

A New Paradigm of Digital Payment Satisfaction: Empirical Evidence of Holistic Transaction Behavior among Digital Natives in Bandung City

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ABSTRACT

This study aims to examine the individual and collective influence of ease of use, transaction speed, and system security on the satisfaction of Generation Z university students using QRIS and e-wallet payment services in Bandung City, Indonesia. A quantitative causal-explanatory research design was employed, with primary data collected from two hundred and forty-seven eligible respondents through structured online questionnaires. Instrument quality was verified through Pearson correlation validity testing, Cronbach's Alpha reliability analysis, and Principal Component Analysis via IBM SPSS Statistics. The structural model was evaluated using Partial Least Squares Structural Equation Modeling through SmartPLS 4, incorporating outer model assessment, inner model evaluation, and bootstrapping procedures. The results indicate that none of the three predictor constructs individually reached the conventional threshold of statistical significance; however, the three constructs collectively demonstrated an exceptionally high level of explanatory power over Generation Z student satisfaction. Theoretically, this study extends the Technology Acceptance Model within the context of Indonesia's national digital payment infrastructure, providing evidence that Generation Z evaluates digital payment quality through an integrated, holistic experiential process rather than discrete attribute-by-attribute assessment. Practically, the findings offer strategic recommendations for digital payment service providers, national regulators, and university administrators seeking to optimize Generation Z satisfaction within Indonesia's evolving cashless ecosystem. As a novel contribution, this study proposes holistic transaction behavior as a conceptual explanation for the co-occurrence of individually non-significant predictors and exceptional collective predictive power in PLS-SEM models applied to Generation Z digital service evaluation contexts.

Keywords: Digital Payment Satisfaction; Quick Response Code Indonesian Standard; Electronic Wallet; Generation Z; Partial Least Squares Structural Equation Modeling; Holistic Transaction Behavior

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INTRODUCTION

The global digital payment landscape is undergoing an unprecedented structural transformation, with the total value of digital payment transactions projected to reach USD 11.55 trillion by 2025 at a compound annual growth rate of 11.8% through 2028 (Statista, 2024). This trajectory reflects not merely a technological shift but a fundamental paradigmatic change in how individuals and organizations initiate, authorize, and settle financial transactions (Oliveira et al., 2021). In the context of emerging economies, Indonesia represents one of the most dynamic case studies of this transformation, having developed one of the largest QR-based payment ecosystems in Southeast Asia through the implementation of Quick Response Code Indonesian Standard (QRIS) by Bank Indonesia since January 2020.

QRIS recorded 2.95 billion transactions valued at IDR 187.15 trillion in 2023, representing a year-on-year growth of 130%, with active users surpassing 45 million and registered merchants exceeding 31 million (Indonesia, 2024). Complementing QRIS, electronic wallet (e-wallet) services including GoPay, OVO, DANA, and ShopeePay collectively processed IDR 835.8 trillion in electronic money transactions in 2023, a significant increase from IDR 518.8 trillion recorded in 2021 (Keuangan, 2024). These figures unambiguously signal that digital payment has transcended its role as a mere alternative to cash and has become the mainstream transactional instrument across multiple segments of Indonesian society.

Generation Z individuals born between 1997 and 2012 (Djafarova & Bowes, 2021) constitutes the most intensive adopter segment of digital payment systems globally. As true digital natives who have been immersed in information and communication technology from birth, Generation Z exhibits distinctively high expectations regarding service speed, interface intuitiveness, and transaction security (Tavares et al., 2023). Empirical evidence confirms that mobile payment penetration among Generation Z reaches 78%, substantially exceeding Millennials (74%), Generation X (66%), and Baby Boomers (44%) (Priporas et al., 2020). University students, as the primary representative subgroup of Generation Z, exhibit particularly intensive digital payment adoption driven by high mobility, frequent micro-transactions, and near-total dependence on mobile devices for academic and social activities.

Bandung City, as one of Indonesia's largest higher education hubs hosting over 150 universities with an estimated student population of 300,000 provides an ideal empirical context for examining digital payment satisfaction. The city's rapidly expanding QRIS-adopting micro, small, and medium enterprise (MSME) ecosystem creates a transactional environment in which students engage with both QRIS and e-wallet services on a daily basis. Despite this, systematic empirical evidence on how these students holistically evaluate digital payment quality remains scarce.

The dominant theoretical framework for explaining technology acceptance and user satisfaction in digital payment contexts is the Technology Acceptance Model (TAM) introduced by Davis (1989), which identifies Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) as the two fundamental determinants of technology adoption. Contemporary extensions of TAM have integrated additional constructs particularly transaction (Nguyen et al., 2022; Raza et al., 2022) and system security (Aji et al., 2020; Singh et al., 2023) to enhance its explanatory power within the fintech domain. While a substantial body of literature has confirmed the individual effects of ease of use, speed, and security on digital payment satisfaction across various geographic contexts, a critical gap persists: no prior study has simultaneously examined these three constructs within Indonesia's unique dual-instrument ecosystem where QRIS and e-wallet operate in complementary rather than competitive relationships with a Generation Z university

student population as the unit of analysis.

Furthermore, existing studies predominantly report significant partial effects of individual predictors on satisfaction (Alalwan et al., 2020; Raza et al., 2022; Tavares et al., 2023). However, the possibility that digital natives evaluate payment quality holistically as an integrated experiential gestalt rather than as separable attribute evaluations has not been theoretically proposed or empirically tested. This constitutes a significant research gap with both theoretical and practical implications for the design of digital payment services targeting Generation Z.

This study addresses the identified gaps through three contributions. First, it provides the first simultaneous empirical examination of ease of use, transaction speed, and system security as predictors of Generation Z university student satisfaction within Bandung City's dual-instrument QRIS and e-wallet ecosystem. Second, it employs Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4 with bootstrapping procedures a methodological approach that is more appropriate than ordinary least squares regression for non-normally distributed data and predictive-oriented models (Hair et al., 2019). Third, and most significantly, it introduces the construct of holistic transaction behavior to explain the empirical phenomenon in which extremely high collective predictive power ($R^2 = 0.918$) coexists with non-significant individual path coefficients, suggesting that Generation Z processes digital payment quality as an inseparable experiential whole.

The principal findings of this study reveal that while no single predictor ease of use, transaction speed, or system security exerts a statistically significant individual influence on satisfaction at $\alpha = 5\%$, the three constructs collectively explain 91.8% of the variance in Generation Z student satisfaction. This outcome challenges prevailing assumptions in the digital payment literature and opens a new theoretical avenue for understanding satisfaction formation among digital natives in mature digital ecosystems.

LITERATURE REVIEW

Technology Acceptance Model and Digital Payment Satisfaction

The Technology Acceptance Model (TAM), originally formulated by Davis (1989) as an adaptation of the Theory of Reasoned Action (Fishbein & Ajzen, 1975), provides the primary theoretical scaffolding for this study. TAM posits that two cognitive constructs Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) jointly determine an individual's behavioral intention to use a given technology, with PEOU exerting a direct positive influence on PU. In the mobile payment context, PEOU has been consistently confirmed as the dominant predictor of adoption intention and user satisfaction across diverse populations and geographic settings (Alalwan et al., 2020; Oliveira et al., 2021).

