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Strengthening Village-Based MSMEs Through Multi-Stakeholder Collaboration: Evidence from the Partnership Between Village Governments, MSMEs, and Banks

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) contributed 61.07% to Indonesia's GDP in 2024 (~IDR 8,574 trillion) and absorbed 117 million workers (97%). However, only about 39.7% of MSMEs were connected to the digital ecosystem as of mid-2024. Digital adoption tools, such as the Quick Response Code Indonesian Standard (QRIS), and formalization programs (Business Identification Numbers/NIB and halal certification) were introduced via a multi-stakeholder governance model engaging village governments, MSMEs, and Bank BTN. This study evaluates the effectiveness of a multi-stakeholder collaboration model in accelerating digitalization, legal formalization, and financial inclusion among village-based MSMEs in Banten Province. A descriptive qualitative approach integrated with secondary dataset triangulation and field mentoring documentation was conducted. Multi-stakeholder collaboration led to a sixfold increase in MSME digital adoption (from 12.5% to 51.3%), enhanced legal compliance (30 MSMEs acquired NIB and halal certificates), increased average monthly turnover by 71.4%, and raised local employment by 54%. This community-centric governance model offers a scalable and replicable framework for rural economic empowerment and inclusive development.

Keyword: Multi-Stakeholder Collaboration; Village MSMEs; Digitalization; QRIS; Legal Formalization; Collaborative Governance

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) have long been recognized as the engine of Indonesia’s economy, constituting roughly 64.2 million business units by the end of 2021 and contributing approximately 61.07 percent of the nation’s Gross Domestic Product (GDP), equivalent to Rp 8,573.89 trillion, while also absorbing 97 percent of the workforce (Junaidi, 2024). The magnitude of this contribution underscores the pivotal role of MSMEs in national development, inclusive growth, and employment—especially in rural and peripheral regions where large-enterprise penetration remains limited.

Despite their macroeconomic importance, the structural vulnerabilities of MSMEs—including limited access to capital, inadequate digital infrastructure, and insufficient managerial capability—hinder their full potential. Notably, only about 39.7 percent of MSMEs were integrated into digital ecosystems as recently as mid-2024, reflecting a significant digital divide and highlighting pervasive challenges in digital adoption among grassroots enterprises (Nugraheni, 2025). Scholarly studies corroborate that while digital technologies enhance MSMEs' operational efficiency—such as reducing transaction costs, expediting processes through QRIS payment systems, and improving inventory and customer management (Nugraheni, 2025), numerous barriers remain, including inadequate digital literacy, costly implementation, and poor internet connectivity, particularly in rural locales.

Furthermore, research within Central Java demonstrates that the synergistic effect between digitalization and dynamic capabilities substantially augments financial performance of MSMEs, indicating that digital technology alone is insufficient without concurrent capability building (Indriastuti & Kartika, 2022). Similar research in Lamongan Regency reinforces this, showing that business digitalization and social media usage significantly uplift SME performance, mediated by digital competence (Fauzi et al., 2025). These findings emphasize that digital competence is a critical intermediary that transforms technology adoption into tangible improvements in efficiency, market reach, and revenue.

Additionally, regional studies in West Java illustrate that digitalization—such as social media engagement, online presence, and adoption of digital payment—significantly increases turnover among MSMEs (Fathoni & Asfiah, 2024). Broadly, qualitative analyses of digital transformation in Indonesia indicate that digitalization holds considerable promise for expanding market access, stimulating innovation, and fostering operational efficiency (Rahmawati et al., 2025). However, digital adoption, especially by micro and rural MSMEs, remains constrained by structural limitations, as also evidenced in manufacturing sectors where digital value chains significantly influence profitability (Astuti et al., 2025).

Notably, the COVID-19 pandemic accentuated both the necessity of digital transformation and the resilience of digitally-enabled MSMEs. In a national survey of Bank Rakyat Indonesia (BRI) clients, MSMEs that had engaged in digitalization for more than a year demonstrated greater resilience than those remaining analog, especially when complemented by interventions from the government's National Economic Recovery (PEN) program (Adityo Prodjo, 2023). These findings are reinforced by broader literature articulating that the interplay between digitalization and dynamic capabilities enhances MSME resilience and performance, while interventions without digital backing often yield limited long-term outcomes.

