



The Effects of Perceived Ease of Use and Security of QRIS on Generation Z's Usage Intention through User Satisfaction: A Study of Students at Universitas Muhammadiyah Cirebon

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Abstract:

The development of digital payment systems in Indonesia has encouraged the increasing use of the Quick Response Code Indonesian Standard (QRIS) as a cashless transaction instrument. Generation Z is the user group with the highest level of digital technology adoption; however, continued QRIS usage is still influenced by various factors, particularly perceived ease of use, security, and user satisfaction. This study aims to analyze the effects of perceived ease of use and security on QRIS usage intention, with user satisfaction as a mediating variable, among students at Universitas Muhammadiyah Cirebon. The study employed a quantitative approach with an explanatory research design. The sample consisted of 160 respondents selected using purposive sampling. Data were collected through a questionnaire using a five-point Likert scale and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The results show that perceived ease of use has a positive and significant effect on user satisfaction and QRIS usage intention. Security has a positive and significant effect on usage intention but does not significantly affect user satisfaction. In addition, user satisfaction has a positive and significant effect on QRIS usage intention. The mediation analysis shows that user satisfaction mediates the effect of perceived ease of use on QRIS usage intention but does not mediate the relationship between security and usage intention. The findings indicate that ease of use is the primary factor in enhancing satisfaction and encouraging continued QRIS usage among Generation Z.

Keywords: QRIS; perceived ease of use; security; user satisfaction; usage intention.

I. Introduction

The development of information technology has driven the transformation of payment systems from cash transactions to faster, more convenient, and more efficient digital payments. This transformation is part of the digitalization of the financial sector, supported by the Indonesia Payment Systems Blueprint (BSPI) 2025 to improve the efficiency of the national payment system and expand financial inclusion (Bank Indonesia, 2020; Bank Indonesia, 2025). One rapidly developing innovation is the Quick Response Code Indonesian Standard (QRIS), which enables various digital payment applications to use a single QR code standard, making transactions easier and more integrated (Bank Indonesia, 2025).

QRIS usage in Indonesia has grown significantly. Increasing smartphone penetration, internet use, and the development of financial technology (fintech) services have encouraged people to shift to digital payment systems (Otoritas Jasa Keuangan, 2024). According to Bank Indonesia data, the number of QRIS users continues to increase each year, while most merchants have adopted the payment system, particularly in the micro, small, and medium enterprise sector

(Bank Indonesia, 2025). This indicates that QRIS has become one of the fastest-growing digital payment instruments in Indonesia.

Generation Z is the population group with the highest level of QRIS adoption. This generation is known as digital natives who have grown up alongside developments in information technology and therefore have a strong ability to adapt to digital innovations (Priporas et al., 2022). Moreover, Generation Z prefers payment systems that are fast, convenient, flexible, and accessible through mobile devices over conventional payment methods (Sahabuddin et al., 2025). These characteristics make Generation Z a promising market segment for the development of digital payment systems in Indonesia.

Although QRIS usage continues to increase, a high adoption rate does not fully demonstrate sustained usage intention. Some users still use QRIS only under certain circumstances and have not made it their primary payment method in everyday activities. This phenomenon indicates that decisions to use digital payment technology are influenced not only by the availability of the technology but also by users' experiences when interacting with digital payment systems (Yuniarti & Herlina, 2025).

From the perspective of the Technology Acceptance Model (TAM), perceived ease of use is one of the main factors determining technology acceptance. The easier a technology is to understand and use, the more likely an individual is to intend to use it (Davis, 1989; Venkatesh et al., 2022). In addition to ease of use, security is also an important factor in digital payments because transactions involve users' personal data and financial information. High perceived security increases users' trust in digital payment systems, thereby encouraging continued usage (Alalwan et al., 2022; Yuniarti & Herlina, 2025).

Previous studies have shown that perceived ease of use and security influence QRIS usage intention. Putri (2024) found that perceived ease of use positively affects QRIS usage intention. In contrast, Fitrah et al. (2023) reported that perceived ease of use has no significant effect. Yuniarti and Herlina (2025) found that security positively affects QRIS usage intention, while Sahabuddin et al. (2025) found that user satisfaction acts as a mediating variable that strengthens the relationship between perceived ease of use and usage intention. These differing findings indicate a research gap that requires further investigation.

Based on these empirical phenomena and inconsistencies in previous findings, this study aims to analyze the effects of perceived ease of use and security on QRIS usage intention, with user satisfaction as a mediating variable, among students at Universitas Muhammadiyah Cirebon. The study is expected to contribute to the development of the Technology Acceptance Model in the context of digital payment systems and provide insights for QRIS service providers into improving user experience to encourage continued QRIS usage.

