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# *QRIS Adoption Intention Among Indonesian MSME Consumers: Ease, Usefulness, and Risk*

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## Abstract

Micro, Small, and Medium Enterprises (MSMEs) have an important role in the Indonesian economy through its contribution to the Gross Domestic Product and employment absorption. The progression of digital transformation necessitates that MSMEs adjust by implementing marketing and operational strategies that are increasingly efficient, transparent, and attuned to consumer demands. One of the forms of transformation is the use of Quick Response Code Indonesian Standard (QRIS) as a national digital payment infrastructure that allows transactions to run quickly, safely and integrated. This study aims to analyse the factors influencing QRIS adoption intention among Indonesian MSME consumers who are familiar with QRIS as a digital payment method. The research focuses on perceived ease of use, perceived utility, and perceived risk. The research applied quantitative approach by using non-probability sampling technique involving 200 respondents based on the criteria of QRIS usage or potential usage. Data were collected through a questionnaire based on a 5-point Likert scale and analysed using Partial Least Square Structural Equation Modelling (PLS-SEM) with SmartPLS 3. The results of the research showed that perceived usefulness had the most dominant influence on adoption intention, perceived risk had the second dominant influence and perceived ease of use had no significant influence. The results show that the adoption of QRIS is more influenced by perceived benefits and risk management, rather than technical ease. It is suggested that future research should adopt qualitative or longitudinal approach to provide a more in-depth understanding.

**Kata Kunci:** Adoption Intention, Perceived Ease of Use, Perceived Risk, Perceived Usefulness, QRIS, MSME

## Introduction

Micro, Small, and Medium Enterprises (MSMEs) represent an important sector in Indonesia's economy, contributing significantly to economic activities and employment opportunities. In the context of digital economic transformation, MSMEs are encouraged to adopt digital payment systems to improve transaction efficiency and support broader financial inclusion. One of the major digital payment infrastructures developed in Indonesia is Quick Response Code Indonesian Standard (QRIS), which enables integrated digital transactions through a standardized QR code system (Iskandar et al., 2023; Shinozaki, 2022). The adoption of QRIS has increased substantially since its implementation as a national QR code payment standard. However, the expansion of QRIS infrastructure does not automatically guarantee continuous adoption because consumers evaluate digital payment systems based on perceived benefits, ease of use, security, and trust. Therefore, understanding consumer adoption intention remains important in explaining the sustainability of QRIS usage among MSME transactions (Bank Indonesia, 2025; Muchtar et al., 2024; Ramayanti et al., 2024).

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Given their significant economic and social contributions, strengthening and advancing the MSME sector is essential to fostering inclusive, sustainable, and resilient economic growth (Asia Small and Medium-Sized Enterprise Monitor 2020, 2020; Shinozaki, 2022). In the context of the rapidly evolving digital economy, digital economic transformation has become one of the Indonesian government's key priorities for improving economic efficiency and expanding financial inclusion. The National Non-Cash Movement, initiated by Bank Indonesia in 2014, constitutes a strategic policy initiative designed to encourage the adoption of digital payment systems and broaden public access to financial services (Mulyana et al., 2022; Nurdin et al., 2025). Alongside this initiative, the continued development of financial technology (fintech) has substantially facilitated digital transactions and contributed to the establishment of a more inclusive, transparent, and accountable digital economic ecosystem (Estiana et al., 2025; Nurdin et al., 2025). Despite these developments, the adoption of digital payment systems in Indonesia remains far from reaching its full potential. This is reflected in the finding that 55.80% of electronic money users have been using such services for less than one year, suggesting considerable opportunities for further expansion and sustained adoption (Rezza et al., 2024).

The rapid advancement of digital technology has reshaped consumer behavior and marketing practices, including those adopted by Micro, Small, and Medium Enterprises (MSMEs). One of the key developments supporting this transformation is the Quick Response Code Indonesian Standard (QRIS), introduced by Bank Indonesia as the national standard for QR code-based payment transactions to accelerate digitalization and broaden financial inclusion (Bank Indonesia, 2025). QRIS functions as an integrated one-gate payment system that facilitates digital transactions in a secure, rapid, efficient, and user-friendly manner (Ayuningtyas et al., 2024). By integrating multiple payment service providers, the system enables merchants to accept payments from various digital wallets and banking applications through a single QR code (Natsir et al., 2023; Wahpiyudin et al., 2024). Recent empirical studies have confirmed that QRIS adoption is increasingly associated with transaction efficiency, financial accessibility, and user acceptance in the Indonesian digital payment ecosystem. Muchtar et al. (2024) found that customer perceptions toward QRIS adoption are strongly influenced by technological benefits and user acceptance factors, while Ramayanti et al. (2024) demonstrated that behavioural intention toward QRIS is determined by multiple technological and psychological factors.

