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PUBLIC POLICY STRATEGIES FOR MSME DIGITAL TRANSFORMATION: PROMOTING SUSTAINABLE ECONOMIC GROWTH AND REDUCING INEQUALITIES IN SURAKARTA, INDONESIA

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ABSTRACT

This study examines how public policy strategies support MSME digital transformation and how these strategies contribute to sustainable local economic growth and reduced inequalities in Surakarta, Indonesia. The study responds to concerns that digitalisation can widen inequalities when MSMEs differ in capital, digital skills, managerial capability, infrastructure access, and market opportunities. Using a qualitative descriptive design, data were collected through in-depth interviews, field observations, and document analysis involving 20 informants: 11 MSME owners, five local government officials, and four digital ecosystem stakeholders. The findings show that digital transformation among MSMEs occurs along a continuum, from basic communication-oriented adoption to integrated digital business practices involving marketplaces, digital payments, stock monitoring, and online promotion. Local government support has encouraged formalisation, digital literacy, QRIS adoption, marketplace participation, product certification, and collaboration with banks, universities, platforms, and MSME communities. However, elderly-owned businesses, traditional micro-enterprises, women-led home businesses, and peripheral MSMEs remain vulnerable because they face limited skills, unstable internet access, high platform costs, weak digital security capacity, and limited follow-up mentoring. The study proposes an integrated policy strategy connecting digital capacity strengthening, infrastructure and platform access, financial and institutional support, regulatory facilitation and data governance, and multi-stakeholder collaboration. The study argues that inclusive digital transformation should be measured not only by the number of MSMEs using digital tools, but also by sustained use, improved productivity, safer transactions, wider market access, and reduced capability gaps.

Keywords: digital governance, inclusive development, MSME digital transformation, public policy, reduced inequalities

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INTRODUCTION

Digital transformation has become a major issue in contemporary development because it changes how enterprises produce, communicate, process information, reach consumers, and organise value creation. For MSMEs, digital tools such as marketplaces, social media, digital payments, cloud services, delivery platforms, and data-based marketing can expand market reach and improve business flexibility. However, digital adoption does not automatically mean that an MSME has undergone comprehensive digital transformation. A business may use WhatsApp, QRIS, or an online marketplace while still managing finance, stock, customer records, and strategic decisions through conventional routines. Digital transformation therefore needs to be understood as a broader process involving technology use, managerial capability, human resources, infrastructure, business processes, and adaptive organisational learning. This distinction is important because policy that only counts platform registration may overstate transformation and ignore whether MSMEs can use digital tools safely, independently, and productively (Vial, 2019; Verhoef et al., 2021).

Recent studies show that SME digital transformation is influenced by differences in firm size, managerial education, financial capacity, human resources, and strategic orientation. Clemente-Almendros et al. (2024) found that digital transformation is shaped by firm heterogeneity, particularly differences in resources and growth capacity. Omrani et al. (2024) further emphasised that adoption depends on interactions between technology, organisation, environment, leadership, and external support. Romero and Mammadov (2025) describe SME digital transformation as an innovation process that affects products, processes, and business routines rather than a simple technology decision. Other studies show that e-business, ambidexterity, and entrepreneurial orientation can improve SME performance when firms possess the organisational capability to apply technology consistently (Hanoum et al., 2025). These findings indicate that digitalisation requires a combination of business readiness and institutional support rather than a uniform intervention applied to all MSMEs.

The literature also shows that digitalisation may produce both inclusion and exclusion. Digital tools can help MSMEs survive market disruption, reduce transaction barriers, and connect small producers with wider consumers. At the same time, businesses with higher education, better finance, stronger internet access, and more advanced managerial skills often capture greater benefits from digital platforms than less-prepared micro-enterprises. Rupeika-Apoga and Petrovska (2022) identify shortages of skills, funding constraints, cyber-security concerns, and limited managerial knowledge as major barriers to sustainable digital transformation. Restrepo-Morales et al. (2024) show that investment costs, employee resistance, weak digital culture, and limited knowledge of technology providers can slow transformation. Muhammad et al. (2025) also caution that new technologies, including artificial intelligence, may deepen the digital divide when firms lack the resources and support needed to adopt them effectively.

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Previous research has made important contributions, but several gaps remain. Many studies focus on firm-level determinants, digital readiness, technology adoption, or business performance, while fewer studies examine how municipal governments combine policy instruments to support inclusive digital transformation. Previous studies have also tended to treat MSMEs as a broad category, even though a micro-scale food vendor, a home-based craft producer, a traditional retailer, and a medium-sized manufacturing business may have very different digital capabilities and policy needs. Little attention has been paid to who benefits most from local digitalisation programmes and who may be left behind when policies assume equal access to infrastructure, skills, finance, and market opportunities. Another limitation is that sustainability is often discussed narrowly as business survival or income increase, while sustainable transformation should also include resilience, fair access, safer transactions, institutional learning, and reduced capability gaps. This study addresses these gaps by analysing MSME digital transformation as a local governance issue connected to SDG 10 on reduced inequalities.

