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The Digital Gap and the Competitiveness of MSMEs in the Eastern Region of Indonesia: An Inclusive Regional Development Policy Agenda

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ABSTRACT

Digital transformation creates new opportunities for micro, small and medium enterprises (MSMEs), yet its regional benefits are uneven. This study examines how the digital divide shapes MSME competitiveness in Eastern Indonesia and formulates an inclusive regional development policy agenda. The study applies an integrative literature review and policy analysis to 37 recent sources, consisting of peer-reviewed studies and official statistical and planning documents published mainly during 2021–2026. The evidence is synthesized into five analytical dimensions: digital infrastructure, digital capabilities, productive technology use, regional entrepreneurial ecosystems, and policy coordination. Official statistics show a persistent spatial gap. In 2024, 72.78% of Indonesians accessed the internet, while the corresponding rate in East Nusa Tenggara was 54.84%; within that province, access reached 76.88% in urban areas but only 46.73% in rural areas. The review indicates that connectivity alone is insufficient to strengthen MSME competitiveness. Digital infrastructure must be complemented by managerial digital literacy, e-commerce and payment capabilities, logistics, financing, local mentoring, and regional market integration. The article proposes a place-based policy framework that links last-mile connectivity, productive digital skills, MSME process digitalization, digital finance, and local value-chain development. The main contribution is to reposition MSME digitalization from a technology-adoption agenda toward a regional competitiveness and inclusion strategy for Eastern Indonesia.

Keywords: *Digital divide; Eastern Indonesia; MSME competitiveness; Regional development; Digital transformation*

INTRODUCTION

Digital transformation has been one of the main drivers of changes in the structure of the economy, the way companies interact with consumers, and patterns of value formation. At the enterprise level, digitalization allows marketing, payment, record-keeping, supply chain coordination, and decision-making processes to take place at lower transaction costs. However, these benefits do not arise automatically. The digital transformation literature confirms that new technologies generate value when supported by changing capabilities, processes, and organizations (Verhoef et al., 2021; Matarazzo et al., 2021). For micro, small, and medium enterprises (MSMEs), this problem becomes more complex because limited capital, human resources, market access, and the ability to absorb technology differ sharply between regions.

Indonesia's context shows a paradox between the acceleration of national connectivity and the still wide spatial gap. The Central Statistics Agency noted that 72.78% of Indonesia's population will have accessed the internet in 2024, an increase from 69.21% in 2023 (BPS, 2025a). At the same time, the quality and intensity of digital use are still very different between urban and rural areas and between Java and outside Java. World Bank (2021) emphasizing that Indonesia's growth of digital economy has not itself produced equitable benefits as access, skills, logistics, transaction trust, and technology adoption by small companies are still uneven. The latest empirical findings also show that Indonesia's digital divide is not only concerned with

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connection ownership, but also with regard to education, employment status, income, gender, and geographical location (Setyanti et al., 2025).

This gap is relevant for the Eastern Region of Indonesia (KTI), which geographically includes areas with lower population density, many archipelago and rural areas, as well as relatively higher logistics and connectivity costs. The government places KTI as one of the focuses of equitable development by strengthening transportation, communication, and spatial development (Kementerian PPN/Bappenas, 2025a). This direction is even more important because the 2025–2029 RPJMN places digital transformation as part of economic transformation, including rural modernization, digital talent development, digitization of priority sectors, and strengthening digital connectivity and applications (Kementerian PPN/Bappenas, 2025b).

MSMEs have a strategic position in this agenda because they are the link between the household economy, local production, regional markets, and job creation. The government noted that around 25 million MSMEs have been integrated into the digital ecosystem by early 2026, while QRIS transactions will remain dominated by MSME actors (Kementerian Koordinator Bidang Perekonomian, 2026). However, the size of the number of businesses that have entered the digital ecosystem is not enough to describe a productive transformation. A business may have a marketplace account or use digital payments, but it does not necessarily have the ability to manage customer data, create consistent content, organize stock, utilize digital financing, or expand the market between regions. In other words, there is a difference between digital onboarding and digital capability.