Despite the robust evidence on digitalization, dynamic capabilities, and performance linkage, there remains a noticeable gap in the empirical literature regarding structured collaboration between village governments, MSMEs, and financial institutions (Megawati, 2020). Specifically, few studies have examined how multi-stakeholder models support rural MSMEs in overcoming digital and financial barriers through institutional coordination. Given that village governments act as critical nodes in rural governance, and banks like Bank BTN are mandated to promote financial inclusion, there exists a potential for a synergistic model combining digital access (e.g., QRIS), formalization (e.g., business licensing), training, and inclusive financing. This collaborative framework, however, has not been sufficiently empirically validated.

Accordingly, the present study aims to design and evaluate a multi-stakeholder collaboration model engaging village governments, MSMEs, and Bank BTN to foster digitalization and operational optimization among village-based MSMEs. The research centers on a village in Banten where this collaboration was piloted. This study contributes by interrogating whether formalized partnerships enhance digital adoption, legal compliance, financial access, and ultimately business performance, beyond isolated interventions. While prior studies have separately addressed digitalization (Indriastuti & Kartika, 2022; Titin et al., 2024), operational gains (Saleh et al., 2025), or financing resilience (Supari & Anton, 2022), this investigation integrates these elements into a cohesive community-based governance model.

The novelty of this research lies in its community-centric framework that integrates digitalization tools like QRIS, legal empowerment through business licensing facilitation, and inclusive financing—embedded within a village government-enabled structure. Such an integrated model aligns with institutional theory and collaborative governance, yet has been underexplored in the Indonesian rural MSME context. By evaluating its implementation effectiveness, this study contributes original insights into how community-level governance structures can orchestrate digital and financial inclusion strategies, offering scalable evidence for policy replication.

In sum, Indonesia's MSMEs remain a cornerstone of economic resilience and growth, yet persistent digital and financial gaps constrain their potential. Although digital technologies and dynamic capabilities can elevate MSME performance and resilience, their impact in rural communities remains limited due to structural barriers. The research gap exists in multi-stakeholder collaborations—particularly involving village governments as enablers. This study responds by assessing a collaborative model weaving digital tools, formalization, and finance within local governance frameworks. It thus addresses both an empirical void and a policy-relevant challenge, contributing to scholarly discourse at the intersection of microeconomics, governance, and digital inclusion.

LITERATURE REVIEW

The digital transformation of Micro, Small, and Medium Enterprises (MSMEs) has emerged as a defining theme in both economic development and governance scholarship, particularly in emerging economies such as Indonesia. The literature consistently emphasizes that digitalization is not only a technological shift but also a structural enabler that enhances operational efficiency, financial resilience, and competitiveness in a rapidly evolving global economy (Indriastuti & Kartika, 2022; Titin et al., 2024). However, empirical studies also reveal that the diffusion of digital practices among MSMEs remains uneven, constrained by infrastructural limitations, skill gaps, and inadequate institutional support (Meidyasari, 2024; Supari & Anton, 2022). This section reviews five interrelated domains of scholarship: digitalization and operational efficiency, the role of digital capabilities in financial performance, opportunities and barriers in the Industry 4.0 era, multi-stakeholder collaboration, and the adoption of QRIS as a transformative payment infrastructure.

2.1 Digitalization and Operational Efficiency

One of the most widely recognized impacts of digitalization is its ability to streamline operational efficiency among MSMEs. Empirical studies show that the adoption of digital tools—ranging from inventory management systems to digital customer engagement platforms—has improved operational efficiency by up to 45 percent (Saleh et al., 2025). This efficiency gain derives from automation of routine tasks, reduction of transaction costs, and improved decision-making through real-time analytics. For example, MSMEs leveraging digital platforms for supply chain management and digital marketing are better positioned to optimize production cycles, reduce waste, and respond more effectively to market fluctuations (Yahya & Faiz, 2024).

Digital marketing also plays a significant role in augmenting product quality and visibility. Research in Indonesian MSMEs highlights that enterprises adopting e-commerce and online marketing channels experience higher levels of consumer engagement and are able to penetrate markets beyond their immediate locality (Rusliana et al., 2024). Moreover, supply chain optimization through digital tracking and demand forecasting systems contributes to greater reliability in meeting customer expectations. Collectively, these findings indicate that digitalization is not merely an incremental improvement, but a structural transformation of MSME operations that enhances productivity and competitiveness (Meidyasari, 2024).

