ANALYSIS OF THE INTENTION TO USE THE QRIS DIGITAL PAYMENT SYSTEM AMONG MSMES IN SERANG CITY BANTEN

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Abstract:

Background: Driven by digital transformation, Quick Response Indonesian Standard (QRIS) was launched as a unified payment standard to enhance MSME efficiency and competitiveness. However, despite its national growth, QRIS adoption in Serang City Banten remains limited due to barriers such as low digital literacy, transaction costs, internet dependency, and a persistent preference for the perceived safety of cash.
Purpose: This study aims to examine the factors influencing the intention of MSMEs to adopt QRIS in Serang City, Banten, by integrating the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), with adding variable Perceived Risk (PR) as a significant determinant. This study aims to analyze the demographic and business characteristics of 105 MSME owners who have not yet adopted QRIS as a payment method.
Design/methodology/approach: This study applies a quantitative survey approach using primary data collected through online questionnaires and secondary data from literature sources. Descriptive statistics method are used to profile respondents, while Structural Equation Modeling with Partial Least Squares (SEM-PLS) is employed to test the integration Technology Acceptance Model and Theory of Planned Behavior (C-TAM-TPB) model and research hypotheses.
Findings/Result: The results indicate that MSMEs in Serang City banten that have not adopted QRIS generally face limited digital and financial literacy, insufficient education, and a preference for cash-based transactions. Several factors hinder adoption including perceived high transaction fees, small-scale business operations with low daily turnover, trust and security concerns, and inadequate infrastructure such as limited smartphone and internet access. This research also provides empirical support for the application of the C-TAM-TPB model in explaining digital payment adoption behavior among micro and small enterprises.
Conclusion: Characteristics of MSMEs in Serang City that are not yet actively using QRIS The majority of business owners are women (63.8%). Age range: 30-39 years (42.1%). Type of business: culinary, F&B (55.1%). Business scale: micro-enterprises (UMI). Length of business: >3 years (50.7%). Total turnover: <Rp300 million (68.2%). Factors that may influence intention to use QRIS is Subjective norm (SN) variable Has the largest significant influence on intention to use QRIS (BIU). Attitude Toward Using (ATU) variable Has a significant but negative influence on intention to use (BIU). Recommendations to increase intention to use QRIS among MSMEs in Serang City Utilization and Strengthening of Social Influence (testimonials and endorsements). An in-depth evaluation process of QRIS features and user perceptions to address potential anomalies.
Originality/value (State of the art): This research not only provides empirical support for the model but also offers practical insights for policymakers to design targeted interventions that enhance financial inclusion through QRIS.

Keywords: digital payment, financial inclusion, MSMEs, QRIS, Serang City

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INTRODUCTION

Digital transformation in Indonesia has been advancing rapidly in the last decade, marking one of the most significant shifts from cash-based to cashless transactions. This transformation forms part of a broader national agenda aimed at improving efficiency, transparency, and inclusivity within economic and financial systems. The Government of Indonesia and Bank Indonesia have consistently emphasized digital payments as a strategic instrument for modernizing the national financial infrastructure and reducing transaction costs across sectors. Within this framework, the introduction of the Quick Response Indonesian Standard (QRIS) represents a crucial milestone toward achieving an integrated and standardized payment system. QRIS provides a single, interoperable QR code that enables consumers to make seamless transactions across multiple financial institutions and payment platforms, thus fostering interoperability and convenience in the digital economy.

Banten Province, with a relatively large number of MSMEs, has significant potential to utilize QRIS. MSMEs in Serang City are dominated by micro and small businesses, which generally still operate traditionally. The majority of these businesses rely on cash transactions and most lack structured financial records. The prominent sectors are culinary and regional souvenirs. The implementation of QRIS among MSMEs in Serang City is significantly hindered by a combination of low digital literacy, a generational gap in technology adoption, and limited infrastructural access. Many entrepreneurs remain hesitant due to a lack of procedural knowledge and a deep-seated preference for cash, which is perceived as safer and more tangible. Furthermore, concerns regarding systemic fraud and inadequate information on consumer protection diminish the perceived urgency for small-scale businesses to transition from conventional payment methods.

Based on data released by the Indonesian Payment Systems Association (ASPI) at the end of 2024, the number of QRIS transactions is grouped based on historical trends, according to regions estimated to be among the top QRIS users. QRIS usage performance in 10 Indonesian provinces, includes West Java, DKI Jakarta, East Java, Central Java, Banten, North Sumatra, South Sulawesi, Bali, South Sumatra, and Yogyakarta, as presented in Figure 1. Provinces Using QRIS Merchants in Indonesia. Serang City, the capital of Banten Province, is currently showing growth in QRIS transaction penetration among MSMEs. However, this growth is still considered less aggressive than other major cities. As seen in Figure 2, the growth trend of QRIS merchants in Serang City only increased by 9%, from 196,500 in 2023 to 213,600 in 2024. This growth indicates growing awareness of the benefits of QRIS in simplifying transactions, but further efforts are needed to improve business efficiency in Serang City.

