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Research Article

INFORMATION SYSTEMS ADOPTION AND USE BEHAVIOR OF QRIS AS A DIGITAL PAYMENT INFRASTRUCTURE AMONG GENERATION Z

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Abstract
Financial technology transformation has positioned QRIS as a core component of the Indonesia's digital payment infrastructure. This study aims to examine the determinants of QRIS usage among Generation Z in Indonesia by extending the UTAUT2 framework. The novelty of this study lies in the integration of Personal Innovativeness to capture internal psychological dimensions in the adoption of a mature national payment system among digital-native users. Quantitative data were collected from 261 Generation Z respondents through questionnaires and analyzed using the SEM-PLS method to evaluate both measurement and structural models. The findings show that Social Influence, Habit, and Personal Innovativeness significantly predict Behavioral Intention. In contrast, utilitarian constructs (Performance Expectancy, Effort Expectancy, Hedonic Motivation, Price Value) are not significant. Additionally, Facilitating Conditions exhibit a significantly negative effect, suggesting that reliance on technical infrastructure is not perceived as a motivating factor. These findings indicate that social and habitual factors play a more prominent role than utilitarian considerations in shaping QRIS usage intention. Functional aspects are increasingly perceived as baseline expectations, while adoption is more strongly influenced by established usage patterns and individual innovativeness. This study suggests that policymakers and service providers should shift their strategic focus from functional promotion toward socially embedded and community-based approaches to strengthen user engagement and sustained adoption.

Keywords: Digital Payment, Generation Z, Personal Innovativeness, QRIS, UTAUT2.

INTRODUCTION

Digital technology development has transformed economic transactions by integrating the internet, mobile devices, and financial technology (fintech) services into our daily lives (Isaac et al., 2019). In Indonesia, this transformation is unfolding rapidly, as evidenced by the number of internet users surpassing 212 million by early 2025, representing 74.6% of the total population (Kemp, 2025). This expansion has accelerated the migration of financial activities to digital channels and has enabled payment services that are faster, more efficient, and more widely accessible (Ali et al., 2024; Gunawan et al., 2023; Paramita & Cahyadi, 2024; Sasongko et al., 2021). A notable example of this transformation is the

growing adoption of Quick Response (QR)-based digital payment systems, which are increasingly embedded in everyday transactions (Ali et al., 2024; Tu et al., 2022).

The development of QR-based payments in Indonesia accelerated with the launch of the Quick Response Code Indonesian Standard (QRIS) in 2019 by Bank Indonesia as the national standard of QR-based payment systems (Bank Indonesia, n.d.; Strategi Nasional Keuangan Inklusif, 2022). The regulation was formalized by Board of Governors Regulation No. 21/18/PADG/2019, which governs the implementation of national QR standards for payment transactions (Bank Indonesia, 2019). Unlike most mobile wallet services that operate in closed-loop ecosystems, QRIS is designed as an interoperable standard that facilitates transactions across payment service providers (Hamzah et al., 2024; Strategi Nasional Keuangan Inklusif, 2022). This interoperable design means that QRIS should be understood not merely as a payment application, but as part of a broader payment infrastructure that supports Indonesia's digital economy. (Bank Indonesia, n.d.).

The growth in transaction volume, totaling 6.05 billion transactions in the first semester of 2025, indicates that QRIS has been widely used across various public economic activities (Bank Indonesia, 2025). When a payment system becomes embedded in routine transactions, user behavior is shaped not only by rational evaluations of technological features but also by habitual use and social interaction (Abdullah & Naved Khan, 2021; Al-qudah et al., 2024; Bhattacherjee & Lin, 2015). This condition raises an important research problem: whether QRIS adoption, especially among younger users, is still driven primarily by utilitarian evaluations or increasingly influenced by social and behavioral mechanisms. In this context, Generation Z, born between 1997 and 2012 (Jayatissa, 2023; Lanier, 2017), represents a particularly important group for analysis. This generation is frequently described as digital natives (Kustiawan & Sugiat, 2026), referring to individuals who grew up alongside digital technology and are accustomed to engaging with multiple digital platforms in their daily lives (Jayatissa, 2023; Ramírez-Herrero et al., 2024; Rosli et al., 2023). These characteristics make Generation Z more adaptive to technological change, more likely to develop routinized patterns of technological use, and potentially more receptive to digital innovation than earlier generations (Al-qudah et al., 2024). Understanding the determinants of QRIS adoption within this cohort is therefore important not only for explaining current user behavior but also for anticipating the future trajectory of digital payment ecosystems (Zhulal et al., 2024).

Research on digital payment adoption in Indonesia has predominantly employed technology acceptance theory frameworks, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Armansyah, 2021; Gunawan et al., 2023; Paramita & Cahyadi, 2024; Ramayanti et al., 2025). These models are frequently used due to their ability to explain technological adoption through users' evaluation of system attributes, such as perceived benefits and ease of use (Chand & Kumar, 2024; Herzallah et al., 2025; Pizzan-Tomanguillo et al., 2024). However, this utility-centered approach becomes less sufficient when digital payment systems evolve into routine infrastructures of daily exchange. In such contexts, adoption may no longer be explained solely by perceived usefulness or ease of use, because social influence, repeated behavior, and user's prior digital exposure may also shape intention and continued use. This gap is especially relevant in the case of QRIS, which operates as a national payment infrastructure rather than as an isolated payment feature.

