P-ISSN: 2828-8599
E-ISSN: 2829-2111

The Impact of Technological Backwardness on the Sustainability of MSMEs in Ciasihan Village

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Abstract

The rapid advancement of digital technology has brought transformative changes to the global economy, impacting the competitiveness and sustainability of businesses across various sectors. However, not all regions have benefited equally from this transformation. This study aims to analyze the impact of technological underdevelopment on the sustainability of micro, small, and medium enterprises (MSMEs) in Ciasihan Village, a rural area in Indonesia that still faces digital inequality. The study used a qualitative descriptive approach through in-depth interviews and direct observation with ten MSME owners operating in various sectors, including food processing, services, and handicrafts. The findings indicate that MSMEs in Ciasihan Village face persistent barriers such as limited digital literacy, unstable internet connectivity, and a lack of institutional support. These obstacles hinder their ability to participate in the digital marketplace and effectively adopt technological innovations. However, MSMEs that have adopted even simple digital tools, such as social media marketing and mobile-based payment systems, have shown significant improvements in market reach and operational efficiency. The study concludes that digital readiness and ongoing literacy training are key determinants of achieving sustainable business growth among rural MSMEs. Strengthening the digital ecosystem in rural areas through government collaboration, educational support, and infrastructure development is crucial to minimizing the technology gap and ensuring inclusive economic progress.

Article Info

Keywords:
Digital Transformation,
Technological Backwardness,
MSMEs,
Rural Development,
Sustainability.

JEL Classification:
O33, R11, M21

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Received: 05-10-2025
Revised: 30-11-2025
Accepted: 22-12-2025
Published: 31-12-2025

1. Introduction

Digital transformation has become a hallmark of the 21st-century economy. Advances in information and communication technology (ICT) have revolutionized the way companies operate, creating new opportunities for efficiency, innovation, and market expansion (Sitompul et al., 2025) . However, these developments have also widened the gap between technologically advanced and underdeveloped regions, creating what experts call *the digital divide*. This gap refers to unequal access to digital devices, literacy, and opportunities to utilize technology in social and economic life (Oktavianoor et al., 2020) . In developing countries like Indonesia, this gap remains clearly visible between urban and rural areas.

Micro, Small, and Medium Enterprises (MSMEs) play a central role in Indonesia's economic resilience. According to the Directorate General of Treasury of the Ministry of Finance of the Republic of Indonesia, by 2024, MSMEs contributed more than 61.07% to national GDP and absorbed more than 97% of the workforce. Despite their extraordinary contribution, the majority of these businesses still operate in rural areas with limited access to digital infrastructure and knowledge. This inequality creates a form of technological marginalization that threatens their long-term sustainability and competitiveness.

Ciasihan Village, located in Pamijahan District, Bogor Regency, is a prime example of this phenomenon. Although telecommunications access in the area has gradually improved, digital adoption among entrepreneurs remains low. Many MSMEs still rely on manual bookkeeping, traditional marketing strategies, and cash transactions. Interviews with local

business owners revealed that most consider digital technology complicated, expensive, and irrelevant to their daily operations. This perception, coupled with infrastructure and education barriers, has created a persistent gap between potential and practice.

From a theoretical perspective, Everett M. Rogers' Diffusion of Innovation Theory helps explain how a new technology spreads through society. The theory's core principle is that adoption occurs gradually: people first learn about an innovation, then evaluate its benefits, decide to try or reject it, implement it in practice, and finally solidify that decision (Soekandar & Pratiwi, 2023) . In this study, this framework is suitable for understanding why many MSMEs in Ciasihan Village only reach the introduction or assessment stage, not fully implementing digital technology due to obstacles such as limited knowledge, costs, and lack of confidence.

For rural entrepreneurs, this process often stalls at the "awareness" stage due to limited exposure and resources. Similarly, the Technology Acceptance Model (TAM) developed by Davis emphasizes perceived usefulness and perceived ease of use as key predictors of technology adoption. In Ciasihan Village, both factors remain weak due to inadequate training and digital infrastructure.

The digital underdevelopment of rural MSMEs also contradicts the Sustainable Development Goals (SDGs), which promote inclusive and sustainable economic growth, employment, and decent work for all (Sutopo, 2025) . The inability of MSMEs in Ciasihan Village to participate in the digital ecosystem limits their competitiveness in the broader market and hinders the overall economic progress of rural Indonesia. Furthermore, digital inequality reduces the multiplier effect of technological innovation on employment and poverty reduction.

Recent studies have shown that digital adoption improves business performance and resilience. For example, (Sapthiarsyah M Faizal & Junita, 2024) found that MSMEs that utilize e-commerce and social media marketing achieve higher growth rates and are more resilient to economic shocks, thereby improving business performance. Similarly, (Rika et al., 2025) emphasized that digital literacy directly impacts innovation capacity and operational efficiency among small businesses. However, these benefits are largely concentrated in urban centers, leaving rural MSMEs underrepresented in the digital economy.