II. Review of Literatures

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most widely used theories for explaining individual acceptance of technology. The model was introduced by Davis (1989), who argued that an individual's decision to use a technology is influenced by perceived ease of use and perceived usefulness. As digital technology has developed, TAM has been extended by incorporating other variables, such as security, trust, and user satisfaction, to explain digital payment service usage behavior (Venkatesh et al., 2022; Alalwan et al., 2022). In the QRIS context, TAM explains that users intend to use digital payment systems when these systems are easy to use, secure, and capable of providing a satisfying user experience.

2.2 Perceived Ease of Use

Perceived ease of use refers to the extent to which an individual believes that a technology can be used easily without requiring substantial effort (Davis, 1989). The simpler a system is to use, the greater the user's tendency to accept and use it. In digital payment services, perceived ease of use is reflected in the ease of accessing the application, scanning QR codes, completing transactions, and understanding the available features (Marinković & Kalinić, 2023).

Previous studies show that perceived ease of use positively affects both satisfaction and intention to use digital payment systems. Users who perceive a system as easy to use have a better experience, which increases their desire to use the service again (Sahabuddin et al., 2025; Maulana et al., 2024).

2.3 Perceived Security

Perceived security refers to users' belief that a digital payment system can protect personal information, transaction data, and financial assets from the risk of misuse and cyber threats (Alalwan et al., 2022). In digital transactions, security is an important factor because it is associated with users' trust in electronic payment service providers.

In QRIS usage, security encompasses personal data protection, user authentication, payment process security, and assurance that transactions are conducted securely. The higher the level of security perceived by users, the more likely they are to trust the digital payment system and continue using it (Apaua & Lallie, 2022; Yuniarti & Herlina, 2025).

2.4 User Satisfaction

User satisfaction is the evaluation users make after comparing their expectations before using a product or service with their actual experience after use. Satisfaction arises when service performance meets or exceeds users' expectations (Kotler et al., 2022).

In digital payment systems, satisfaction is influenced by ease of use, transaction security, system speed, application stability, and the quality of the service provided. High satisfaction encourages users to maintain their use of the service and increases loyalty to the digital payment system (Saragih et al., 2024; Alalwan et al., 2022).

2.5 Usage Intention

Usage intention refers to an individual's desire to use a technology in the present or in the future. According to Venkatesh et al. (2022), usage intention is a key predictor of actual technology usage behavior. Users who have positive perceptions of a system show a greater tendency to use the technology again and recommend it to others.

In the QRIS context, usage intention is demonstrated by users' desire to make QRIS their primary payment method, increase their frequency of use, and maintain usage across various transactional activities (Maulana et al., 2024).

III. Research methods

This study employs a quantitative approach with an explanatory research design to analyze the causal relationships among perceived ease of use, perceived security, user satisfaction, and QRIS usage intention. A quantitative approach was selected because it enables hypothesis testing and objectively explains the effects among variables through statistical analysis (Sekaran & Bougie, 2021).

The study population comprised all students at Universitas Muhammadiyah Cirebon who use the Quick Response Code Indonesian Standard (QRIS) as a digital payment instrument through electronic wallet (*e-wallet*) applications. Purposive sampling was employed, with the following respondent criteria: (1) currently enrolled as a student at Universitas Muhammadiyah Cirebon; (2) having used QRIS for payment transactions; and (3) using digital payment applications such as GoPay, OVO, DANA, ShopeePay, or mobile banking. Based on these criteria, 160 respondents were obtained as the study sample.

The study used primary data collected through an online questionnaire distributed using Google Forms. The research instrument was developed using indicators adapted from previous studies and measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The perceived ease of use variable was adapted from Davis (1989), while the perceived security, user satisfaction, and usage intention variables drew on Alalwan et al. (2022), Venkatesh et al. (2022), and relevant studies on digital payment adoption.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. PLS-SEM was selected because it can analyze complex relationships among latent variables, assess the measurement model (*outer model*) and structural model (*inner model*), and is suitable for predictive research with a relatively moderate sample size (Hair et al., 2022).

The outer model was evaluated by assessing convergent validity using *outer loading* values (>0.70) and Average Variance Extracted (AVE) (>0.50). Construct reliability was assessed using Composite Reliability and Cronbach's Alpha, with a minimum value of 0.70 (Hair et al., 2022). The inner model was subsequently evaluated by analyzing R^2 , f^2 , Q^2 , and *Standardized Root Mean Square Residual* (SRMR), and by testing *path coefficients* through a bootstrapping procedure with 5,000 resamples. Research hypotheses were accepted when the t-statistic was >1.96 and the p-value was <0.05 at a 5% significance level (Hair et al., 2022).