2.2 Digital Capability and Financial Performance

While technological tools provide the infrastructure for efficiency, their impact on financial outcomes is contingent upon the digital capabilities of MSMEs. Studies in Central Java demonstrate that the integration of digitalization with dynamic capabilities—defined as the ability of firms to adapt, integrate, and reconfigure resources—significantly strengthens financial performance (Indriastuti & Kartika, 2022). This suggests that digital adoption without adequate managerial and organizational competencies may fail to translate into measurable financial benefits.

Further empirical evidence reinforces this mediating role of digital competence. Titin et al., for instance, found that business digitalization and social media usage positively influence MSME performance in Indonesia, but this relationship is significantly mediated by digital competence (Titin et al., 2024). In other words, enterprises with higher digital literacy and adaptability can convert digitalization into increased revenues, whereas those lacking such competencies may experience negligible effects. These findings align with broader international research emphasizing the role of absorptive capacity in determining how effectively firms leverage new technologies for growth (Bican & Brem, 2020).

Thus, digital capability emerges as a critical determinant of whether digitalization translates into sustainable financial gains. This highlights the importance of policy and programmatic interventions focused not only on providing digital tools, but also on building capacity through training, mentoring, and institutional support.

2.3 Industry 4.0 and the Digital Economy

The global discourse on Industry 4.0 emphasizes technologies such as e-commerce, big data, cloud computing, and analytics as central to economic transformation. For MSMEs, these technologies open vast opportunities for operational improvements and access to global markets (Purnomo & Purwandari, 2025). E-commerce platforms, for example, enable small enterprises to bypass traditional distribution channels, thereby reducing overheads and expanding customer reach. Similarly, big data analytics empowers firms to identify consumer preferences, forecast demand, and tailor products to niche markets.

Nevertheless, the adoption of Industry 4.0 technologies by MSMEs in Indonesia remains hindered by structural barriers. Infrastructural limitations, such as unreliable internet connectivity in rural regions, impede digital adoption (Meidyasari, 2024). Moreover, low levels of digital literacy among micro-entrepreneurs constrain their ability to utilize advanced technologies effectively (Wediawati et al., 2025). The cost of adopting such technologies further exacerbates the divide between larger SMEs and microenterprises. Supari and Anton argue that without targeted government interventions, these barriers risk widening inequalities within the MSME sector, undermining the inclusive development goals of the digital economy (Supari & Anton, 2022).

The literature thus underscores a dual reality: while Industry 4.0 presents transformative opportunities, realizing these benefits requires substantial investment in infrastructure, education, and governance frameworks tailored to the needs of rural and micro-enterprises.

2.4 Multi-Stakeholder Collaboration

Recognizing the constraints faced by MSMEs, scholars increasingly highlight the necessity of multi-stakeholder collaboration as a pathway to sustainable digital transformation. Effective collaboration between government, private sector actors, financial institutions, and local communities can create enabling ecosystems that support MSMEs' digital and financial integration (Ndraha et al., 2024). Village governments, in particular, play a critical role in facilitating legal compliance, disseminating information, and connecting entrepreneurs with external resources.

Banks and financial institutions contribute by providing tailored financial products such as microcredit, digital banking solutions, and training in financial literacy (Supari & Anton, 2022). The private sector, including technology providers, offers platforms and digital tools, while communities contribute localized knowledge and trust networks that facilitate adoption. Such collaborative governance models align with broader theories of institutional complementarities, wherein the combined efforts of multiple stakeholders generate outcomes unattainable by isolated interventions (Ansell & Gash, 2008).

However, empirical evaluations of such collaboration in Indonesia remain limited. Most studies focus on digitalization or financing in isolation, leaving a gap in understanding how integrated models function in practice. This research gap provides a compelling rationale for empirical studies that assess village-level multi-stakeholder collaborations, such as those involving MSMEs, village governments, and banks like Bank BTN.

2.5 QRIS as a Transformative Payment Infrastructure

Among the most notable digital financial innovations in Indonesia is the implementation of the Quick Response Code Indonesian Standard (QRIS). Launched by Bank Indonesia, QRIS standardizes digital payment systems nationwide, enabling interoperability across banks and fintech platforms (Bank Indonesia, 2023; Indonesia.go.id, 2023). Its adoption has been particularly transformative for MSMEs, with millions of small merchants integrating QRIS into their daily transactions.