The problem of technological underdevelopment among rural MSMEs is not solely caused by technical factors, but is also influenced by complex social and cultural aspects. For most rural entrepreneurs, adopting new technologies often requires changes in deeply ingrained ways of thinking, beliefs, and habits. Furthermore, generational differences are also a prominent factor. Younger entrepreneurs are generally more open to change and don't hesitate to try various digital platforms to grow their businesses. Conversely, older entrepreneurs tend to be cautious, preferring to stick with old methods, which are considered more stable and familiar.

Another factor exacerbating this situation is limited capital and access to financial resources. Many rural MSMEs struggle to purchase new digital equipment or finance online promotions. As a result, their ability to adapt to technological developments and expand their markets is severely limited.

Given this situation, questions arise regarding how technological underdevelopment affects the sustainability of MSMEs in rural areas like Ciasihan Village. And what strategies can be implemented to bridge the digital divide? Answering these questions is crucial for designing policies that promote inclusive development and empower rural communities to participate in the digital economy.

Therefore, this study aims to:

1. Analyzing the level of technological backwardness of MSMEs in Ciasihan Village.
2. Identify the key barriers hindering digital adoption.
3. Evaluate how these limitations impact business sustainability and competitiveness.
4. Proposing strategic recommendations to accelerate digital transformation in rural MSMEs.

By focusing on the local realities of Ciasihan Village, this research contributes to the broader discourse on digital inclusion and rural economic empowerment. It not only highlights persistent structural inequalities in Indonesia's digital landscape but also provides

practical pathways for policymakers, educators, and entrepreneurs to promote equitable technological progress.

2. Methods

This section describes the qualitative methods applied to study MSMEs in Ciasihan Village.

2.1 Research Design

This research uses a qualitative descriptive approach, aiming to understand and interpret phenomena within their natural context. A qualitative approach is considered appropriate because it allows for an in-depth exploration of the social realities and behavioral patterns that influence technology adoption among MSMEs in Ciasihan Village. Unlike quantitative studies that rely on numerical measurements, qualitative research provides contextual depth and a nuanced understanding of the local dynamics that shape decision-making processes.

According to Miles and Huberman, qualitative descriptive research is suitable for analyzing complex human interactions and social constructs. Therefore, this study seeks to illustrate the reality of technological underdevelopment and its implications for the sustainability of MSMEs by focusing on the perspectives of the entrepreneurs themselves.

This research was conducted in Ciasihan Village, Pamijahan District, Bogor Regency, West Java Province. This location was chosen because it represents a typical rural area with underdeveloped technological infrastructure but highly active entrepreneurial activity. The village's geographical location, relatively remote from the city center, makes it an ideal location to examine the persistence of the digital divide.

2.2 Research Participants

This study involved ten MSME owners from various sectors, including food production, home crafts, and the service industry. Participants were selected using purposive sampling techniques based on three main criteria:

1. They have been running their business for at least two years.
2. Their companies are categorized as micro or small according to the Ministry of Cooperatives and SMEs standards.
3. They live and operate in the Ciasihan Village area.

Respondents represented a diverse range of age groups, educational backgrounds, and business experience. This diversity helped capture variations in digital awareness and adoption behavior. Participants ranged in age from 25 to 55, with varying levels of formal education, from junior high school graduates to university graduates.

All participants were treated ethically throughout the research process. Their identities were anonymized, and their consent was obtained before the interviews were conducted.

2.3 Data Collection Techniques

Primary data was collected through semi-structured interviews and direct field observations.

1. The interviews were designed to explore respondents' experiences, perceptions, and challenges related to digital technology adoption. Questions focused on four dimensions: access to technology, digital literacy, usage behavior, and perceived barriers.
2. Observation involves visits to each business location to document existing infrastructure, marketing practices, and business processes.

In addition to primary data, secondary data was collected from relevant literature such as journal articles, government reports, and official documents published between 2020 and 2025. These sources help contextualize local findings within broader national and global digital transformation trends.

2.4 Data Analysis

This study uses Miles and Huberman's interactive qualitative data analysis model, which consists of three interrelated steps:

1. Data Reduction: selecting, simplifying, and organizing raw data from interviews and field notes.
2. Data Display: presenting reduced data in descriptive form to identify emerging patterns.
3. Conclusion: interpret the findings to develop conceptual insights into technological backwardness and its impact on the sustainability of MSMEs.

The data analysis process was conducted concurrently with data collection to ensure continuous refinement of emerging categories and themes. This iterative process allowed researchers to verify information through cross-checking and triangulation.

2.5 Validity and Reliability of Research

To ensure the credibility and reliability of the data, several validation techniques are applied:

1. Source triangulation was carried out by comparing interview data with observation results and secondary documents.
2. Member checking is conducted by asking participants to review and confirm the accuracy of transcribed statements.
3. Peer debriefing was used to maintain the rigor of the analysis, involving discussions with academic supervisors and colleagues in the Department of Islamic Economics at Nahdlatul Ulama University of Indonesia.