Studies on the digital transformation of MSMEs in Indonesia have grown rapidly. Anatan and Nur (2023) shows that the digital readiness of MSMEs is determined by a combination of internal drivers and barriers, while Zahoor et al. (2023) emphasizing the role of managerial digital literacy in the business transformation process. Purnomo et al. (2024) Through a systematic review, the benefits of digitalization are found in the form of market expansion, efficiency, and business opportunities, but also identify obstacles to technical skills, resources, security, and technology integration with business processes. On the spatial side, research Susilowati et al. (2026) found that ICT factors have a more important contribution to village development outside Java than in Java. The evidence shows the need to combine a corporate perspective and a regional perspective.

However, most studies on the digitalization of MSMEs still focus on the adoption of technology at the enterprise level or examine the relationship between digital capabilities and performance without placing regional characteristics as a core part of the explanation. In contrast, studies of the digital divide often stop at differences in household access and have not systematically linked them to the competitiveness of MSMEs, the entrepreneurial ecosystem, logistics, and regional development. This gap in the study is important for KTI because the benefits of digitalization are highly dependent on the ability of regions to transform connectivity into productive economic activities.

Based on these issues, this article aims to analyze the linkage between the digital divide and the competitiveness of MSMEs in the Eastern Region of Indonesia and formulate a more inclusive regional development policy agenda. The article uses an integrative review approach and policy analysis to bring together evidence on digital infrastructure, business actors' capabilities, productive use of technology, regional entrepreneurial ecosystem, and policy coordination. The contribution of the article is to offer a region-based framework that places the digitalization of MSMEs not just as a platform adoption agenda, but as an instrument to strengthen productivity, market connectivity, inclusion, and regional competitiveness.

LITERATURE REVIEW

Digital transformation and MSME capabilities

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Digital transformation is different from simple digitization. Digitization transforms analog information into a digital format, whereas digital transformation transforms the way organizations create value, make decisions, and interact with markets (Verhoef et al., 2021). In MSMEs, the process is highly dependent on individual and managerial abilities. Scuotto et al. (2021) shows that individual digital capabilities are related to the growth and innovation of MSMEs, while Zahoor et al. (2023) Found that managerial digital literacy interacts with managerial attributes in driving company transformation. Matarazzo et al. (2021) added that sensing and learning capabilities allow MSMEs to use technology to create customer value and change business models.

Digital entrepreneurship ecosystem and regional competitiveness

Digital entrepreneurship does not take place in a vacuum. Bejjani et al. (2023) Placing the digital entrepreneurial ecosystem as a combination of actors, platforms, institutions, networks, resources, and infrastructure that enable digital-based entrepreneurial activities. The spatial dimension is important because the location of the business still affects the availability of skilled workers, the quality of connectivity, logistics, access to financing, and proximity to the market. Bergholz et al. (2024) shows that digital entrepreneurship can grow in rural areas if digital infrastructure is present with skilled human resources. This finding is important for KTI because network building without capacity building and local ecosystems risks creating connectivity that does not produce productivity.

Digital divide and inclusive development

The digital divide encompasses more than physical access. The cutting-edge literature distinguishes between the gaps in access, skills, quality of use, and benefits derived from technology. Ferrari et al. (2022) shows that rural digitalization faces technological, competency, organizational, and institutional barriers. Raihan et al. (2024) It also emphasizes that digital inequity is multidimensional and influenced by structural factors. In the Indonesian context, Sheila and Fahmi (2024) shows that the digital inclusion of villages needs to be seen through access, skills, actual use, and supporting environments. Koswara (2024) shows that the main weakness of rural economic digitalization lies in empowerment and employment, not just in the existence of infrastructure. Thus, the measure of policy success needs to shift from coverage to productive use.

Digitalization, markets, and financial inclusion of MSMEs

The adoption of e-commerce can expand the market and improve MSMEs' access to financial products. Wirdiyanti et al. (2023) found that the adoption of e-commerce in Indonesian MSMEs is related to improved performance and financial inclusion, especially through strengthening brand recognition and customer awareness. Daud and Ahmad (2022) shows the relationship between digital marketing, digital finance, and digital payments with the financial performance of MSMEs. However, these benefits are highly dependent on the ability of businesses to integrate technology into marketing, transaction, and recording processes. Therefore, regional digitalization policies need to connect internet access with financing, logistics, financial literacy, and business assistance.

