SMART INTERNATIONAL MANAGEMENT JOURNAL

Vol. 3 No. 2, Month 2026
Page 64 – 75 | e-ISSN: 3048-0019

The Paradox of Digital Payment Transformation: A Critical Synthesis of QRIS Adoption and Structural Barriers among Indonesian MSMEs

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Article Information

Received: March 31, 2026
Revised: June 25, 2026
Online: June 29, 2026

ABSTRACT

The rapid expansion of the Quick Response Code Indonesian Standard (QRIS) has accelerated digital payment adoption among Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. However, existing studies have largely emphasized the economic benefits of QRIS while overlooking the structural barriers that constrain inclusive digital transformation. This study critically synthesizes the opportunities and challenges of QRIS implementation and develops a conceptual understanding of the structural factors influencing MSME digitalization. A Systematic Literature Review (SLR) was conducted by analyzing peer-reviewed journal articles, government reports, and institutional publications published between 2021 and 2026, retrieved from Scopus, ScienceDirect, and Google Scholar. The selected literature was examined using thematic analysis to identify recurring patterns related to operational efficiency, business performance, and structural constraints. The findings reveal that QRIS enhances transaction efficiency, financial transparency, and market expansion among MSMEs. Nevertheless, the review also uncovers a substantial deceleration in QRIS merchant growth, declining from 91.6% in 2022 to 13.3% in 2024, alongside persistent urban–rural digital disparities, limited digital literacy and cognitive readiness among micro-merchants, and increasing dependence on digital platform ecosystems. These findings demonstrate that successful digital payment transformation depends not only on technological adoption but also on institutional support, socio-economic readiness, and equitable digital infrastructure. This study contributes by extending the QRIS literature beyond its economic perspective and proposing a structural framework for understanding inclusive and

PUBLISHED BY : http://doi.org/10.70076/simj.v3i2.193
HEI PUBLISHING https://heijournal.id/index.php/apj

sustainable digital financial transformation in emerging economies.

Keywords: QRIS, Digital Payment, MSMEs, Financial Inclusion, Digital Transformation, Systematic Literature Review

1. Introduction

Digital transformation has become an important part of global economic development, including in Indonesia. Changing people's increasingly technology-dependent behaviors are encouraging the business sector to adapt to faster, more efficient, and more flexible transaction systems. One form of transformation is the use of digital payments through the QRIS (Quick Response Code Indonesian Standard) system.

QRIS is a national QR code standard developed by Bank Indonesia to unite various digital payment methods in one integrated system. This policy has been widely implemented since 2020 as part of the acceleration of the national digital economy and finance. The presence of QRIS provides convenience for business actors and consumers because transactions can be made only through scanning QR codes using digital payment applications such as GoPay, OVO, Dana, and mobile banking.

Bank Indonesia data shows that QRIS transaction volume in 2024 will reach more than 5.4 billion transactions with an annual growth of more than 150 percent compared to the previous year. The increase was dominated by the MSME sector which began to adopt non-cash payments in daily business activities [1]. These developments show that payment digitalization is no longer a secondary need, but rather has become an essential part of modern business strategies.

MSMEs have a great contribution to the Indonesian economy. Based on data from the Ministry of Cooperatives and SMEs of the Republic of Indonesia, the MSME sector contributes around 61 percent to the national Gross Domestic Product (GDP) and absorbs more than 97 percent of the national workforce [23]. However, most MSMEs still face various limitations such as financial access, operational efficiency, and digital technology adaptability.

In this context, QRIS is present as a solution that is able to expand financial inclusion and improve business transaction efficiency. The use of QRIS allows MSME actors to receive payments from various digital platforms without having to provide many payment tools. In addition, digital payment systems also help record transactions to be more transparent and structured.

However, the transformation of digital payments through QRIS does not always run smoothly. There are still MSME actors who are reluctant to use QRIS due to low digital literacy, concerns about transaction security, and limited internet networks in several regions. This shows that digital transformation is not only a technological issue, but also related to the social and cultural readiness of the Indonesian business community.

Previous studies on QRIS adoption in Indonesia have generally focused on the positive effects of digital payments, including transaction efficiency, sales growth, customer satisfaction, and financial inclusion among MSMEs. Most empirical studies conclude that QRIS adoption improves business performance and facilitates access to cashless transactions [22]. However, the existing literature remains largely concentrated on urban business environments and tends to assume that the benefits of digital payment systems are uniformly distributed across different regions and business scales [20][21][22].

Despite the growing body of literature, limited attention has been given to the structural barriers that hinder the diffusion of QRIS among MSMEs, particularly in suburban and rural areas. Issues such as digital literacy gaps, information asymmetry, technological resistance, inadequate internet infrastructure, and unequal access to digital ecosystems remain underexplored. Consequently, there is a conceptual gap in understanding whether QRIS adoption genuinely promotes inclusive digital transformation or merely benefits MSMEs with stronger technological capabilities. This study addresses this gap by providing a critical synthesis of the literature and examining both the opportunities and structural constraints associated with QRIS implementation in Indonesia.