Accordingly, this study asks whether QRIS usage intention among Generation Z is explained mainly by conventional technology acceptance factors or by social, habitual, and individual characteristics that emerge from everyday digital practice. Prior mobile payment studies largely focus on trust, risk, and security as the major determinants of technological adoption, as in Oliveira et al. (Oliveira et al., 2016), Slade et al. (Slade et al., 2013). By contrast, users' personal innovative tendencies remain underexplored in QR-based payment research, particularly in rapidly developing digital ecosystems.

Besides social and experiential factors, individual characteristics also arguably affect individuals' responses to digital technological innovation. One such characteristic is Personal Innovativeness (PI), defined as an individual's willingness to adopt new information technology (Agarwal & Prasad, 1998). Individuals with higher PI are generally more open to technological change and more willing to experiment with novel systems. In the context of Generation Z, which is already highly exposed to digital technology (Al-qudah et al., 2024), these characteristics may be particularly relevant in explaining variation in responses to innovative payment technologies (Herzallah et al., 2025; Suo et al., 2022). Yet prior studies have not sufficiently clarified whether PI adds explanatory value when digital payment adoption is examined in the context of a widely institutionalized and interoperable payment infrastructure such as QRIS.

Based on these arguments, this study integrates the PI into the UTAUT2 framework developed by Venkatesh et al. (Venkatesh et al., 2012). This integration is intended to provide a more comprehensive explanation of QRIS usage intention among Generation Z by incorporating not only functional and social predictors, but also an individual characteristic associated with openness to technological innovation. This study uses Partial Least Squares Structural Equation Modeling (SEM-PLS) to test the relationships among the constructs in the proposed model. Therefore, this study aims to examine the determinants of QRIS usage intention and use behavior among Indonesian Generation Z by integrating UTAUT 2 and PI in the context of a national digital payment infrastructure.

The study makes three contributions. First, it sharpens the gap in digital payment adoption research by showing that a utility-centered explanation may be incomplete when the technology under study has become infrastructural in nature. Second, it extends UTAUT2 by incorporating PI in order to capture individual variation in openness to technological change. Third, it provides empirical evidence from the Indonesian QRIS context, thereby offering a more context-sensitive explanation of digital payment adoption among Generation Z and practical implications for strengthening cashless payment ecosystems. To address these gaps, the following section reviews the theoretical foundation of UTAUT2, the role of PI in technology adoption, and the specific conceptual limitations that motivate the proposed model. By doing so, this study contributes to refining technology adoption theory in the context of infrastructure-level digital systems and provide practical guidance for policymakers and payment providers in designing more effective cashless ecosystems. Taken together, these contributions refine technology adoption theory in insfratructure-level contexts and provide practical guidance for policymakers and payment providers in designing more effective and inclusive digital payment ecosystems.

Although UTAUT2 has been widely applied to explain technological adoption, prior studies indicate that the model remains strongly oriented toward users' evaluation of technological attributes such as usefulness, ease of use, and facilitating conditions (Suo et al., 2022). While this orientation is valuable, it may not fully capture user behavior when the technology has become embedded in everyday routines and supported by an expanding payment ecosystem. In such settings, habitual behavior, social embeddedness, and personal openness to innovation may play a more prominent role than purely functional evaluations. Personal Innovativeness is particularly relevant in this context because it captures individuals' readiness to experiment with new technologies and their tolerance for uncertainty in the adoption process (Agarwal & Prasad, 1998; Suo et al., 2022).

Accordingly, this study addresses two gaps. First, it addresses a contextual gap by examining QRIS not merely as a digital payment feature but as part of Indonesia's national payment infrastructure. Second, it addresses a theoretical gap by integrating PI into the UTAUT2 framework to explain adoption among Generation Z, a cohort whose digital habits and prior technological exposure may alter the relative importance of conventional adoption factors. This study argues that in a digital-native context, where payment systems are already institutionalized, behavioral intention is not solely driven by functional system evaluations but is increasingly shaped by social influence, habitual usage, and individual innovativeness. This perspective represents the core novelty of the study. Rather than assuming that QRIS adoption is primarily driven by utilitarian considerations, this study provides a more nuanced explanation of digital payment adoption in a developing economy context, while maintaining caution in generalizing the findings beyond similar settings.

LITERATURE REVIEW

Unified Theory of Acceptance and Use of Technology 2

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), introduced by Venkatesh et al. (Venkatesh et al., 2012), was developed from the UTAUT model (Venkatesh et al., 2003). UTAUT was initially designed to explain organization-wide technological acceptance and could effectively explain usage behavior in work environments (Venkatesh et al., 2003). Nonetheless, evolving consumer technology necessitates the extension of this model into individual usage outside organizations (Venkatesh et al., 2012). In this context, UTAUT was considered less effective in capturing consumer-level technological usage dynamics, especially those related to intrinsic motivation, user experience, and habitual formation in daily lives (Bayaga & du Plessis, 2024; Venkatesh et al., 2012). As a response to this limitation, Venkatesh et al. (Venkatesh et al., 2012) developed UTAUT2 that explains the extent to which individuals, especially as consumers, are willing to adopt certain technological systems. This model retains four core UTAUT constructs, i.e., Performance Expectancy (PE), Effort Expectancy (EE), Social