Surakarta is selected as a single-city case because it offers a relevant municipal setting for examining how digital transformation policies operate in a diverse urban MSME ecosystem. The city has MSMEs in culinary activities, batik and fashion, handicrafts, creative services, local retail, processed food, and urban agriculture, allowing comparison across sectors with different digital requirements. The focus on one city does not aim to produce statistical generalisation to all Indonesian regions. Instead, it provides analytical transferability by explaining policy mechanisms, readiness differences, and inclusion challenges that may also appear in other medium-sized urban economies. Surakarta is therefore treated as an informative case for understanding how municipal policy can link digital capacity, infrastructure, financing, legal facilitation, and collaboration. This case-based approach is appropriate because local implementation conditions often determine whether national digital agendas become inclusive opportunities or new sources of inequality.

The objective of this study is to analyse public policy strategies that support MSME digital transformation in Surakarta and examine their contribution to sustainable economic growth and reduced inequalities. Specifically, the study investigates how digital capacity building, infrastructure and platform access, financial and institutional support, regulatory facilitation, and multi-stakeholder collaboration shape MSME participation in the digital economy. It also identifies barriers that limit inclusive participation among traditional, elderly-owned, women-led, micro-scale, and peripheral MSMEs. The novelty of the study lies in its integrated municipal policy strategy that links MSME readiness with coordinated support and measurable inclusive outcomes. The study contributes to public policy and digital governance literature by showing that digital transformation should not be assessed only through adoption indicators. Instead, inclusive transformation requires evidence of sustained use, improved productivity, safer digital participation, wider market access, and reduced gaps among different MSME groups.

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METHODS

This study employed a qualitative descriptive design to examine public policy strategies that support MSME digital transformation in Surakarta, Indonesia. The qualitative approach was selected because the study sought to understand experiences, meanings, interactions, and policy mechanisms rather than estimate causal effects. The design enabled the researchers to explore how MSME owners, local government officials, and digital ecosystem stakeholders interpret digitalisation, policy support, and inclusion challenges. The study does not claim that digitalisation statistically causes improved economic outcomes. Instead, it identifies perceived associations, enabling conditions, policy pathways, and barriers that shape how MSMEs experience digital transformation. This position is consistent with qualitative inquiry, which prioritises contextual interpretation and multiple sources of evidence in explaining complex social processes (Creswell & Creswell, 2018; Creswell & Poth, 2024; Kim et al., 2017).

The unit of analysis was the public policy strategy for MSME digital transformation within the Surakarta municipal governance context. The study involved 20 informants selected through purposive and maximum-variation sampling to capture differences in business sector, institutional role, digital readiness, gender, age, location, and level of involvement in MSME digitalisation. The informants consisted of 11 MSME owners, five local government officials, and four representatives of digital ecosystem institutions, including banking, platform, university, and business association actors. MSME informants were included when they operated in Surakarta, had used at least one digital tool or participated in digitalisation-related support, and were willing to provide informed consent. Government and ecosystem informants were included when they had direct knowledge of MSME development, digital infrastructure, training, financing, regulation, or platform facilitation. The sample size was determined through information power and thematic saturation, where the relevance and diversity of information were considered more important than statistical representativeness (Hennink & Kaiser, 2022; Malterud et al., 2016).

Data were collected through semi-structured interviews, field observations, and document analysis. The interview guide covered digital adoption experience, readiness and capability, barriers and risks, public policy support, programme accessibility, institutional collaboration, and recommendations for inclusive digital transformation. Interviews were conducted individually and were supported by field notes regarding business conditions, digital practices, programme settings, and contextual constraints. Documentary sources included policy documents, programme guidelines, local development documents, training materials, and institutional information related to MSME development and digitalisation. This combination was used to strengthen triangulation and reduce reliance on a single source of evidence. A before-and-after or longitudinal design would be useful for future causal evaluation, but the present study

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focuses on cross-sectional qualitative explanation of how actors perceive and experience local policy support.

Data analysis followed an iterative thematic procedure. Interview transcripts, observation notes, and documents were read repeatedly to identify recurring meanings and patterns. Coding combined deductive codes based on the five policy dimensions with inductive codes emerging from the data, including platform costs, fraud concerns, family dependency, gendered time constraints, peripheral infrastructure, and fragmented programme follow-up. Codes were then grouped into broader categories and themes that explained readiness differences, policy support, inclusion barriers, and integrated strategy requirements. Data displays and comparison matrices were used to compare MSME owners, government officials, and ecosystem stakeholders (Miles et al., 2020). Trustworthiness was strengthened through source triangulation, comparison across stakeholder groups, participant confirmation of key interpretations, peer discussion, and an audit trail documenting coding and analytical decisions (Braun & Clarke, 2021; Castleberry & Nolen, 2018; Nowell et al., 2017).