These findings indicate that QRIS adoption should not only be viewed from the availability of digital infrastructure but also from users' perceptions regarding the value and reliability of the system. The implementation of QRIS has consequently contributed to substantial changes in both transaction mechanisms and marketing strategies among MSMEs in Indonesia. In operational terms, the technology improves transaction efficiency, decreases dependence on cash payments, and supports real-time financial record-keeping (Alkhowaiter, 2022). The implementation of QRIS has experienced substantial growth since its introduction. Following its mandatory adoption on January 1, 2020, the number of QRIS users increased markedly to 20.6 million, supported by 19.3 million registered merchants, of which nearly 90% were MSMEs (Sholihah & Nurhapsari, 2023). According to Bank Indonesia's 2024 report, the number of QRIS merchants expanded considerably from 3.6 million at the end of 2020 to more than 30 million in 2024 (Syahrin et al., 2025). This rapid expansion has been partly attributed to business actors' confidence in the simplicity and practicality of the QRIS system, particularly its ability to facilitate payments from multiple applications through a single QR code (Syahrin et al., 2025). In addition, the nominal value of QRIS transactions increased by 283% year-on-year in May 2022, suggesting that its adoption has broadened beyond upper-middle social groups and reached a wider segment of the population (Sholihah & Nurhapsari, 2023).

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The COVID-19 pandemic further accelerated this trend by reshaping consumer preferences in Indonesia toward non-cash payment methods. During this period, QRIS adoption gained additional momentum because it offered a fast, simple, and hygienic payment alternative (Muchtar et al., 2024; Syahrin et al., 2025). Physical distancing measures and restrictions on direct physical contact also encouraged consumers to shift toward payment methods perceived as safer and more efficient (Sailawati et al., 2024). Within this context, QRIS has played an important role in supporting post-pandemic national economic recovery while simultaneously advancing financial inclusion within the MSME sector (Sailawati et al., 2024; Sholihah & Nurhapsari, 2023). Taken together, these developments underscore the strategic importance of QRIS as a key digital payment infrastructure for strengthening MSME competitiveness in an increasingly digitalized marketing environment (Ratnawati & Malik, 2024).

While QRIS is rapidly growing, the adoption of QRIS varies and is influenced by various critical factors, such as perceived ease of use, perceived advantages and perceived risk. From the point of view of digital marketing management, these determinants are not just restricted to merely technical issues but are strongly related to customer behaviour and offer useful insights for the development of effective marketing strategies (Lin & Tanaka, 2024). Adoption intention can be defined as the inclination of consumer behaviour to use or try to use new technology continuously in the future (Mahyuni & Setiawan, 2021; Sholihah & Nurhapsari, 2023). Consumer adoption intention in the Indonesian MSME ecosystem is influenced by internal factors from the Technology Acceptance Model such as perceived ease of use and perceived usefulness, and external factors such as social influence from the surrounding environment and government policy support to accelerate the recovery of the national economy (Sailawati et al., 2024; Setiawan & Mahyuni, 2020). Perceived ease of use influences directly on usage intention and indirectly through perceived usefulness (PU), which then affects consumers' intention to utilise the technology (Nurhapsari & Sholihah, 2022).

Recent studies on QRIS adoption among MSMEs also emphasize that perceived usefulness has become an important determinant because users evaluate digital payment systems based on the practical benefits obtained during transactions. Buchdadi et al. (2024) reported that extending the Technology Acceptance Model with additional contextual factors provides a better explanation of QRIS behavioural intention among MSMEs. Similarly, Ramayanti et al. (2024) highlighted that perceived benefits remain a critical factor influencing users' willingness to adopt QRIS. The ease of use elements within the framework of QRIS have been found to be significant drivers of the intention to adopt and can contribute to improvements in MSME financial performance (Wardhani et al., 2023). But ease of use alone is not a reason why consumers are eager to adopt QRIS. In terms of the perceived benefits, some consumers still have the perception that QRIS is predominantly a payment instrument and not as a digital solution that can increase the efficiency, security, and added value of interacting with MSMEs (Sari, 2024). The more consumers feel the benefits, such as better transaction efficiency, faster reconciliation, more accurate transaction recording, and fewer physical contact, the higher the consumer's intention to use QRIS in MSME transactions (Mahyuni & Setiawan, 2021; Silviawati & Rahmi, 2024). Moreover, perceived advantages have been found to affect not only attitude toward QRIS and intention to use (Azqar & Kamal, 2025), but also to be a significant predictor of QRIS adoption intention (Yadi et al., 2023).

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For Indonesian MSME consumers, this means that the stronger their perception that QRIS can make transactions faster, more practical and more efficient, the more eager they are to use the system (Gunawan et al., 2023). The effective adoption of QRIS among MSME consumers depends on how users perceive transaction security, convenience, and functional benefits when considering QRIS as a digital payment alternative. Therefore, this study focuses on consumer perceptions rather than operational perspectives from MSME owners or business operators, while at the same time highlighting the convenience of use and functional benefits of QRIS in daily transactions (Mahyuni & Setiawan, 2021; Naibaho & Siregar, 2025). Social influence, namely suggestions or encouragement from friends, family members, and social influencers (Mahyuni & Setiawan, 2021; Setiawan & Mahyuni, 2020), also affects consumers' adoption intentions. The perceived risks in digital transactions are often related to personal data security, system failure during payment processing, and financial loss such as losing the account balance without a successful transaction (Nurhapsari & Sholihah, 2022; Silaen et al., 2021). Recent evidence suggests that perceived risk remains an important dimension in digital payment adoption because consumers continue to evaluate security, transaction reliability, and protection of financial information before adopting electronic payment systems.