Influence (SI), and Facilitating Conditions (FC), and adds three constructs that are relevant to consumer behavior: Hedonic Motivation (HM), Price Value (PV), and Habit (HT). The addition enables this model to explain usage intention and technological usage more effectively than prior models (Herzallah et al., 2025; Suo et al., 2022). However, prior studies applying UTAUT2 in digital payment contexts tend to assume that user decisions are primarily driven by evaluations of system attributes. This assumption may be less valid when digital payment systems have evolved from operational tools into routine infrastructures, where habitual use and social interaction may override purely cognitive evaluation. This limitation becomes particularly relevant in contexts where digital payment systems have evolved from optional tools into routine infrastructures, suggesting that adoption behavior may no longer be adequately explained by purely attribute-based evaluations.

Personal Innovativeness in Information Technology

Personal Innovativeness (PI), introduced by Agarwal and Prasad (Agarwal & Prasad, 1998), refers to an individual's willingness to experiment with new information technologies. In information system research, PI reflects a relatively stable personal tendency to accept technological novelty and uncertainty. Individuals with higher levels of PI are more likely to explore innovations, respond positively to technological change, and develop favorable attitudes toward emerging systems (Suo et al., 2022). In the context of digital payments, QR-based systems represent a form of technological innovation characterized by convenience, speed, and interoperability (Suo et al., 2022). Accordingly, PI has been widely used to explain initial adoption and users' willingness to experiment with financial technologies (Herzallah et al., 2025; Suo et al., 2022). However, prior studies predominantly examine PI in early-stage adoption contexts, where technology is perceived as novel and uncertain. This focus limits our understanding of whether PI remains relevant when the technology has become widely institutionalized and embedded in everyday transactions. In such contexts, the role of PI may shift from enabling initial experimentation to reinforcing continued usage or interacting with habitual and social factors. This unresolved issue suggests that the explanatory role of PI in mature digital payment ecosystems remains theoretically underexplored.

RESEARCH METHOD

This study proposes an extension of UTAUT2 by integrating Personal Innovativeness (PI) as an additional predictor. Different from the original model of Venkatesh et al. (Venkatesh et al., 2012), we eliminated the demographic moderating variables like age, gender, and experience because prior studies demonstrated that among demographically homogeneous samples, the moderating effect was frequently insignificant and could obfuscate the direct association between major constructs in the technological adoption model (Dwivedi et al., 2019; Hidayat et al., 2020). Although the sample is demographically homogeneous, individual-level variation such as PI remains relevant in explaining differences in behavioral responses. Figure 1 illustrates the proposed research model.

Based on the proposed conceptual model, this study predicts the following hypotheses: Performance Expectancy (PE) reflects a belief that QRIS improves transaction efficiency through cashless speed and functionality. Prior studies confirmed PE as the major driving factor of the adoption intention of digital payment systems (Penney et al., 2021; Suo et al., 2022).

H1: PE positively affects BI in QRIS usage among Generation Z.

Effort Expectancy (EE) refers to individuals' perceived ease of use when utilizing a given technology. Individuals exerting lower cognitive efforts to learn and adopt QRIS are more likely to adopt it (Venkatesh et al., 2012), (Penney et al., 2021).

H2: EE positively affects BI in QRIS usage among Generation Z.

Social Influence (SI) represents the extent to which individuals perceive that their surrounding people, such as families, friends, and influencers, encourage them to adopt a certain technology (Suo et al., 2022).

H3: SI positively affects BI in QRIS usage among Generation Z.

Facilitating Conditions (FC) are associated with infrastructure supports, such as internet access and compatible instruments, that facilitate technological adoption (Herzallah et al., 2025).

H4: FC positively affects BI in QRIS usage among Generation Z.

Hedonic Motivation (HM) highlights the intrinsic enjoyment and comfort perceived by users when interacting with digital payment platforms (Armansyah, 2021; Venkatesh et al., 2012).

H5: HM positively affects BI in QRIS usage among Generation Z.

Price Value (PV) is consumers' cognitive evaluations of the comparison between the benefits acquired and the monetary costs incurred (Penney et al., 2021; Suo et al., 2022).

H6: PV positively affects BI in QRIS usage among Generation Z.

Habit (HT) reflects the level of automated behavior due to repeated usage, which consistently enhances sustainable use intention (Penney et al., 2021).

H7: HT positively affects BI in QRIS usage among Generation Z.

Personal Innovativeness (PI) is an individual characteristic that reflects one's willingness to adopt new technology (Agarwal & Prasad, 1998; Herzallah et al., 2025; Suo et al., 2022). Individuals with greater PI levels are arguably more open towards changes, more positive towards innovation, and more receptive to digital technology (Herzallah et al., 2025).

H8: PI positively affects BI in QRIS usage among Generation Z.

Behavioral Intention (BI) represents users' intention to adopt information technology in the future continuously (Kilani et al., 2023; Venkatesh et al., 2012).

H9: BI positively affects UB in QRIS usage among Generation Z.