Table 1. Operationalization of Variables

Variable	Indicators	Source
Perceived Ease of Use (X1)	Easy to learn, easy to understand, easy to use, easy to conduct transactions	Davis (1989)
Perceived Security (X2)	Data security, transaction security, privacy protection, trust in the system	Alalwan et al. (2022)
User Satisfaction	Satisfaction with the service, user experience,	Kotler et al.

ple	tors	e
(Z)	fulfillment of expectations, overall satisfaction	(2022)
Usage Intention (Y)	Intention to reuse, frequency of use, preference for using QRIS, recommendations to others	Venkatesh et al. (2022)

Source: Adapted from Davis (1989), Alalwan et al. (2022), Kotler et al. (2022), and Venkatesh et al. (2022).

IV. Result and Discussion

4.1 Measurement Model Evaluation (Outer Model)

The measurement model was evaluated to ensure that each indicator measures its latent construct validly and reliably. The assessment included outer loadings, Average Variance Extracted (AVE), discriminant validity, and construct reliability using Composite Reliability and Cronbach's Alpha values (Hair et al., 2022).

Table 1. Outer Loading Values

Variable	Loading Range
Perceived Ease of Use (X1)	0.747–0.870
Security (X2)	0.720–0.851
User Satisfaction (Z)	0.791–0.829
Usage Intention (Y)	0.792–0.843

The results show that all indicators have outer loading values above 0.70. According to Hair et al. (2022), indicators with loading values greater than 0.70 demonstrate good convergent validity. Accordingly, all indicators of perceived ease of use, security, user satisfaction, and usage intention are considered valid and suitable for subsequent analysis.

Table 2. Average Variance Extracted (AVE) Values

Variable	AVE
Perceived Ease of Use (X1)	0.671
Security (X2)	0.611
User Satisfaction (Z)	0.666
Usage Intention (Y)	0.672

All constructs have AVE values above 0.50 and therefore meet the criteria for convergent validity (Hair et al., 2022). These values indicate that each construct explains more than 50% of the variance in its indicators.

Furthermore, the Fornell–Larcker criterion results show that the square root of the AVE for each construct is greater than the correlations between constructs. These results indicate that each variable has good discriminant validity, meaning that each construct explains its own indicators better than other constructs do.

Table 3. Composite Reliability and Cronbach's Alpha

Variable	Cronbach's Alpha	Composite Reliability
Perceived Ease of Use (X1)	0.877	0.910
Security (X2)	0.846	0.887
User Satisfaction (Z)	0.835	0.889
Usage Intention (Y)	0.902	0.925

The Composite Reliability values of all constructs are above 0.70, and their Cronbach's Alpha values also exceed the minimum threshold of 0.70. Thus, all research variables demonstrate very good reliability, indicating that the research instrument produces consistent measurements (Hair et al., 2022).

4.2 Structural Model Evaluation (Inner Model)

The structural model was evaluated by assessing R-Square (R^2) and effect size (f^2), and by testing the hypotheses using a bootstrapping procedure.

Table 4. R-Square Values

Endogenous Variable	R^2
User Satisfaction (Z)	0.201
Usage Intention (Y)	0.306

The R^2 value of 0.201 indicates that perceived ease of use and security explain 20.1% of the variation in user satisfaction. Meanwhile, the R^2 value of 0.306 indicates that perceived ease of use, security, and user satisfaction explain 30.6% of the variation in QRIS usage intention. The remaining variation is influenced by factors outside the research model, such as perceived usefulness, trust, service quality, and usage habits.

Based on the f^2 results, perceived ease of use has a medium effect on user satisfaction ($f^2 = 0.239$), whereas the effect of security on user satisfaction is relatively small ($f^2 = 0.003$). Furthermore, the effects of perceived ease of use on usage intention ($f^2 = 0.092$), security on usage intention ($f^2 = 0.062$), and user satisfaction on usage intention ($f^2 = 0.098$) fall within the small-effect category according to Hair et al. (2022).

