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Impact Digital Transformation towards Growth Regional Economics : A Study The case of MSMEs in Indonesia

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Abstract

This study aims to analyze the influence of digital transformation on regional economic growth through a case study of Micro, Small, and Medium Enterprises (MSMEs) in five provinces in Indonesia. The quantitative approach was employed using multiple linear regression and ANOVA to measure the relationship between digital adoption levels—including the use of e-commerce, social media, and digital payment systems—and MSME performance and their contribution to regional economic growth. The research was conducted across five provinces (DKI Jakarta, West Java, Central Java, South Sulawesi, and East Nusa Tenggara) with a total sample of 300 MSMEs selected through stratified random sampling. Data collection involved structured questionnaires, semi-structured interviews, and secondary data from government agencies and international institutions. The results show that digital transformation has a significant impact on improving turnover, market reach, and operational efficiency of MSMEs. Provinces with high levels of digital adoption such as DKI Jakarta and West Java show greater MSME contributions to economic growth compared to regions with low digitalization levels such as East Nusa Tenggara. These findings support endogenous growth theory which emphasizes the importance of innovation and technology in driving economic productivity. The regression analysis revealed that 69% of variance in MSME performance can be explained by digitalization variables, with e-commerce use showing the highest coefficient (β=0.312, p<0.001). This research recommends the need for region-based policies that encourage digital literacy, infrastructure provision, and cross-sector collaboration to accelerate equitable distribution of digital transformation benefits. Digital transformation is proven not only to strengthen MSME competitiveness but also plays a role as the main driver of sustainable regional economic development, particularly in addressing regional disparities and promoting inclusive growth.

Keywords: Digital transformation, MSMEs, regional economic growth, digital literacy, regional disparities

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1. Introduction

Digital transformation has become a major driver of structural change in the global economy, including in developing countries like Indonesia. Digitalization drives efficiency, improves market access, and creates new business opportunities across various sectors, particularly among Micro, Small, and Medium Enterprises (MSMEs) (McKinsey, 2020; OECD, 2021; World Bank, 2022). MSMEs are the backbone of the Indonesian economy, contributing more than 60% to Gross Domestic Product (GDP) and absorbing more than 97% of the national workforce (Ministry of Cooperatives and SMEs, 2023; BPS, 2023; ILO, 2021).

Globally, the digital divide between developed and developing countries has become increasingly pronounced, with significant implications for economic competitiveness and social equity. The COVID-19 pandemic has accelerated digital adoption worldwide, but this acceleration has been uneven, creating new forms of inequality both between and within countries (OECD, 2021; World Bank, 2022). In the context of emerging economies like Indonesia, this digital divide manifests not only at the national level but also regionally, where urban areas with better infrastructure and higher digital literacy rates experience faster digital transformation compared to rural and remote areas.

Amid fluctuating economic growth, digital transformation is one solution to increase the competitiveness of MSMEs regionally. However, not all MSMEs can optimally access and adopt digital technology due to limited infrastructure, digital literacy, and capital (Susanti et al., 2021; Rahardjo, 2020; Tambunan, 2019). The challenge is particularly acute in Indonesia's archipelagic geography, where connectivity infrastructure varies significantly across regions, creating a complex landscape of digital opportunity and disadvantage. Therefore, it is important to study to what extent digital transformation contributes to regional economic growth empirically and contextually.

Endogenous growth theory emphasizes the importance of innovation and technology in increasing productivity and economic growth (Romer, 1990; Aghion & Howitt, 1992; Barro & Sala-i-Martin, 2004). In the regional context, the utilization of digital technology can accelerate knowledge diffusion and reduce interregional inequality (Florida, 2002; Crescenzi & Rodríguez-Pose, 2011; Rodríguez-Pose, 2018). This theoretical framework provides a robust foundation for understanding how technological innovation, particularly in the form of digital transformation, can serve as an endogenous factor driving regional economic development.

Data from the Ministry of Cooperatives and SMEs shows that digital adoption by MSMEs in Indonesia has increased significantly since the COVID-19 pandemic, however it remains uneven interregionally. The following table describes the percentage of digital MSMEs in five main

provinces in 2023, highlighting the substantial regional disparities that motivate this study.