Muchtar et al. (2024) emphasized that customer acceptance of QRIS is influenced by confidence in the payment mechanism, while Naibaho and Siregar (2025) confirmed that perceived risk remains relevant in explaining QRIS usage intention among Indonesian consumers. The impact of perceived risk on QRIS usage intention also varies based on situation (Sudiatmika & Martini, 2022). It's impact might be more significant when risk is considered as a key adoption barrier or where protective characteristics such as trust, convenience of use, and functional benefits are not adequately apparent to users (Jusman & Fauziah, 2024). In contrast, perceived risk may not significantly affect usage intention when perceived ease of use and perceived benefits have a more prominent role in forming adoption decisions (Hidayatulah et al., 2023). Even with practical obstacles like unreliable internet connectivity and transaction costs, intrinsic motivation stemming from positive views of QRIS benefits continues to be a key motivator for broad acceptance in the MSME sector (Mahyuni & Setiawan, 2021). Despite the continued good rise of QRIS adoption, there are still some challenges that hinder its wider acceptability among MSME consumers in Indonesia. Among these issues are the limited access to the Internet, relatively poor digital proficiency of small company operators, and the ongoing assumption that cash transactions are safer and more reliable than digital payment methods (Syahrin et al., 2025; Wahpiyudin et al., 2024).

The Technology Acceptance Model (TAM) provides a relevant framework for explaining digital payment adoption because perceived ease of use and perceived usefulness represent key factors influencing users' behavioural intention. However, previous QRIS studies show inconsistent findings, particularly regarding the influence of perceived risk and the relative importance of TAM variables in different user contexts (Nurhapsari & Sholihah, 2022; Buchdadi et al., 2024; Ramayanti et al., 2024; Syah et al., 2022). Based on TAM, perceived ease of use and perceived usefulness are the main factors of users' attitudes and behavioural intents to use technology (Mahyuni & Setiawan, 2021; Setiawan & Mahyuni, 2020). In addition to the fundamental TAM characteristics, perceived risk is also a significant factor in the adoption of digital payment systems, especially since consumers may still have concerns about personal data protection and the risk of financial losses (Silaen et al., 2021; Tri & Ahmad, 2024). However, research results in Indonesia on the influence of perceived risk on QRIS usage intention are inconsistent.

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Several research have shown a substantial negative correlation, showing that security issues may deter consumers from utilising QRIS (Nurhapsari & Sholihah, 2022; Tri & Ahmad, 2024). In contrast, some studies have shown that perceived risk does not significantly impact usage intention partially, especially if consumers have a high level of trust in the institution providing the service or the perceived benefits of QRIS significantly outweigh the technical risks of the service (Naibaho & Siregar, 2025; Sailawati et al., 2024). These contradictory findings suggest that the intention to adopt QRIS remains variable across empirical circumstances. Against this background, an important study problem is the need for a more comprehensive knowledge of the determinants influencing QRIS adoption intention among Indonesian MSME consumers. The focus is particularly on ease of use, perceived utility and perceived risk. These aspects are considered to have an impact on the consumer's desire to use the Quick Response Code Indonesian Standard (QRIS) in the MSME digital marketing. By investigating these characteristics, this study is expected to potentially add to the wider knowledge of consumer behaviour in digital payment system adoption.

From a practical standpoint, the findings may also offer valuable insights for stakeholders in devising strategies to accelerate financial inclusion and support the digital transformation of Indonesia's MSME sector. Although QRIS has been widely adopted by Indonesian MSMEs, the adoption pattern is still significantly varied. While ease of use can simplify transaction processes and help with financial record-keeping, these benefits may be hindered by practical issues such as inconsistent internet connectivity and low digital proficiency. These circumstances create a disconnect between the possible advantages of QRIS and the actual experiences of consumers. Similarly, although perceived usefulness has always been known to be a critical factor affecting adoption intention, many consumers still consider QRIS as a payment instrument instead of a tool to enhance efficiency, security, and overall digital interaction value. The existing research are still restricted in the perspective of how the digital marketing tactics might support the perceived benefits and present the QRIS as an important part of the more holistic transactional experience.