Previous studies on QRIS adoption in Indonesia have consistently reported its positive contribution to transaction efficiency, financial inclusion, business performance, and customer convenience among MSMEs. Empirical evidence suggests that QRIS facilitates cashless transactions, improves financial transparency, and supports business digitalization by integrating merchants into broader digital payment ecosystems. Recent studies have also emphasized the role of perceived usefulness, ease of use, and trust as key determinants of QRIS adoption, while government policies and financial technology innovations have accelerated its diffusion across the country. Nevertheless, the existing literature remains predominantly empirical and benefit-oriented, with most studies focusing on adoption determinants or short-term business outcomes within specific regional contexts. Consequently, limited attention has been devoted to examining the broader structural conditions that influence the sustainability and inclusiveness of digital payment transformation among Indonesian MSMEs.

Furthermore, the rapid expansion of QRIS has introduced several emerging issues that remain insufficiently explored in previous studies. While merchant adoption has continued to increase, the annual growth rate has slowed considerably, indicating that digital payment diffusion may be approaching saturation in highly digitalized urban markets while facing greater barriers in suburban and rural areas. Structural challenges such as unequal digital infrastructure, disparities in digital literacy, cognitive constraints among micro-merchants, and increasing dependence on digital platform ecosystems have received relatively limited scholarly attention. Therefore, this study seeks to fill these gaps by providing a critical synthesis of the literature on QRIS implementation in Indonesia. Rather than merely reviewing the economic benefits of QRIS adoption, this study develops a conceptual understanding of how technological, institutional, and socio-economic factors collectively shape the opportunities and structural barriers to inclusive digital transformation among MSMEs. By adopting a Systematic Literature Review (SLR) approach, this study extends the existing body of knowledge beyond adoption outcomes and offers a more comprehensive framework for understanding sustainable digital financial transformation in emerging economies.

Accordingly, this study aims to critically synthesize the existing literature on QRIS implementation in Indonesia by examining its multidimensional contributions to MSME performance and the structural barriers that constrain inclusive digital transformation. Specifically, the study seeks to develop a conceptual understanding of how technological, institutional, and socio-economic factors interact to influence the sustainability of QRIS adoption and digital financial inclusion among Indonesian MSMEs.

2. Materials and Method

This study employed a Systematic Literature Review (SLR) to critically synthesize existing knowledge on QRIS implementation and its implications for MSME performance in Indonesia. The review followed a structured and transparent procedure to ensure methodological rigor, replicability, and comprehensive literature coverage. Relevant publications were retrieved from Scopus, ScienceDirect, and Google Scholar, as these databases provide broad coverage of peer-reviewed research and policy-related publications in the fields of digital finance and business management.

The search was limited to publications published between 2021 and 2026 to capture recent developments following the nationwide implementation of QRIS. Only publications written in English or Indonesian were included. The review considered peer-reviewed journal articles, government reports, and institutional publications, while conference proceedings, undergraduate theses, dissertations, newspapers, blogs, and other non-scientific sources were excluded.

The literature search was performed using Boolean search strings to ensure consistency across databases. The primary search string was: ("QRIS" OR "Quick Response Code Indonesian Standard") AND ("MSMEs" OR "SMEs" OR "Micro, Small and Medium

Enterprises") AND ("digital payment" OR "cashless payment" OR "financial inclusion" OR "digital transformation"). The search strategy was adapted slightly to accommodate the indexing requirements of Scopus, ScienceDirect, and Google Scholar while maintaining the same conceptual scope.

The selected studies were analyzed using thematic analysis following four sequential stages: (1) data reduction, in which relevant findings related to QRIS implementation were extracted; (2) open coding, where recurring concepts and empirical findings were systematically coded; (3) categorization, during which similar codes were grouped into broader analytical themes; and (4) thematic synthesis, in which the themes were integrated into three overarching dimensions: operational efficiency, sales and market performance, and structural challenges. This analytical procedure enabled the identification of consistent patterns across studies while simultaneously revealing conceptual gaps and emerging structural issues related to inclusive digital transformation among Indonesian MSMEs.

3. Results

Development of QRIS in Indonesia

The implementation of QRIS has shown very significant growth since its national launch. Based on a Bank Indonesia report, the number of QRIS merchants in 2024 has reached more than 34 million users and the majority come from the MSME sector. This increase shows that business actors are starting to see digital payments not only as an additional transaction tool, but as part of a business strategy that is able to increase business competitiveness.