Table 1. describes the percentage of digital MSMEs in five main provinces in 2023

Province	% of Digital MSMEs	Economic Growth (%)
DKI Jakarta	78%	5.2
West Java	65%	5.1
Central Java	52%	4.9
South Sulawesi	40%	4.3
NTT	28%	3.7

Source: Ministry of Cooperatives and SMEs, 2023; BPS, 2023; World Bank, 2022

A number of studies have examined the influence of digitalization on MSME performance, such as the study by Nugroho et al. (2022), which found that e-commerce use increases MSME turnover in Central Java. Meanwhile, Nasution (2021) stated that digitalization expands market access for MSMEs at the national level. A study by Prasetyo & Sutopo (2020) shows that digital technology plays an important role in accelerating post-pandemic recovery of MSMEs.

However, despite the abundance of studies discussing MSME digitalization, few have evaluated the impact on regional economic growth specifically and measurably (Yuniarti, 2021; Hartono et al., 2022; Purnomo, 2020). Most focus on micro aspects (such as turnover or efficiency), not macro contributions to regional economic structure. Additionally, cross-regional studies to measure digitalization disparities and successes remain limited. This represents a significant research gap, as understanding the regional economic implications of MSME digitalization is crucial for policy formulation and development planning.

This study offers novelty by integrating spatial and economic analysis in examining the influence of digital transformation on regional economic growth. Using quantitative and qualitative data, as well as a case study approach across several MSMEs in provinces with different digitalization levels, this research provides a complete and in-depth description (Setiawan & Lestari, 2023; Fauzi, 2022; Aprilianti et al., 2021). The integration of spatial disparities in MSME digitalization represents a unique contribution to the literature, bridging the gap between micro-level business studies and macro-level regional development analysis.

This study aims to analyze the impact of digital transformation on regional economic growth through a case study of MSMEs in Indonesia. Specifically, this study aims to (1) measure the contribution of MSME digitalization to regional economic growth; (2) identify factors influencing

the success of digital adoption in MSMEs; and (3) provide policy recommendations based on data and empirical evidence (Coordinating Ministry for Economic Affairs, 2023; Dewi & Ramadhan, 2021; Utami, 2022).

Indonesia has a highly diverse regional economic structure, with distinct demographic, social, and technological characteristics. The archipelagic nature of the country, combined with varying levels of infrastructure development, creates unique challenges for achieving equitable digital transformation. Some regions benefit from proximity to major urban centers and established digital infrastructure, while others face challenges related to connectivity, digital literacy, and access to capital. Therefore, a regional approach is crucial to ensuring fairness and equity in the outcomes of digital development (Firdaus et al., 2021; Haryanto, 2022; Suryani, 2020). By focusing on MSMEs as the main subject, this study can provide a more targeted overview of the local context and policies.

This article will be structured into several main sections: (1) Introduction, which explains the background and urgency of the research; (2) Literature Review, which discusses theories and previous research findings; (3) Methodology, which details the study design, location, and data analysis methods; (4) Results and Discussion; and (5) Conclusions and Recommendations. This structure is designed to allow readers to follow the flow of thought and analysis systematically (Sugiyono, 2020; Creswell, 2014; Yin, 2018).

2. Method

This research uses a quantitative approach with descriptive and explanatory methods, aiming to describe and explain the relationship between digital transformation and regional economic growth. This approach is considered appropriate because it allows researchers to identify the influence of digital technology adoption by MSMEs on economic indicators at the regional level. This study also utilizes primary and secondary data, which are analyzed statistically to answer the research questions and test the hypotheses.

Research Ethics Statement: This study was conducted in accordance with ethical research principles. All participants provided informed consent before participation, and their confidentiality was maintained throughout the research process. Data collection procedures were designed to protect participant privacy and ensure voluntary participation.

The population in this study was all MSMEs in five Indonesian provinces with varying levels of digital adoption: DKI Jakarta, West Java, Central Java, South Sulawesi, and East Nusa Tenggara (NTT). The sample was drawn using a stratified sampling technique with random sampling, with classification based on the level of MSME digitalization (high,

medium, low). The total sample size was 300 MSMEs, with 60 represented in each province. A detailed explanation is presented in the following table:

Table 2. Research Population and Sample

Province	Digitalization Category	Number of Samples	Sampling Techniques
DKI Jakarta	High	60	Stratified Random Sampling
West Java	Medium-High	60	Stratified Random Sampling
Central Java	Medium	60	Stratified Random Sampling
South Sulawesi	Low-Medium	60	Stratified Random Sampling
East Nusa Tenggara	Low	60	Stratified Random Sampling
Total	--	**300**	

The main instrument used in this study was a structured questionnaire containing a number of statements using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). This questionnaire was developed to measure three main variables: digital adoption rate, MSME performance, and perceptions of regional economic impact. The questionnaire underwent validity testing using Pearson Product Moment correlation and reliability test with Cronbach's Alpha, where all variables have an α value > 0.70 which indicates that the instrument is declared reliable.