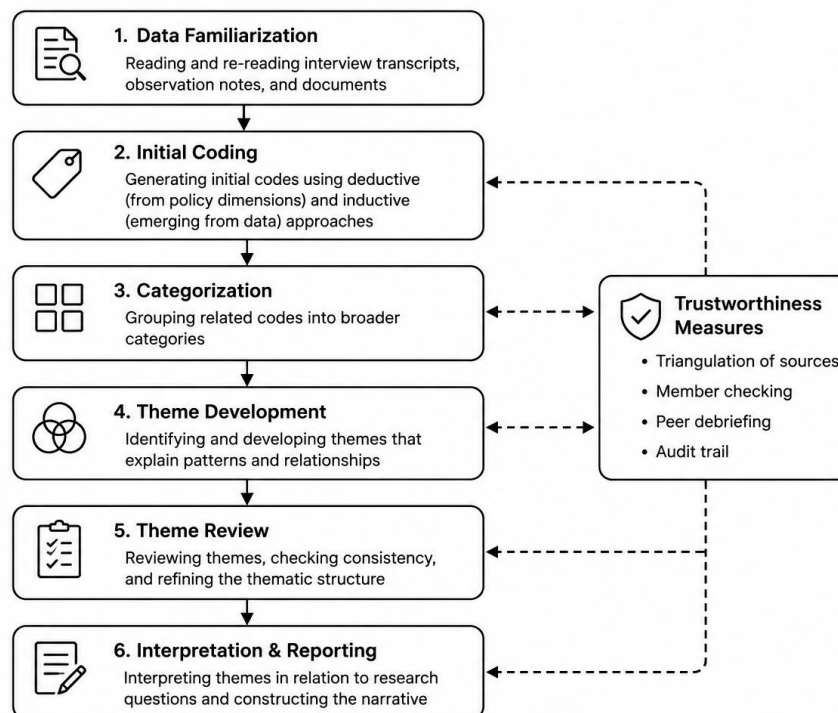


Figure 1. Data Analysis Process

Source: Developed by the authors based on Miles et al. (2020), Braun and Clarke (2021), and Nowell et al. (2017).

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RESULTS AND DISCUSSION

3.1 Digital Transformation Landscape and Unequal Readiness among MSMEs in Surakarta

Interview, observation, and documentary evidence show that digital transformation among MSMEs in Surakarta has progressed through diverse and uneven pathways. Most participating MSMEs had adopted at least one digital tool, including social media, online marketplaces, food-delivery applications, digital payments, messaging applications, and basic digital accounting systems. However, the intensity of technology use varied substantially across business sectors, business scale, owner characteristics, access to resources, and location. Some MSMEs had integrated digital platforms into marketing, sales, payment, stock monitoring, and customer management, whereas others used technology only to receive orders or communicate with existing customers. This finding confirms that digital transformation should not be understood as simple technology adoption. The Surakarta case therefore reveals a continuum of digital readiness, ranging from basic communication-oriented adoption to integrated digital business practices (Pelletier & Cloutier, 2019; Pingali et al., 2023).

Table 1. Digital Transformation Patterns and Readiness among MSMEs in Surakarta

Readiness category	Informant codes	Dominant digital practices	Main characteristics	Key constraints
High and integrated readiness	MSME-02, MSME-05, MSME-07, MSME-08	Marketplace, social media, digital payments, live streaming, digital cashier, stock and order management	Digital tools are embedded in marketing and operational activities	Advertising costs, platform algorithm changes, financial analysis, content-production costs
Moderate and selective readiness	MSME-01, MSME-03, MSME-06, MSME-09, MSME-10, MSME-11	Social media, food delivery, WhatsApp Business, QRIS, marketplace, online scheduling	Digital tools are mainly used for promotion, orders, communication, or selected business functions	Manual financial records, logistics, unstable internet, limited analytics capability, perishable products
Low and dependent readiness	MSME-04	WhatsApp and limited QRIS use	Technology is used only for basic communication and depends on family assistance	Low confidence, age-related barriers, limited skills, fraud concerns, financial limitations

Source: Authors' analysis based on interview data, 2026.

The highest level of readiness was found among MSMEs that combined marketplace participation, visual content production, digital payments, and internal management applications. MSME-02, a modern batik business, stated, "Our turnover increased by up to 200 percent when we consistently conducted live streaming," indicating that interactive content had expanded its market beyond Surakarta. MSME-05, a shoe-care service provider, added that "monthly financial records are automatically organised through the cashier application," showing that technology was used for both customer acquisition and administrative efficiency. These MSMEs were characterised by stronger digital confidence, younger work teams, mentoring participation, and greater

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willingness to experiment with platform features. Their experience indicates that digital readiness depends on the capacity to identify technological opportunities and translate digital tools into business action. This pattern is consistent with studies showing that digital transformation requires digital culture, managerial support, human resources, and financial resources for technology use and promotion (Faiz et al., 2024; Kraus et al., 2022).