Several empirical studies have identified multiple barriers influencing MSMEs' decisions to adopt QRIS and other digital payment platforms. The most common obstacles include limited digital literacy, low awareness of QRIS benefits, perceptions of risk in electronic transactions, and concerns related to transaction fees and data usage (Judijanto & Husnayetti, 2024; Pratiwi, 2025). In addition, many MSMEs in Serang City prioritize operational needs such as purchasing raw materials or paying employees over investing in new technological tools. These behavioral tendencies are compounded by infrastructural constraints, including limited smartphone ownership and unstable internet connections. Cultural attitudes also contribute significantly cash is often perceived as safer and more tangible, reinforcing resistance toward digital payment adoption.

The persistence of cash-based transaction preferences among MSMEs in Banten Province indicates that digital payment adoption is influenced not only by technological access but also by psychological, social, and perceptual dimensions. A deeper understanding of these factors is crucial to addressing the barriers to QRIS adoption effectively. Therefore, it is necessary to examine MSMEs' behavioral aspects, including perceived ease of use, perceived usefulness, subjective norms, and perceived behavioral control, which jointly shape their attitudes toward digital payment technologies. These constructs provide a comprehensive behavioral framework for analyzing MSMEs' readiness to adopt digital innovations within developing regional economies such as Serang City.

Given these challenges and opportunities, this study focuses on analyzing the determinants of QRIS adoption among MSMEs in Serang City, Banten Province. The research explores how perceived ease of use and perceived usefulness influence MSMEs' attitudes toward QRIS utilization and how social norms,

behavioral control, and perceived risk collectively shape their intention to adopt the technology. By identifying these determinants, this study aims to provide empirical insights that can guide policymakers, financial institutions, and payment service providers in designing targeted interventions. Such efforts are expected to accelerate the diffusion of QRIS adoption, promote financial inclusion, and strengthen Indonesia's transition toward a more inclusive digital economy.

Prior studies and national reports indicate that QRIS adoption has grown substantially, supported by 119 payment service providers comprising 72 banks, 43 fintechs, and 4 switching institutions. QRIS has demonstrated significant benefits, including reducing reliance on cash, mitigating counterfeit risks, improving transaction efficiency, and broadening financial access. The Indonesian Payment System Association (ASPI, 2024) identified MSMEs as the largest user group of QRIS, underscoring its importance as a key instrument for financial inclusion and digital economic development. Despite these achievements, adoption levels remain uneven across Indonesia's regions, reflecting disparities in infrastructure, literacy, and access to technology.

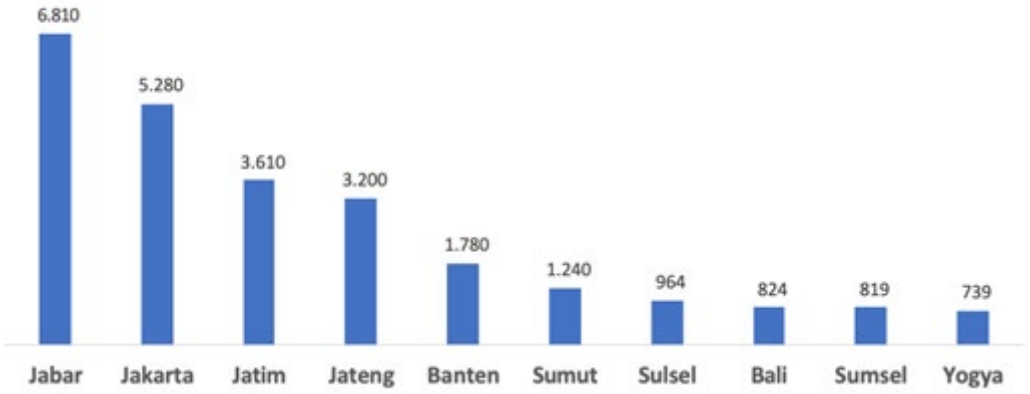


Figure 1. Provinces using QRIS merchants (in thousands) ASPI, 2024

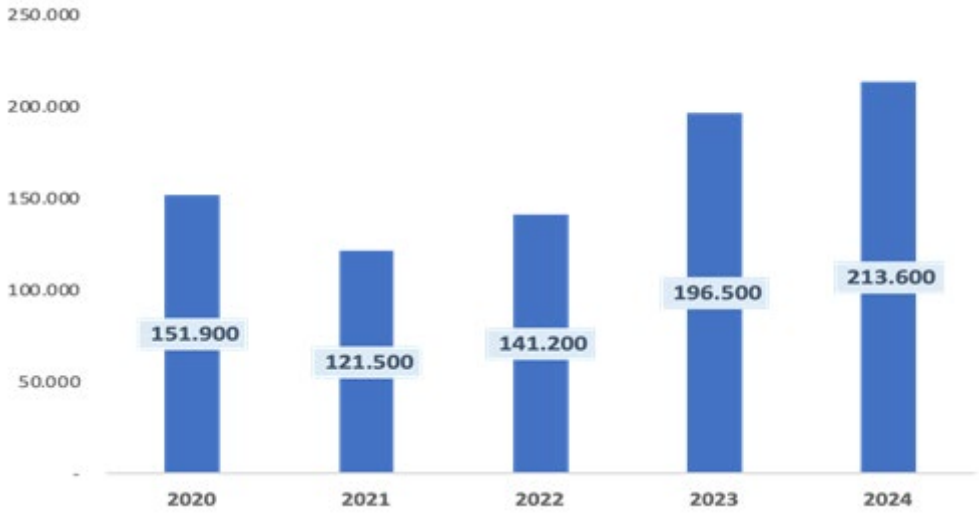


Figure 2. QRIS merchant growth trend in Serang city (ASPI, 2024)