This study used three main methods of data collection, employing triangulation to enhance data validity and reliability**:** online and offline questionnaires, semi-structured interviews with selected MSMEs as key informants, and documentation from secondary data, such as reports from the Statistics Indonesia (BPS), the Ministry of Cooperatives and SMEs, and international institutions such as the World Bank. The integration of these data sources followed a systematic triangulation approach where quantitative survey data provided the statistical foundation, qualitative interviews offered deeper insights into the mechanisms and experiences of digital transformation, and secondary data provided contextual and comparative perspectives. Primary data was collected directly from MSMEs, while secondary data was used to support the macro analysis and provide context for field findings.

The research procedure began with the selection of research locations based on the level of regional digitalization analyzed from the initial data. Next, instruments were developed and tested to ensure measurement clarity and accuracy. Data collection was then conducted by distributing

questionnaires and conducting interviews. The collected data were then coded, cleaned, and tabulated. The final stage included data analysis and the preparation of a research report. The entire process took place between July and October 2024.

The data analysis technique used was multiple linear regression to test the effect of the independent variable (the level of MSME digitalization) on the dependent variable (regional economic growth). This econometric approach was chosen over alternative methods such as panel data analysis or structural equation modeling due to the cross-sectional nature of the data and the need to examine direct causal relationships between digitalization components and economic outcomes. This model allows us to examine the contribution of each aspect of digitalization—such as the use of e-commerce, social media, and digital payments—to regional economic performance. ANOVA tests were conducted to determine differences in influence between regions. Furthermore, interview data was analyzed thematically using systematic coding procedures to strengthen quantitative interpretations with more in-depth qualitative narratives, ensuring comprehensive triangulation of findings.

3. Results & Discussion

Digital Adoption Rate by MSMEs in Five Regions

The adoption rate of digital technology by MSMEs in Indonesia shows significant variation across regions. A survey of 300 MSME respondents across five provinces found that MSMEs in Jakarta and West Java have the highest digital adoption rates, particularly in the use of e-commerce and digital payment systems. Conversely, provinces such as East Nusa Tenggara (NTT) still show low adoption rates, primarily due to limited infrastructure and digital literacy (Ministry of Cooperatives and SMEs, 2023; OECD, 2021; Susanti et al., 2021). This pattern reveals the persistence of a digital divide between regions that can significantly influence the contribution of MSMEs to regional economic growth.

Factors that encourage digital adoption include access to stable internet connectivity, availability of digital training programs, and the presence of a supportive technology ecosystem such as local marketplaces and fintech services. MSMEs that received support from government programs such as "UMKM Go Digital" show better digitalization achievements (Nasution, 2021; McKinsey, 2020; Aprilianti et al., 2021).

These findings strengthen previous research results indicating that digital transformation is not evenly distributed spatially and has the potential to widen interregional development gaps (Rodríguez-Pose, 2018; Firdaus et al., 2021; Florida, 2002). This comparative analysis with international studies, particularly OECD reports on digital transformation, reveals that Indonesia's regional disparities mirror global patterns observed

in other emerging economies, where urban-rural digital divides significantly impact economic development trajectories.

This means that digital economy-based development policies need to consider regional disparities so that there is no widening "digital divide". Therefore, mapping the level of digital adoption of MSMEs becomes important as the basis for central and regional government policy making to identify areas that are still lagging in terms of digitalization to be given more intensive interventions (Hartono et al., 2022; Coordinating Ministry for Economy, 2023; Suryani, 2020). This strategy is also in line with the regional development approach based on local advantages and digital inclusion.

Influence of Digital Transformation on MSME Performance

Multiple linear regression test results show that digital transformation has a significant influence on improving MSME performance. Three main digitalization indicators—the use of e-commerce, social media, and digital payment systems—have positive relationships with turnover, number of customers, and operational efficiency of MSMEs. The coefficient of determination (R^2) of 0.69 indicates that about 69% of variation in MSME performance can be explained by digitalization variables (Ghozali, 2018; Setiawan & Lestari, 2023; Prasetyo & Sutopo, 2020).

MSMEs actively utilizing social media report significant improvements in market reach and customer interaction. This aligns with findings from Nugroho et al. (2022), which show that digital marketing has become a main growth factor for micro businesses during and after the pandemic. The use of e-commerce also enables operational cost efficiency by reducing the need for physical stores and distribution networks.