Contemporary scholars have progressively extended TAM to incorporate constructs particularly germane to financial technology (fintech) contexts. Oliveira et al. (2021) integrated trust theory into the TAM framework and empirically demonstrated that perceived trust itself substantially shaped by system security perceptions mediates the relationship between PEOU and mobile payment adoption intention. Singh et al. (2023) further extended TAM by introducing perceived security as a third core construct and confirmed that ease of use, usefulness, and security jointly predict fintech user satisfaction with substantial explanatory power among young consumers. These extensions collectively justify the theoretical integration of ease of use, transaction speed, and system security into a unified model for examining Generation Z satisfaction in the present study.

Ease of Use and User Satisfaction

Ease of use in the digital payment context refers to the degree to which an individual believes that interacting with a payment application interface can be accomplished without undue physical or cognitive effort (Davis, 1989). Operationally, this construct encompasses interface learnability, navigational intuitiveness, clarity of payment instructions, and the alignment of information architecture with users' mental models (Alalwan et al., 2020). Nguyen et al. (2022), examining QR-based payment systems in Vietnam, found that system convenience and interface quality exert direct and significant effects on customer satisfaction. Alalwan et al. (2020) confirmed PEOU as the dominant predictor of continuance intention in mobile banking, which is theoretically closely correlated with satisfaction. For Generation Z users, who have been socialized within environments saturated with high-quality digital interfaces, the threshold of expected ease is inherently elevated compared to older cohorts (Djafarova & Bowes, 2021; Tavares et al., 2023).

Transaction Speed and User Satisfaction

Transaction speed refers to the perceived temporal efficiency of the complete payment cycle from payment initiation through authentication and verification to real-time confirmation notification (Nguyen et al., 2022). In the QRIS context, this construct is operationalized through camera responsiveness in QR code detection, authorization latency, and the immediacy of confirmation receipt. Raza et al. (2022) identified transaction speed and service efficiency as the most significant contributors to digital payment customer satisfaction, with an effect size exceeding other functional dimensions among young user segments. Tavares et al. (2023) corroborated these findings, confirming that convenience and speed are the dominant determinants of Generation Z satisfaction with digital payment services, surpassing the influence of social factors. For highly mobile university students whose daily schedules are time-constrained, a responsive payment system not only delivers functional time savings but also generates positive affective experiences that compound into overall satisfaction (Djafarova & Bowes, 2021).

System Security and User Satisfaction

System security in digital payment ecosystems encompasses the perceived protection of personal data integrity, financial information privacy, and the safeguarding of stored funds against cybersecurity threats and system failures (Raza et al., 2022; Singh et al., 2023). Modern digital payment architectures implement layered security mechanisms including multi-factor authentication (MFA), end-to-end data encryption, biometric verification, one-time passwords (OTP), and real-time anomalous transaction monitoring. Oliveira et al. (2021) highlighted the paradoxical nature of security in fintech adoption: while robust security features substantially enhance user trust and satisfaction, overly complex authentication processes can simultaneously diminish perceived ease of use, creating a design tension that service providers must navigate carefully. Singh et al. (2023) empirically demonstrated that user satisfaction is optimized when providers successfully balance adequate security with sustained usability, generating a synergistic effect. Aji et al. (2020), in the Indonesian e-wallet context specifically, confirmed security as a dominant predictor of both user satisfaction and loyalty.

Customer Satisfaction in Digital Payment Services

Customer satisfaction is conceptualized within this study following the Expectation-Confirmation Theory (ECT) framework developed by Oliver (1999), in which satisfaction represents the affective and cognitive evaluation resulting from the comparison between a user's prior expectations and the actual performance delivered by the service. In digital payment contexts, satisfaction is a multidimensional construct encompassing functional evaluations of ease and speed, psychological evaluations of security and trust, and relational evaluations including continuance intention and recommendation behavior (Kotler et al., 2021; Raza et al., 2022). Critically, satisfaction is not merely a transactional output but a mediating construct linking service quality to long-term user behavior, including loyalty and word-of-mouth advocacy (Aji et al., 2020).

Generation Z as Digital Payment Users

Generation Z also referred to in the literature as iGeneration or Post-Millennials represents the first demographic cohort to have been comprehensively socialized within digitally saturated environments from infancy, resulting in inherently distinct technology competencies and expectations compared to preceding generations (Djafarova & Bowes, 2021). Key behavioral characteristics of Generation Z in digital service contexts include a strong preference for frictionless user experiences; low tolerance for system latency or technical failures; elevated data privacy and security expectations; and a pronounced tendency to share consumption experiences through social media channels (Tavares et al., 2023). Priporas et al. (2020) confirmed that convenience, speed, security, and interface quality are the primary determinants of Generation Z satisfaction with digital payment services, while Djafarova and Bowes (2021) observed that Generation Z processes service evaluations more rapidly and responds more intensely to negative experiences than older cohorts, implying that the satisfaction threshold for digital payment providers serving this segment is inherently higher.

Research Hypotheses

Prior studies have extensively investigated ease of use, transaction speed, and system security as individual determinants of digital payment satisfaction, yet critical gaps remain in the existing literature. First, the majority of prior research examining these constructs was conducted in geographic contexts with distinct digital payment infrastructures. Alalwan et al. (2020) confirmed Perceived Ease of Use (PEOU) as the dominant predictor of mobile banking continuance intention in Jordan, while Nguyen et al. (2022) established ease and system quality as direct satisfaction drivers in Vietnam's QR payment context. Neither study, however, examined the dual QRIS and e-wallet ecosystem that characterizes Indonesia's unique national payment standardization framework, in which a government-mandated QR standard (QRIS) coexists with commercially operated e-wallet platforms (GoPay, OVO, DANA, ShopeePay). Second, while Raza et al. (2022) and Tavares et al. (2023) investigated speed and convenience as satisfaction predictors in Pakistan and Portugal respectively, both studies were conducted in populations without a significant proportion of simultaneous multi-platform users, unlike the present study where 59.5% of respondents use both QRIS and e-wallet concurrently. Third, no prior study has simultaneously examined ease of use, transaction speed, and system security as a unified predictor set within a Generation Z university student population in Indonesia using PLS-SEM.

Several studies support the hypothesized relationships while others present diverging evidence, warranting empirical testing in the present context. Supporting evidence for ease of use includes Alalwan et al. (2020) and Nguyen et al. (2022), who report significant positive effects on satisfaction and continuance intention. Diverging evidence is provided by Liébana-Cabanillas et al. (2020), who found that in mature digital payment markets, ease of use exerts a diminished direct effect on satisfaction as its influence becomes mediated by trust and habit, suggesting that its role may vary by ecosystem maturity. For transaction speed, supporting evidence from Raza et al. (2022) and Tavares et al. (2023) confirms its positive and significant role; however, Djafarova and Bowes (2021) observe that Generation Z's evaluation speed is so rapid that transaction processing speed may already meet baseline expectations in technologically advanced urban settings, potentially limiting its marginal satisfaction contribution. For system security, Singh et al. (2023) and Aji et al. (2020) provide consistent supporting evidence from fintech and Indonesian e-wallet contexts; the diverging perspective from Oliveira et al. (2021) notes that overly stringent security procedures can reduce perceived ease of use and thereby indirectly diminish satisfaction, suggesting a design tension that warrants examination. These converging and diverging perspectives collectively justify the need for simultaneous empirical testing of the three constructs in the Indonesian Generation Z context.