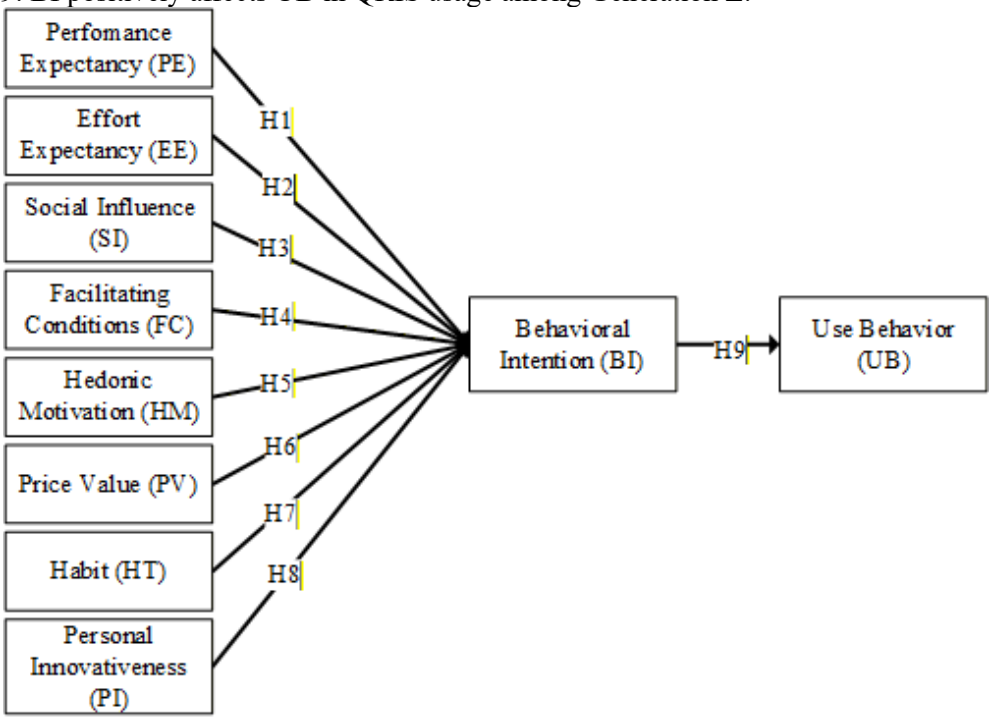

Figure 1. Proposed Research Model

This study employs a cross-sectional quantitative research design to test the inter-variable association in the QRIS adoption model. Our population was Generation Z individuals in Indonesia. Respondents below 16 years old were excluded from the analysis for ethical reasons because they were considered to lack the capacity to provide participation consent independently (Mathews, 2023). Our sample was selected using the purposive sampling method, which selected respondents purposively among qualified groups (Sekaran & Bougie, 2016). This method ensured that our respondents had direct experience with QRIS, making them relevant to our research purpose. This approach is appropriate because the study focuses on actual QRIS users, ensuring that responses reflect real usage behavior rather than hypothetical perceptions.

The respondent criteria included: (a) those born between 1997 and 2009, and (b) having used QRIS as a digital payment instrument. Following Hair et al. (Hair et al., 2022), an a priori power analysis

was conducted using G*Power to ensure sufficient statistical power. With a power level of 0.95, a significance level of 0.05, and a medium effect size (0.15), the minimum required sample was 160 respondents. The final sample of 261 respondents exceeds this threshold, indicating that the model has adequate statistical power to detect the hypothesized relationships.

Data were collected online by distributing a Google Form in July 2025 via social media such as Instagram, Facebook, and WhatsApp. Given the open nature of social media, this research included screening questions on the first page of the questionnaire. Potential respondents must provide their birth year and QRIS usage status before accessing the core questions. This mechanism ensured that respondents who did not meet the inclusion criteria would be automatically excluded from data collection, thereby maintaining respondent validity despite the public distribution of questionnaires.

This study measured ten constructs using instruments validated by prior studies. Nine main constructs were PE, EE, SI, FC, HM, PV, HT, BI, PI (Armansyah, 2021; Herzallah et al., 2025; Penney et al., 2021; Suo et al., 2022; Venkatesh et al., 2012), and UB were measured as the final dependent variables predicted by BI. Each construct was operationalized using four items on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). We selected a 7-point scale because it arguably offered more extensive response variance and more sensitive measures than a 5-point scale (Rieth, 2025; Russo et al., 2021). A detailed measurement instrument grid, including construct definitions, item indicators, and sources, is provided in Appendix A. All measurement items were adapted from previously validated instruments to ensure content validity. Construct reliability and validity were assessed using Cronbach's alpha, composite reliability, and average variance extracted (AVE) during measurement model evaluation. This study did not include open-ended questions, as the objective is to test predefined theoretical relationships using structured measurement items.

Given that all variables in this study were obtained via self-report questionnaires, several procedural measures were implemented to mitigate the risk of common method bias, including ensuring respondent anonymity and meticulously organizing the questionnaire items. Additionally, Harman's single-factor test was performed to assess the potential for common method bias. The analysis indicated that the principal factor accounted for less than 50% of the total variance, hence common method bias was not a substantial issue in this study (Alhasnawi et al., 2024). Additionally, we ran the full collinearity assessment using the Variance Inflation Factor (VIF) value as suggested by Kock (Kock, 2015). The analysis revealed that all VIF values were below the recommended thresholds (Kyriazos & Poga, 2023), hence indicating no common method bias problems in the research model.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. This method is appropriate for predictive modelling and complex structural relationships involving multiple constructs. The analysis was conducted in two stages. First, the measurement model was evaluated by assessing indicator reliability, internal consistency (Cronbach's alpha and composite reliability), convergent validity (AVE), and discriminant validity (HTMT). Second, the structural model was evaluated using path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2), with hypothesis testing performed using bootstrapping.