The following table displays the results of multiple regression tests to examine the influence of each aspect of digitalization on MSME performance:

Table 3. Results of Multiple Linear Regression Test

Independent Variables	Beta Coefficient	Sig. (p-value)	Interpretation
Use of E-Commerce	0.312	0.001	Significant positive
Use of Social Media	0.274	0.003	Significant positive
Digital Payments	0.198	0.012	Significant positive
R^2 (Determination)	0.69	--	Strong

Source: Research Data Processing Results, 2024

Additionally, interview studies with MSMEs revealed that successful digital adoption is heavily influenced by support from digital platform partners and training from non-governmental organizations and local governments (Fauzi, 2022; Dewi & Ramadhan, 2021; Tambunan, 2019). Cross-referencing these findings with World Bank reports on digital transformation in emerging economies reveals that Indonesia's experience aligns with global patterns where ecosystem support is crucial for successful digital adoption. This means that cross-sector collaboration is crucial in creating a sustainable digital ecosystem for MSMEs.

This finding strengthens the argument of endogenous growth theory, which emphasizes the important role of technology and innovation in driving economic growth through increased productivity and efficiency (Romer, 1990; Aghion & Howitt, 1992; Barro & Sala-i-Martin, 2004). Digitalization has proven to be one form of innovation that is capable of driving business growth at the micro and regional levels.

Contribution of MSMEs to Regional Economic Growth

Analysis conducted using ANOVA shows the existence of differences in MSME contributions to regional economic growth based on digitalization levels. Provinces with high levels of digital adoption show stronger regional economic growth, driven by improvements in business activities and job creation by MSMEs (BPS, 2023; World Bank, 2022; ILO, 2021). For example, DKI Jakarta and West Java recorded economic growth above 5%, in line with the dominance of MSME digitalization in these regions.

These findings support previous studies indicating that digitalization plays an important role in integrating MSMEs into better and more extensive modern economic value chains (McKinsey, 2020; OECD, 2021; Nugroho et al., 2022). When MSMEs are able to increase productivity and market expansion through digital technology, the domino effect on regional GRDP becomes greater.

However, interregional inequality in digital adoption shows that not all regions can feel the benefits of economic growth evenly. Comparative analysis with OECD country experiences demonstrates that similar patterns of digital divide have significant long-term implications for regional competitiveness and social cohesion. This leads to the importance of a regional approach based on fair technology distribution (Rodríguez-Pose, 2018; Hartono et al., 2022; Firdaus et al., 2021). Without government intervention, underdeveloped areas will be increasingly left behind because they are unable to compete in the national digital ecosystem.

Policy recommendations that can be drawn from these findings include the need for synergy between government institutions, private sector, and civil society to accelerate inclusive MSME digitalization. Programs such as digital literacy training, connectivity subsidies, and digital business

incubators need to be expanded in coverage, especially in areas that still have low adoption levels (Yuniarti, 2021; Purnomo, 2020; Coordinating Ministry for Economic Affairs, 2023). Specifically, policy interventions should include: (1) targeted infrastructure development in underserved regions, (2) customized digital literacy programs that account for local contexts and languages, (3) financial incentives for private sector participation in digital ecosystem development, and (4) establishment of regional digital innovation hubs to support MSME transformation.

4. Conclusion

This study concludes that digital transformation has a significant influence on regional economic growth through improved MSME performance, which is visible from improvements in turnover, market reach, and operational efficiency as a result of using e-commerce, social media, and digital payments. The quantitative analysis results show that about 69% of MSME performance variation can be explained by the level of digitalization, while ANOVA results show differences in MSME contributions to interregional economic growth, where provinces with high digitalization levels such as DKI Jakarta and West Java show stronger economic growth compared to areas with low digitalization such as NTT.

These findings support endogenous growth theory which emphasizes the role of innovation and technology in driving economic growth, while confirming the existence of a digital divide that requires region-based policy interventions to expand digital literacy, strengthen infrastructure, and encourage comprehensive technology inclusion.

Therefore, digital transformation is not only a business performance improvement strategy, but also an important instrument in accelerating just and sustainable economic development in Indonesia. Policy makers should prioritize: (1) development of region-specific digital infrastructure that addresses connectivity gaps, (2) implementation of comprehensive digital literacy programs tailored to local needs, (3) establishment of financial support mechanisms for MSME digital transformation, and (4) creation of multi-stakeholder collaboration platforms to ensure coordinated and inclusive digital development across all regions.

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