The complexity of QRIS adoption is also exacerbated by the perceived risk of personal data security, transaction failures, and possible financial losses, all of which can reduce consumers' usage intention. However, the effect of perceived risk might be influenced by the presence of protective variables such as trust, ease of use and clear perceived functional benefits. Existing literature has only limitedly studied ease of use, perceived usefulness and perceived risk simultaneously within an integrated framework of QRIS adoption. Therefore, this study examines the simultaneous effects of perceived ease of use, perceived usefulness, and perceived risk on QRIS adoption intention among Indonesian MSME consumers to provide a more comprehensive understanding of digital payment adoption behaviour (Buchdadi et al., 2024; Ramayanti et al., 2024). This gap reflects the need to adopt a more comprehensive strategy to achieve richer insights into consumer adoption behaviour and to develop robust digital marketing strategies that can reinforce QRIS adoption and boost the competitiveness of MSMEs in the digital economy.

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## Methodology

This research uses a quantitative research strategy and non-probability sampling techniques in the recruitment of respondents (Anton & Siratan, 2026) who fit the criteria as present or potential users of QRIS. The research subjects were Indonesian MSME consumers who were familiar with QRIS and had experience using digital payment systems or intention to use QRIS in future transactions. The respondents were selected based on their knowledge and awareness of QRIS because evaluating perceived ease of use, perceived usefulness, perceived risk, and adoption intention requires sufficient understanding of the QRIS payment mechanism. This study applied purposive sampling as the type of non-probability sampling technique because respondents were selected based on specific criteria relevant to the research objectives. The criteria included Indonesian residents who were familiar with QRIS and had experience or potential intention to use QRIS as a digital payment method in MSME transactions. The purposive sampling approach was considered appropriate because this study aimed to obtain respondents with sufficient knowledge and exposure to the QRIS payment system rather than general population representation. The research objects are perceived ease of use, perceived utility, perceived risk, and adoption intention to QRIS.

This study aims to examine the impact of perceived ease of use, perceived usefulness and perceived risk on QRIS adoption intention of MSME consumers in Indonesia. The main interest of this research is consumer behaviour in adopting QRIS as a digital payment technology, focusing specifically on the perceptions and behavioural intention of MSME consumers. The factors used in this research were modified from the Technology Acceptance Model and risk theory and contextualised particularly for QRIS adoption (Buchdadi et al., 2024; Syah et al., 2022; Tri & Ahmad, 2024). Perceived ease of use is the amount to which users perceive that running QRIS needs minimal effort, is straightforward to learn, involves limited complexity, and is backed by clear instructions. Perceived utility refers to the users' perception that QRIS enables faster and more efficient transactions and yields more benefits compared to the conventional payment methods. Perceived risk is users' anxiety over data security, possibility of transaction failure, and possibility of financial loss when using QRIS . Lastly, adoption intention is the users' willingness or behavioural intention to initiate utilising or continue to utilise QRIS as their main payment method.

Data collection was done using surveys which were administered both online using social media and on location through direct administration. All measurement items were measured using a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree") (Anton & Siratan, 2026). The screening questions were designed to ensure that respondents had sufficient familiarity with QRIS. The screening criteria included: (1) respondents lived in Indonesia, (2) respondents were familiar with QRIS, and (3) respondents had either previous experience using QRIS or intention to use QRIS in future MSME transactions. Only those respondents who answered "Yes" to both screening questions were allowed to continue to the questionnaire. The required sample size was established following the suggestions in the statistical literature about Structural Equation Modelling (SEM), which typically propose a minimum sample size of five to ten times the number of indicators in the study model (Hair et al., 2021). The target sample size was determined between 100 and 200 respondents, based on an estimated 20 indicators, to ensure the stability of the model and support the validity of the analytical results. The data were analysed using SmartPLS 3 with the method of Partial Least Square Structural Equation Modelling (PLS-SEM).

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PLS-SEM was selected instead of multiple regression analysis using SPSS because this study aims to simultaneously examine the measurement model and structural relationships among multiple latent constructs. Unlike conventional regression analysis that mainly focuses on the relationship between observed variables, PLS-SEM allows the evaluation of construct validity, reliability, and the predictive relationship between latent variables within a single analytical framework. Furthermore, PLS-SEM is considered appropriate for exploratory research models that involve multiple constructs and aim to maximize variance explanation of the dependent variable, which is consistent with the objective of this study to examine QRIS adoption intention based on perceived ease of use, perceived usefulness, and perceived risk (Hair et al., 2021). The analytical technique included the following two basic stages: The first step was Outer Model Evaluation to test convergent validity, discriminant validity and reliability of the instrument. Second, the evaluation of the inner model was performed to evaluate the strength of the causal relationship between the study variables using the coefficient of determination (R2). Then the hypothesis testing was performed based on the t-statistics and p-values.