While major provinces such as West Java, Jakarta, and East Java show strong adoption rates, the level of QRIS usage in Banten Province, especially in Serang City, remains significantly lower compared to other regions (ASPI, 2024). This discrepancy highlights the need to better understand the behavioral and contextual factors influencing MSME adoption decisions. Moreover, MSMEs in Serang City continue to face persistent barriers, including limited digital and financial literacy, lack of awareness regarding the benefits of QRIS, and distrust toward financial institutions. Infrastructural challenges, such as insufficient smartphone ownership and unstable internet connectivity, further compound these obstacles, hindering the widespread diffusion of QRIS technology.

Previous studies have emphasized that perceived risk and low digital literacy are among the most critical obstacles preventing MSMEs from adopting digital payment technologies (Bank Indonesia, 2023). Moreover, consumer preferences for cash-based transactions remain deeply rooted, reinforcing MSMEs' reluctance to transition toward digital payments. As a result, the number of QRIS-registered merchants in Serang City increased by only 9% between 2023 and 2024 an indication that, despite its potential, QRIS utilization remains suboptimal. This persistent gap underscores the urgency of examining QRIS adoption not only from a technological perspective but also through behavioral and social dimensions that reflect local realities.

To address these issues, this study employs an integrated analytical framework combining the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), with the addition of Perceived Risk (PR) as an extension to capture MSMEs' concerns regarding digital payment usage. This comprehensive model allows for the examination of how perceived ease of use, perceived usefulness, subjective norms, and perceived behavioral control influence MSMEs' attitudes and behavioral intentions toward QRIS adoption. The inclusion of perceived risk provides further insight into the potential moderating or mediating effects that shape MSMEs' decision-making processes when adopting new technologies.

A quantitative research design is applied, utilizing survey data collected from MSME operators in Serang City. The data are analyzed using Structural Equation Modeling (SEM), a statistical technique suitable for testing complex causal relationships among latent constructs. This methodological approach ensures a robust analysis of the interrelationships among the variables while enabling the identification of both direct and indirect effects. The findings from this model are expected to provide evidence-based recommendations that contribute to policy formulation and practical strategies for promoting QRIS adoption among MSMEs in the region.

The primary objective of this research is to examine the factors influencing MSMEs' behavioral intention to adopt QRIS in Serang City, Banten Province. Specifically, the study integrates the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) by incorporating Perceived Risk (PR) as a critical determinant of adoption intention. The research aims to identify and evaluate key constructs such as Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Subjective Norms (SN), Attitude Toward Use (ATU), Behavioral Intention to Use (BIU), and Perceived Behavioral Control (PBC) in the context of QRIS adoption (Taylor & Todd, 1995). Furthermore, the study seeks to analyze how perceived risks influence MSMEs' decision-making processes, particularly in balancing potential concerns against the recognized benefits and convenience of QRIS technology (Pavlou, 2003). By integrating these theoretical constructs, the study provides a multidimensional understanding of MSME adoption behavior in digital payment systems. Ultimately, the findings are expected to contribute to the formulation of policy recommendations and the development of practical strategies aimed at enhancing QRIS adoption among MSMEs in Serang City. This, in turn, will foster local financial inclusion and accelerate Indonesia's broader transition toward a resilient and sustainable digital economy.

METHODS

The data used consists of primary data collected directly through questionnaires distributed through social media platforms. In addition to primary data, this study also utilizes secondary data from various sources, such as previous research, related literature, and online information sources, which serve as references to enrich the analysis.

Data collection will be conducted using an online survey method via Google Forms with respondents. The online questionnaire serves as the primary instrument for collecting data from MSMEs in Serang City, Banten Province, who are not yet actively conducting transactions using QRIS. This questionnaire is specifically designed to measure variables in the combined TAM and TPB model, as well as other factors relevant to QRIS acceptance among MSMEs. By using a purposive sampling approach and an adequate sample size, this study is expected to produce valid and reliable data to test the relationships and direct influences between variables. To measure user perceptions of QRIS, this study adopts a combined TAM and TPB model based on a Likert scale with a value range of 1 to 5. This allows for the determination of the influence of perceived ease of use and perceived usefulness of QRIS on user intention to continue using this payment service. The scale used is the Likert Scale with five levels, namely (1) Strongly Disagree, (2) Disagree, (3) Quite Agree, (4) Agree and (5) Strongly Agree. Writing answers based on the Likert Scale is done to process data using Structural Equation Modeling (SEM) Analysis.

In this study, seven variables are employed as research indicators, namely Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), Intention to Use (ITU), Subjective Norm (SN), Perceived Behavioral Control (PBC), and Perceived Risk (PR). Among these, PEOU and PU are utilized as independent variables, representing the core constructs of the Technology Acceptance Model (TAM) that influence QRIS adoption (Fred D. Davis, 1989). Furthermore, the model is extended by incorporating SN and PR as additional independent variables, which are theorized to affect the intention to adopt QRIS (Pavlou P.A, 2003). The dependent variable of this study is ITU (Fred D. Davis, 1989), while PBC functions as a moderating variabl e that influences the relationship between the independent and dependent variables, consistent with evidence from the Theory of Planned Behavior (La Barbera & Ajzen, 2020).