A second pattern involved MSMEs that had entered digital markets but had not yet transformed their internal business processes. MSME-01, a culinary business owner, stated that "digitalisation is still only used for promotion and orders, while bookkeeping remains in a notebook." A similar pattern appeared in MSME-06, where food-delivery applications helped sustain sales and reach hotel-based consumers, but kitchen management and financial recording remained conventional. MSME-03 and MSME-08 had developed stronger digital marketing practices through product catalogues, marketplace use, and market observation, yet they still experienced difficulties in paid advertising and data-based decisions. These findings suggest that online presence does not automatically result in comprehensive digital transformation. This condition is consistent with Indonesian SME research showing that firms often begin digitalisation through marketing and transactions before developing advanced management capabilities (Priyono et al., 2020; Rahayu & Day, 2017).

Unequal readiness was most evident among traditional, elderly-owned, micro-scale, and peripheral MSMEs. MSME-04, a traditional grocery store owner, explained, "I depend entirely on my child. When my child is working outside, WhatsApp orders are not answered." MSME-09 highlighted the spatial dimension of the digital divide by stating, "The internet connection is unstable because our production house is located on the outskirts of Surakarta." GOV-01 also observed a substantial gap between younger entrepreneurs and business owners above fifty years old, especially among traditional wet-food producers and home-based craft businesses. ECO-03 further noted that many MSMEs can create online accounts but still cannot interpret sales data for business strategy. These findings show that readiness is shaped by age, device quality, digital confidence, capital, learning time, and sustained assistance, not merely by internet access.

3.2 Public Policy Support for MSME Digital Transformation

Public policy support for MSME digital transformation in Surakarta has been implemented through business formalisation, digital literacy training, marketplace facilitation, non-cash payment adoption, infrastructure development, and targeted empowerment. Several agencies are involved, including the Office of Cooperatives and MSMEs, the Office of Communication and Informatics, the Office of Trade, Bappeda, and the women's empowerment agency. The policy approach seeks to move MSMEs from informal activities toward more formal and digitally connected business practices

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through business identification numbers, product certification, marketplace accounts, and QRIS adoption. GOV-01 explained that "the indicator of success is the number of MSMEs actively conducting digital transactions after training, not merely the number of accounts created." This shows that local government has begun to move beyond symbolic digitalisation toward more outcome-oriented support. Such an approach is consistent with the view that public intervention should build conditions that enable small businesses to use digital tools productively and sustainably (Chen et al., 2021; Garzoni et al., 2020).

Digital capacity-building programmes were perceived as useful when they addressed practical business needs. MSME-01 reported that training from the local cooperative office improved food packaging practices for online delivery, although the owner still needed help with paid advertisements and search optimisation. MSME-06 benefited from assistance in obtaining a business identification number, which enabled participation in formal digital-payment ecosystems. However, MSME-04 had never received direct digital training and stated that "the best policy would be for local officers to come directly to old grocery stores and teach us slowly on-site." This indicates that general training is not equally accessible to elderly entrepreneurs, traditional micro-businesses, and owners who cannot leave daily operations. The evidence shows that training can increase basic capability, but its effectiveness depends on continuity, accessibility, and adaptation to different readiness levels.

Table 2. Public Policy Support for MSME Digital Transformation in Surakarta

Policy dimension	Main forms of support	Reported benefits	Remaining limitations
Digital literacy and mentoring	Marketplace training, product photography, digital marketing, financial literacy, incubation programmes	Improved product presentation, online promotion, customer communication, and basic platform use	Training is often short-term and not equally accessible to elderly or low-readiness MSMEs
Business formalisation and legal support	NIB registration, halal certification, intellectual property facilitation, product testing and certification	Greater eligibility for digital platforms, formal payments, product trust, and wider market participation	Follow-up support for digital financial management and market expansion remains limited
Marketplace and local-product promotion	Digital exhibitions, e-commerce facilitation, platform partnerships, export administration training	Increased market visibility, wider customer reach, and stronger local branding	High advertising costs, algorithmic competition, and limited support for local-product visibility
Infrastructure and payment systems	Public Wi-Fi, QRIS expansion, e-retribution, data integration, internet access in public spaces	Easier non-cash transactions, improved access to online markets, and greater business connectivity	Uneven internet quality in peripheral areas and limited access to reliable devices
Financial and institutional support	KUR information, digital financial literacy, banking partnerships, women-focused financial programmes	Improved financial awareness and access to formal financial services	Collateral requirements, limited financing for equipment, and insufficient support for scaling
Sectoral and inclusive support	Women entrepreneur programmes, market-based QRIS assistance, local business partnerships	Expanded participation among women-owned and traditional businesses	Support remains uneven across creative services, agriculture, peripheral enterprises, and elderly-owned businesses

Source: Authors' analysis based on interview data, 2026.