## Result and Dicussion

### Result

The online questionnaire was conducted via Google Forms and originally 229 replies were obtained. In total, 29 responses were eliminated after screening with the preliminary filter questions as they did not match the eligibility criteria. Thus, the final sample consisted of 200 respondents who met the parameters of the study. The productive age group constituted the majority of the sample in terms of age distribution. The highest proportion were those aged 26–35 years (n=69; 34.5%) followed by those aged 36–45 years (n=62; 31.0%) and those aged 17–25 years (n=60; 30.0%). Regarding geographical distribution, respondents were categorized based on the Indonesian regional classification. Respondents from Western Indonesia consisted of participants from provinces located in Sumatra and Java, including Jakarta, West Java, Central Java, East Java, Banten, and Sumatra regions. Respondents from Central Indonesia consisted of participants from provinces in Kalimantan, Sulawesi, and Bali-Nusa Tenggara regions, including South Kalimantan, East Kalimantan, South Sulawesi, Bali, and surrounding areas. Meanwhile, respondents from Eastern Indonesia consisted of participants from provinces in Maluku and Papua regions.

The distribution consisted of 144 respondents from Western Indonesia (72.0%), 30 respondents from Central Indonesia (15.0%), and 26 respondents from Eastern Indonesia (13.0%). Gender was somewhat tipped toward female, with 112 participation (56.0%) and 88 male participants (44.0%). From the economic point of view, the highest income group was respondents with a monthly income of IDR 3,000,000 - IDR 5,000,000 with a total of 57 respondents (28.5%). Followed by respondents with income below IDR 3,000,000 with a total of 52 respondents (26.0%) and respondents with income between IDR 5,000,001 - IDR 7,000,000 with a total of 48 respondents (24.0%). In terms of education level, the most respondents are high school/Vocational School graduates, totalling 88 respondents (44.0%), and undergraduate degree holders (S1), totalling 81 respondents (40.5%). In general, the demographic profile shows that the sample was predominantly composed of individuals of productive age and with medium to high educational levels, characteristics that are generally relevant to the adoption of digital technologies in the daily economic activities.

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**Table 1.** Results of Outer Loading for Convergent Validity Testing

| Variable | Item | Loadings |
|---|---|---|
| Perceived Ease of Use | PEU1 | 0,913 |
| | PEU2 | 0,900 |
| | PEU3 | 0,927 |
| | PEU4 | 0,928 |
| Perceived Usefulness | PU1 | 0,917 |
| | PU2 | 0,919 |
| | PU3 | 0,899 |
| | PU4 | 0,913 |
| Perceived Risk | PR1 | 0,897 |
| | PR2 | 0,941 |
| | PR3 | 0,926 |
| | PR4 | 0,869 |
| Adoption Intention | AI1 | 0,863 |
| | AI2 | 0,880 |
| | AI3 | 0,919 |
| | AI4 | 0,893 |

Source: Primary data processed using SmartPLS 3 (n = 200)

All the indicators for each construct shown in Table 1 satisfy the requirements of the convergent validity with the outer loading values above the cutoff point of 0.70 (ranged from 0.863 to 0.941). Hair et al. (2021) argue that in PLS-SEM, an indicator with a loading of greater than 0.70 explains more than half of the construct variation, and hence, can be kept as a measure of the latent variable. Perceived Ease of Use construct loadings vary from 0.900 to 0.928, Perceived Usefulness from 0.899 to 0.919, Perceived Risk from 0.869 to 0.941, and Adoption Intention from 0.863 to 0.919. Therefore, the indicators of Perceived Ease of Use, Perceived Usefulness, Perceived Risk, and Adoption Intention are regarded to meet the criteria of convergent validity and are eligible to be retained in the measurement model.

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**Table 2.** Average Variance Extracted (AVE), Cronbach's Alpha, and Composite Reliability Results

| Variable | Average Variance Extracted (AVE) | Cronbach's Alpha | Composite Reliability |
|---|---|---|---|
| Perceived Ease of Use | 0,841 | 0,937 | 0,955 |
| Perceived Usefulness | 0,832 | 0,911 | 0,938 |
| Perceived Risk | 0,826 | 0,932 | 0,952 |
| Adoption Intention | 0,790 | 0,931 | 0,950 |

Source: Primary data processed using SmartPLS 3 (n = 200)

All the constructs in this research have met the standards for convergent validity and internal reliability as shown in Table 2 . This is supported by Average Variance Extracted (AVE) values for Perceived Ease of Use (0.841), Perceived Usefulness (0.832), Perceived Risk (0.826) and Adoption Intention (0.790) which are all over the 0.50 criterion. Each construct accounts for the variance of its indicators sufficiently. Cronbach's Alpha values (0.911–0.937) and Composite Reliability values (0.938–0.955) are similarly much above the minimal value of 0.70, indicating that each variable has a very strong internal consistency (Hair et al., 2021). Thus, the measurement model in this study is eligible for further investigation in the structural model evaluation or hypothesis testing stage.