RESULTS AND DISCUSSION

Respondents' Demographic Characteristics

This study used primary data collected via online questionnaires distributed through Google Forms. A total of 261 respondents from the Indonesian Generation Z were obtained. Table 1 indicates a predominance of female respondents (64.0%) over male respondents (36.0%). Most respondents were 19-24 years old (81.6%), representing higher educational levels. This aligns with the educational profile, which predominantly includes undergraduate (70.1%) and high school/equivalent (25.3%) levels. In terms of usage duration, 71.2% of respondents utilized QRIS for over one year, with the predominant group exceeding two years at 44.4%. These characteristics indicate that the majority of respondents had prior experience using QRIS.

Table 1. Respondents' Characteristics

Characteristic	Category	Freq.	Percent
Gender	Male	94	36.0%
	Female	167	64.0%
Age	16-18	26	10.0%
	19-21	101	38.7%

Characteristic	Category	Freq.	Percent
	22-24	112	42.9%
	25-28	22	8.4%
Educational	SMA/Sederajat	66	25.3%
Background	D1 - D3	2	0.8%
	S1	183	70.1%
	S2-S3	10	3.8%
Length of QRIS Use	< 6 months	37	14.2%
	6 - 12 months	38	14.6%
	1 -2 Years	70	26.8%
	> 2 Years	116	44.4%

Measurement Model

Convergent validity was assessed using three criteria: outer loadings (> 0.7), Average Variance Extracted (AVE > 0.5), and Composite Reliability (CR > 0.6) (Hair et al., 2022; Ramayanti et al., 2025). Several indicators exhibited outer loadings below 0.7; however, values between 0.4 and 0.7 are acceptable when supported by sufficient AVE or CR. As shown in Table 2, all constructs achieved AVE values above 0.5 and CR values above 0.7, indicating adequate convergent validity. Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015). As presented in Table 3, HTMT values ranged from 0.475 to 0.898, all below the threshold of 0.9 (Ringle et al., 2024), indicating that discriminant validity was established.

Table 2. Measurement Model

Item	Outer Loading	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
PE1	0.900	0.894	0.926	0.759
PE2	0.865			
PE3	0.882			
PE4	0.836			
EE1	0.877	0.835	0.890	0.672
EE2	0.683			
EE3	0.859			
EE4	0.846			
SI1	0.775	0.781	0.854	0.597
SI2	0.872			
SI3	0.773			
SI4	0.655			
FC1	0.843	0.775	0.855	0.598
FC2	0.778			
FC3	0.641			
FC4	0.816			
HM1	0.879	0.907	0.935	0.781
HM2	0.872			
HM3	0.882			
HM4	0.902			
PV1	0.821	0.818	0.879	0.646
PV2	0.810			
PV3	0.734			
PV4	0.846			
HT1	0.837	0.859	0.903	0.700
HT2	0.815			
HT3	0.850			
HT4	0.843			
PI1	0.786	0.838	0.892	0.676
PI2	0.705			

Item	Outer Loading	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
PI3	0.883			
PI4	0.899			
BI1	0.854			
BI2	0.917	0.915	0.940	0.797
BI3	0.888			
BI4	0.910			
UB1	0.889			
UB2	0.875	0.896	0.928	0.762
UB3	0.868			
UB4	0.860			

Structural Model

	BI	EE	FC	HM	HT	PE	PI	PV	SI	UB
BI										
EE	0.596									
FC	0.603	0.898								
HM	0.623	0.595	0.640							
HT	0.834	0.814	0.836	0.750						
PE	0.644	0.804	0.732	0.570	0.814					
PI	0.688	0.615	0.771	0.799	0.780	0.645				
PV	0.733	0.665	0.732	0.781	0.858	0.692	0.790			
SI	0.559	0.518	0.639	0.486	0.640	0.475	0.517	0.602		
UB	0.808	0.639	0.642	0.767	0.805	0.625	0.765	0.750	0.545	

To test proposed hypotheses (H1-H9), this study employed *Partial Least Squares Structural Equation Modelling* (PLS-SEM) using SmartPLS 4. A bootstrapping procedure with 5,000 samples was applied to evaluate the significance of path coefficients based on t-statistics and p-values. The structural model was evaluated using path coefficients, VIF, f^2, R^2, and Q^2. The collinearity test findings in Table 4 indicate that the VIF values for each construct varied from 1 to 3.621. Given that all values were below the thresholds of 5 or 10, indicating no serious multicollinearity issues in the model (Kyriazos & Poga, 2023). A robustness check was conducted by re-estimating the model after removing indicators with outer loadings ≤ 0.70. The results remained consistent, indicating model stability.

