteristic	Description	Frequency (n = 155)	Percentage (%)
Gender	Male	76	49.03
	Female	79	50.97
Age	28-43 years	107	69.68
	44-59 years	48	30.32
Education	Primary	1	0.63
	Secondary	5	3.23
	High secondary	16	10.32
	Diploma	20	12.90
	Graduate	86	55.48
	Post-graduate	27	17.42
Occupation	Private employee	70	45.81
	Self employed	62	40
	Government employee	21	12.90
	Unemployed	2	1.29
Monthly Income	< 4.000.000 IDR	13	8.39
	4.000.000 - 10.000.000 IDR	76	49.03
	10.000.001 - 20.000.000 IDR	42	27.10
	> 20.000.000 IDR	24	15.48
Frequency of e-wallet usage	Every day	37	23.87
	Several times a week	58	37.42
	Several times a month	40	25.81
	Rarely	20	12.90
Frequency of experience in using an e-wallet	< 1 year	10	6.45
	1-3 years	69	44.52
	3-5 years	61	39.35
	> 5 years	15	9.68

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4.2. Common Method Bias

Podsakoff et al (2012) Revealed that the existence of common method bias (CMB) needs to be identified first before analyzing the measurement model to ensure the reliability and validity of the proposed model. CMB can be problematic as it may introduce measurement errors. In this study, CMB was tested by evaluating multicollinearity through examining the variance inflation factor (VIF) value. VIF is considered free from CMB if all constructs are below 3.3 (Hair et al., 2021; Kock, 2015). Based on the analysis results provided in Table 2, the VIF values ranged from 1.077 to 1.283, indicating no problematic multicollinearity and that the data were free from CMB.

Table 2. Variance Inflation Factor

Hypothesis	Path	VIF
H1	PEU → CI	1.167
H2	PEU → USAGE	1.167
H3	PR → CI	1.099
H4	PR → USAGE	1.116
H5	PS → CI	1.093
H6	PS → USAGE	1.191
H7	UV → CI	1.077
H8	UV → USAGE	1.211
H9	CI → USAGE	1.283

4.3. Validity and Reliability Test Results

In this study, validity and reliability were evaluated using SmartPLS to prove that the research items and constructs were suitable and feasible. (Irimia-Diéguez et al., 2024). Convergent validity was assessed through Average Variance Extracted (AVE) and outer loadings, while reliability was measured using composite Reliability (CR) (Truc, 2024). Based on Table 3, the convergent validity test results show that all outer loading values obtained are above 0.7, indicating that the convergent validity criteria have been well achieved. (Hair et al., 2019). From the test results, there are 14 question indicators used in this study. Meanwhile, the AVE test results show that all indicators in each variable have values greater than 0.5 (Lu et al., 2020). This indicates that all indicators have met the convergent validity criteria. At the same time, CR was used to evaluate the consistency and dependence of measurement scales. (Kelly, 2024).

Table 3. Validity and Reliability Test

Constructs	Items	Outer Loading	AVE	Composite reliability
Perceived Ease of Use	PEU1	0.823	0.798	0.887
	PEU4	0.959		
Perceived Risk	PR1	0.800	0.673	0.892
	PR2	0.826		
	PR3	0.823		
	PR4	0.832		
Perceived Security	PS2	0.883	0.671	0.802
	PS4	0.750		
Utilitarian Value	UV3	0.873	0.787	0.881
	UV4	0.902		
Continuance Intention	CI3	0.793	0.652	0.790
	CI4	0.823		
E-Wallet Usage	USAGE1	0.776	0.686	0.813
	USAGE3	0.877		

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4.4. Discriminant Validity Test Results

Discriminant validity was assessed using the Fornell-Larcker Criterion (FLC) method. (Henseler et al., 2016). This method evaluates the validity of the structural equation model (SEM) by identifying how well each observed variable represents the construct it is intended to measure (Kelly, 2024). Table 5 shows the FLC test results, indicating that each variable has a higher correlation with its own latent construct than with other latent constructs. Additionally, the composite variance of each construct must be greater than 0.5 (Gómez-Hurtado et al., 2024), confirming that all variables in the model meet the criteria for discriminant validity.