This research was conducted using an online survey method through Google Forms, with the questionnaire serving as the primary research instrument. The questionnaire was specifically designed to measure variables derived from the combined Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB), as well as other relevant factors related to QRIS adoption among MSMEs.

The sampling technique employed in this study was purposive sampling, a non-probability approach in which participants are deliberately selected based on specific characteristics relevant to the research objectives (Scribbr, 2023). Following the commonly cited rule of thumb suggesting five to ten respondents per indicator, with some scholars recommending even larger ratios to strengthen validity, the required sample size in this study ranged from a minimum of 95 to a maximum of 190 respondents (Memon et al., 2020). In total, data were successfully collected from 105 respondents.

After data collection, the data were processed and analyzed using Smart PLS 4.0 software in two stages. First, a descriptive analysis was conducted to provide an overview of respondent characteristics, such as demographics and usage behavior (Hair et al., 2022). This analysis will help understand the profile of QRIS users sampled in the study. Second, a Structural Equation Modeling (SEM) analysis based on Partial Least Squares (PLS) to test the C-TAM-TPB model and the research hypotheses (Hair et al. 2022). With SEM-PLS, the causal relationships between latent variables in the C-TAM-TPB model, such as perceived ease of use, perceived usefulness, and intention to use QRIS, can be tested simultaneously and can provide recommendations for the future development of QRIS digital payment services. The SEM-PLS models used are the Outer Model and the Inner Model.

This study adopts the C-TAM-TPB integration model, which predicts that an individual's perception of technology acceptance directly influences their attitude toward the technology (Taylor and Todd, 1995). A positive attitude, in turn, encourages individuals to develop an intention to use the technology (Davis, 1989). In this research, The C-TAM-TPB integration model in this study was also expanded by adding an additional variable, namely Perceived Risk (Pavlou 2003), so that it is expected to provide a more comprehensive picture of the factors that can influence the intention to use QRIS by referring to user perceptions of the possibility of risk or loss due to the use of QRIS technology. The research framework integrating TAM, TPB, and perceived risk is presented in Figure 3.