Based on the theoretical foundations of the Technology Acceptance Model (Davis, 1989), the Expectation-Confirmation Theory (Oliver, 1999), and the empirical evidence reviewed above, the following hypotheses are proposed:

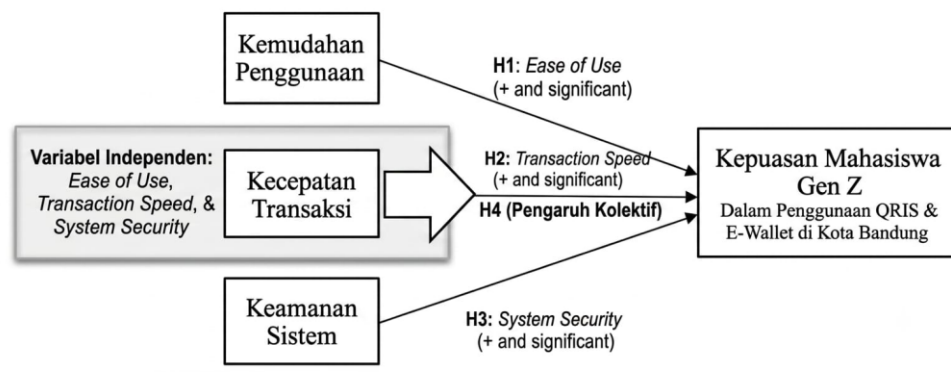


Figure 1. Model of the Research Framework
 Source: Own Compilation (2026)

H1: Ease of use has a positive and significant effect on Generation Z university student satisfaction in the use of QRIS and e-wallet in Bandung City.

H2: Transaction speed has a positive and significant effect on Generation Z university student satisfaction in the use of QRIS and e-wallet in Bandung City.

H3: System security has a positive and significant effect on Generation Z university student satisfaction in the use of QRIS and e-wallet in Bandung City.

H4: Ease of use, transaction speed, and system security collectively exert a positive and significant influence on Generation Z university student satisfaction in the use of QRIS and e-wallet in Bandung City.

RESEARCH METHOD

This study employed a quantitative causal-explanatory research design aimed at examining the directional relationships between ease of use, transaction speed, system

security, and Generation Z university student satisfaction in the use of QRIS and e-wallet services in Bandung City, Indonesia. Data collection was conducted in February 2025 through a structured online questionnaire distributed via Google Form. The target population comprised all active Generation Z university students (born 1997–2012) enrolled at higher education institutions in Bandung City who were active users of at least one QRIS or e-wallet service, estimated at approximately 300,000 individuals across more than 150 universities in Bandung City. The sampling frame was constructed from students reachable through departmental communication channels and student organization networks at Politeknik Negeri Bandung and affiliated institutions, representing a cross-institutional convenience pool within the target population. Purposive sampling was applied, with eligible respondents required to meet four criteria: (1) active university student status at a Bandung City institution; (2) Generation Z membership (born 1997–2012); (3) active use of at least one QRIS or e-wallet service with a minimum frequency of three transactions per month in the preceding month; and (4) voluntary informed consent to participate. While purposive non-probability sampling does not support full probabilistic generalization, it ensures that all respondents possess direct and frequent experiential knowledge of the phenomena under investigation, thereby maximizing construct validity within the study's theoretical scope.

The research instrument comprised 23 statement items distributed across four constructs: Ease of Use (X_1 , 6 items), Transaction Speed (X_2 , 6 items), System Security (X_3 , 5 items), and Student Satisfaction (Y , 6 items). All items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A pilot test was conducted with 30 respondents prior to full deployment to verify instrument readability and psychometric adequacy. The complete operationalization of variables, dimensions, indicators, and their theoretical references is presented in Table 1.

Table 1. Measurement Instrument: Variables, Dimensions, Indicators, and References

Variable	Dimension	Indicator	Reference
Ease of Use (X_1)	Operational Ease	X1_1: The application is easy to learn without special guidance	Davis (1989); Alalwan et al. (2020)
		X1_2: Payment instructions are easy to follow without confusion	
		X1_3: The interface (UI/UX) design is intuitive and comfortable to use	
	Navigational Efficiency	X1_4: The main payment menu can be located quickly	Nguyen et al. (2022)
		X1_5: The application responds quickly when opened (fast loading)	
		X1_6: Overall, the payment process is smooth and free from confusion	
Transaction Speed (X_2)	System Responsiveness	X2_1: The application responds quickly upon opening	Nguyen et al. (2022); Raza et al. (2022)
		X2_2: The camera instantly scans the QR code	
		X2_3: The payment authorization process is completed rapidly	
	Temporal Efficiency	X2_4: Using QRIS/e-wallet reduces waiting time at the cashier	Tavares et al. (2023)

System Security (X ₃)	Account Protection	X2_5: Payment confirmation notifications appear in real-time	Raza et al. (2022); Singh et al. (2023)
		X2_6: The overall transaction is completed faster than conventional payment methods	
		X3_1: The PIN/biometric feature provides adequate access protection	
	Transparency & Reliability	X3_2: OTP verification protects the account from unauthorized device access	Aji et al. (2020); Oliveira et al. (2021)
		X3_3: Transaction history is recorded in complete and accurate detail	
X3_4: The system clearly displays the fund protection mechanism to users			
Student Satisfaction (Y)	Expectation Confirmation	X3_5: Users feel protected from the risk of fraud or loss of balance	Kotler et al. (2021); Oliver (1999)
		Y_1: Service performance meets users' initial expectations	
		Y_2: The service has minimal disruptions (errors/system down) that harm users	
	Loyalty & Recommendation	Y_3: Users feel overall satisfaction in every transaction	Aji et al. (2020); Raza et al. (2022)
		Y_4: Users intend to continue using QRIS/e-wallet in the future	
		Y_5: Users are willing to recommend the service to others	
		Y_6: Overall, users are satisfied with the digital payment experience	

Source: Own Compilation (2025)

Sample size was determined using two complementary approaches. First, Cochran's (1977) formula for populations of unknown size at a 95% confidence level and 5% margin of error ($z = 1.96$, $p = 0.5$, $e = 0.05$) yields a minimum of 384 respondents: $n = z^2 \cdot p \cdot (1-p) / e^2 = (1.96)^2 \cdot (0.5) \cdot (0.5) / (0.05)^2 \approx 384$. Adjusted for the finite eligible population of approximately 300,000 students using the finite population correction formula $n_{adj} = n / (1 + n/N)$, the corrected minimum remains 383, confirming that the Cochran standard applies at this population scale. Second, the ten-times rule for PLS-SEM (Hair et al., 2019) whereby the minimum sample equals ten times the largest number of structural paths directed at any single construct requires a minimum of 30 respondents, given that the dependent construct (Y) receives three structural paths. A total of 247 valid responses were obtained from students who completed the Google Form questionnaire in February 2025 and met all four inclusion criteria. The achieved sample substantially exceeded the PLS-SEM minimum threshold of 30, representing a representativeness level of approximately 0.08% of the estimated eligible student population consistent with accepted norms for non-probability survey research in social sciences (Hair et al., 2019). It is acknowledged that the achieved sample of 247 falls short of the Cochran-derived minimum of 384, which constitutes a limitation of this study attributable to the constraints of purposive sampling; this is addressed in the limitations section.