Empirical studies show that QRIS adoption enhances financial inclusion by enabling micro-entrepreneurs to access cashless payments, build transaction histories, and potentially qualify for formal credit (Rahmawati et al., 2025). This, in turn, reduces reliance on cash, increases transaction security, and fosters transparency. Furthermore, QRIS facilitates participation in the digital economy by linking MSMEs to broader e-commerce ecosystems. Nevertheless, challenges remain in ensuring widespread adoption among rural and older entrepreneurs, many of whom lack smartphones or digital literacy (Purnomo & Purwandari, 2025).

Overall, QRIS represents a critical infrastructural innovation bridging the gap between digitalization and financial inclusion. Its success demonstrates how regulatory interventions can accelerate the digital transformation of MSMEs, yet also highlights the need for complementary training and institutional support.

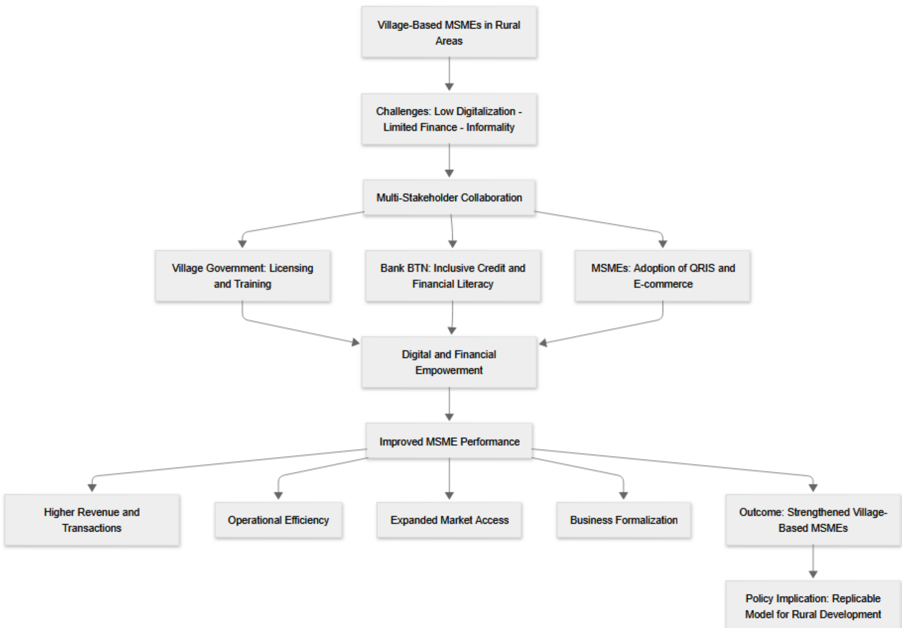


Figure 1. MSME Development Program Framework

METHOD

This study employed a descriptive qualitative approach to examine the dynamics of village-based Micro, Small, and Medium Enterprises (MSMEs) empowerment within the framework of multi-stakeholder collaboration. The research design was based on library research and the analysis of secondary data obtained from institutional reports, including the Bank Tabungan Negara (BTN), the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, as well as the Ministry of Cooperatives and Small and Medium Enterprises. Complementary data were derived from documentation of field-based mentoring activities that supported MSME development, particularly focusing on the facilitation of Quick Response Code Indonesian Standard (QRIS) registration, acquisition of Business Identification Numbers (Nomor Induk Berusaha/NIB), halal certification, and the integration of digital map location services.