4.3 Hypothesis Testing

Table 5. Hypothesis Testing Results

Hypothesis	Coefficient	t	p	Decision
$X1 \rightarrow Z$	0.440	7.295	0.000	Accepted
$X2 \rightarrow Z$	0.051	0.677	0.498	Rejected
$X1 \rightarrow Y$	0.282	4.266	0.000	Accepted
$X2 \rightarrow Y$	0.209	3.262	0.001	Accepted
$Z \rightarrow Y$	0.292	4.136	0.000	Accepted

The results show that perceived ease of use has a positive and significant effect on user satisfaction ($\beta = 0.440$; $p < 0.001$). This finding indicates that the easier QRIS is to use, the higher the level of user satisfaction. This result is consistent with the Technology Acceptance Model, which explains that ease of use is a major factor driving technology acceptance (Davis, 1989; Venkatesh et al., 2022).

In contrast, security does not significantly affect user satisfaction ($\beta = 0.051$; $p = 0.498$). This finding indicates that students using QRIS regard security as a standard feature, so it is not yet a determining factor in their satisfaction. Furthermore, perceived ease of use positively affects QRIS usage intention ($\beta = 0.282$; $p < 0.001$). The easier the payment process using QRIS, the stronger users' desire to continue using it. This result is consistent with Maulana et al. (2024) and Venkatesh et al. (2022).

Security also positively affects usage intention ($\beta = 0.209$; $p = 0.001$). This indicates that feeling secure when conducting digital transactions increases users' confidence in using QRIS as a payment method.

In addition, user satisfaction positively affects usage intention ($\beta = 0.292$; $p < 0.001$). Users who have a satisfying transaction experience tend to want to continue using QRIS for subsequent transactions. This finding supports Alalwan et al. (2022), who stated that satisfaction is an important determinant of continued digital payment service usage.

4.4 Mediation Effect Testing

The specific indirect effect results show that user satisfaction mediates the effect of perceived ease of use on QRIS usage intention ($\beta = 0.128$; $t = 3.471$; $p = 0.001$). Accordingly, the mediation hypothesis is accepted. This means that ease of use increases usage intention both directly and through improved user satisfaction.

In contrast, user satisfaction does not mediate the relationship between security and usage intention ($\beta = 0.015$; $t = 0.644$; $p = 0.519$). This result indicates that security plays a greater role in directly influencing usage intention than in influencing it through user satisfaction.

4.2 Discussion

The Effect of Perceived Ease of Use on User Satisfaction

The results show that perceived ease of use has a positive and significant effect on QRIS user satisfaction. This finding indicates that the easier the QRIS system is to learn, understand, and use in the transaction process, the higher users' perceived satisfaction. Ease of payment enables users to complete transactions faster and more efficiently, providing a positive user experience.

This finding is consistent with the Technology Acceptance Model (TAM) developed by Davis (1989), which explains that perceived ease of use is a key determinant of technology acceptance. Users tend to feel satisfied when a technology does not require substantial effort to learn or operate. In the context of digital payments, ease of use is important because users seek a simple, fast transaction process with minimal obstacles (Venkatesh et al., 2022).

The results also support Maulana et al. (2024) and Sahabuddin et al. (2025), who found that perceived ease of use positively affects user satisfaction with digital payment services. Thus, the easier QRIS is to use, the greater users' satisfaction when conducting digital transactions.

The Effect of Security on User Satisfaction

The results show that security does not significantly affect QRIS user satisfaction. This finding indicates that security is not yet a primary factor determining the satisfaction of students using QRIS.

This situation can be explained by the fact that most respondents are members of Generation Z who are accustomed to using various digital applications and regard security as a basic feature that digital payment service providers must offer. Consequently, a security system is no longer perceived as an added benefit that increases user satisfaction, but rather as a service standard that should already be in place.

This finding is consistent with Fitrah et al. (2023), who stated that security does not always affect user satisfaction when trust in the system has already been established. However, this result differs from Alalwan et al. (2022), who found that security is a factor that can increase user satisfaction with digital payment services. These differences indicate that the effect of security on satisfaction depends heavily on respondent characteristics, digital literacy, and users' experience with payment technology.

The Effect of Perceived Ease of Use on QRIS Usage Intention

The results show that perceived ease of use has a positive and significant effect on QRIS usage intention. This indicates that the easier users find it to operate QRIS, the stronger their desire to continue using QRIS as a payment method in everyday activities.

According to Davis (1989), ease of use reduces the complexity of a technology, thereby increasing individuals' intention to use it. In digital payment systems, easy QR code scanning, a fast payment process, and an intuitive application interface are important factors encouraging continued usage (Venkatesh et al., 2022).

This finding is consistent with Maulana et al. (2024), Yuniarti and Herlina (2025), and Marinković and Kalinić (2023), who stated that perceived ease of use positively affects intention to use digital payment services. This indicates that QRIS service providers need to continue improving ease of access and user experience to increase QRIS adoption.