METHODS

This study uses an integrative review approach combined with policy analysis. The approach was chosen because the purpose of the research is not to estimate a single causal relationship, but to bring together cross-disciplinary evidence on MSME digitalization, digital divide, regional entrepreneurship, and regional development. The analysis unit consists of scientific publications as well as statistical and planning documents relevant to Indonesia, rural areas, and regional economies.

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The search was conducted in a targeted manner to peer-reviewed articles on the pages of scientific publishers, indexes and journal portals, as well as official documents from the Central Statistics Agency, the Ministry of Communication and Digital, the Ministry of National Development Planning/Bappenas, the Coordinating Ministry for Economic Affairs, the OECD, and the World Bank. The keywords used included digital transformation, digital divide, MSME digitalization, rural digital inclusion, digital entrepreneurship, regional development, smart village, e-commerce, and Indonesia. Scientific literature is prioritized in the period 2021–2026; older sources are only used when needed as a conceptual context.

The inclusion criteria include four conditions: discussing the digitalization of MSMEs or the digital divide; having relevance to regional/rural development or the context of developing countries; presenting empirical findings, synthesis, or a traceable conceptual framework; and published by journals, publishers, or official institutions. From the selection process, 37 sources were obtained that were actively used in the analysis, consisting of scientific articles and policy/statistical documents. The analysis was carried out by thematic coding of five dimensions: digital infrastructure, digital capabilities, productive use of technology, regional entrepreneurial ecosystem, and policy coordination.

The validity of the synthesis was strengthened through triangulation between types of sources. Statistical figures were not generalized as an estimate of the entire KTI, but were used as contextual indicators to show the form of relevant gaps. Academic findings were then compared with national policy directions to compile a matrix of problems–mechanisms–interventions. With this design, the success rate of the analysis was measured from the consistency of the pattern of cross-source findings, the ability to explain the mechanism of the relationship between the digital divide and the competitiveness of MSMEs, and the coherence of recommendations with regional development characteristics.

RESULTS AND DISCUSSION

Portrait of digital access and utilization gaps

Statistical evidence shows that national connectivity achievements still hide large regional variations. BPS (2025a) recorded that 72.78% of Indonesia's population will access the internet in 2024. In East Nusa Tenggara, the percentage is only 54.84%. The gap within the province is even wider: internet access reaches 76.88% in urban populations, but 46.73% in rural populations. The difference of around 30.15 percentage points shows that the issue of last-mile connectivity and affordability is still relevant in areas with large residential distributions.

South Sulawesi gives a different picture. BPS South Sulawesi Province (2024) reported that 66.95% of the population aged five years and above accessed the internet in 2023 and was the highest percentage among provinces on the island of Sulawesi that year. However, a relatively better position at the island level does not mean that the business transformation is complete. Digital access needs to be translated into productive use in marketing, payments, record-keeping, and customer relations. This is the reason why access measures need to be read alongside indicators of capability and usage.

Indonesia's Digital Society Index 2025 reinforces that argument. The national value increased to 44.53, but the IMDI framework itself places the digital society in four pillars: infrastructure and ecosystem, digital literacy, empowerment, and jobs (Kementerian Komunikasi dan Digital, 2025). This structure emphasizes that connectivity is only one component. For the KTI region, policies that stop at signal expansion risk producing connectivity without capability, i.e. people and businesses are connected but have not been able to convert connections into increased income and productivity.

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Table 1. Selected digital indicators relevant to the discussion of KTI

Indicator	Value	Year	Source	Meaning of policy
Indonesian residents access the internet	72,78%	2024	BPS	National connectivity is increasing, but it does not reflect the equitable distribution of territory.
South Sulawesi residents access the internet	66,95%	2023	BPS Sulsel	The relatively high achievement on the island of Sulawesi needs to be translated into productive use.
NTT residents access the internet	54,84%	2024	BPS NTT	Shows the gap in access to the national average.
Urban/rural NTT population	76,88% / 46,73%	2024	BPS NTT	The gap of 30.15 percentage points emphasizes urban-rural and last mile challenges.
Indonesian Digital Society Index	44,53	2025	Komdigi	Policies need to include infrastructure, literacy, empowerment, and jobs.
MSMEs integrated with digital ecosystem	±25 juta	2026	Kemenko Perekonomian	The next focus needs to shift from onboarding to intensity and quality of use.