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Support for marketplace access, digital payments, and local product promotion has created new opportunities for MSMEs to reach wider consumer segments. GOV-03 described the expansion of QRIS and e-retribution in traditional markets as a strategy to encourage non-cash transactions and introduce traders to broader digital commerce practices. MSME-02 appreciated support through digital MSME exhibitions and trademark registration, but argued that "a local e-commerce platform for authentic Solo products without administration fees would be very helpful." At the same time, MSME-09 reported that free public internet infrastructure in peripheral areas remained limited. These findings show that market access policies cannot be separated from reliable internet, affordable tools, promotional support, and platform visibility. Institutional support is especially important because MSME adoption is influenced by regulatory signals, facilitation mechanisms, and the wider environment in which business actors interact with digital platforms (Fauzi & Sheng, 2022; Mishrif & Khan, 2023).

Financial and institutional support emerged as another critical component. MSME-07 stated that digital financial literacy training helped separate household and business accounts, but access to collateral-free financing for equipment remained limited. MSME-05 also explained that soft-loan information was available, but collateral requirements were difficult for a rented service business to fulfil. These experiences suggest that formalisation and financial literacy are necessary but insufficient when MSMEs still lack affordable capital for devices, production equipment, paid promotion, or business-system upgrades. Financial support should therefore consider digital transaction records, verified legality, and marketplace performance as alternative indicators of creditworthiness. Research shows that government support and fintech-based mechanisms can improve finance access, survival, and performance among smaller enterprises (Abu et al., 2025; Audretsch et al., 2025).

The sustainability of policy support depends on whether programmes continue beyond initial training and ceremonial activities. ECO-02 stated that government cooperation with platforms was progressive, but "its effectiveness is often limited to programme launches without follow-up evaluation of sales performance after training." ECO-03 similarly observed that many programmes remained one-size-fits-all and did not sufficiently differentiate MSMEs according to readiness, sector, or resource constraints. These accounts indicate that fragmentation, weak monitoring, and limited mentoring capacity may reduce the long-term impact of relevant programmes. Stronger collaboration with universities, banks, platforms, and business associations is needed to provide ongoing mentoring, data-based evaluation, financial linkage, and market access support. Innovation intermediaries can play a strategic role in connecting SMEs with knowledge, technology, and cross-sectoral resources required for sustained transformation (Hafeez et al., 2025).

3.3 Barriers to Inclusive Digital Participation and Governance Challenges

The findings indicate that the benefits of digital transformation have not been distributed evenly among MSMEs in Surakarta. Barriers emerged at the individual, business, market, infrastructure, and institutional levels, creating different capacities to participate in the digital economy. While several MSMEs expanded markets and improved operational efficiency, others used digital tools only for basic communication or order-taking. The most common constraints were limited digital literacy, inadequate devices, high advertising costs, financial pressure, weak confidence in digital transactions, and dependence on family members or external assistance. These findings suggest that digital transformation is not mainly a technology-access issue, but a broader capability and governance issue. Human capital, organisational capability, and external relationships therefore remain central to understanding SME digitalisation (Romero & Mammadov, 2025).

At the individual level, elderly entrepreneurs, traditional micro-business owners, and women-led home-based enterprises appeared to be the most vulnerable groups. MSME-04 stated, "I depend entirely on my child. When my child is working outside, WhatsApp orders are not answered." This statement shows that digital access may remain ineffective when business owners lack confidence and practical skills. MSME-07 described how content creation had to be balanced with household responsibilities and childcare. GOV-05 confirmed that women entrepreneurs often face limited time for technology learning because of dual roles in household and business activities. These findings reflect evidence that digital readiness is constrained by skills, knowledge, organisational management, financial capacity, and support networks (Anatan & Nur, 2023).

Financial pressures and platform-based competition limited meaningful participation in digital markets. MSME-01 reported that commissions from food-delivery applications could reach 20 percent of sales, reducing narrow profit margins. MSME-08 explained that search algorithms tended to favour better-funded sellers able to afford advertising and professional content equipment. MSME-02 also faced rising pay-per-click advertising costs and product-photo imitation by competing online stores. These conditions show that entering a marketplace does not guarantee equal visibility, profitability, or bargaining power. Research on Indonesian SMEs demonstrates that trust, perceived usefulness, financial literacy, innovation orientation, and government support influence adoption of digital financial technology and digital transactions (Nugraha et al., 2022).

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Table 3. Barriers to Inclusive Digital Participation and Governance Challenges in Surakarta

Barrier dimension	Empirical evidence	Vulnerable MSME groups	Governance challenge
Digital literacy and confidence	Limited ability to create content, manage marketplace accounts, analyse sales data, and use QRIS independently	Elderly-owned businesses, traditional retailers, low-education micro-enterprises	Training is not always accessible, continuous, or adjusted to beginner-level needs
Financial and platform costs	Advertising expenses, platform commissions, device costs, internet quotas, and premium software fees	Micro-enterprises, start-up businesses, home-based businesses	Limited affordable financing and insufficient incentives for digital investment
Trust and digital security	Fake orders, payment fraud, account hacking, fake reviews, fraudulent proof of transfer, and product imitation	Elderly entrepreneurs, low-literacy users, micro-scale businesses	Cybersecurity education, consumer protection, and IP support remain limited
Infrastructure and location	Unstable internet access, limited public Wi-Fi, outdated devices, and peripheral distribution constraints	Peripheral MSMEs, craft producers, informal enterprises	Uneven infrastructure and limited local access points for technical support
Sector-specific operational constraints	Perishable products, delivery risks, high logistics costs, product returns, and visual-content demands	Culinary, agriculture, handicraft, and personal-service MSMEs	Policies are often insufficiently differentiated according to sectoral needs
Institutional coordination and programme continuity	Overlapping programmes, limited follow-up, short-term training, and weak post-training evaluation	MSMEs with low readiness and limited networks	Fragmented coordination and limited mentoring capacity across agencies and partners

Source: Authors' analysis based on interview data, 2026.