**Table 3.** Cross-Loading Results for Discriminant Validity Testing

| Items | Perceived Ease of Use | Adoption Intention | Perceived Usefulness | Perceived Risk |
|---|---|---|---|---|
| PEU1 | 0,913 | 0,632 | 0,778 | 0,104 |
| PEU2 | 0,900 | 0,663 | 0,804 | 0,066 |
| PEU3 | 0,927 | 0,656 | 0,833 | 0,089 |
| PEU4 | 0,928 | 0,645 | 0,817 | 0,072 |
| AI1 | 0,706 | 0,863 | 0,749 | 0,119 |
| AI2 | 0,664 | 0,880 | 0,688 | 0,271 |
| AI3 | 0,578 | 0,919 | 0,641 | 0,195 |
| AI4 | 0,548 | 0,893 | 0,628 | 0,205 |
| PU1 | 0,840 | 0,684 | 0,917 | 0,079 |
| PU2 | 0,789 | 0,704 | 0,919 | 0,089 |
| PU3 | 0,778 | 0,721 | 0,899 | 0,094 |
| PU4 | 0,809 | 0,682 | 0,913 | 0,067 |
| PR1 | 0,101 | 0,219 | 0,067 | 0,897 |
| PR2 | 0,084 | 0,212 | 0,086 | 0,941 |
| PR3 | 0,089 | 0,223 | 0,116 | 0,926 |

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| | | | | |
|---|---|---|---|---|
| PR4 | 0,028 | 0,104 | 0,037 | 0,869 |

Source: Primary data processed using SmartPLS 3 (n = 200)

Table 3 shows the cross-loading findings of the discriminant validity test. It can be seen that all indicators have the highest loading values on their respective constructs than on other constructs. PEU1–PEU4 loaded highest on Perceived Ease of Use (0.900–0.928), AI1–AI4 on Adoption Intention (0.863–0.919), PU1–PU4 on Perceived Usefulness (0.899–0.919), and PR1–PR4 on Perceived Risk (0.869–0.941). These results demonstrate that each indicator is more correlated with its own construct than with other constructs, which confirms that the measurement model fits the criteria for discriminant validity based on cross-loading (Hair et al., 2021). Some cross-correlations are rather significant, especially between Perceived Ease of Use and Perceived Usefulness, although the major loading of each indicator is still highest on its own construct. Thus, each construct of the present study may be regarded as empirically different from other constructs and is appropriate for further investigation of the structural model.

**Table 4.** Fornell Larcker Results

| | **PEU** | **AI** | **PU** | **PR** |
|---|---|---|---|---|
| PEU | 0,917 | | | |
| AI | 0,708 | 0,889 | | |
| PU | 0,881 | 0,766 | 0,912 | |
| PR | 0,090 | 0,221 | 0,090 | 0,909 |

Source: Primary data processed using SmartPLS 3 (n = 200)

According to the Fornell-Larcker criterion, all constructs satisfy the necessary conditions (see Table 4). This is clear from the square root of the AVE values on the diagonal: Perceived Ease of Use (PEU) 0.917, Adoption Intention (AI) 0.889, Perceived Usefulness (PU) 0.912 and Perceived Risk (PR) 0.909, which are higher than the correlations among the constructs in the same rows or columns (Hair et al., 2021). For example, the strongest correlation between PEU and PU is 0.881, although the value is still below the square root of AVE for each construct. These results support the adequate discriminant qualities of each construct and better explains its indicators than other constructs, which indicates that the measurement model is suitable for further examination of the structural model (Hair et al., 2021).

**Table 5.** R-Square Test Results

| **Variabel** | **R-Square** | **R-square adjusted** |
|---|---|---|
| Adoption Intention | 0,614 | 0,608 |

Source: Primary data processed using SmartPLS 3 (n = 200)

It can be seen from Table 5 that the R squared value of the Adoption Intention variable is 0.614, which means that the model is able to explain 61.4% of the variation in adoption intention and the remaining 38.6% is impacted by other factors outside the model. This score indicates that the model accounts for the moderate to strong. Meanwhile, the adjusted R-squared value of 0.608 is quite close to the R-squared value and so shows that the model is stable after adjustment for the number of predictors. Thus, the independent variables in the study are judged to be sufficiently able to explain

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adoption intention, and the structural model is regarded to be sufficient to test hypotheses (Hair et al., 2021).

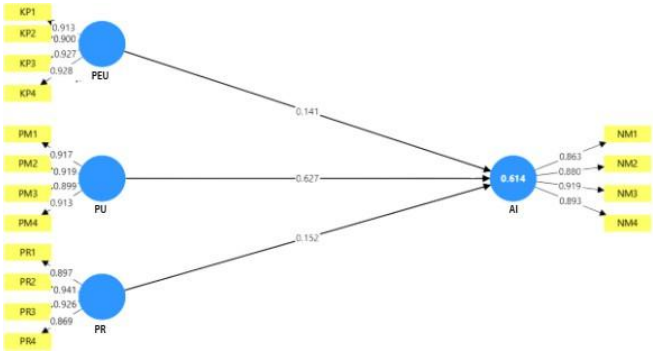
**Table 6.** Hypothesis Testing Results (Direct and Indirect Effects)

| Koefisien Jalur (Path) | Original Sample (O) | Sample Mean (M) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|
| PEU → AI | 0,141 | 0,138 | 1,614 | 0,107 |
| PU → AI | 0,627 | 0,629 | 7,331 | 0,000 |
| PR → AI | 0,152 | 0,155 | 3,591 | 0,000 |