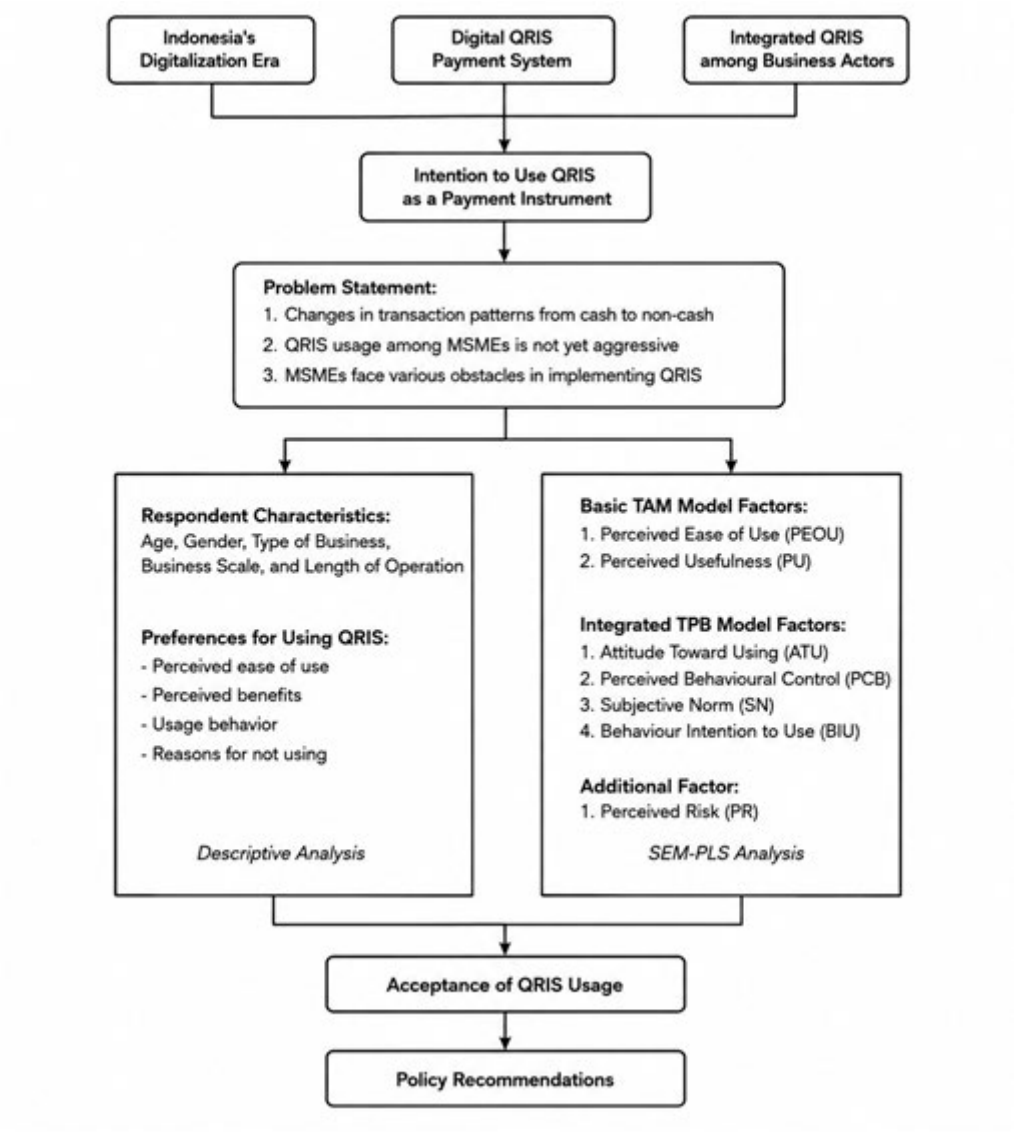


Figure 3. Research framework of the intention to use the QRIS digital payment system among MSMEs in Serang City Banten

RESULTS

This study involved 105 respondents who were owners of micro, small, and medium enterprises (MSMEs) who had not yet actively adopted QRIS as a digital payment method. Respondent characteristics were categorized based on gender, age, educational background, business type, MSME classification, business duration, and annual turnover.

Analysis of respondent characteristics reveals a female - dominated MSME landscape (63.8%), aligning with national trends where women drive micro-enterprises through skill and resilience. The age distribution is led by the 30–39 age group (42.1%), representing a peak of innovation and financial independence, followed by mature entrepreneurs (40-49 years) and an emerging youth segment. Educationally, the majority are high school graduates (55.2%), suggesting a foundational level of digital and financial literacy that necessitates practical, intensive socialization for QRIS adoption.

Sectorally, the culinary industry (FnB) dominates at 55.1%, highlighting its stability as a primary consumer need, followed by service-oriented sectors like laundry and fashion. The study is characterized by a high concentration of micro-enterprises (62.9%) with annual turnovers below Rp300 million (68.2%), reflecting a grassroots economic structure of home-based and informal businesses. Furthermore, over half of these enterprises (50.7%) have operated for more than three years, indicating significant resilience and market stability within the Serang City MSME ecosystem.

Descriptive Analysis

The descriptive analysis in this study was conducted using Microsoft Excel and SmartPLS 4.0. The purpose of the analysis was to evaluate respondents' perceptions measured using a Likert scale, with response options ranging from strongly disagree, disagree, Moderately Agree, agree, to strongly agree. The mean scores for each indicator were then calculated based on respondents' answers. The results of the descriptive analysis for each research variable PEOU, PU, ATU, BIU, SN, PBC, and PR are presented in Table 1.

The 19 indicators used in the study yielded the following results: a. Strongly Agree (STS) Category The behavioral control (PBC) variable consists of two indicators with the highest average value of 4.8, or strongly agree. This indicates that respondents are very confident and strongly agree that they have the necessary abilities and opportunities to implement behaviors in using a technology. b. Agree (S) Category There are four variables consisting of eleven indicators: perceived usefulness (PU), perceived ease of use (PEOU), subjective norm (SN), and intention to use (BIU), which have average values of 3.5, 3.8, 3.9, and 4.0, or agree. These values are considered high and approach the threshold of strongly agree. This indicates that respondents agree that the four variables mentioned above are factors that are considered and well-received by them. c. Moderately Agree (CS) Category Three variables with eight indicators fall into the moderately agree category: subjective norms (SN), attitudes (ATU), and risk perception (PR), with average scores of 2.9, 3.4, and 3.5, respectively. This indicates that respondents have a neutral, tending towards positive, or moderate agreement with these three variables, which is neither fully accepted nor strongly rejected.

Structural Equation Modeling–Partial Least Squares (SEM-PLS) Analysis

In this study, the analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4.0 software. The evaluation process comprised two stages: the measurement model (outer model) and the structural model (inner model). Subsequently, hypothesis testing was performed using the bootstrapping technique to assess the statistical significance of the model parameters, such as regression coefficients, thereby producing confidence intervals for the parameters under examination (Hair et al., 2022). The estimated SEM-PLS model is presented in Figure 4.

Evaluation of Measurement Models (Outer Models)

Validity was assessed based on two main criteria, namely the loading factor and the average variance extracted (AVE). Referring to the criteria proposed by (Chin & Dibbern, 2010), an indicator is considered valid if it has a loading factor greater than 0.60 and an AVE value exceeding 0.50. The loading factor reflects the strength of the relationship between an indicator and its construct, where a higher loading value indicates a greater contribution of the indicator in explaining the latent construct. Meanwhile, AVE represents the proportion of variance in the indicators that can be explained by the latent construct. The assessment results of both loading factors and AVE for each construct indicate that all constructs are valid, with AVE values greater than 0.50. This confirms that, in terms of both loading factors and AVE, all constructs have met the required convergent validity.