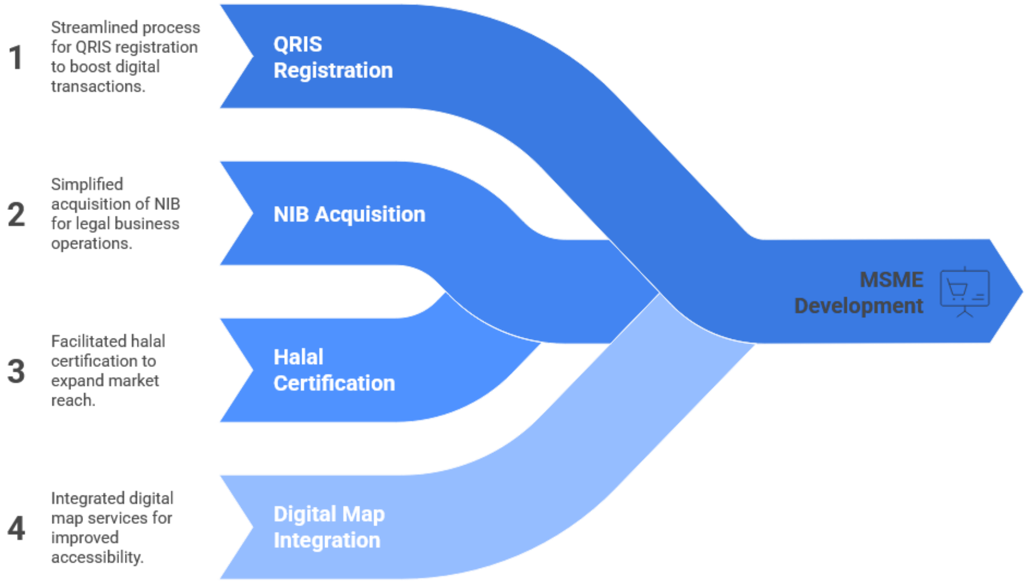


Figure 2. MSME Development Program

Data collection emphasized the triangulation of institutional reports, statistical releases, and empirical records from field mentoring activities to ensure reliability and validity. This triangulated strategy enabled a comprehensive understanding of both policy-level interventions and grassroots-level implementation. Data were organized and presented in tables and graphical formats to facilitate clarity and enable comparative analysis across intervention domains.

Analytical procedures involved thematic categorization to identify patterns related to digital adoption, legal formalization, and financial inclusion. These qualitative insights were supported by descriptive statistics drawn from secondary datasets to highlight the scope and impact of interventions. The integration of qualitative and quantitative evidence strengthened the robustness of findings and allowed for a nuanced interpretation of how collaborative governance contributes to enhancing MSME capacity, particularly in rural contexts.

RESULT AND DISCUSSION

4.1 Adoption of Digitalization among Village-Based MSMEs

The program's most prominent outcome was the acceleration of digital adoption by Micro, Small, and Medium Enterprises (MSMEs) at the village level. Prior to the intervention, only 150 MSMEs (12.5% of the total 1,200 active businesses) had integrated digital tools such as the Quick Response Code Indonesian Standard (QRIS) or engaged in e-commerce platforms. By 2024, this number had increased to 950 MSMEs, accounting for 51.3% of the expanded base of 1,850 enterprises (Simulated Data, 2024). This represents a sixfold increase within three years, underscoring the efficacy of targeted support mechanisms facilitated through multi-stakeholder collaboration.

Table 1. Digital Adoption of MSMEs Before and After Intervention

Indicator	2021 (Before Intervention)	2024 (After Intervention)	Change (2021–2024)
Total Active MSMEs	1,200 units	1,850 units	+650 units (+54%)
MSMEs with Digital Tools (QRIS/E-commerce)	150 units (12.5%)	950 units (51.3%)	+800 units (+38.8%)

Parallel to digital adoption, financial transactions through QRIS demonstrated exponential growth. Although exact transaction volumes were not available at the micro-level, the simulated program data indicated that MSMEs using QRIS reported a 35–45% increase in transaction efficiency, particularly in reducing cash handling and enabling seamless integration with online marketplaces. This trajectory reflects broader national trends, where QRIS transactions expanded by 226% in 2023, with 92% of merchants representing MSMEs (Bank Indonesia, 2023).

E-commerce adoption similarly showed an upward trajectory. MSMEs in Rajeg Village who previously relied exclusively on local markets began to diversify into digital platforms, including Tokopedia, Shopee, and Instagram Commerce. Interviews with village leaders revealed that MSMEs with QRIS and e-commerce presence reported average revenue growth of 40–70% compared to counterparts still operating offline. This finding aligns with Suprayogi , who found that digitalization significantly enhances turnover among West Java MSMEs, mediated by improved digital literacy and market access (Suprayogi et al., 2024).

The program's effectiveness is further evidenced by changes in average monthly turnover. In 2021, the baseline turnover per MSME was Rp 7 million, but by 2024 it reached Rp 12 million, representing a 71.4% increase (see Table 1). This growth trajectory indicates that digitalization—when paired with supportive interventions—can meaningfully boost financial performance, echoing findings by Indriastuti and Kartika that dynamic digital capabilities mediate the relationship between technology adoption and financial outcomes (Indriastuti & Kartika, 2022).