Source: Primary data processed using SmartPLS 3 (n = 200)

The hypothesis testing results shown in Table 6 suggested that several of the structural routes in the model were not significant. Perceived Ease of Use has a positive coefficient of 0.141 on Adoption Intention. However, this association was not statistically significant (t = 1.614, p = 0.107), and hence, the hypothesis was not validated. However, Perceived Usefulness was found to have a positive and substantial effect on Adoption Intention (β=0.627, t-statistic=7.331, p-value=0.000 . Likewise, Perceived Risk had a positive and substantial impact on Adoption Intention with a coefficient of 0.152, t-statistic of 3.591 and p-value of 0.000. This finding indicates that perceived risk does not function as a deterrent factor in this research context. However, the positive relationship should be interpreted carefully because the current model only examines the direct association between perceived risk and adoption intention without investigating the underlying psychological mechanisms that may explain this relationship (Nurhapsari & Sholihah, 2022; Muchtar et al., 2024). Our results suggest that the intention to adopt is better explained by perceived usefulness and perceived risk as defined in the model whereas the ease of use does not yet have a direct meaningful effect. This shows that the decision whether to embrace the system is fairly dependent on the perceived benefit of the technology, even if the system is seen as user friendly.

**Figure 1.** PLS-SEM Algorithm Output Model Results




Source: Primary data processed using SmartPLS 3 (n = 200)

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The structural model (Fig. 1) shows that the Adoption Intention variable has an R-squared of 0.614, indicating that 61.4% of the variance in adoption intention can be explained by Perceived Ease of Use, Perceived Usefulness, and Perceived Risk, and the remaining 38.6% is affected by variables outside the model. The path coefficient of Perceived Usefulness is the highest among the three paths evaluated, with a value of 0.627. Thus, the higher the perceived benefits, the higher the respondents' willingness to embrace the technology. Perceived Risk also has favourable influence with the coefficient 0.152 although its contribution is relatively smaller. In contrast, the Perceived Ease of Use has a value of 0.141 which indicates a positive but weak influence. In general, the findings support that the adoption decision is mostly based on perceived usefulness rather than perceived ease of use or perceived risk.

**Discusion**

The hypothesis testing results (H1) indicated that the perceived ease of use did not have any significant effect on adoption intention. While perceived ease of use is typically positively associated with adoption in the original Technology Acceptance Model, some other studies have shown different results because of user experience, technology type, or the dominance of perceived usefulness, where ease of use is not a determining factor for individuals' intention to adopt technology in that context (Hakim & Supriyanto, 2024). This is consistent with mobile banking customers in Indonesia, where competing payment systems (such as OVO and GoPay) provide similar convenience or digital banking services, making this feature unimportant in differentiating adoption intention (Ahmed et al., 2025; Widiar et al., 2023). The application of instant messaging in the business setting further supports the notion that simplicity of use is no longer a major predictor of technology acceptance for experienced users (Luo et al., 2010).

From the consumer perspective, ease of use may become a basic expectation when users have previous exposure to digital payment applications, making perceived usefulness a stronger factor in determining adoption intention, and they are more driven by functional benefits (perceived utility) than merely technical simplicity (Setiawan et al., 2022; Syah et al., 2022). This is further evidenced by the fact that ease of use has reached a saturation threshold, when users see it as a basic "must-have" feature, and changes in ease no longer significantly boost adoption intention (Ramayanti et al., 2024). Thus, simplicity of use often becomes meaningless because people are already accustomed with the technology (Dimitrova, 2024). This finding provides an empirical extension of the Technology Acceptance Model (TAM), which originally emphasizes perceived ease of use as a fundamental determinant of technology acceptance. In the QRIS context, the result indicates that ease of use may have shifted from being a dominant adoption driver into a basic expectation among users who are already familiar with digital payment applications.

Therefore, this study contributes to the recent empirical discussion by showing that TAM constructs may vary in their explanatory power depending on technological maturity and user experience (Dimitrova, 2024). Moreover, users do not care much about the ease of government applications if they can get the essential services. Instead, they are more concerned with results (usefulness) than the ease of the usage process (Alotaibi et al., 2017). The hypothesis testing results (H2) suggest that perceived usefulness has a strong positive influence on adoption intention. The finding strengthens the importance of perceived usefulness as a key predictor in various technology adoption frameworks including the Technology Acceptance Model and suggests that the greater the benefits users perceive from a technology, the higher their intention to adopt it (Dhingra & Mudgal, 2019; Emon, 2023).