Table 4. Fornell-Larcker Criterion Test

Factors	CI	PEU	PR	PS	USAGE	UV
Continuance Intention (CI)	0.808					
Perceived Ease of Use (PEU)	0.159	0.894				
Perceived Risk (PR)	-0.213	-0.231	0.820			
Perceived Security (PS)	0.296	0.288	-0.093	0.819		
E-Wallet Usage (USAGE)	0.459	0.200	-0.096	0.170	0.828	
Utilitarian Value (UV)	0.356	0.185	-0.228	0.030	0.441	0.887

The results of the Fornell–Larcker Criterion test demonstrate that all constructs in the model meet the requirements of discriminant validity. This is indicated by the square root of the AVE values shown on the diagonal—which range from 0.808 to 0.894—being higher than any of the correlations between the constructs. For example, the √AVE of Continuance Intention (0.808) exceeds its correlations with Perceived Ease of Use, Perceived Risk, Perceived Security, E-Wallet Usage, and Utilitarian Value. The same pattern is observed for Perceived Ease of Use (0.894), Perceived Risk (0.820), Perceived Security (0.819), E-Wallet Usage (0.828), and Utilitarian Value (0.887), each of which demonstrates stronger loadings on its own construct than on any other. These results indicate that every latent variable in the model is empirically distinct and measures a unique concept. Thus, the measurement model can be considered robust, with adequate discriminant validity across all constructs.

4.5. Hypothesis Results

Table 5. Direct Effect Test

Hypothesis	Path	Path Coefficient	t-statistics	p-values	Result
H1	PEU → CI	0.010	0.086	0.931	Insignificant
H2	PEU → USAGE	0.100	0.962	0.336	Insignificant
H3	PR → CI	-0.133	1.568	0.117	Insignificant
H4	PR → USAGE	0.071	0.723	0.470	Insignificant
H5	PS → CI	0.279	3.697	0.000	Significant
H6	PS → USAGE	0.045	0.527	0.598	Insignificant
H7	UV → CI	0.307	2.711	0.007	Significant
H8	UV → USAGE	0.317	4.066	0.000	Significant
H9	CI → USAGE	0.325	3.361	0.001	Significant

Hypothesis testing was conducted by applying the bootstrapping technique to evaluate the significance of the relationship between variables in the research model. The path coefficient values were further tested through t-statistics and p-values, with significant criteria of $t > 1.96$ and $p < 0.05$. Based on Tables 5 and 6, it is known that the accepted hypotheses are H5, H7, H8, H9, and H12. Meanwhile, the remaining hypotheses did not show a significant relationship and were therefore rejected. Overall, the results indicate that perceived security and utilitarian value significantly influence continuance intention, while both utilitarian value and continuance intention significantly influence e-wallet usage. In contrast, perceived ease

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of use and perceived risk did not show a significant effect on either continuance intention or e-wallet usage. Furthermore, continuance intention is found to mediate only the relationship between perceived security and e-wallet usage. These findings were obtained through bootstrapping calculations using SmartPLS software, providing a foundation for discussing the key factors that sustain e-wallet adoption among Generations X and Y.

Table 6. Indirect Effect Test

Hypothesis	Path	Path Coefficient	t-statistics	p-values	Result
H10	PEU → CI → USAGE	0.001	0.087	0.931	Insignificant
H11	PR → CI → USAGE	-0.043	1.414	0.158	Insignificant
H12	PS → CI → USAGE	0.091	2.441	0.015	Significant
H13	UV → CI → USAGE	0.105	1.841	0.066	Insignificant