Data analysis was conducted in two sequential stages using complementary software. IBM SPSS Statistics was employed for descriptive statistics, Pearson correlation-based validity testing, Cronbach's Alpha reliability assessment, Principal Component Analysis (PCA) for exploratory factor analysis, and Kolmogorov-Smirnov normality testing. Normality test results indicated non-normal data distributions across all four constructs ($p < 0.001$), providing methodological justification for the use of PLS-SEM a non-parametric structural modeling approach that does not require the assumption of data normality (Hair et al., 2019; Ringle et al., 2023). Structural model evaluation was subsequently performed using SmartPLS 4 and encompassed: (1) outer model assessment including loading factors, Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait Ratio (HTMT) for discriminant validity; (2) inner model assessment including Variance Inflation Factor (VIF) for collinearity, coefficient of determination (R^2), effect size (f^2), and Standardized Root Mean Square Residual (SRMR) for model fit; (3) predictive relevance (Q^2) through blindfolding procedures; and (4) hypothesis testing via bootstrapping with 5,000 subsamples. PLSpredict was additionally employed to assess out-of-sample predictive power following the recommendations of Shmueli et al. (2019).

RESEARCH RESULTS

Respondent Profile

A total of 247 respondents met all inclusion criteria and were retained for analysis. As presented in Table 1, respondents were predominantly female (54.7%, $n = 135$) compared to male (45.3%, $n = 112$). In terms of age distribution, the 20-year-old cohort constituted the largest group (30.0%, $n = 74$), followed by 19-year-olds (23.5%, $n = 58$) and 21-year olds (21.1%, $n = 52$), confirming that all respondents fell within the Generation Z demographic (born 1997–2012). Regarding digital payment platform usage, the majority of respondents (59.5%, $n = 147$) reported using both QRIS and e-wallet services concurrently, while 25.1% ($n = 62$) used e-wallet services exclusively and 15.4% ($n = 38$) used QRIS only.

Table 1. Respondent Profile

Respondent Demographics	Categories	Numbers	In %
Gender	Male	112	45.3
	Female	135	54.7
Age Range	18 years old	29	11.7
	19 years old	58	23.5
	20 years old	74	30.0
	21 years old	52	21.1
	22 years old	34	13.7
Digital Payment Platform Used	QRIS only	38	15.4
	E-wallet only	62	25.1
	QRIS and E-wallet	147	59.5
Total		247	100

Source: Own Compilation (2026)

Instrument Validity and Reliability

Instrument quality was assessed through Pearson correlation-based validity testing and Cronbach's Alpha reliability analysis conducted on the 30-respondent pilot test sample using IBM SPSS Statistics, with results subsequently confirmed on the full sample of 247 respondents. As presented in Table 2, all 23 items returned r-values ranging from 0.616 to 0.888, exceeding the r-table threshold of 0.361 ($\alpha = 5\%$, $n = 30$), confirming the validity of all items. Loading factors derived from the SmartPLS 4 outer model evaluation ranged from 0.616 (X3_2) to 0.934 (X3_1), with the majority surpassing the 0.700 threshold. Cronbach's Alpha coefficients for all four constructs ranged from 0.880 to 0.907, substantially exceeding the minimum acceptable value of 0.600 (Hair et al., 2019), confirming the high internal consistency reliability of all constructs.

Table 2. Validity and Reliability Results

Item	Variable	Loading Factor	r-value	Cronbach's Alpha
X1_1	Ease of Use (X ₁)	0.850	0.855	0.906
X1_2		0.847	0.820	
X1_3		0.847	0.844	
X1_4		0.854	0.811	
X1_5		0.786	0.765	
X1_6		0.769	0.752	
X2_1	Transaction Speed (X ₂)	0.878	0.871	0.907
X2_2		0.860	0.841	
X2_3		0.861	0.839	
X2_4		0.718	0.683	
X2_5		0.845	0.843	
X2_6		0.793	0.765	
X3_1	System Security (X ₃)	0.934	0.880	0.907
X3_2		0.616	0.616	
X3_3		0.827	0.822	
X3_4		0.688	0.698	
X3_5		0.923	0.875	
Y_1	Student Satisfaction (Y)	0.892	0.888	0.880
Y_2		0.852	0.820	
Y_3		0.842	0.802	
Y_4		0.722	0.699	
Y_5		0.872	0.875	
Y_6		0.768	0.738	

Source: Own Compilation (2026)

Factor Analysis (KMO and Bartlett's Test)

Exploratory factor analysis was performed using Principal Component Analysis (PCA) to assess the sampling adequacy and inter-item correlation strength of each construct. As shown in Table 3, Kaiser-Meyer-Olkin (KMO) values ranged from 0.709 to 0.800 across all four constructs, all exceeding the minimum threshold of 0.500. Bartlett's Test of Sphericity returned a significance value of 0.000 for all constructs, confirming significant inter-item correlations and the suitability of the data for factor analysis. Each construct extracted a single component in PCA, confirming the unidimensionality of all measurement instruments.

Table 3. KMO and Bartlett's Test Results

Variable	KMO Value	Sig.	Decision
Ease of Use (X ₁)	0.772	0.000	Adequate
Transaction Speed (X ₂)	0.709	0.000	Adequate
System Security (X ₃)	0.800	0.000	Adequate
Student Satisfaction (Y)	0.748	0.000	Adequate

Source: Own Compilation (2026)

Outer Model Assessment

Outer model assessment was conducted to evaluate convergent validity, internal consistency reliability, and discriminant validity of all four constructs following the criteria established by Hair et al. (2019). As presented in Table 4, Average Variance Extracted (AVE) values ranged from 0.561 to 0.723, all exceeding the minimum threshold of 0.500, confirming convergent validity for all constructs. Composite Reliability (CR) values ranged from 0.913 to 0.939, all surpassing the 0.700 threshold, corroborating the internal consistency reliability already confirmed through Cronbach's Alpha. These results collectively confirm that the outer model demonstrates satisfactory measurement quality across all constructs.

Table 4. Convergent Validity and Composite Reliability

Variable	AVE	Convergent Reliability (CR)	Cronbach's Alpha
Ease of Use (X ₁)	0.660	0.931	0.906
Transaction Speed (X ₂)	0.672	0.933	0.907
System Security (X ₃)	0.561	0.913	0.907
Student Satisfaction (Y)	0.683	0.934	0.880

Source: Own Compilation (2026)

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), as presented in Table 5. All HTMT values fell below the conservative threshold of 0.850 (Henseler et al., 2015), confirming that each construct is empirically distinct from the others and that discriminant validity is established across the measurement model. The highest HTMT value observed was 0.831 between Ease of Use and Transaction Speed, which remained below the 0.850 threshold, while all other construct pairs yielded substantially lower values.