Table 1. Descriptive Statistics of Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), Subjective Norm (SN), Perceived Behavioral Control (PBC), and Perceived Risk (PR)

Variable	Mean	Remark
Perceived Ease of Use	3.8	Agree
Perceived Usefulness	3.9	Agree
Attitude Toward Using	3.4	Moderately Agree
Behavioral Intention to Use	4.0	Agree
Subjective Norm	3.5	Moderately Agree
Perceived Behavioral Control	4.8	Strongly Agree
Perceived Risk	2.9	Moderately Agree

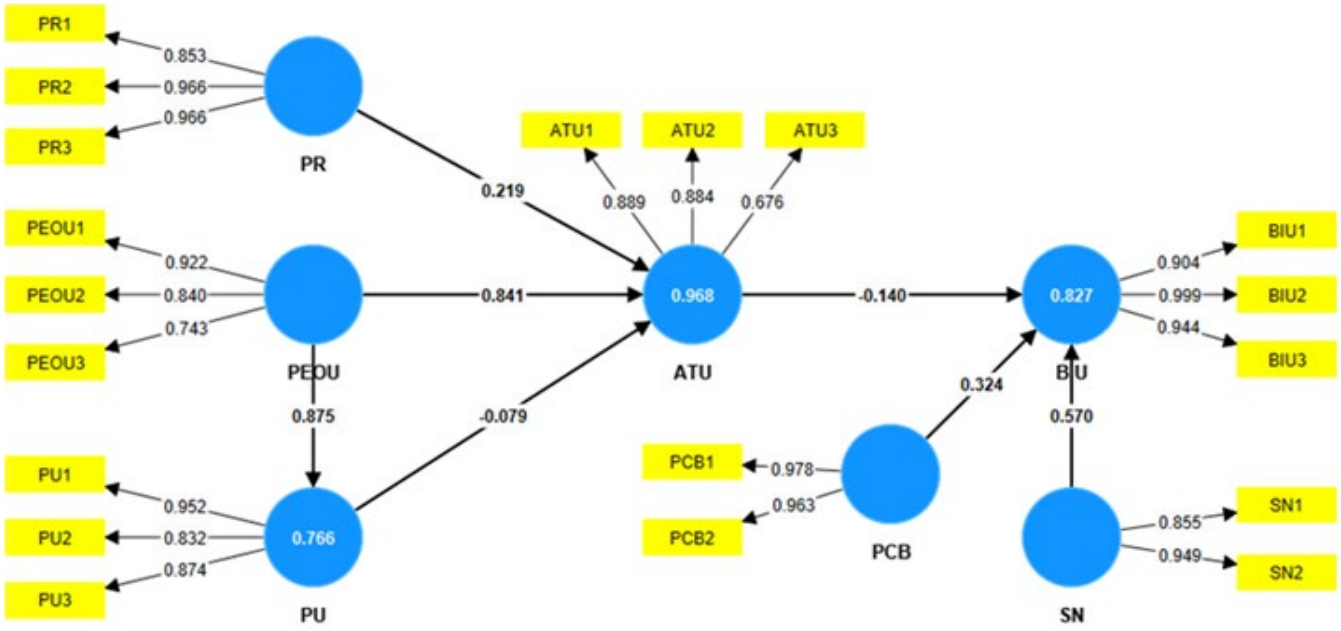


Figure 4. Structural equation modeling–partial least squares (SEM-PLS) specification for MSME's intention to use the QRIS digital payment system in Serang City, Banten

Discriminant validity assesses the extent to which a construct is empirically distinct from others, meaning each construct should have unique indicators. It was evaluated using cross-loading analysis by comparing an indicator's loading on its own construct with its loadings on other constructs. In this study, most indicators showed cross-loading values above 0.70, such as ATU1 on ATU (0.889), BIU2 on BIU (0.999), PBC1 and PBC2 (>0.96), PU1–PU3 on PU (>0.83), and SN1–SN2 on SN (>0.85). Although some indicators, such as ATU3 (0.676), fell slightly below 0.70, their values remained above 0.60 and were therefore still acceptable given the overall reliability of the constructs. After testing both convergent and discriminant validity, results confirmed that most indicators met the established criteria. Convergent validity was supported by satisfactory loading factors and AVE values, while discriminant validity was demonstrated by higher loadings on their respective constructs compared to others. Thus, the indicators used in this model can be considered valid, appropriately representing their respective latent constructs.

Evaluation of Structural Models (Inner models)

Model R-Square Assessment (R^2)

The coefficient of determination (R-square) test was conducted to analyze the causal relationships among the constructs that had been previously validated in the outer model assessment. Table 2 shows the proportion of variation or diversity in the endogenous variables that can be explained by the exogenous variables in the model. The strong model criteria for all endogenous constructs indicate that these hypothesized exogenous variables are highly effective and relevant explanatory or predictive factors influencing perceived attitudes, usage intentions, and perceived benefits of QRIS among MSMEs in Serang City: 1) Perceived Attitude (ATU) has an R-square (R^2) value of 0.968, meaning that 96.8% of the variation in MSMEs' perceived attitudes toward QRIS can be jointly explained by all influencing exogenous variables, such as perceived ease of use and/or other variables in the model. The remaining 3.2% is explained by factors outside the research model. 2) Intention to Use (BIU) has an R-square (R^2) value of 0.827, indicating that 82.7% of the variation in QRIS usage intention can be explained by influencing constructs such as perceived attitude and perceived usefulness. 3) Perceived usefulness (PU) has an R-square (R^2) value of 0.766, indicating that 76.6% of the variation in QRIS perceived usefulness can be explained by influencing exogenous constructs. Overall, the endogenous constructs demonstrate high R^2 values, indicating that the structural model developed in this study possesses a strong explanatory power in capturing user behavior.