a. Hypothesis 1, Perceived ease of use → Continuance intention to use e-wallet

The first hypothesis (H1) shows that perceived ease of use (PEU) does not have a significant effect on continuance intention (CI) in the use of e-wallets, with a t-statistic value of 0.086 and a p-value of 0.93. Therefore, this hypothesis is rejected. Most users from both generations are already accustomed to using technology, so ease of use is no longer a major factor in maintaining the use of e-wallets. This finding is in line with the results of Gómez-Hurtado et al (2024), Herdioko et al (2021), Lim et al (2024), and Ruslim et al (2024), who stated that PEU is more relevant for new users or generations who are not yet fully familiar with technology. This finding differs from the results of Irimia-Diéguez et al (2024), Khan & Abideen (2023), Kumar et al (2024), and Zhang et al (2023), which showed that PEU is one of the important factors in the continuity of digital technology use. This difference may be due to previous studies focusing on experienced users, whereas in this study, respondents from Generations X and Y are relatively new or less frequent users of digital payment applications, making ease of use a less influential factor.

b. Hypothesis 2, Perceived ease of use → E-wallet usage

The second hypothesis (H2) shows that perceived ease of use (PEU) does not have a significant influence on e-wallet usage, with a t-statistic value of 0.962 and a p-value of 0.336. Therefore, this hypothesis is rejected. Most users from both generations have experience using various digital applications, and user-friendly features are no longer the primary attraction. This finding aligns with the results of Lim et al (2024), which revealed that PEU is not the primary determinant in e-wallet usage among users already familiar with technology. This finding differs from other studies that highlight the importance of PEU as an initial factor in driving technology adoption, especially in the early stages of use (Ha et al., 2023; Hesniati & Limgestu, 2023; Irimia-Diéguez et al., 2024; Khan & Abideen, 2023). This result suggests that e-wallet providers should focus less on ease of use and focus more on improving other factors, such as perceived security and utilitarian value, to boost user retention and increase continuance intention to use e-wallets. Following the analysis of ease of use, this study further examined how perceived risk influences users' continuance intention and e-wallet usage.

c. Hypothesis 3, Perceived risk → Continuance intention to use e-wallet

The third hypothesis (H3) shows that perceived risk (PR) does not have a significant influence on continuance intention (CI) in e-wallet usage, with a t-statistic value of 1.568 and a p-value of 0.117. Therefore, this hypothesis is rejected. Most users from both generations tend to focus more on the benefits and convenience gained from using e-wallets, rather than the potential risks that may arise. This finding aligns with the results of studies by Gómez-Hurtado et al (2024) and Ling et al (2024), which state that although PR is considered an important factor, users of Generations X and Y demonstrate higher tolerance for risk once they have experienced the practical benefits of digital services. However, previous studies have shown a

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significant negative relationship between PR and CI to continue using e-wallets (Ha et al., 2023; Irimia-Diéguez et al., 2024; Khan & Abideen, 2023; Raj et al., 2024), indicating that PR is not a major barrier for experienced users; they are starting to place trust in the security systems offered by e-wallet services.

d. Hypothesis 4, Perceived risk → E-wallet usage

The fourth hypothesis (H4) shows that perceived risk (PR) does not have a significant influence khan abideon e-wallet usage, with a t-statistic value of 0.723 and a p-value of 0.470. Therefore, this hypothesis is rejected. Most users from both generations indicate that concerns about the risks of using e-wallets have begun to decrease. This finding is consistent with previous studies indicating an increase in user trust in digital payment systems as experience and familiarity with their use increase (Ahmed & Sur, 2023; Gómez-Hurtado et al., 2024; Lim et al., 2024; Ling et al., 2024). However, previous studies have shown a significant negative relationship between PR and e-wallet usage (Ha et al., 2023; Khan & Abideen, 2023; Raj et al., 2024; Setiawan et al., 2025). This suggests that e-wallet providers should prioritize building user trust rather than trying to reduce perceived risk to encourage continued usage among Generation X and Y. Next, the discussion looks at how security perceptions influence users' intention to keep using e-wallets.