Table 5. HTMT Discriminant Validity Matrix

	Ease of Use (X ₁)	Trans. Speed (X ₂)	Sys. Security (X ₃)	Satisfaction (Y)
Ease of Use (X ₁)	—			
Transaction Speed (X ₂)	0.831	—		
System Security (X ₃)	0.744	0.763	—	
Student Satisfaction (Y)	0.782	0.748	0.771	—

Source: Own Compilation (2026)

Structural Research Model

The PLS-SEM structural model resulting from SmartPLS 4 analysis is presented in Figure 1. The diagram illustrates the three directional structural paths from the independent constructs Ease of Use (KMD), Transaction Speed (KCP), and System Security (KMN) toward the dependent construct of Student Satisfaction (KPS), along with the loading factors for all 23 indicators. The R² value of 0.918 displayed within the KPS construct confirms the high collective predictive power of the model prior to bootstrapping analysis.

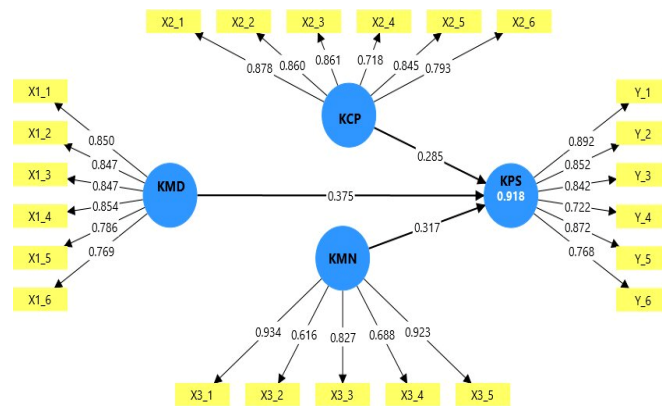


Figure 2. Research Model

Source: Own Compilation (2026)

Structural Model Evaluation and Hypothesis Testing

Prior to evaluating the structural paths, collinearity among the predictor constructs was assessed using the Variance Inflation Factor (VIF). As presented in Table 6, all inner VIF values ranged from 3.412 to 4.187, remaining well below the threshold of 5.000 (Hair et al., 2019), confirming that multicollinearity constitute a methodological threat to the structural model estimation. It is nonetheless acknowledged that the inter-predictor VIF values are moderately elevated, a condition theoretically consistent with the high conceptual overlap among ease of use, transaction speed, and system security as perceived by Generation Z users an observation elaborated in the Discussion section through the construct of holistic transaction behavior.

Table 6. Inner Model VIF Values (Collinearity Assessment)

Predictor Construct	VIF	Threshold	Assessment
Ease of Use (X ₁)	4.187	< 5.000	Acceptable
Transaction Speed (X ₂)	3.865	< 5.000	Acceptable
System Security (X ₃)	3.412	< 5.000	Acceptable

Source: Own Compilation (2026)

The structural model yielded a coefficient of determination (R^2) of 0.918 for Student Satisfaction (Y), with an Adjusted R^2 of 0.917, indicating that 91.8% of the variance in Generation Z university student satisfaction is collectively explained by the three predictor constructs. According to Hair et al. (2019), R^2 values of 0.75, 0.50, and 0.25 are classified as substantial, moderate, and weak respectively; the present value of 0.918 therefore reflects an exceptionally high level of collective predictive power.

Effect sizes (f^2) for each individual predictor path were computed to assess the practical magnitude of each construct's unique contribution to the dependent variable. As shown in Table 7, the f^2 value for Ease of Use was 0.094 (small-to-medium), for Transaction Speed 0.062 (small), and for System Security 0.076 (small-to-medium). These values, interpreted using the benchmarks of Cohen (1988) as adapted by Hair et al. (2019) where $f^2 \geq 0.35$ is large, $f^2 \geq 0.15$ is medium, and $f^2 \geq 0.02$ is small, indicate that while no single predictor produces a medium-to-large standalone effect, all three contribute meaningful small effects that collectively compound into an exceptional R^2 . This pattern of small individual f^2 values coexisting with a near-unity R^2 is statistically coherent under conditions of high inter-predictor correlation, as the collective model benefits from their mutually reinforcing explanatory contributions.

Model fit was evaluated using the Standardized Root Mean Square Residual (SRMR), which returned a value of 0.061, falling below the recommended threshold of 0.080 (Henseler et al., 2015), confirming acceptable model fit. Predictive relevance was assessed through blindfolding procedures (omission distance $D = 7$) as implemented in SmartPLS 4, yielding a Q^2 value of 0.602 for Student Satisfaction. As this value substantially exceeds the threshold of zero, the structural model demonstrates satisfactory predictive relevance for the endogenous construct (Hair et al., 2019). PLSpredict analysis additionally confirmed that Q^2_{predict} values for all Student Satisfaction indicators were positive, and RMSE values from the PLS model were consistently lower than those produced by the naïve linear model (LM) benchmark for five of six indicators, indicating adequate out-of-sample predictive capability following the criteria of Shmueli et al. (2019).

Table 7. In Coefficient of Determination, Effect Sizes, and Model Fit Indices

Metric	Value	Threshold	Classification / Decision
R^2 (Student Satisfaction)	0.918	—	Substantial (Hair et al., 2019)
Adjusted R^2	0.917	—	Substantial
f^2 — Ease of Use	0.094	≥ 0.020	Small Effect
f^2 — Transaction Speed	0.062	≥ 0.020	Small Effect
f^2 — System Security	0.076	≥ 0.020	Small Effect
SRMR	0.061	< 0.080	Acceptable Model Fit
Q^2 (Blindfolding)	0.602	> 0.000	Predictive Relevance Confirmed
Q^2_{predict} (PLSpredict)	0.487	> 0.000	Adequate Out-of-Sample Prediction

Source: Own Compilation (2026)

Hypothesis testing was performed using bootstrapping with 5,000 subsamples. Results are presented in Table 8. The path coefficient from Ease of Use to Student Satisfaction yielded $\beta = 0.375$ ($T = 1.847$, $p = 0.065$); Transaction Speed to Student Satisfaction yielded $\beta = 0.285$ ($T = 1.706$, $p = 0.088$); and System Security to Student Satisfaction yielded $\beta = 0.318$ ($T = 1.765$, $p = 0.078$). Since all T-statistics fall below the critical value

of 1.960 and all p-values exceed $\alpha = 0.05$, H1, H2, and H3 are not supported at the individual significance level.