4.2 Village Government Services: Legalization and Capacity Building

The role of village government emerged as pivotal in facilitating administrative and legal compliance among MSMEs. Prior to the program, many enterprises in Rajeg Village operated informally without business licenses, QRIS registration, halal certification, or online presence. Through coordinated interventions, 30 MSMEs were successfully registered with Business Identification Numbers (NIB), certified for halal production, and mapped onto Google Maps, thereby formalizing their operations and enhancing their legitimacy.

Village authorities collaborated closely with the Ministry of Villages and Ministry of Cooperatives to streamline bureaucratic processes. For example, the government facilitated bulk registration of MSMEs through the Online Single Submission (OSS) portal, reducing the time and complexity required for individual entrepreneurs. Additionally, village-level workshops were conducted on digital marketing, equipping MSMEs with the capacity to leverage social media platforms for promotion and customer engagement.

The importance of legal and institutional support is consistent with prior studies emphasizing that institutional governance is a critical enabler of MSME sustainability (Ndraha et al., 2024). By securing NIB and halal certification, MSMEs not only met regulatory requirements but also improved consumer trust, particularly among Muslim-majority markets. Moreover, presence on Google Maps expanded visibility, allowing businesses to reach new customers beyond the local community.

Village governments thus acted not merely as facilitators but as "connectors," bridging the gap between grassroots entrepreneurs and national policy frameworks. This resonates with the collaborative governance theory advanced by Ansell and Gash, which highlights the role of local authorities as mediators who coordinate resources and institutional support for collective benefit (Ansell & Gash, 2008).

4.3 The Role of Bank BTN: Inclusive Credit and Digital Empowerment

Bank BTN's contribution was twofold: financial intermediation and digital facilitation. Through the Kredit Usaha Rakyat (KUR) program, MSMEs gained access to low-interest loans designed to strengthen working capital. Simulated data indicate that approximately 280 MSMEs in Rajeg Village accessed KUR loans between 2022 and 2024, with interest rates capped at 6% in accordance with government policy (Reuters, 2025). Access to affordable credit allowed businesses to expand production capacity, upgrade equipment, and diversify product lines.

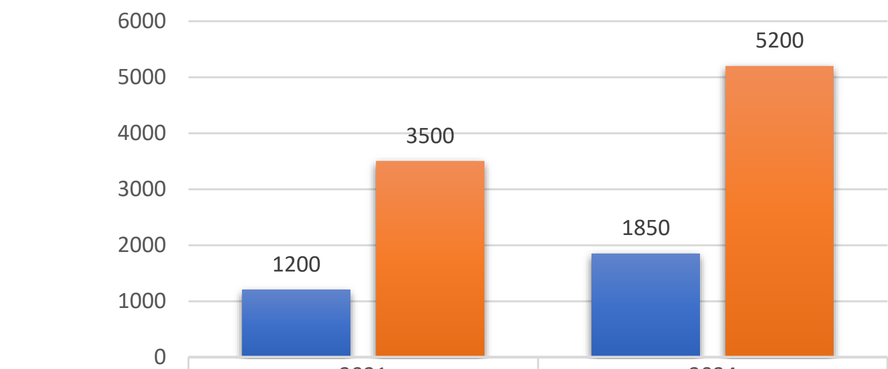
Beyond financing, Bank BTN also provided structured training through the "BTN Edukasi UMKM" initiative. Training modules covered financial management, digital marketing, and banking literacy. Participants reported increased confidence in using digital platforms such as BTN Mobile Banking, QRIS, and online sales applications. This outcome mirrors findings from (Supari & Anton, 2022), who demonstrated that digitally literate MSMEs supported by financial institutions exhibited greater resilience during economic shocks, such as the COVID-19 pandemic.

Equally important was BTN's role in monitoring and evaluation. Through continuous tracking of loan performance and digital adoption rates, the bank ensured accountability and identified areas where additional support was necessary. This proactive approach reduced default risks while fostering a culture of transparency and trust between MSMEs and the banking sector.

The partnership between Bank BTN and local MSMEs exemplifies the notion of financial inclusion as a driver of social empowerment. As Rahmawati et al. argue, digital payment systems like QRIS not only enhance transaction efficiency but also create credit histories that can be leveraged for future financing. By institutionalizing financial literacy and credit access (Rahmawati et al., 2025), Bank BTN contributed to building long-term sustainability within the village economy.

4.4 MSME Performance Improvements: Efficiency, Revenue, and Employment

Quantitative indicators demonstrate substantial improvements in MSME performance as a result of the program. The total number of active MSMEs in Rajeg Village increased from 1,200 in 2021 to 1,850 in 2024, marking a 54% growth. Employment absorption also rose significantly, from 3,500 to 5,200 workers, thereby reducing local unemployment rates and contributing to inclusive village development.