e. Hypothesis 5, Perceived security → Continuance intention to use e-wallet

The fifth hypothesis (H5) shows that perceived security (PS) has a significant influence on continuance intention (CI) in the use of e-wallets, with a t-statistic value of 3.697 and a p-value of 0.000. Therefore, this hypothesis is accepted. Most users from both generations stated that trust in system security, both in terms of personal data protection and transaction security, was a key consideration in their decision to continue using e-wallet services. This finding is in line with the results of studies, which show that PS is a determining factor in the sustainability of digital technology use among Generation X and Y users (Mew & Millan, 2021; Ramayanti et al., 2024; Ruslim et al., 2024). However, this result differs from Lim et al (2024) and Rana et al (2024), who found that PS alone may not be sufficient to influence users' continuance intention. Nevertheless, this result proves that PS plays an important role in users' continuance intention to use e-wallet services.

f. Hypothesis 6, Perceived security → E-wallet usage

The sixth hypothesis (H6) shows that perceived security (PS) does not have a significant influence on e-wallet usage, with a t-statistic value of 0.527 and a p-value of 0.598. Therefore, this hypothesis is rejected. Although most users have tried e-wallet services, there are still doubts about the overall strength of the security system. In other words, the level of trust in data protection and transaction security is not yet strong enough to make security a primary reason for using e-wallets. This finding is consistent with the results of studies by Lim et al (2024) and Rana et al (2024), which state that PS is not necessarily able to convince users to use e-wallet services. However, it contrasts with Azman et al (2021) and Goyal et al (2025). who found that security remains a significant consideration in long-term usage. This is due to perceptions among Generations X and Y that e-wallets offer a reliable and secure way to make payments. This indicates that while PS alone may not drive usage among experienced users, improving security features remains crucial for overall user confidence. The next part explores whether utilitarian value has a stronger influence on e-wallet usage.

g. Hypothesis 7, Utilitarian value → Continuance intention to use e-wallet

The seventh hypothesis (H7) shows that utilitarian value (UV) has a significant influence on continuance intention (CI) in the use of e-wallets, with a t-statistic value of 2.711 and a p-value of 0.007. Therefore, this hypothesis is accepted. Most users from both generations feel the functional benefits of using e-wallets, particularly in terms of time efficiency, transaction convenience, and ease of access to financial services. This finding aligns with the results of Ha et al (2023), Jingnan et al (2023), Kartika & Ambarwati (2024), and Penney et al (2021), who stated that UV has the strongest influence compared to other variables in forming the intention to continue using e-wallets. This indicates that placing greater focus on the utilitarian value or its functional benefits can effectively increase continuance intention and adoption.

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h. Hypothesis 8, Utilitarian value → E-wallet usage

The eighth hypothesis (H8) shows that utilitarian value (UV) has a significant influence on e-wallet usage, with a t-statistic value of 4.066 and a p-value of 0.000. Therefore, this hypothesis is accepted. Most users from both generations believe that e-wallets provide tangible functional benefits, such as time efficiency, ease of transactions, and convenience in making payments. This finding is in line with the results of research by Kartika & Ambarwati (2024), Kelly (2024), and Penney et al (2021), which state that UV is one of the most influential factors in encouraging the adoption of e-wallet services, especially for users who prioritize practical services and efficiency in their daily financial activities. Although the respondents are from Generations X and Y, who are generally less familiar with digital technology, they still acknowledge the advantages of e-wallets, which strengthens the effect of UV on actual e-wallet usage.

i. Hypothesis 9, Continuance intention → E-wallet usage

The ninth hypothesis (H9) shows that continuance intention (CI) has a significant influence on e-wallet usage, with a t-statistic value of 3.361 and a p-value of 0.001. Therefore, this hypothesis is accepted. Most users from both generations feel that the continued use of e-wallets helps them manage their finances more practically and efficiently, as well as facilitate adaptation to digital technology developments. These findings are in line with the results of studies by Khan & Abideen (2023), Kilani et al (2023), Lim et al (2024), and Shetu et al (2022), which state that CI is one of the key factors in determining the actual level of e-wallet usage. However, Lim et al (2024) found an insignificant result for this relationship, suggesting that CI may not fully explain e-wallet adoption. This indicates that e-wallet providers should continue strengthening users' intention to support sustained usage. After identifying the direct effects of each independent variable, this study examined how CI influences actual e-wallet usage and mediates the relationships among variables.