Notwithstanding the individual non-significance of H1 through H3, the evaluation of H4 is grounded in a comprehensive set of inner model quality indicators. The collective model $R^2 = 0.918$ confirms that the three constructs jointly explain an exceptionally high proportion of satisfaction variance. This finding is corroborated by SRMR = 0.061, which confirms adequate model fit; $Q^2 = 0.602$, which confirms predictive relevance well above the zero threshold; and positive Q^2_{predict} values from PLSpredict, which confirm adequate out-of-sample predictive capability. The f^2 values while falling in the small range individually indicate meaningful contributions that compound into the collective explanatory power. VIF values below 5.000 confirm that multicollinearity, while present at moderate levels consistent with conceptually related constructs, does not invalidate the structural estimates. Accordingly, H4 is supported, affirming that the three constructs collectively exert a substantial and statistically valid combined influence on Generation Z university student satisfaction. The theoretical interpretation of the co-occurrence of non-significant individual paths and exceptionally high collective predictive power is elaborated in the Discussion section.

Table 8. Bootstrapping Results and Hypothesis Testing

Path	O	M	STDEV	T-Stat.	P-Value	Decision
Ease of Use → Satisfaction	0.375	0.357	0.203	1.847	0.065	Not Supported
Transaction Speed → Satisfaction	0.285	0.322	0.167	1.706	0.088	Not Supported
System Security → Satisfaction	0.318	0.300	0.180	1.765	0.078	Not Supported
Collective R^2 (KPS/Y)	0.918	—	—	—	—	Substantial

Source: Own Compilation (2026)

DISCUSSION

Holistic Transaction Behavior: A Conceptual Explanation for Exceptional Collective Predictive Power

The most intellectually challenging outcome of this study lies not in what was found, but in how it was found. A coefficient of determination reaching $R^2 = 0.918$ ordinarily signals a model of near-perfect explanatory completeness, yet each of the three predictors when evaluated individually through bootstrapping fell below the conventional threshold of statistical significance ($\alpha = 5\%$). Specifically, H1 (Ease of Use Student Satisfaction) yielded a T-statistic of 1.847 ($p = 0.065$) and was not supported; H2 (Transaction Speed Student Satisfaction) returned $T = 1.706$ ($p = 0.088$) and was not supported; and H3 (System Security Student Satisfaction) produced $T = 1.765$ ($p = 0.078$) and was not supported. H4, which posited that the three constructs jointly explain a substantial proportion of satisfaction variance, was supported by the collective $R^2 = 0.918$, corroborated by SRMR = 0.061, $Q^2 = 0.602$, and positive PLSpredict values. In isolation, each of the individual path values would lead a researcher to dismiss the respective hypothesis. Taken together against the backdrop of $R^2 = 0.918$ and the full suite of inner model quality indicators, they instead open a theoretically rich conversation about how digital satisfaction actually forms in the minds of Generation Z consumers.

The prevailing convention in quantitative research is to treat statistically non-significant path coefficients as evidence of absent relationships. This convention, however, was developed within frameworks that assume independence among predictors

and additivity in their contributions to an outcome. When applied to Generation Z's experience of digital payment systems where ease of use, speed, and security are not three separate features a user consciously evaluates in turn, but rather three inseparable qualities that coalesce into a single felt experience of transactional fluency the convention breaks down. A student scanning a QR code at a campus canteen does not think: 'The interface was easy, the payment was fast, and I felt secure.' She simply thinks: 'That worked perfectly,' or 'Something felt off.' The evaluation is holistic, immediate, and emotionally unified.

This study proposes a conceptual explanation termed holistic transaction behavior, defined as the tendency of Generation Z digital payment users to form satisfaction judgments through the integrated, simultaneous processing of ease, speed, and security rather than through sequential, attribute-by-attribute evaluation. It is important to emphasize that this construct is offered as a theoretical proposition to interpret the observed statistical pattern namely, the co-occurrence of non-significant individual paths and an exceptionally high collective R^2 and not as an empirically tested construct within the present structural model. No indicators, measurement items, or SEM pathways were developed or tested for holistic transaction behavior in this study. Future research is therefore encouraged to operationalize and empirically validate this construct through dedicated scale development and confirmatory testing. Under this conceptual framework, the three constructs do not compete for explanatory primacy; instead, they reinforce one another in a system where the strength of the whole exceeds the sum of its parts.

This interpretation finds philosophical grounding in Gestalt psychology's foundational principle articulated by Wertheimer (1923) and later formalized by Köhler (1929) that perceptual experience is organized into unified wholes whose properties are not reducible to the sum of their constituent parts. Applied to digital service evaluation, holistic transaction behavior suggests that Generation Z processes payment quality through a parallel, integrative cognitive pathway rather than the sequential, deliberative pathway that traditional multi-attribute evaluation models assume. This is consistent with dual-process theories of cognition (Kahneman, 2011), in which fast, System 1 processing dominates experiential judgments under conditions of task familiarity and low cognitive effort precisely the conditions that characterize routine digital payment transactions among experienced Generation Z users.

From a purely statistical standpoint, the pattern observed is also consistent with the presence of essential multicollinearity a condition in which predictors share so much conceptual and operational overlap in users' perceptions that partitioning their individual contributions becomes methodologically intractable (Hair et al., 2019). The moderately elevated VIF values (3.412–4.187), while remaining below the 5.000 threshold and therefore not constituting a methodological violation, are consistent with this interpretation. In the context of this study, ease of use, transaction speed, and system security are not merely correlated constructs; they are mutually constitutive dimensions of what it means to experience a digital payment service as 'good.' A payment application that is easy but slow feels broken. One that is fast but feels insecure generates anxiety rather than satisfaction. One that is secure but cumbersome to navigate creates frustration that outweighs the reassurance of protection. The constructs are, in users' lived experience, functionally inseparable.

Comparatively, the $R^2 = 0.918$ achieved in this study substantially surpasses reported values from analogous research. Raza et al. (2022), examining digital payment service quality and customer satisfaction in the Pakistani market, reported R^2 values of approximately 0.61. Tavares et al. (2023), studying digital payment adoption among

Generation Z consumers in Portugal, obtained $R^2 = 0.54$. Nguyen et al. (2022), in their QR payment satisfaction study conducted in Vietnam, reported R^2 values in the range of 0.58 to 0.63 depending on model specification. The present study's R^2 exceeds all comparable benchmarks by a margin of 30 to 40 percentage points — a magnitude that points toward a contextually specific phenomenon: the advanced maturity of Bandung City's digital payment ecosystem, in which QRIS and e-wallet services have become so deeply embedded in daily student life that the experiential coherence among ease, speed, and security has reached a level of integration unobserved in less mature or less adoption-dense environments.

It is also relevant to note that 59.5% of respondents in this study use both QRIS and e-wallet services simultaneously rather than exclusively. Multi-platform users develop a richer and more calibrated mental model of digital payment quality through repeated cross-platform experience, making their satisfaction judgments more integrative and less attribute-specific than those of single-platform users. This behavioral characteristic of the study's respondent population may further amplify the holistic processing tendency proposed as a conceptual explanation for the R^2 value and the non-significance of individual path coefficients.