Sources: BPS (2025a), BPS Sulawesi Selatan (2024), BPS NTT (2025), Komdigi (2025), dan Kemenko Perekonomian (2026).

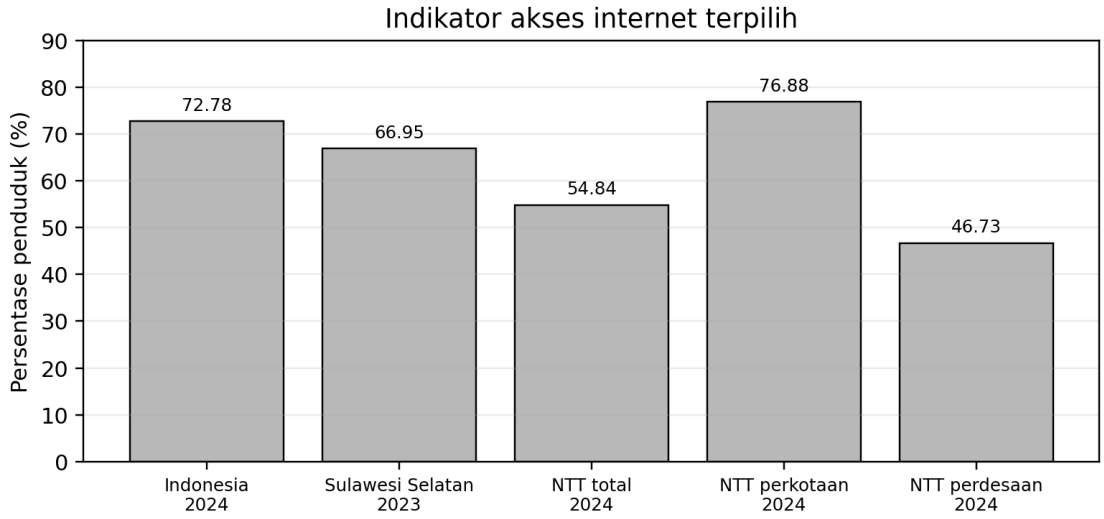

Figure 1. Selected internet access indicators at the national and eastern regional levels

Note: South Sulawesi uses 2023 data; other indicators 2024. Source: BPS, processed by the author.

From the access gap to the gap in the competitiveness of MSMEs

The literature shows that a company's ability to utilize technology explains why two MSMEs with the same level of internet access can produce different performances. Zahoor et al. (2023) shows the importance of managerial digital literacy, while Scuotto et al. (2021) emphasizing the digital capabilities of individuals as the foundation of growth and innovation. At the enterprise level, these capabilities include reading customer data, managing digital content and channels, understanding the costs and benefits of platforms, arranging payments, and integrating technology with day-to-day operations.

These findings are in line with the condition of Indonesia. Anatan and Nur (2023) found that the problem of digitization of MSMEs includes aspects of finance, human resources, marketing, operations, administration, and organizational management. This means that the problem of digitalization is not just a lack of applications. The same barriers can become heavier in KTI

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because mentoring support, technology providers, training centers, and business networks tend to be concentrated in growth centers. Therefore, increasing competitiveness requires a capability package, not an application package.

Skills also determine whether technology can reduce regional inequality. Bergholz et al. (2024) It shows that digital infrastructure only encourages digital entrepreneurship in rural areas when skilled human resources are available. The implications for KTI are clear: network investment needs to be paired with talent development and local sector-based business mentoring. Without it, infrastructure can increase digital consumption more than digital production.

Table 2. Synthesis of literature findings on digitalization, region, and competitiveness

Studies	Focus	Key findings	Implications for KTI
Scuotto et al. (2021)	MSME digital capabilities	Individual capabilities support growth and innovation.	Training should improve capabilities, not just app access.
Zahoor et al. (2023)	Managerial digital literacy	Managerial literacy plays a role in the digital transformation process.	Assistance needs to target MSME owners/managers.
Bejjani et al. (2023)	Digital entrepreneurship ecosystem	Platforms, institutions, networks, and resources complement each other.	Regional digitalization must be ecosystem-based.
Bergholz et al. (2024)	Spatial digital entrepreneurship	Infrastructure and skilled human resources need to be present at the same time.	KTI connectivity needs to be combined with digital talent.
Wirdiyanti et al. (2023)	E-commerce and financial inclusion	The adoption of e-commerce improves financial performance and inclusion.	The platform needs to be connected to funding and the market.
Setyanti et al. (2025)	Urban–rural gap	Rural households have a lower probability of digital access.	Interventions need to target groups and locations that are left behind.
Susilowati et al. (2026)	Smart village Java vs outside Java	ICT contributes more strongly to the development of villages outside Java.	The value of digital development can be high in non-Java regions.
Ferrari et al. (2022)	Rural digitalization	Barriers include technology, skills, organization, and institutions.	Policies need to be multidimensional.