Table 2. R-square values of endogenous constructs in the SEM-PLS structural model for MSMEs' intention to use the QRIS digital payment system in Serang City, Banten

Endogenous Construct	R-Square	Interpretation
ATU	0.968	Strong Model
BIU	0.827	Strong Model
PU	0.766	Strong Model

Note: Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), perceived usefulness (PU)

Effect Size (f^2)

After testing the significance of the structural paths between constructs, the next evaluation in the inner model is the analysis of effect size (f^2). The f^2 value measures the magnitude of the contribution of an exogenous construct to an endogenous construct individually, assuming that the exogenous construct is excluded from the model. According to Cohen (1988), the interpretation of f^2 values is categorized is $f^2 < 0.02$: very small or negligible effect, $0.02 \leq f^2 < 0.15$: small effect, $0.15 \leq f^2 < 0.35$: medium effect, and $f^2 \geq 0.35$: large effect.

Based on the results presented in Table 3, the conclusions can be drawn:

1. PEOU → PU ($f^2 = 3.265$). This path shows a very large effect, indicating that the perceived ease of use of QRIS plays a dominant role in explaining the perceived usefulness of QRIS among users. The easier QRIS is to use, the greater the perceived benefits for business actors.
2. PEOU → ATU ($f^2 = 1.545$). This path also exhibits a very large effect, suggesting that the ease of using QRIS strongly influences users' positive attitudes toward adopting the technology.
3. SN → BIU ($f^2 = 0.466$). This relationship demonstrates a large effect, meaning that subjective norms such as encouragement from customers or recommendations from others significantly contribute to users' intentions to continue using QRIS.
4. PBC → BIU ($f^2 = 0.148$). This path shows an effect approaching a medium level, indicating that the availability of systems and ease of access in using QRIS relatively contribute to behavioral intention, although not statistically significant in this model.
5. ATU → BIU ($f^2 = 0.106$). This path reflects a small effect, showing that a positive attitude toward using QRIS contributes to the intention to use it, but it is not a dominant factor.
6. PR → ATU ($f^2 = 0.078$). This path has a small effect, suggesting that perceived risks associated with using QRIS such as transaction errors or data security concerns have a limited influence on user attitudes.
7. PU → ATU ($f^2 = 0.034$). This relationship exhibits a small effect, indicating that although QRIS is perceived as useful, such perception alone is not sufficiently strong to substantially shape a more positive user attitude.

Hypothesis Testing

This test was conducted to determine the influence of the relationships between variables in this study by examining the values of the original sample (O), *t*-statistics, and *p*-values, with a 95% confidence level (significance threshold 0.05) and a critical value of $t > 1.96$. Null hypothesis (H_0): There is no significant effect of the independent variables on the dependent variable. Alternative hypothesis (H_1): There is a significant effect of the independent variables on the dependent variable.

Based on the path coefficients tested in Table 4, four of the seven hypotheses were accepted (H1, H2, H3, and H5), while the other three were rejected (H4, H6, and H7). The main factors that positively influenced the research model were perceived ease of use (PEOU) and subjective norm (SN), while perceived behavioral control (PBC), perceived risk (PR), and perceived usefulness (PU) were found to be insignificant on attitudes or intentions to use.

Hypothesis 1 Perceived Ease of Use (PEOU) → Perceived Usefulness (PU)

Results: Positive and significant (Original Sample = 0.875; T-Statistic = 61.242; and P-Value = 0.000). This hypothesis proved significant, indicating that the easier it is for MSMEs in Serang City to use QRIS (Perceived Ease of Use), the higher their belief in the benefits and usefulness of QRIS for their businesses (Perceived Usefulness). This aligns with Davis's (1989) theory, which states that ease of use leads to users perceiving greater value and usefulness.

Hypothesis 2 Perceived Ease of Use (PEOU) → Attitude Toward Use (ATU)

The results showed a positive and significant effect (Original Sample = 0.841; T-Statistic = 7.645; P-Value = 0.000)

Hypothesis 3 Subjective Norm (SN) → Behavioral Intention to Use (BIU)

The results obtained showed a positive and significant effect (Original Sample = 0.570; T-Statistic = 2.892; P-Value = 0.004)

Hypothesis 5 Attitude Toward Use (ATU) → Behavioral Intention to Use (BIU)

The results obtained showed a negative and significant effect (Original Sample = -0.140; T-Statistic = 4.932; P-Value = 0.000). This relationship is significant but has a negative effect. In theory, a positive attitude should increase intention. However, this finding indicates an anomaly in that MSMEs' positive attitudes toward QRIS do not effectively drive their intention to use it. This anomaly indicates the presence of unmeasured inhibiting factors in the model, such as dependence on cash or concerns about transaction costs, which outweigh positive attitudinal evaluations.

Hypothesis 4 Behavioral Control (PBC) → Intention to Use (BIU)

The results obtained show a positive but insignificant effect (Original Sample = 0.324; T-Statistic = 1.610; P-Value = 0.107). This hypothesis is not statistically significant (T-statistic <1.96), meaning that MSMEs' perceptions of their own ability or availability of resources to use QRIS (Perceived Behavioral Control) do not significantly influence their intention to use it.