The Effect of Security on QRIS Usage Intention

The results show that security has a positive and significant effect on QRIS usage intention. This means that the higher the security perceived by users, the stronger their desire to use QRIS for transactions.

Security is an important factor in digital payment systems because it concerns personal data protection, transaction security, and users' trust in the system. Users feel more confident using QRIS when they believe that their data and funds are protected against misuse and cybercrime threats (Apaua & Lallie, 2022).

This finding supports Alalwan et al. (2022) and Yuniarti and Herlina (2025), who stated that security is an important determinant of intention to use digital payment technology. Accordingly, QRIS service providers need to continue improving transaction security through layered authentication, data encryption, and user education on digital transaction security.

The Effect of User Satisfaction on QRIS Usage Intention

The results show that user satisfaction has a positive and significant effect on QRIS usage intention. Users who are satisfied with their QRIS experience tend to want to use the service again and recommend it to others.

From a marketing perspective, satisfaction results from users' evaluation after comparing their expectations with the actual experience obtained while using a service (Kotler et al., 2022).

When the user experience meets or exceeds expectations, users tend to maintain their use of the service.

This finding is consistent with Saragih et al. (2024) and Alalwan et al. (2022), who found that user satisfaction positively affects intention to reuse digital payment services. Thus, improving user satisfaction is an important strategy for encouraging continued QRIS usage.

The Mediating Role of User Satisfaction

The mediation analysis shows that user satisfaction mediates the effect of perceived ease of use on QRIS usage intention. This indicates that ease of use not only directly affects usage intention but also increases user satisfaction, which subsequently encourages intention to continue using QRIS. This finding reinforces the Technology Acceptance Model, which explains that positive experiences with technology increase its acceptance and continued use (Davis, 1989; Venkatesh et al., 2022).

In contrast, user satisfaction does not mediate the relationship between security and QRIS usage intention. This finding indicates that security plays a greater role in directly influencing users' decisions to use QRIS than in influencing those decisions through satisfaction. In other words, users continue to consider security when deciding to use QRIS, but security does not necessarily increase their satisfaction with the service.

Overall, the results show that perceived ease of use is the most influential factor in the research model, as indicated by its having the highest path coefficient for user satisfaction ($\beta = 0.440$). This finding suggests that efforts to improve QRIS ease of use, such as simplifying application interfaces, accelerating transaction processes, and improving ease of access, will have a greater impact on satisfaction and usage intention than focusing solely on security improvements. Accordingly, digital payment service providers need to balance ease of use and security to enhance user experience and encourage sustained QRIS adoption.

V. Conclusion

This study aimed to analyze the effects of perceived ease of use and security of QRIS on usage intention, with user satisfaction as a mediating variable, among students at Universitas Muhammadiyah Cirebon. Based on the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, perceived ease of use has a positive and significant effect on both user satisfaction and QRIS usage intention. This indicates that ease of operating QRIS is a primary factor in improving user experience and encouraging continued use of digital payment systems.

Furthermore, security has a positive and significant effect on QRIS usage intention but does not significantly affect user satisfaction. This finding indicates that security plays a greater role in building users' confidence in using QRIS than in increasing their satisfaction. In addition, user satisfaction has a positive and significant effect on usage intention; thus, the higher users' perceived satisfaction, the stronger their desire to continue using QRIS.

The mediation results show that user satisfaction mediates the effect of perceived ease of use on QRIS usage intention but does not mediate the relationship between security and usage intention. Accordingly, perceived ease of use is the most dominant factor in the research model because it increases usage intention both directly and through user satisfaction.

Theoretically, this study reinforces the Technology Acceptance Model (TAM) by showing that perceived ease of use is a key determinant of satisfaction and intention to use digital

payment technology, whereas security plays a greater role in directly influencing usage intention. Practically, the findings have implications for Bank Indonesia, QRIS service providers, and financial technology (fintech) companies to continue improving ease of use by simplifying application interfaces, accelerating transaction processes, and enhancing the quality of user experience. At the same time, security needs to be strengthened through personal data protection, transaction authentication, and digital security education so that trust and QRIS usage can continue to grow sustainably.

This study has limitations because it included only students at Universitas Muhammadiyah Cirebon as respondents; therefore, the results cannot yet be generalized to all QRIS users in Indonesia. Future studies are advised to expand the sample to include respondents from various population groups and regions, and to incorporate other variables such as perceived usefulness, trust, service quality, digital literacy, or habit to explain QRIS usage behavior more comprehensively.

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