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This also shows a change in viewpoint as the technologies with high value are being viewed more and more as a requirement in the digital ecosystem (Mustafa & Kar, 2017). Therefore, perceived usefulness serves as a powerful kind of extrinsic incentive, in that consumers with high extrinsic motivation are likely to have higher intention to embrace new services (Cocosila et al., 2009). The significant effect of perceived usefulness confirms the central assumption of TAM that users are more likely to adopt technology when they perceive functional advantages from its usage. Compared with previous QRIS adoption studies that examined general acceptance factors, this study strengthens the empirical evidence that usefulness remains the primary consideration in digital payment adoption among Indonesian MSME consumers. The finding also highlights that consumers evaluate QRIS not only as a payment mechanism but as a tool that provides efficiency and practical value in daily transactions (Buchdadi et al., 2024; Ramayanti et al., 2024). The perceived usefulness is observed to greatly impact the usage intention because the individuals are motivated by the desire to get the functional benefits from the application or system (Shariff et al., 2022).

That is, perceived high usefulness can boost the adoption when users have certain performance risks since the benefits supplied are seen to outweigh the possible obstacles (Mustafa & Kar, 2017). In the hypothesis testing results (H3), perceived risk has a positive and significant effect on adoption intention. This finding differs from several previous digital payment studies that commonly identify perceived risk as a barrier to technology adoption. However, the positive relationship found in this study should not be interpreted as evidence that risk directly increases users' willingness to adopt QRIS. Instead, this result indicates that within this research context, respondents who perceived risks related to QRIS still demonstrated higher adoption intention. One possible explanation is that respondents may already have sufficient familiarity with digital payment systems, causing perceived risk to coexist with adoption intention rather than preventing adoption. Nevertheless, this mechanism requires further investigation because factors such as trust, security assurance, and risk mitigation were not included in the current research model (Muchtar et al., 2024; Naibaho & Siregar, 2025).

This finding differs from several previous digital payment studies that generally describe perceived risk as a barrier to adoption. The positive relationship identified in this study suggests that risk perception in QRIS adoption may have a different interpretation, where users who recognize transaction risks may simultaneously become more aware of security features and payment protection mechanisms. This result expands the understanding of risk theory by indicating that perceived risk does not always function as an inhibitor, particularly when users perceive that digital payment systems provide sufficient benefits and reliability (Nurhapsari & Sholihah, 2022; Muchtar et al., 2024; Naibaho & Siregar, 2025). Most of the previous research such as internet banking services and QRIS payment systems, showed that perceived risk has a significant negative effect as it is believed to inhibit the intention to use (Arifin et al., 2022; Nurhapsari & Sholihah, 2022). However, in this study, the characteristics of the respondents and the type of service studied suggest that risk is no longer perceived as a threatening barrier, but rather as a factor that motivates individuals to act and adopt the offered solution to prevent possible losses in the future.

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Overall, this study contributes to the QRIS adoption literature by demonstrating that the explanatory power of technology acceptance factors depends on the characteristics of the digital payment environment. While TAM remains relevant in explaining adoption intention, the findings indicate that perceived usefulness has a stronger role than perceived ease of use, while perceived risk may produce different effects depending on user perceptions and technological confidence. These findings address the existing empirical gap regarding the inconsistent influence of TAM and risk-related factors in QRIS adoption studies (Buchdadi et al., 2024; Ramayanti et al., 2024; Muchtar et al., 2024).

## Kesimpulan

The results of this study prove that the adoption of QRIS by MSME consumers in Indonesia is influenced by the interaction of perceived ease of use, perceived usefulness, and perceived risk. Consumers evaluate QRIS based on its ability to provide efficient, transparent, and reliable digital payment experiences within MSME transactions. QRIS is a crucial infrastructure that will enable rapid and safe digital transactions, thus boosting financial inclusion, transaction recordkeeping and operational efficiency. Ease of use, however, is a basic expected feature, but adoption decisions are largely decided by real perceived benefits and perceived risk. The results indicate that perceived risk has a significant relationship with QRIS adoption intention in this research context. However, the interpretation of this relationship requires caution because the current study does not examine additional factors that may explain how consumers perceive and manage digital payment risks. The results demonstrate the significance of the functional value of QRIS and the need for digital marketing tactics by MSMEs to gain user trust. This study has various limitations, especially in the coverage of the sample, which is somewhat limited to the MSME consumers who are exposed to the information about QRIS.

Hence, the results may not be sufficiently representative of the views and situations of business players working in places with low levels of online literacy or inadequate accessibility to the internet. Furthermore, the study is based on a quantitative approach using a questionnaire, which may not fully capture the psychological motives, user experiences and social settings that may affect the adoption intention. Moreover, several external factors such as government promotional campaigns, local culture impacts and rivalry from other digital payment systems may have substantial impact on the adoption behaviour, but they have not been thoroughly investigated within the framework of this study. Future studies may collect data via interview or by FGD to understand the experiences and viewpoints of MSMEs directly or perform longitudinal studies to follow the adoption of QRIS over time. Apart from generating more relevant and useful information, such techniques would also allow MSME actors to understand and use QRIS in a better manner. Hence, the design of marketing strategies and government regulations may be more accurately developed to boost the use of QRIS and assist the growth of MSMEs in the digital era.

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