Spatial and sectoral conditions further intensified unequal digital benefits. MSME-09 stated that "the internet connection is unstable because our production house is located on the outskirts of Surakarta," illustrating how peripheral location can restrict access to online markets and programme information. MSME-10 faced different constraints because vegetables are perishable and require rapid delivery, while capital for refrigerated transport remained limited. MSME-03 also experienced high logistics costs and complex export procedures for heavy handicraft products. These examples show that a uniform marketplace-oriented policy is unlikely to fit all sectors. Previous research confirms that location and local business environments influence SME digitalisation, with peripheral areas often facing greater obstacles (Holl & Rama, 2024).

Institutional barriers were evident in programme coordination and continuity. ECO-02 stated that collaboration between the city government and digital platforms was promising, but its impact was limited when sales performance after training was not evaluated. ECO-03 argued that programmes remained one-size-fits-all and were not sufficiently differentiated according to readiness, sector, or resource capacity. ECO-04 noted that overlapping programmes across agencies could confuse MSMEs when selecting support that matched their needs. These findings indicate that the governance challenge is the absence of an integrated pathway connecting training, mentoring,

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financing, infrastructure, market access, digital security, and post-programme evaluation. SME digitalisation produces better outcomes when digital skills, organisational orientation, technology use, and strategic implementation are aligned rather than treated as separate interventions (Kallmuenzer et al., 2025).

These barriers show that digital transformation may deepen inequality when policy success is measured only by the number of MSMEs registered on platforms, using QRIS, or attending training. Such indicators capture early adoption but not independent use, sustained sales, safer transactions, finance access, or wider market participation. The issue is directly related to SDG 10 because unequal digital capability can reproduce disparities between centre and peripheral businesses, larger and smaller firms, younger and older entrepreneurs, and male and women-owned enterprises. Digital transformation also creates risks related to customer information, payment data, marketplace accounts, product imitation, fake reviews, and intellectual property protection. Therefore, inclusive policy must combine mentoring, affordable finance, digital-security education, consumer protection, sector-specific logistics, and readiness-based targets. Digitalisation should move from a platform-enrolment agenda toward a substantive strategy for reducing inequality among MSME actors.

3.4 Integrated Policy Strategy for Sustainable Growth and Reduced Inequalities

The findings from the previous sections show that MSME digital transformation in Surakarta cannot be strengthened through isolated programmes. Training, marketplace registration, QRIS adoption, business legality, financing, and public internet access have generated benefits, but their impacts remain uneven because they are not always connected to distinct readiness and operational needs. GOV-01 described an emerging division of work by stating that "the government handles business legality, banks provide access to soft loans, and e-commerce platforms deliver marketing training." However, this division of work has not yet guaranteed an integrated support pathway for MSMEs with limited capital, weak digital literacy, or sector-specific logistics constraints. Therefore, the central contribution of this study is an integrated policy strategy that links MSME readiness with coordinated public support, ecosystem collaboration, digital security, and measurable inclusive outcomes. The model responds to the need to identify who benefits most, who is left behind, and what policy mechanisms can narrow capability gaps.

The proposed strategy consists of five interdependent policy dimensions: digital capacity strengthening, inclusive infrastructure and platform access, financial and institutional support, regulatory facilitation and data governance, and multi-stakeholder collaboration. These dimensions should not be implemented sequentially or treated as separate programmes because weakness in one dimension can reduce the effectiveness of the others. Training may not improve performance when MSMEs cannot afford devices,

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advertising costs, internet access, or logistics services. Financial support will also have limited impact when recipients lack the skills to manage online transactions, interpret market data, or protect accounts from fraud. The D-BEST perspective similarly emphasises the relationship between data, business, ecosystem, skills, and technology in supporting SME digital transformation (Sassanelli & Terzi, 2022). Sustainable digital transformation should therefore be assessed through long-term economic, social, and organisational outcomes rather than the number of technologies adopted (Melo et al., 2023).