Hypothesis 6 Perceived Risk (PR) → Attitude Toward Use (ATU)

The results obtained showed a positive and insignificant effect (Original Sample = 0.219; T-Statistic = 1.242; P-Value = 0.214). This relationship was also insignificant. This indicates that MSMEs' concerns about the risks of using QRIS (such as personal data security or system errors) do not significantly influence their attitudes toward the technology. This suggests that MSMEs may become accustomed to or overlook small risks if the perceived benefits (by PEOU and PU) are greater.

Table 3. Effect size (f^2) results of the SEM-PLS structural model for MSMEs' intention to use the QRIS digital payment system in Serang City, Banten

Variable	f-square	Result
PEOU→ PU	3.265	Very Large Effect
PEOU→ ATU	1.545	Very Large Effect
SN→ BIU	0.466	Large Effect
PBC→ BIU	0.148	Small Effect
ATU→ BIU	0.106	Small Effect
PR→ ATU	0.078	Small Effect
PU→ ATU	0.034	Small Effect

Note: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), Subjective Norm (SN), Perceived Behavioral Control (PBC), and Perceived Risk (PR)

Table 4. Hypothesis testing results of the SEM-PLS structural model for MSMEs' intention to use the QRIS digital payment system in Serang City, Banten

	Original sample	t-Statistics	p-Values	Significance
PEOU→ PU	0.875	61.242	0.000	Significant
PEOU→ ATU	0.841	7.645	0.000	Significant
SN→ BIU	0.570	2.892	0.004	Significant
PBC→ BIU	0.324	1.610	0.107	Not Significant
ATU→ BIU	-0.140	4.932	0.004	Significant
PR→ ATU	0.219	1.242	0.214	Not Significant
PU→ ATU	-0.079	0.852	0.394	Not Significant

Note: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), Behavioral Intention to Use (BIU), Subjective Norm (SN), Perceived Behavioral Control (PBC), and Perceived Risk (PR)

Hypothesis 7 Perceived Usefulness (PU) → Attitude Toward Use (ATU)

The results obtained showed a negative and insignificant effect (Original Sample = -0.079; T-Statistic = 0.852; P-Value = 0.394). This relationship was insignificant and had a negative coefficient. This indicates that although MSMEs perceive QRIS as functionally beneficial (Perceived Usefulness), this perception is not yet strong enough to form a positive attitude (Attitude Toward Use). It is possible that MSMEs are still dissatisfied with the user experiences or the actual results obtained, so the perceived benefits have not yet been converted into a strong attitude of acceptance.

Managerial Implications

Based on the empirical findings, this study provides several managerial implications and practical suggestions that can be used as guidelines to increase QRIS adoption, especially among MSMEs in Serang Banten. The managerial implications of this study are presented as strategic recommendations to increase QRIS adoption intentions, specifically by targeting factors proven to have the most significant influence in the research model. The analysis results indicate the need for readjustment of existing programs and policies, as explained in Table 5.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Characteristics of MSMEs in Serang City that are not yet actively using QRIS The majority of business owners are women (63.8%). Age range: 30-39 years (42.1%). Type of business: culinary, F&B (55.1%). Business scale: micro-enterprises (UMI). Length of business: >3 years (50.7%). Total turnover: <Rp300 million (68.2%). Factors that may influence intention to use QRIS is Subjective norm (SN) variable Has the largest significant influence on intention to use QRIS (BIU). Attitude Toward Using (ATU) variable Has a significant but negative influence on intention to use (BIU). Recommendations to increase intention to use QRIS among MSMEs in Serang City Utilization and Strengthening of Social Influence (testimonials and endorsements). An in-depth evaluation process of QRIS features and user perceptions to address potential anomalies.

Table 5. Managerial Implications

Key Findings	Stakeholder	Recommendations/Managerial Implications
Subjective Norms (SN) to Intention to Use (BIU) (Significantly Positive)	Serang City Department of Cooperatives, MSMEs, and Industry	Community Endorsement Strategy: For example, utilizing local MSMEs in Serang City who have successfully used QRIS as official role models to provide testimonials and share sessions.
		Peer-to-Peer (P2P) programs, such as providing funding capital or logistical support for MSME mentors (peers) to train new micro-MSMEs
Attitudes towards using (ATU) to Intention to Use (BIU) (Significantly Negative)	Bank Indonesia	Periodically and in-depth evaluation of the Merchant Fee Policy (Merchant Discount Rate) regarding the perception of transaction costs (Merchant Discount Rate) experienced by MSMEs. Transparently communicate cost incentives for micro-MSMEs.
	Payment Service Providers (PJP)	Simplifying Financial Features, such as developing value-added features that directly address MSMEs' working capital constraints, such as simplified bookkeeping integration or access to microloans, can help convert positive attitudes into intention to act

Recommendations

This study highlighted that although the variables PEOU, PU, ATU, BIU, SN, PBC, and PR are generally satisfactory, the adoption and education regarding the ease of use, benefits, and security of QRIS still require more intensive and continuous efforts through locally based collaborations involving regional banks and community leaders to foster trust among MSMEs. Suggestions for future research include: Expanding the scope of the study on QRIS adoption intentions among MSMEs by adding other potentially more relevant factors. Deepening the unique research findings surrounding the anomaly in the Attitude Toward Using (ATU) variable using the theoretical framework of barriers to QRIS adoption.

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