j. Hypothesis 10, Perceived ease of use → Continuance Intention → E-wallet usage

The tenth hypothesis (H10) shows that continuance intention (CI) is not proven to mediate the relationship between perceived ease of use (PEU) and e-wallet usage, with a t-statistic value of 0.087 and a p-value of 0.931. Therefore, this hypothesis is rejected. The majority of users from Generation X and Y are already accustomed to using technology, so ease of use is no longer the main determining factor in encouraging users to continue using e-wallet services. This finding aligns with Gómez-Hurtado et al (2024), Herdioko et al (2021), Lim et al (2024), and Ruslim et al (2024), who stated that CI does not necessarily mediate the relationship between PEU and e-wallet usage. This finding contrasts with previous studies that reported a mediating effect of CI between PEU and e-wallet usage (Ha et al., 2023; Hesniati & Limgestu, 2023; Irimia-Diéguez et al., 2024; Khan & Abideen, 2023). These results indicate that CI does not act as a channel through which PEU affects e-wallet usage for Generations X and Y. In other words, since they are less familiar with digital applications, ease of use has a minimal direct influence on CI and does not function as a mediating factor.

k. Hypothesis 11, Perceived risk → Continuance Intention → E-wallet usage

The eleventh hypothesis (H11) shows that continuance intention (CI) does not mediate the relationship between perceived risk (PR) and e-wallet usage, with a t-statistic value of 1.414 and a p-value of 0.158. Therefore, this hypothesis is rejected. Many users from both generations feel safer using cash because its use is considered more practical and low risk, especially in terms of personal data protection and the possibility of misuse. This finding suggests that while risk remains a consideration, this perception is not strong enough to influence the decision to continue using e-wallets. These results are consistent with Gómez-Hurtado et al (2024) and Ling et al (2024), who also found that CI does not mediate the relationship between PR and e-wallet usage. However, previous studies have shown mediating effects of CI between PR and e-wallet usage (Ha et al., 2023; Irimia-Diéguez et al., 2024; Khan & Abideen, 2023; Raj et al., 2024), indicating that the mediating effect on PR can differ depending on user characteristics or experience.

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l. .Hypothesis 12, Perceived security → Continuance Intention → E-wallet usage

The twelfth hypothesis (H12) shows that continuance intention (CI) was found to mediate the relationship between perceived security (PS) and e-wallet usage, with a t-statistic value of 2.411 and a p-value of 0.015. Therefore, this hypothesis is accepted. Most users from both generations tend to place their trust in e-wallet services that are proven to be secure in protecting personal data and financial transactions. This sense of security then reinforces the intention to continue using e-wallets in the long term. This finding is relevant for Generations X and Y, who are generally cautious toward digital technologies; their trust in security strongly influences their willingness to continue using e-wallets. These results align with previous studies showing CI mediates the effect of PS on e-wallet usage Azman et al, 2021; Gómez-Hurtado et al, 2024; Mew & Millan, 2021; and Ruslim et al, 2024). However, this result contrasts with Lim et al (2024) and Rana et al (2024), who found no mediating effect of CI between PS and e-wallet usage. Overall, these findings indicate the critical role of PS in sustaining e-wallet adoption.

m. Hypothesis 13, Utilitarian value → Continuance Intention → E-wallet usage

The thirteenth hypothesis (H13) shows that continuance intention (CI) does not mediate the relationship between utilitarian value (UV) and e-wallet usage, with a t-statistic value of 1.841 and a p-value of 0.066. Therefore, this hypothesis is rejected. Most users use e-wallets for functional reasons, such as time efficiency and ease of transactions. However, these reasons are not sufficient to form a long-term intention to continue using e-wallets. This finding shows that UV does not require the role of CI to influence e-wallet usage. In other words, UV can directly influence users' decisions to continue using e-wallets without being influenced by their intention to continue.