Table 4. Integrated Policy Strategy for Inclusive MSME Digital Transformation in Surakarta

Policy dimension	Core intervention	Main actors	Inclusion mechanism	Expected outcome
Digital capacity strengthening	Tiered training, one-on-one mentoring, digital security education, bookkeeping and data-analysis assistance	City government, universities, business associations, platform providers	Separate support for low, moderate, and advanced readiness MSMEs	Improved digital skills, independent platform use, and stronger business management
Infrastructure and platform access	Public Wi-Fi, affordable devices, digital service points, local-product promotion, shared logistics facilities	Diskominfo, platforms, telecommunications providers, logistics partners	Priority for peripheral areas, traditional markets, and low-connectivity business clusters	More equal access to online markets, payments, and business information
Financial and institutional support	Collateral-light finance, digital transaction-based credit assessment, equipment support, advertising incentives	Local banks, cooperatives, fintech providers, city government	Targeted financing for micro, women-owned, and low-capital enterprises	Greater ability to invest in technology, production, promotion, and business expansion
Regulatory facilitation and data governance	Simplified legality, certification, local e-catalogue, integrated MSME data, local-product protection	City government, trade office, cooperative office, Bappeda	Easier programme access and better identification of excluded MSME groups	Formalisation, transparent support allocation, and stronger local-market participation
Multi-stakeholder collaboration	Permanent local digital transformation forum, shared monitoring, incubator and mentoring network	Government, universities, banks, platforms, MSME communities, media	Representation of women, elderly entrepreneurs, peripheral businesses, and traditional sectors	Coordinated implementation, sustained mentoring, and inclusive digital ecosystem development

Source: Authors' synthesis based on interview data, 2026.

The first dimension concerns differentiated capacity strengthening based on readiness level. ECO-03 stressed that low-readiness groups require "one-on-one mentoring for at least three to six months, not only a one-day seminar." This is important because elderly-owned businesses, traditional food producers, women-led home enterprises, and micro-scale retailers often need direct guidance that can be applied in daily operations. Capacity-building should begin with basic smartphone use, customer communication, QRIS operation, digital security awareness, and simple financial recording before progressing to online advertising, content development, data analytics, and customer relationship management. Universities can act as knowledge providers by preparing simple modules, conducting field-based mentoring, and evaluating programme

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outcomes. MSME communities can complement this role through peer learning and local business networks.

The second and third dimensions focus on infrastructure, platforms, financing, and institutional support. GOV-02 highlighted the need for public internet access in neighbourhood facilities and markets, especially for clusters located outside central economic areas. This should be complemented by affordable devices, reliable connectivity, shared logistics, and platform visibility for local products. ECO-02 proposed a subsidised shared warehouse and logistics cluster because high delivery costs remain a major barrier for local MSMEs seeking wider markets. Financial support should move beyond conventional collateral by considering digital transaction records, marketplace performance, and verified business legality as alternative indicators of creditworthiness. Digital platforms can support business-model innovation only when MSMEs are able to reconfigure resources, operations, and customer relationships around new market opportunities (Xie et al., 2022).

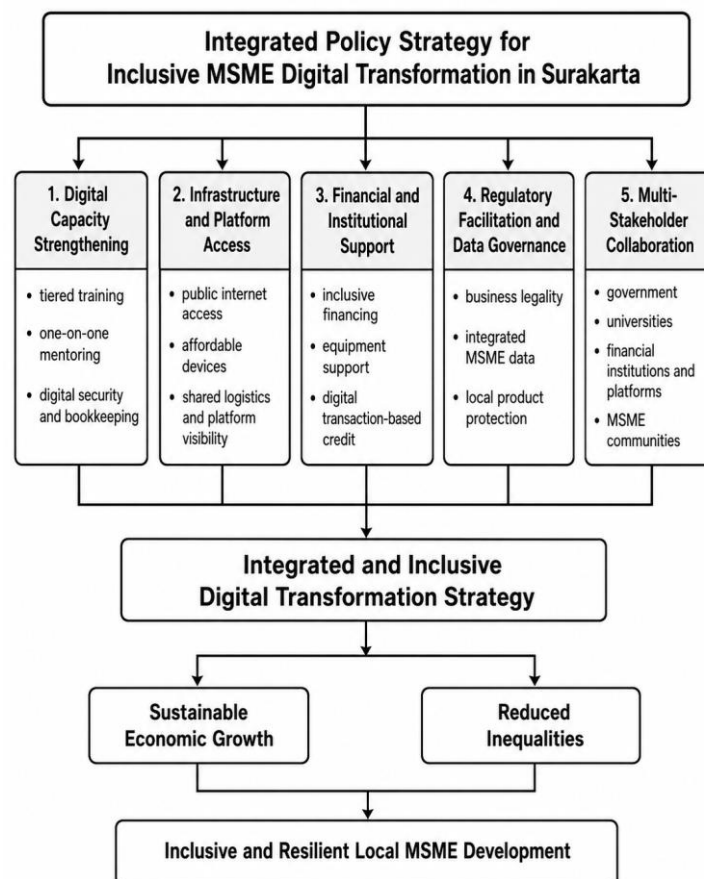


Figure 2. Integrated Policy Strategy for Inclusive MSME Digital Transformation in Surakarta

Source: Authors' synthesis based on interview data, 2026.