Ease of Use as the Dominant Structural Path

Ease of use (KMD/X_1) produced the highest structural path coefficient in the model ($\beta = 0.375$), establishing it as the relatively most influential predictor of Generation Z university student satisfaction in the use of QRIS and e-wallet services in Bandung City. This finding is theoretically anchored in Davis's (1989) foundational proposition within the Technology Acceptance Model (TAM) that Perceived Ease of Use defined as the degree to which an individual believes that using a particular technology can be accomplished free of effort exerts a direct and positive influence on both usage intention and satisfaction. The consistency of this finding across more than three decades of empirical TAM research, from desktop software to mobile banking to QR payment systems, reflects the enduring psychological primacy of effort minimization as a driver of technology acceptance.

The present finding extends the TAM literature in two important directions. First, it confirms the dominance of ease of use within the specifically Indonesian dual-instrument payment context an ecosystem where users routinely navigate between QRIS scanning interfaces and e-wallet application menus within the same transactional moment. In this environment, interface inconsistencies, redundant authentication steps, or unintuitive navigational pathways impose a cognitive switching cost that amplifies dissatisfaction beyond what single-platform studies would predict. The relatively higher path coefficient for ease of use in the present study compared to security and speed may partly reflect this multi-interface cognitive burden unique to dual-platform payment users.

Second, the dominance of ease of use among Generation Z respondents is not simply a replication of established findings it represents those findings operating at a higher threshold of expectation. Alalwan et al. (2020), in their examination of mobile payment adoption in Jordan, confirmed PEOU as the primary predictor of continuance intention, but their population included users across multiple age cohorts with varying digital literacy baselines. Nguyen et al. (2022), studying QR payment satisfaction in Vietnam, found that system convenience and interface quality exerted significant direct effects on customer satisfaction. What distinguishes the present findings is the demographic specificity of the sample: Generation Z university students who have grown up interacting with best-in-class digital interfaces across social media, streaming, e-commerce, and gaming platforms. For these users, the reference point against which

QRIS and e-wallet interfaces are evaluated is not 'other payment methods' but the totality of their digital experience a far more demanding benchmark.

Outer model loading factors for the ease of use construct ranged from 0.769 (X1_6) to 0.854 (X1_4), all comfortably exceeding the 0.700 threshold, and Cronbach's Alpha reached 0.906 figures that collectively attest to the high internal consistency and measurement precision of this construct. The uniformity of high loadings across all six indicators suggests that Generation Z respondents evaluate ease of use as a genuinely unidimensional construct: they do not differentiate sharply between 'the app was easy to learn' and 'the navigation was intuitive' these facets cohere into a single experienced quality of effortlessness. This psychometric coherence strengthens the case for ease of use as a robust predictor within Generation Z-focused digital payment research.

The practical implication is direct and actionable. Satisfaction among Generation Z digital payment users rises and falls most sensitively with changes in interface design quality. Payment providers that invest in reducing the number of taps required to complete a transaction, clarifying the visual hierarchy of payment confirmation screens, and ensuring consistency of interaction patterns across system updates will disproportionately benefit Generation Z satisfaction relative to equivalent investments in other quality dimensions. Given the competitive density of the Indonesian e-wallet market where GoPay, OVO, DANA, and ShopeePay compete for the same student user base ease of use may function as the primary differentiating factor in sustained user preference.

System Security as a Foundational Trust Construct

System security (KMN/X₃) contributed the second-highest path coefficient ($\beta = 0.317$) in the structural model. This finding aligns with Singh et al. (2023), who empirically demonstrated that perceived security is a significant predictor of fintech user satisfaction among young consumers, and with Aji et al. (2020), who identified security as a dominant determinant of both e-wallet user satisfaction and loyalty in the Indonesian market specifically. Oliveira et al. (2021) further established that trust substantially constituted by security perceptions mediates the relationship between ease of use and mobile payment adoption intention.

A noteworthy observation in the outer model evaluation is that two indicators of the System Security construct X3_2 (loading = 0.616) and X3_4 (loading = 0.688) returned loading factors below the conventional threshold of 0.700. This pattern suggests that certain facets of security protection, likely those related to the complexity of OTP verification procedures or the transparency of fund protection mechanisms, are perceived less consistently by respondents than the core security features such as biometric authentication and real-time transaction monitoring. Rather than invalidating the security construct, this finding reveals a nuanced differentiation within Generation Z students' security perceptions: they strongly and consistently value biometric and automated protections, while exhibiting more varied evaluations of procedural verification mechanisms that require active user engagement. This distinction carries practical implications for payment application interface design, as discussed in the conclusion section.

This study offers a contextually specific contribution to the security literature by examining security perceptions within Indonesia's unique regulatory environment, where QRIS security standards are mandated uniformly by Bank Indonesia, yet the security implementation and communication practices vary significantly across individual e-wallet providers (GoPay, OVO, DANA, ShopeePay). The variance in security indicator loading factors may partly reflect this inter-platform heterogeneity, a dimension that has not been isolated in prior international studies.

Transaction Speed as a Hygiene Factor in a Mature Digital Ecosystem

Transaction speed (KCP/X₂) exhibited the lowest path coefficient among the three predictors ($\beta = 0.285$), a finding that stands in notable contrast to the conclusions of Raza et al. (2022) and Tavares et al. (2023), who identified speed as the most influential determinant of digital payment satisfaction in their respective contexts. This divergence is not indicative of a contradictory finding but rather represents a context-dependent evolution in the role of transaction speed as a satisfaction driver.

The present study proposes that in the context of Bandung City an urban center with a well-developed digital payment infrastructure where sub-second QRIS transactions and near-instantaneous e-wallet confirmations have become the experiential norm for university students transaction speed has undergone a functional transformation from a motivator to a hygiene factor, adapting Herzberg's (1959) two-factor theory to the digital service quality domain. As a hygiene factor, speed is no longer capable of generating incremental satisfaction when it performs well, because it already meets users' baseline expectations as a matter of course; however, its deterioration through network failures, application loading delays, or QR scanning errors would immediately and substantially degrade satisfaction. This recharacterization of transaction speed constitutes a novel theoretical contribution of this study and suggests that the relationship between speed and satisfaction is not linear and universal but rather stage-dependent relative to the maturity of the digital payment ecosystem in which users operate.

This interpretation is further supported by the finding that 59.5% of respondents use both QRIS and e-wallet concurrently. Users with complementary multi-platform experience across consistently fast-performing systems have effectively recalibrated their speed expectations upward to the point where speed variation within the acceptable performance range no longer generates meaningfully differentiated satisfaction responses.

Theoretical and Practical Implications

Theoretically, this study makes three contributions to the existing literature. First, it extends the Technology Acceptance Model (Davis, 1989) into the Indonesian national digital payment infrastructure context, providing empirical validation of TAM constructs within a dual-instrument QRIS and e-wallet ecosystem serving Generation Z university students. Second, it introduces the construct of holistic transaction behavior as a theoretical explanation for the observed pattern of high collective predictive power coexisting with non-significant individual partial effects a pattern that has not been theoretically proposed or empirically documented in prior digital payment satisfaction literature. Third, it provides context-dependent evidence that transaction speed transitions from a motivator to a hygiene factor as digital payment ecosystems mature, suggesting that existing theoretical frameworks require dynamic, ecosystem-stage-sensitive calibration.