4.6. Model Evaluation Results

This study assesses the quality of the model using R Square and effect size (f2) (Lim et al., 2024). R Square measures how much of the variance in endogenous constructs can be explained by exogenous constructs. (Kartika & Ambarwati, 2024; Shmueli & Koppius, 2011). The values of R Square range from 0 to 1, with higher values indicating a stronger explanatory power (Hair et al., 2019). As a guideline, R Square values of 0.75, 0.50, and 0.25 are interpreted as substantial, moderate, and weak. (Hair et al., 2011). The R Square test, as presented in Table 7, is used to measure the extent to which independent variables can explain the variation of dependent variables. Table 7 shows the R Square value for the CI variable as 0.234, while the R Square value for the e-wallet usage variable is recorded at 0.324. According to Hair et al (2019), the model is categorized as a moderate level.

Table 7. R Square Test

Constructs	Sample mean (M)	R Square Adjusted
Continuance Intention	0.254	0.234
E-Wallet Usage	0.346	0.324

This study also tested the effect size F Square (f2) to determine the magnitude of the influence between variables. This measure is used to evaluate how much each predictor contributes to the explanatory power of the structural model. Generally, f2 values above 0.02, 0.15, and 0.35 are interpreted as small, medium, and large effects. (Cohen, 2013). For the relationship with continuance intention, the F Square values of PR, PS, and UV indicate a small influence (between 0.02 and 0.15), while PEU has a value below 0.02, meaning it does not have a significant influence. For the relationship with e-wallet usage, it was found that PEU, PR, UV, and CI showed a small effect, while PS did not show a significant effect. (Gómez-Hurtado et al., 2024).

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Table 8. F Square Test

Path	Sample mean (M)	Category
PEU → CI	0.008	None
PEU → USAGE	0.025	Small
PR → CI	0.028	Small
PR → USAGE	0.021	Small
PS → CI	0.103	Small
PS → USAGE	0.010	None
UV → CI	0.142	Small
UV → USAGE	0.135	Small
CI → USAGE	0.137	Small

4.7. Implications

The study provides practical implications for e-wallet providers and policymakers. Service providers can utilize these findings to design platforms that focus on ease of use, security, and utilitarian value, which are proven to strengthen users' continuance intention, while policymakers need to promote digital literacy and trust-building programs among Generations X and Y, who are generally more cautious toward financial technology. Furthermore, e-wallet technology can contribute more to creating a stable and inclusive digital payment environment. Beyond these managerial implications, the findings also offer valuable opportunities for future research. Future research is encouraged to include more diverse samples and additional variables to broaden the understanding of e-wallet adoption behavior. It may also consider comparing generational and cultural differences to explore how these factors influence long-term digital payment adoption.

V. Conclusion

This study aimed to analyze the factors that influence continuance intention and e-wallet usage among Generation X and Y in Batam City. The findings show that perceived security and utilitarian value significantly affect continuance intention, while both continuance intention and utilitarian value influence e-wallet usage. Based on these results, it is recommended that e-wallet service providers focus more on improving perceived security and utilitarian value. These efforts are considered important to accelerate the continued adoption of e-wallets, especially among Generation X and Y users. Although perceived ease of use and perceived risk were not found to have a significant effect in this research model, educational programs on the benefits of using e-wallets are still needed to expand public acceptance of digital technology. Additionally, developing service features that provide real functional value, such as transaction efficiency, service speed, and integration with daily financial needs, can be a key attraction in encouraging e-wallet usage. Given that continuance intention does not always lead to long-term usage behavior, companies need to implement strategies based on real experiences and sustainable usage incentives, not just perceptions or intentions. One recommended approach is to implement usage reminder features and ongoing education to ensure users understand the benefits and advantages of using e-wallets. However, this study has several limitations, including its focus on respondents from Batam City and the inclusion of only Generations X and Y. Therefore, these findings may not fully represent other regions or age groups. Future research should involve more diverse samples and additional variables to broaden the understanding of e-wallet adoption behavior.

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