Source: author's synthesis of the literature reviewed.

Regional ecosystem as a lever for MSME transformation

The competitiveness of MSMEs is not only determined by internal capacity. The concept of a digital entrepreneurial ecosystem emphasizes the importance of interaction between business actors, platforms, governments, financial institutions, universities, logistics providers, communities, and markets (Bejjani et al., 2023). For KTI, the ecosystem approach is particularly relevant because distance and spatial fragmentation lead to higher coordination costs. Digital platforms can partially reduce information costs, but they cannot replace all physical logistics, product quality, standardization, and financing needs.

E-commerce and digital payments can be the gateway to market integration. Wirdiyanti et al. (2023) shows that the adoption of e-commerce in Indonesian MSMEs contributes to financial performance and inclusion. David and Ahmad (2022) It also shows that digital marketing, digital finance, and digital payments have a relationship with financial performance. However, market integration will be limited if shipping costs are high, the quality of supply is inconsistent, or business actors are unable to meet demand outside the region. Therefore, regional strategies need to link digitalization with strengthening local value chains.

BPS (2025b) presents the 2024 E-Commerce Statistics to the provincial level, which shows that regional digital economy monitoring is increasingly possible on a data-driven basis. Local governments can use this kind of data to differentiate sectors that require basic digital onboarding from sectors that already require more advanced interventions, such as payment integration, inventory management, marketing analytics, certification, and digital exports. Such an approach is more effective than uniform training programs for all MSMEs.

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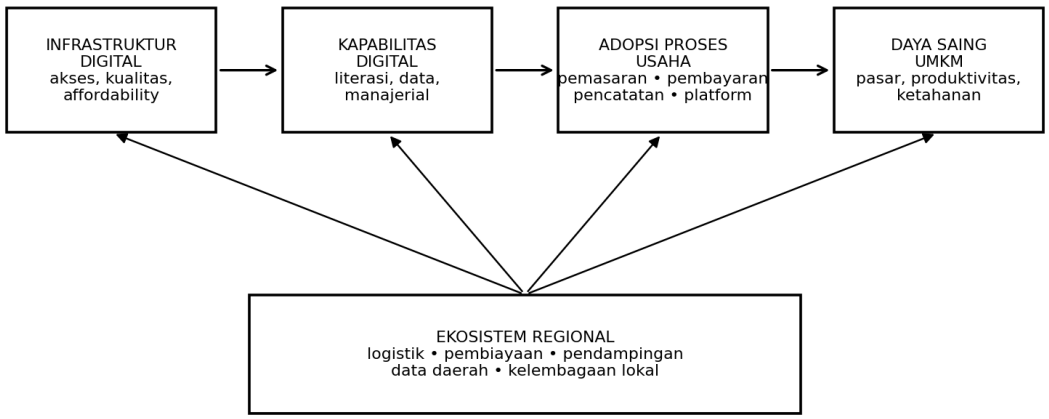

Figure 2. Policy framework for MSME digitalization based on regional competitiveness

Source: author's synthesis based on Verhoef et al. (2021), Bejjani et al. (2023), Bergholz et al. (2024), and Zahoor et al. (2023).

Digital rural development and its relevance for KTI

KTI has many rural areas, archipelagos, and small-scale economic centers. Therefore, the experience of smart villages and digital inclusion provides important lessons. Sheila and Fahmi (2024) shows that rural digital inclusion needs to be supported by access, skills, use, and supportive environments. Susilowati et al. (2026) It was even found that ICT factors are positively related to village development outside Java, which indicates that technology can have a high marginal value of development in areas with spatial limitations.