Table 4. The Structural Model

Hypo-theses	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result	VIF	f^2
H1	PE -> BI	0.076	0.080	0.074	1.031	0.302	Not Supported	2.512	0.006
H2	EE -> BI	-0.006	-0.008	0.068	0.083	0.934	Not Supported	2.873	0.000
H3	SI -> BI	0.112	0.113	0.051	2.181	0.029	Supported	1.558	0.021
H4	FC -> BI	-0.139	-0.132	0.066	2.094	0.036	Not Supported	2.913	0.017
H5	HM -> BI	0.018	0.009	0.085	0.208	0.835	Not Supported	2.491	0.000
H6	PV -> BI	0.111	0.114	0.069	1.603	0.109	Not Supported	2.739	0.012
H7	HT -> BI	0.536	0.534	0.078	6.885	0.000	Supported	3.621	0.205

Hypo-theses	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result	VIF	f^2
H8	PI -> BI	0.168	0.168	0.077	2.182	0.029	Supported	2.588	0.028
H9	BI -> UB	0.736	0.736	0.036	20.624	0.000	Supported	1.000	1.183

The bootstrapping results (Table 4) show that H3 (SI → BI), H7 (HT → BI), H8 (PI → BI), and H9 (BI → UB) are statistically supported ($p < 0.05$), while H1, H2, H5, and H6 are not significant. Although H4 (FC → BI) is statistically significant, the negative coefficient does not support the hypothesized direction. Among the predictors of BI, HT has the largest effect (β = 0.536), followed by PI (β = 0.168) and SI (β = 0.112). FC shows a negative effect (β = -0.139). BI has a strong positive effect on UB (β = 0.736). The coefficient of determination (R^2) indicates that BI is explained by 61.4% of the variance, while UB is explained by 54.1% (Table 5). The predictive relevance (Q^2) values are 0.579 for BI and 0.527 for UB, both above the zero, indicating predictive relevance.

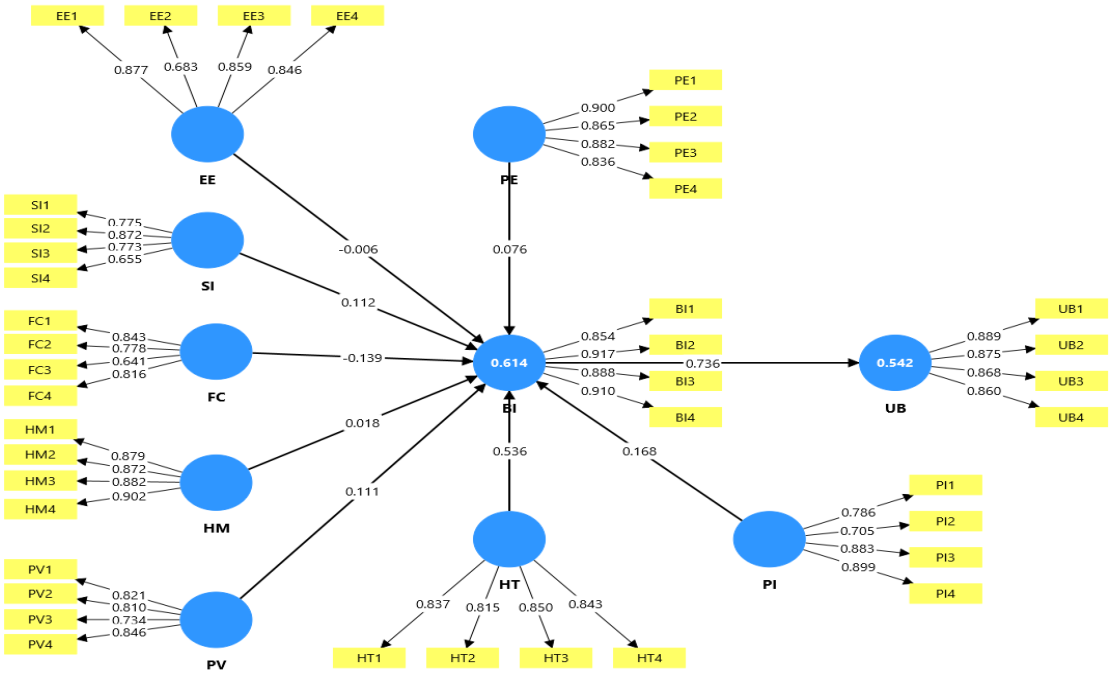

Figure 2. Result of Structural Model SEM-PLS

Table 5. Results of Structural Model R^2 and Q^2

Independent Variables	R^2	Q^2
Behavioral Intention (BI)	0.614	0.579
Use Behavior (UB)	0.541	0.527

Importance Perfomance Matrix Analysis (IPMA)

IPMA extends the structural model by incorporating the average scores of latent variables to assess both importance and performance (Hair et al., 2022). Figure 3 presents Behavioral Intention (BI) as the focal construct. At the onstruct level, Habit (HT) demonstrates the highest importance in influencing BI, consistent with the structural model results. Effort Expectancy (EE) exhibits the highest performance scores but low importance in explaining BI.