Table 1. The Growth of QRIS Merchants in Indonesia

Year	Number of QRIS Merchants (Million)	Growth
2021	12	-
2022	23	91%
2023	30	30%
2024	34	13%

Source: Bank Indonesia, 2025

Based on Table 1, the diffusion of QRIS among Indonesian MSMEs has continued to expand, reflecting the growing acceptance of digital payment systems within the national economy. However, a more critical examination of the data reveals a substantial deceleration in the annual growth rate of QRIS merchants, declining sharply from 91.6% in 2022 to 30.4% in 2023 and further to 13.3% in 2024. Rather than indicating a weakening demand for digital payment technologies, this trend is more plausibly interpreted as evidence of market maturation and the gradual saturation of highly digitalized metropolitan areas, where the majority of early adopters have already implemented QRIS. Consequently, future merchant expansion increasingly depends on reaching underserved suburban and rural regions, where adoption is constrained by structural barriers such as inadequate digital infrastructure, limited internet connectivity, lower levels of digital literacy, and the cognitive readiness of micro-merchants to adopt new technologies. These findings suggest that the next phase of QRIS diffusion is no longer driven primarily by technological availability, but by the capacity of policymakers and financial institutions to address structural inequalities and promote a more inclusive digital transformation across diverse regional contexts.

This growth is influenced by several factors, including the increase in smartphone use, changes in consumer behavior after the COVID-19 pandemic, and government policies in accelerating the national digital economy. The integration of QRIS with various digital wallet and mobile banking platforms makes this payment system even easier for the public to accept.

Empirically, the increase in QRIS transactions shows that Indonesian people are starting to enter a pattern of cashless society transactions. Consumers no longer only consider the price and quality of the product, but also the convenience and speed of transactions in determining purchasing decisions. In this context, MSMEs that have not adopted digital payments have the potential to experience a decrease in competitiveness compared to business actors who have been integrated with digital payment systems.

The Impact of QRIS on MSME Operational Efficiency

The use of QRIS has a direct impact on the operational efficiency of MSMEs. Prior to the use of QRIS, most MSME transactions were carried out in cash, so they often caused obstacles such as incorrect refunds, transaction delays, and the risk of counterfeit money circulation. After using QRIS, the payment process becomes faster and more practical because transactions are carried out automatically through digital applications.

In addition to transaction efficiency, QRIS also helps MSMEs in reducing operational costs. Business actors no longer need many electronic payment instruments from various banks or financial service providers because all transactions can be done through a single national standard QR code.

This study found that increased operational efficiency has a positive impact on business productivity. MSME actors can serve more consumers in a shorter time. This is especially important for culinary businesses, small retail, and the service sector that have a high volume of daily transactions.

The Influence of QRIS on Increasing MSME Sales

One of the most significant impacts of the implementation of QRIS is the increase in MSME sales. Consumers tend to be more comfortable making non-cash transactions because they are considered practical, secure, and flexible. Many consumers no longer carry large amounts of cash so the existence of QRIS is an important factor in purchasing decisions.

Several recent studies show that MSMEs that adopt QRIS have experienced an increase in the number of daily transactions compared to before using digital payments. This condition occurs because digital payments are able to speed up the transaction process while increasing customer convenience.

The increase in sales is not only influenced by the ease of transactions, but also by various digital promotional programs such as cashback, discounts, and rewards from electronic payment platforms. The program indirectly helps MSMEs attract more customers without incurring large promotional costs.

However, this study also found that the increase in sales due to QRIS did not occur evenly among all MSMEs. Business actors in urban areas benefit more than MSMEs in rural areas due to internet infrastructure factors and different levels of digital literacy of the community.

Challenges of QRIS Implementation in MSMEs

Although QRIS provides many benefits, its implementation still faces a number of challenges. One of the main obstacles is the low digital literacy of MSME actors, especially in micro businesses and elderly business actors. Some business actors still find it difficult to understand the use of digital payment applications and electronic transaction management.

In addition, limited internet access in several regions is also an obstacle in the use of QRIS. The digital payment system relies heavily on the stability of the internet network. When the network is disrupted, transactions cannot be carried out optimally, reducing user convenience.

Critically, this study shows that digital transformation does not always produce an equitable positive impact. QRIS does increase efficiency and business transactions, but at the same time it also creates a dependence on digital technology. This dependence can become a problem if MSMEs do not have adequate human resource readiness and digital security protection.

In addition, the dominance of financial technology companies in the digital payment ecosystem has the potential to create access inequality for small MSMEs in disadvantaged areas. Therefore, the transformation of digital payments should not only be oriented towards the growth of digital transactions, but also on equitable access to technology and increasing the capacity of small businesses.