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The fourth and fifth dimensions emphasise regulatory facilitation, integrated data governance, and multi-stakeholder collaboration. GOV-04 explained that cross-sectoral coordination is necessary to reduce sectoral ego between local agencies and to ensure that digital economy programmes are supported by coherent planning and budgeting. An integrated MSME database should combine legality, sector, location, digital readiness, training participation, financing access, and transaction development to identify groups requiring additional support. ECO-01 also recommended a single MSME data platform that links digital transaction records with business legality to strengthen access to financing and reduce information gaps. Government-led digital transformation succeeds when public institutions mobilise networks, resources, and ecosystem relationships rather than relying only on internal bureaucratic capacity (Senyo et al., 2024). Collaboration should therefore be institutionalised through a permanent city-level forum involving government, universities, financial institutions, platforms, MSME associations, logistics providers, and community organisations.

This integrated strategy offers a more substantive approach to sustainable growth and reduced inequalities. Its success should be measured not only by marketplace registration, QRIS ownership, or training attendance, but also by sustained digital use, sales growth, improved financial management, safer transactions, access to finance, employment opportunities, and reduced gaps between MSME groups. The role of city government is to provide policy direction, regulation, budget coordination, and inclusive monitoring. Universities provide knowledge support, financial institutions expand accessible capital, platforms connect MSMEs with markets, and communities ensure that assistance remains grounded in business realities. This ecosystem approach is consistent with research linking digital transformation, innovation, and collaborative business ecosystems to more sustainable development outcomes (Liao et al., 2024). The strategy can be adapted by other Indonesian cities with similar urban economies if they first map MSME readiness, sectoral characteristics, spatial disparities, and institutional capacity.

CONCLUSION

This study concludes that public policy plays an important role in supporting MSME digital transformation in Surakarta, but its effectiveness depends on how well policy instruments are integrated and adapted to the readiness of business actors. The findings show that digitalisation has expanded market access, improved product visibility, supported online transactions, and created new economic opportunities for several MSMEs. However, these benefits are not experienced equally because readiness varies by sector, scale, owner characteristics, financial capacity, infrastructure access, and managerial capability. More adaptive MSMEs can use marketplaces, social media, digital payments, and business applications to improve productivity and reach wider markets. In contrast, traditional micro-enterprises, elderly-owned businesses, women-led home

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businesses, and peripheral MSMEs still face difficulties in using digital tools independently. Therefore, MSME digital transformation in Surakarta is not merely technological adoption, but a governance process that requires inclusive and responsive public policy.

The study finds that local policy strategies include digital literacy training, business formalisation, marketplace facilitation, QRIS adoption, infrastructure support, financial access, product certification, and collaboration with ecosystem actors. These strategies have contributed to MSME upgrading by improving online promotion, legal eligibility, transaction systems, market participation, and business credibility. Nevertheless, their impact remains limited when support is short-term, generic, and weakly connected to post-training evaluation. Several MSMEs still need continuous mentoring, practical assistance, affordable devices, reliable internet access, cybersecurity education, and support for financial management. This study does not claim a causal effect between digitalisation and economic performance because the method is qualitative and cross-sectional. Instead, it explains perceived pathways and governance conditions through which digital policy support may strengthen MSME participation in the digital economy.

The research further shows that barriers to inclusive digital participation are multidimensional. At the business level, MSMEs face limited literacy, weak confidence, high platform commissions, paid advertising costs, logistics constraints, fraud risks, data security concerns, product imitation, and limited capital. At the governance level, challenges include uneven programme information, fragmented coordination, limited follow-up after training, and insufficient differentiation based on readiness and sectoral needs. These barriers show that digital transformation can unintentionally widen inequality when only digitally prepared enterprises benefit from online markets. The issue is directly related to SDG 10 because unequal capability can reinforce disparities between micro and larger businesses, central and peripheral areas, younger and older entrepreneurs, and male and women-owned enterprises. Inclusive digital transformation therefore requires policy intervention that prioritises vulnerable MSME groups and distributes digital opportunities more fairly.

The novelty of this study lies in its integrated policy strategy for inclusive MSME digital transformation at the municipal level. The proposed model connects five dimensions: digital capacity strengthening, infrastructure and platform access, financial and institutional support, regulatory facilitation and data governance, and multi-stakeholder collaboration. These dimensions must operate simultaneously because training without finance, infrastructure without capability, platforms without protection, and collaboration without coordination will not produce sustainable outcomes. Practically, Surakarta needs readiness-based mentoring, local digital service centres, integrated MSME data, affordable financing schemes, shared logistics support, cybersecurity support, and stronger protection for local products in digital markets. The

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model can be adapted by other cities with similar urban economic characteristics, provided that each city first maps MSME readiness, sectoral barriers, spatial disparities, and institutional capacity. Future studies should apply longitudinal, panel, quasi-experimental, or before-and-after programme evaluation designs to measure the causal impact of digital policy interventions on MSME performance and inequality reduction.

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