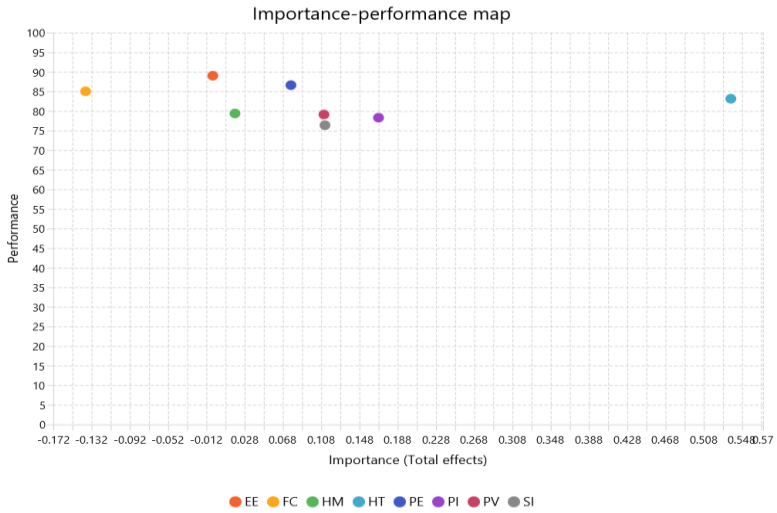

Figure 3. IPMA

Our findings offer a critical perspective on Generation Z's intention to adopt QRIS in Indonesia. Specifically, the results indicate a shift in how core UTAUT2 constructs operate in this context. The model testing results demonstrate that several technical factors typically considered dominant in technological adoption theory do not emerge as major determinants in this context. For instance, PE does not significantly affect Generation Z's intention to use QRIS. The results are consistent with prior studies that indicated that Generation Z, being a digital native cohort familiar with technology, generally does not prioritize application performance expectations in their technology adoption decisions (Taufiq Hail et al., 2024). This suggests that for Generation Z, PE no longer functions as a driver of intention but has shifted into a baseline expectation within digital payment systems. The interpretation is supported by evidence from prior studies in Spain and Oman, where young users perceive technological functionality as a basic feature (Sebastián et al., 2023; Taufiq Hail et al., 2024). This contrasts with older generations, who tend to rely more on perceived usefulness due to higher adaptation barriers (Deana et al., 2021; Schmitz et al., 2022).

The insignificance of PE in this study suggests that QRIS is increasingly perceived as part of the broader digital payment infrastructure, making its efficiency less relevant to most users. Similar to PE, prior studies demonstrate that EE does not significantly affect BI. The finding is consistent with prior studies (Sebastián et al., 2023; Suo et al., 2022) which indicate a similar pattern where EE is no longer a determining factor due to the high level of digital literacy among Generation Z. This reinforces the argument that usability is assumed rather than actively evaluated. In contrast to these technical factors, SI exerts a significantly positive impact on BI. The finding is aligned with prior studies (Herzallah et al., 2025; Penney et al., 2021; Suo et al., 2022) which highlight the role of social pressure and behavioral normalization within peer groups as key drivers of financial technology adoption. These findings indicate that QRIS adoption among Generation Z is shaped not only by individual evaluation but also by social conformity mechanisms (Nasr et al., 2023). Our finding for H4 (FC -> BI) indicates a statistically significant effect, albeit in the negative direction (O = -0.139, P = 0.036). This finding suggests a potential saturation effect, where infrastructure availability no longer promotes adoption. The empirical direction contradicts the basic assumption of UTAUT2, suggesting that technical facility availability is not necessarily associated with intention to use.

HM does not exert a significant impact on BI. Although its empirical direction supports the hypothesis, the magnitude is not statistically significant. The finding implies that although Generation Z may consider QRIS enjoyable and modern, these factors are not the primary drivers of their QRIS adoption decisions. The finding is consistent with prior studies (Herzallah et al., 2025; Penney et al., 2021; Suo et al., 2022). Besides, PV does not significantly affect BI because most QRIS usage does not charge additional fees (Bank Indonesia, n.d.), rendering financial cost-benefit considerations less relevant for their decision-making processes (Schmitz et al., 2022). The insignificance of HM and PV indicates that QRIS is primarily perceived as a functional payment infrastructure rather than a source of experiential or economic evaluation.

The significantly positive association between HT and BI is consistent with prior studies (Herzallah et al., 2025; Penney et al., 2021; Suo et al., 2022). The t-statistic for HT (6.885) indicates that QRIS usage has been increasingly integrated into users' transactional routines. This suggests that QRIS adoption is driven by routinized behavior rather than deliberate evaluation. Our findings document a significantly positive association between PI and BI. This indicates that individual openness to innovation remains relevant even in mature digital payment environments. Hence, individuals' receptiveness toward innovation likely enhances their intentions to use digital payment technology. In the context of digital payment adoption, PI significantly affects intention to use mobile wallet services (Herzallah et al., 2025; Penney et al., 2021) and QR code-based payments (Suo et al., 2022), thus suggesting that users' innovative characteristics may serve as a driving factor of digital payment acceptance. This suggests that the role of PI may be context-dependent, becoming more salient in infrastructure-level systems. Table 4 indicates that BI exerts a significantly positive effect on UB ($T = 20.624$). The result is consistent with the technology adoption framework, which argues that intention to use is a crucial predictor of actual usage behavior. Overall, the findings indicate that QRIS adoption among Generation Z is shaped more by habitual behavior and social embedding than by traditional utilitarian drivers.