However, the digital divide can also strengthen social stratification. Anugrah et al. (2024) shows that the digital divide is related to social class in rural development. Setyanti et al. (2025) found that rural households are significantly less likely to have access to digital technology than urban households, and the influence of education on access is also weaker in rural areas. This means that MSME digital policies that only target actors who are already digitally active can create selection bias and widen the gap with the most disadvantaged micro businesses.

Therefore, the digital transformation of MSMEs must be positioned as an economic inclusion policy. The initial program needs to prioritize affordable access, devices, basic literacy, and mentoring. The next stage focuses on productive use: product photos and information, payments, digital record-keeping, cataloging, customer management, and data utilization. The new advanced stage leads to platform integration, automation, financing, and market expansion. This gradual sequence is more in line with the heterogeneity of MSME capacity in KTI.

Inclusive regional development policy agenda

The synthesis of research and policy documents resulted in five agendas. First, treating connectivity as basic economic infrastructure. The last-mile connectivity program needs to be prioritized in rural areas, archipelagos, and MSME production centers, not just residential centers. Second, building sector-based productive digital capabilities. Materials for MSMEs in food, handicrafts, tourism, fisheries, and trade need to be differentiated because transaction flows and digital needs are different.

Third, strengthening the financing and transaction ecosystem. Digital payments must be linked to business records, financing feasibility, and cash flow management. Fourth, building regional market infrastructure through regional catalogs, product data, logistics aggregation, and partnerships with platforms. Fifth, improving data governance and coordination. Bappenas places rural modernization, digital talent, and digital applications as part of its 2025–2029 strategy; its

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implementation requires regional indicators that measure not only the number of onboard MSMEs, but also the intensity of use, transactions, market expansion, productivity, and business sustainability (Kementerian PPN/Bappenas, 2025b).

The framework in Figure 2 summarizes the policy mechanisms. Digital infrastructure increases access opportunities, but its impact on competitiveness works through digital capabilities and business process adoption. All of these pathways are strengthened or weakened by regional ecosystems. Thus, the most effective policy is not to choose between infrastructure or training, but rather to build an integrated package that connects connectivity, skills, business processes, financing, logistics, and markets.

Table 3. Digital regional development policy agenda for KTI MSMEs

Main problems	Priority interventions	Key actors	Indicator outcome
Last-mile gap and access fees	Expansion of connectivity in production centers/rural areas; shared infrastructure	Central, local government, operator	Quality and affordability of connections at MSME centers
Low productive digital literacy	Sector-based digital clinics and recurring mentoring	Local governments, universities, communities	Proportion of MSMEs that use technology for business processes
Onboarding without process integration	Marketing–payment–record-keeping – inventory package	Local government, banking, platforms	Transaction intensity and completeness of digital recording
Logistics costs and fragmented markets	Catalog aggregation, fulfillment, and logistics between regions	Local governments, BUMDs, logistics platforms	Market reach outside the district/province
MSME data is not interoperable	Dashboard of regional MSME digitalization outcomes	Local Government, BPS, Komdigi, Ministry of Cooperatives	Active data on transactions, markets, productivity, and survival

Source: author's synthesis.

CONCLUSIONS AND SUGGESTIONS

The digital divide in the Eastern Region of Indonesia is not only a problem of internet access, but also a problem of the region's ability to transform connectivity into productive economic activities. Official evidence shows that national internet access has increased, but the urban-rural gap is still large in some eastern regions. The literature shows that the competitiveness of MSMEs increases when digital infrastructure is combined with managerial digital literacy, the use of e-commerce and digital payments, financing, logistics, and regional entrepreneurial ecosystems. Therefore, the digitalization of MSMEs in KTI should be designed as a place-based regional development strategy, not a uniform technology onboarding program. The advantage of this article lies in the integration of the perspective of the digital divide, MSME capabilities, and regional development; the limitation is the use of cross-year secondary data that does not yet allow for causal estimation between provinces. The next research needs to build a district/city data panel on internet access, e-commerce intensity, digital transactions, MSME productivity, and logistics indicators to test the proposed mechanism. Practically, the central and regional governments need to prioritize last-mile connectivity, the development of productive digital talents, sector-based MSME assistance, payment integration with recording and financing, logistics aggregation, and outcome-based monitoring so that digital transformation truly strengthens the competitiveness and equitable distribution of KTI development.

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