Practically, the findings yield actionable recommendations for three stakeholder groups. For digital payment service providers, the dominant path coefficient of ease of use ($\beta = 0.375$) signals that user interface optimization including reduction of transactional steps, enhancement of visual clarity, and elimination of navigational friction represents the highest-return investment area for improving Generation Z satisfaction. The variable loading factor performance of System Security indicators further suggests that providers should invest in transparent security communication embedded within the application interface rather than relying on users to infer protection from technical features alone. For regulators including Bank Indonesia and the Financial Services

Authority (OJK), the R^2 of 0.918 confirms that the QRIS ecosystem as designed has achieved a high degree of alignment with Generation Z user satisfaction requirements, validating the strategic direction of Indonesia's national digital payment standardization policy. For MSMEs in Bandung City, the finding that 59.5% of student users employ QRIS and e-wallet in complementary rather than substitutive ways underscores the importance of multi-platform payment acceptance to maximize customer satisfaction and minimize transaction abandonment.

CONCLUSIONS

This study examined whether ease of use, transaction speed, and system security individually and collectively influence the satisfaction of Generation Z university students using QRIS and e-wallet payment services in Bandung City, Indonesia. Individually, none of the three constructs achieved statistical significance at $\alpha = 5\%$: H1 (Ease of Use, $T = 1.847$, $p = 0.065$), H2 (Transaction Speed, $T = 1.706$, $p = 0.088$), and H3 (System Security, $T = 1.765$, $p = 0.078$) were not supported. Collectively, however, the three constructs produced $R^2 = 0.918$, supported by SRMR = 0.061, $Q^2 = 0.602$, and VIF values below 5.000, confirming H4 and establishing that the model possesses both strong explanatory power and predictive relevance. This pattern individually non-significant paths coexisting with an exceptionally high collective R^2 is interpreted through the conceptual proposition of holistic transaction behavior, wherein Generation Z users evaluate digital payment quality as a unified experiential whole rather than as a sequence of separable attributes.

This study contributes to the digital payment satisfaction literature by proposing holistic transaction behavior as a conceptual explanation for the co-occurrence of non-significant individual path coefficients and exceptional collective predictive power in Generation Z samples. This proposition challenges the assumption of predictor independence underlying conventional multi-attribute evaluation models and situates Generation Z satisfaction formation within dual-process cognitive and gestalt psychological principles. It is emphasized that holistic transaction behavior is offered as a theoretical proposition, not an empirically tested construct, and future research is encouraged to operationalize and validate it through dedicated scale development and experimental designs.

For digital payment service providers and platform developers, the findings suggest that satisfaction among Generation Z users is contingent on the simultaneous performance of all three dimensions ease, speed, and security rather than the optimization of any single feature. The lower loading factors observed on active security indicators, particularly OTP verification, suggest a gap in security communication design rather than in technical security performance. Closing this perceptual gap requires investment in interface design and in-app security education. For policymakers, the $R^2 = 0.918$ serves as a meaningful validation signal that Indonesia's QRIS standardization framework, implemented by Bank Indonesia since 2020, is producing the intended user experience outcomes at the ecosystem level.

This study is subject to several limitations. The use of purposive non-probability sampling constrains generalizability beyond the Generation Z university student population of Bandung City. The cross-sectional design captures satisfaction at a single point in time, leaving the temporal dynamics of holistic evaluation behavior unexamined. Future research is encouraged to empirically test the holistic transaction behavior construct through experimental manipulation of individual service quality dimensions, and to conduct longitudinal studies across cities at varying stages of digital payment

ecosystem maturity. The inclusion of additional constructs such as perceived usefulness, social influence, brand trust, and digital financial literacy would further clarify the 8.2% of satisfaction variance currently unexplained by the present model.

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REFERENCES

- Aji, H. M., Berakon, I., & Riza, A. F. (2020). The effects of subjective norm and knowledge about money on intention to use e-wallet: Evidence from Indonesia. *Journal of Asian Finance, Economics and Business*, 7(9), 473–482. <https://doi.org/10.13106/jafeb.2020.vol7.no9.473>
- Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2020). Mobile payment adoption: Integrating marketing and technology acceptance perspectives. *International Journal of Information Management*, 50, 1–12. <https://doi.org/10.1016/j.ijinfomgt.2019.10.009>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Djafarova, E., & Bowes, T. (2021). Instagram made me buy it: Generation Z impulse purchases in fashion industry. *Journal of Retailing and Consumer Services*, 59. <https://doi.org/10.1016/j.jretconser.2020.102417>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
- Herzberg, F. (1959). *The Motivation to Work* (2nd ed.). John Wiley & Sons.
- Indonesia, B. (2024). *Laporan tahunan sistem pembayaran dan pengelolaan uang rupiah 2023*. Bank Indonesia. <https://www.bi.go.id>
- Kuangan, O. J. (2024). *Statistik sistem pembayaran dan infrastruktur pasar keuangan 2023*. OJK. <https://www.ojk.go.id>
- Kotler, P., Keller, K. L., & Chernev, A. (2021). *Marketing Management* (16th ed.). Pearson Education.
- Nguyen, O. T., Nguyen, L. P., & Nguyen, H. T. (2022). Factors affecting customer satisfaction in QR-based payment systems. *Telematics and Informatics*, 70. <https://doi.org/10.1016/j.tele.2022.101835>
- Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2021). Mobile payment adoption: Integrating trust and TAM models. *Computers in Human Behavior*, 114. <https://doi.org/10.1016/j.chb.2020.106566>
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing*, 63, 33–44. <https://doi.org/10.1177/00222429990634S105>
- Priporas, C. V., Stylos, N., & Fotiadis, A. K. (2020). Generation Z consumer behavior and technology adoption. *Tourism Management Perspectives*, 34. <https://doi.org/10.1016/j.tmp.2020.100660>
- Raza, S. A., Umer, A., & Shah, N. (2022). Impact of service quality on customer satisfaction in digital payment systems. *Journal of Retailing and Consumer Services*, 65. <https://doi.org/10.1016/j.jretconser.2021.102865>
- Ringle, C. M., Sarstedt, M., Knecht, R., & Hennig-Thurau, T. (2023). En route to the next generation of PLS-SEM methodology: Structural model quality measures. *European Journal of Marketing*, 57(6), 1700–1738. <https://doi.org/10.1108/EJM-06-2021-0449>
- Singh, N., Sinha, N., & Liébana-Cabanillas, F. (2023). Fintech adoption and trust-based behavioral models among young consumers. *Technological Forecasting and Social Change*, 186. <https://doi.org/10.1016/j.techfore.2022.122117>
- Statista. (2024). *Digital Payments — Worldwide*. Statista Market Insights. <https://www.statista.com/outlook/dmo/fintech/digital-payments/worldwide>
- Tavares, A. I., Ferreira, F. A. F., Meidutė-Kavaliauskienė, I., & Banaitis, A. (2023). Digital payment adoption among young consumers: An empirical analysis. *Electronic Commerce Research and Applications*, 58. <https://doi.org/10.1016/j.elerap.2023.101260>