This study contributes to the information systems literature by demonstrating that the integration of Personal Innovativeness extends existing adoption models by incorporating individual-level readiness alongside external determinants in explaining national digital payment adoption. Furthermore, the results point to a unique adoption pattern within this digital-native cohort. Variables such as Performance Expectancy, Effort Expectancy, Price Value, and Hedonic Motivation do not function as primary drivers, but rather operate as baseline expectations. Conversely, the significance of Social Influence and Habit indicates that adoption intention is more strongly associated with social dynamics and routinized behavior. The findings align with the habit-formation perspective in digital technology use (Deana et al., 2021; Isaac et al., 2019). This provides a contextual boundary for UTAUT2, suggesting that in mature financial technologies, sociological and behavioral mechanisms may outweigh utilitarian and hedonic drivers. A notable finding is the significantly negative association with Facilitating Conditions. This finding suggests that for digital-native users, reliance on technical infrastructure may be perceived as reducing efficiency rather than enabling adoption. This indicates a potential shift in the role of facilitating conditions from enablers to friction points in highly familiar digital environments.

From the managerial perspective, these findings provide several implications for the development of national digital payment ecosystems. The significance of Social Influence indicates that the adoption of digital payment technology is closely associated with network effects within users' ecosystems. Therefore, development strategies should emphasize ecosystem expansion and service integration, including interoperable and cross-border payment systems in ASEAN (InterActive QRIS, 2025a). The significance of Habit suggests that sustained usage depends on consistent and seamless user experience. Innovations such as Near Field Communication (NFC)-based QRIS tapping (InterActive QRIS, 2025b) can support this by reducing transaction friction and reinforcing routine usage behavior. This highlights the importance of designing systems that prioritize continuity of use rather than initial adoption alone. The significance of Personal Innovativeness indicates that users remain responsive to ongoing technological advancements. This implies that continuous, user-centered innovation is necessary to maintain engagement in mature digital payment environments (Awuku et al., 2023). Finally, the negative association with Facilitating Conditions underscores the need for infrastructure that is fully seamless and minimally visible to users, consistent with the vision of the Indonesian Payment System Blueprint or *Blueprint Sistem Pembayaran Indonesia* (BSPI) 2030 (Bank Indonesia, 2024). This suggests that technical systems should operate in the background without requiring active user consideration.

Despite providing new empirical insight into digital payment adoption among Generation Z in Indonesia, this study has several limitations that offer opportunities for future research. First, this study focuses exclusively on Generation Z as a digital-native cohort. As a result, the findings may not be generalizable to other generational groups. Future research may adopt a comparative approach by examining differences between Generation Z and Millennials, particularly in terms of how the transition from conventional to digital payment systems occurs across age groups. Second, in terms of variable scope, although this study integrates Personal Innovativeness into the UTAUT2 framework, the model does not fully capture potential inhibitors that may become increasingly relevant in mature financial ecosystems. Given the findings that technical aspects have shifted into baseline expectations, future studies should examine variables related to risk and security, such as perceived risk, trust, security concerns, and digital literacy, which may function as emerging determinants of adoption in advanced

digital payment environments. Finally, the use of a quantitative survey-based approach limits the ability to capture deeper underlying motivations behind user behavior. Future research is encouraged to adopt mixed-methods approaches, such as incorporating Focus Group Discussions (FGDs), to explore the psychological nuances and social dynamics underlying adoption decisions. This is particularly important given that social influence and habitual behavior were found to be dominant factors in this study but cannot be fully explained through quantitative measures alone. By addressing these limitations, future research can further refine theoretical models of digital payment adoption and provide more context-sensitive insights into user behavior in increasingly mature digital ecosystems.

CONCLUSION

This study demonstrates that intentions to use QRIS among Generation Z in Indonesia are more strongly influenced by socio-psychological than by functional considerations, as commonly emphasized in technology adoption models. These findings suggest that the standard UTAUT2 framework may require extension, particularly through the inclusion of Personal Innovativeness, to better explain use intention in the context of national infrastructure-based digital payments. The insignificance of Performance Expectancy, Effort Expectancy, and Price Value highlights that digital-native users increasingly perceive ease of use and functional benefits as baseline expectations rather than differentiating factors. In this context, variation in use intention is more closely associated with individual characteristics, particularly openness to innovation, as well as socially embedded and habitual usage patterns. The findings further show that Habit has become a dominant factor, indicating that QRIS usage is increasingly integrated into users' daily transaction routines. In addition, the negative association observed for Facilitating Conditions suggests that technical infrastructure is perceived as a basic requirement rather than a motivating factor, and in some cases may even reduce perceived efficiency when it becomes overly salient to users. From a practical perspective, these findings imply that policymakers and service providers should shift their focus from promoting functional benefits toward strategies that strengthen social influence and encourage habitual usage. Approaches that emphasize ecosystem integration, user experience continuity, and personalization for innovation-oriented users may be more effective in expanding QRIS adoption among Generation Z in Indonesia.

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AUTHOR CONTRIBUTIONS

Adrian Herma Sugiarto: Conceptualization, Methodology, Data Curation, Writing - Original Draft. Evi Maria: Methodology, Investigation, Writing - Review & Editing, Supervision, Formal analysis. Yessica Nataliani: Writing - Review & Editing, Supervision, Formal analysis.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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