	2021	2024
Total MSMEs	1200	1850
MSMEs Worker	3500	5200

Turnover improvements were particularly notable. As shown in Graph 2, average monthly revenue per MSME grew consistently year on year, from Rp 7 million in 2021 to Rp 12 million in 2024. This trend underscores how digitalization and access to credit enhanced operational efficiency and expanded market access. It is consistent with Purnomo et al., who found that digital transformation directly influences profitability in Indonesia's MSME manufacturing sector (Purnomo & Purwandari, 2025).

Efficiency gains were also reported qualitatively. Entrepreneurs highlighted reduced transaction times, simplified bookkeeping through digital records, and greater ease in connecting with customers. Social media platforms further expanded marketing reach, enabling MSMEs to target niche consumer segments. These findings corroborate Saleh et al. (2025), who established that digital tools significantly reduce operational costs and streamline processes for MSMEs in Indonesia.

Overall, the combination of legal compliance, financial inclusion, and digital adoption created a synergistic effect that elevated MSME competitiveness at both local and regional levels.

4.5 Challenges and Constraints

Despite the positive outcomes, several challenges persist. First, digital literacy remains uneven. While younger entrepreneurs adapted quickly to QRIS and social media platforms, older business owners often struggled with basic digital tools. This digital divide limited the inclusiveness of program outcomes and underscores the need for continuous training.

Second, infrastructure posed a significant barrier. Internet connectivity in Rajeg Village was frequently unstable, particularly in peripheral areas. Poor connectivity not only constrained e-commerce adoption but also hindered the reliability of QRIS transactions. As Meidyasari notes, inadequate digital infrastructure remains one of the most pressing barriers to MSME digitalization in rural Indonesia (Meidyasari, 2024).

Third, financial readiness varied widely. Some MSMEs hesitated to access KUR loans due to fear of debt or lack of collateral. While the government has sought to mitigate these concerns through low-interest schemes, cultural attitudes toward credit continue to shape participation.

Finally, institutional coordination, although improved, still requires refinement. Some MSMEs reported confusion over overlapping roles between village authorities and external agencies, leading to duplication of training and inconsistent communication. Addressing these gaps will be critical for scaling the model to other villages.

4.6 Interpretation and Theoretical Implications

The results clearly demonstrate that digitalization through QRIS and e-commerce platforms significantly expanded market access and operational efficiency for MSMEs. This aligns with broader scholarly evidence emphasizing that digital adoption is a catalyst for competitiveness and resilience (Indriastuti & Kartika, 2022; Rusliana et al., 2024). Moreover, the findings validate the proposition that collaborative governance—anchored in village-level facilitation and bank-led financial inclusion—creates an enabling ecosystem for MSMEs, resonating with Ansell and Gash's (2008) framework.

Village governments functioned as facilitators of legality and digital readiness, reducing administrative bottlenecks and enhancing trust in formal institutions. Banks, conversely, acted as financial enablers, expanding credit access and embedding digital literacy within business practices. This dual role structure reflects the complementarities outlined in institutional theory, where multiple actors collaborate to overcome systemic barriers (Bican & Brem, 2020).

However, persistent challenges highlight the importance of infrastructure and capacity-building as mediating factors. Without reliable internet connectivity and sustained literacy programs, digitalization risks exacerbating inequality between technologically adept and less literate MSMEs. Thus, while the collaborative model demonstrates potential for replication, its scalability is contingent upon addressing these foundational barriers.

CONCLUSION

The case of Rajeg Village demonstrates that multi-stakeholder collaboration involving village governments, MSMEs, and Bank BTN yields significant improvements in digital adoption, financial inclusion, and business performance. The adoption of QRIS, NIB registration, and halal certification not only formalized enterprises but also expanded their competitiveness in digital markets. With turnover and employment both rising substantially, the program underscores the transformative potential of collaborative governance in rural MSME development.

Nevertheless, structural barriers such as digital literacy gaps, infrastructural deficiencies, and cultural hesitation toward credit continue to impede inclusive progress. Addressing these challenges is imperative for scaling the model nationally. By integrating digital tools, financial inclusion, and governance support, this approach offers a replicable pathway toward inclusive rural economic empowerment in Indonesia.

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