4. Discussion

The findings of this review demonstrate that QRIS has become a strategic instrument for accelerating digital payment adoption among Indonesian MSMEs. Beyond improving transaction efficiency, QRIS has transformed business operations by enhancing financial transparency, reducing transaction time, and facilitating broader market access through cashless payment systems [22], who reported that QRIS adoption improves operational performance and business competitiveness among MSMEs. However, the present review extends previous empirical evidence by demonstrating that these benefits are not distributed uniformly across different geographical and business contexts. The effectiveness of QRIS is influenced not only by technological adoption but also by broader institutional and socio-economic conditions that determine the inclusiveness of digital transformation.

From the perspective of the Technology Acceptance Model (TAM), the widespread adoption of QRIS reflects the importance of perceived usefulness and perceived ease of use in encouraging technology acceptance among MSMEs. Faster transactions, improved financial record-keeping, and greater payment flexibility increase the perceived usefulness of QRIS, thereby strengthening merchants' willingness to adopt digital payment systems. Nevertheless, this review indicates that technology acceptance is increasingly constrained by external structural factors. The sharp decline in merchant growth from 91.6% in 2022 to 13.3% in 2024 suggests that perceived ease of use is no longer determined solely by system characteristics but is also affected by infrastructure availability, internet accessibility, and the digital capabilities of business owners.

These findings are further explained through the perspective of Digital Divide Theory. Rather than representing a decline in demand for digital payments, the deceleration in merchant growth reflects widening disparities in digital readiness between metropolitan and peripheral regions. Urban MSMEs generally benefit from reliable internet infrastructure, greater exposure to digital innovation, and higher levels of digital literacy, whereas businesses operating in rural areas continue to face limited connectivity, inadequate technological infrastructure, and lower cognitive readiness to adopt digital technologies. This interpretation supports the findings of [24], who identified digital literacy and infrastructure limitations as major barriers to QRIS adoption among rural micro-enterprises. However, the present synthesis expands previous studies by arguing that the slowing growth rate also signals market saturation in highly digitalized urban areas, making future expansion increasingly dependent on overcoming structural barriers in underserved regions.

The findings also contribute to the literature on Platform Capitalism, which argues that digital payment systems increasingly operate within integrated digital ecosystems. QRIS adoption enables MSMEs to access broader financial and commercial networks through mobile banking applications, e-wallets, online marketplaces, and digital promotional platforms. While such integration creates significant opportunities for improving business efficiency and market reach, it also introduces new forms of institutional dependency. Rather than merely generating abstract inequalities, this review identifies concrete structural mechanisms such as transaction fees, asymmetric access to consumer data, and ecosystem lock-ins that may reduce the bargaining position of micro-merchants. Consequently, digital payment platforms simultaneously function as instruments of economic empowerment and sources of institutional dependence for businesses with limited technological and financial resources. This interpretation extends the structural perspective proposed, who primarily emphasized barriers to adoption without examining the long-term implications of platform dependency.

Overall, this review demonstrates that the success of QRIS should not be evaluated solely by the increasing number of merchants or transaction volumes. Sustainable digital transformation depends on the interaction between technological innovation, institutional support, digital infrastructure, and human capability development. Therefore, policies promoting QRIS adoption should move beyond expanding merchant registration and instead prioritize reducing regional digital disparities, strengthening digital literacy, improving internet infrastructure, and ensuring that MSMEs can participate in digital ecosystems without becoming structurally dependent on dominant platform providers.

5. Conclusions

This Systematic Literature Review demonstrates that QRIS has generated substantial benefits for Indonesian MSMEs by improving transaction efficiency, financial transparency, operational productivity, and market accessibility. Across the reviewed studies, digital payment adoption consistently contributes to business digitalization and strengthens financial inclusion. Nevertheless, the synthesis also reveals several persistent structural constraints, including the sharp deceleration in merchant growth, unequal digital infrastructure, urban–rural disparities in digital readiness, limited digital literacy among micro-merchants, and increasing dependence on digital platform ecosystems. These findings indicate that the sustainability of QRIS implementation depends not only on technological availability but also on broader institutional, infrastructural, and socio-economic conditions.

The review further suggests that the recent decline in merchant growth should not be interpreted as evidence of declining demand for digital payment systems. Instead, it reflects the transition from rapid diffusion in highly digitalized metropolitan areas toward a more challenging stage of expansion in underserved suburban and rural regions, where structural barriers remain significant. Consequently, future progress in digital financial transformation will depend largely on reducing these structural inequalities rather than solely expanding technological adoption.

Based on these empirical patterns, policymakers should prioritize investments in digital infrastructure, strengthen digital literacy programmes, and establish long-term mentoring initiatives for micro and small enterprises, particularly in regions with limited digital readiness. Financial institutions and digital payment providers should also develop more inclusive digital ecosystems by reducing barriers related to transaction costs, improving accessibility, and minimizing institutional dependency within platform-based payment systems. Finally, this study contributes to the literature by extending discussions on QRIS beyond its economic benefits and providing a structural perspective for understanding inclusive and sustainable digital financial transformation among MSMEs in emerging economies.

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