Furthermore, this study adhered to ethical standards in social science research, including informed consent, voluntary participation, and confidentiality.

2.6 Research Limitations

While qualitative research provides depth, it has inherent limitations in terms of generalizability. The findings are specific to Ciasihan Village and may not be representative of all rural MSMEs in Indonesia. However, the insights gained can form the basis for comparative studies and inform future quantitative research.

3. Results and Discussion

The results Provides analysis and findings on technological awareness, infrastructure barriers, socio-economic implications, cultural attitudes, and empowerment opportunities among MSMEs.

3.1 Technology Awareness and Digital Literacy among MSMEs

Research findings indicate that technological awareness among MSMEs in Ciasihan Village remains relatively low. Although internet connectivity in the area has gradually improved, the ability to utilize digital tools for business purposes remains limited. Most entrepreneurs rely on conventional methods such as direct sales, cash transactions, and word-of-mouth marketing.

Based on interviews, eight out of ten respondents admitted to having heard of online marketing but had never tried it due to a lack of confidence or technical knowledge. One respondent explained:

I know some people sell through WhatsApp or Shopee, but I don't understand how to upload products or manage payments. I'm afraid of making mistakes.

This reflects key dimensions of the digital literacy gap, including lack of practical knowledge, lack of entrepreneurial intention, fear of mistakes, and limited access to learning resources. These findings align with the Technology Acceptance Model (TAM), which states that *perceived ease of use* and *perceived usefulness* are important factors determining adoption behavior (et al., 2021) .

In the case of Ciasihan Village, both perceptions are weak because technology has not been integrated into local entrepreneurship education or training programs. Furthermore, age and educational background significantly influence digital readiness. Young entrepreneurs (aged 25–35) are generally more open to using smartphones and online media for marketing, while older business owners prefer traditional approaches.

However, MSMEs are also increasingly recognizing that technology is increasingly crucial

for survival. Several respondents expressed interest in learning basic digital skills if provided with adequate training. This indicates that the willingness to adopt technology exists, but is hampered by a lack of systematic support.

3.2 Infrastructure and Institutional Barriers

Infrastructure is another major challenge affecting technology adoption. (Octiva et al., 2024) . Some areas in Ciasihan Village still experience unstable internet connections, especially during peak hours or heavy rain. Some MSME owners reported having to travel to nearby cities to obtain stable internet service.

Electricity reliability also plays a crucial role in technology utilization. Periodic power outages hamper the use of digital devices such as computers or mobile POS systems. Furthermore, data package costs are considered burdensome for MSMEs, whose daily income fluctuates.

Institutionally, the study found that government programs and education related to digital transformation rarely reach remote villages. Respondents stated that while they occasionally heard about national digital literacy programs such as the "National Digital Literacy Movement," these initiatives were largely concentrated in urban areas. None of the MSME owners interviewed had received structured training on e-commerce, online finance, or digital marketing.

This lack of sustainable institutional support reinforces the structural inequality between urban and rural MSMEs. According to Farida et al. (2025) , sustainable digital adoption requires collaboration between various stakeholders government, academia, the private sector, and local communities. Without such collaboration, rural entrepreneurs remain marginalized from the benefits of digital transformation.

3.3 Socio-Economic Implications of Technological Backwardness

Delays in keeping up with technological developments have a significant impact on the sustainability of small and medium enterprises. MSMEs that have not yet utilized digital technology often struggle to reach a wider market, experience slow production processes, and ultimately lose out to more modern businesses. Conversely, MSMEs that have begun utilizing simple technologies such as WhatsApp Business, Facebook Marketplace, or digital payment services have been able to better survive amidst economic challenges (Fathoni & Asfiah, 2024) . Evidently, during the COVID-19 pandemic, businesses that have become accustomed to adapting digitally tend to be more flexible and can continue operating despite economic instability.

For example, a food producer in Ciasihan reported that using WhatsApp to communicate with customers helped maintain orders when physical mobility was limited. Another handicraft seller successfully expanded her market by joining local online groups. These examples demonstrate that gradual digitalization, even on a small scale, can improve business continuity and social connectivity.

Furthermore, the digital divide exacerbates gender inequality in entrepreneurship. Many female entrepreneurs in rural areas are involved in home industries such as snack production or sewing (Simamora & Ningsih, 2020) . They often lack exposure to technology or rely on their partners for digital-related activities. Therefore, promoting women's digital empowerment through training and mentoring can generate broader socio-economic benefits.

Persistent technological underdevelopment also hampers rural financial inclusion. Some entrepreneurs express skepticism about digital banking and online payments, fearing fraud or mismanagement. This lack of trust limits their access to formal financial services, which are crucial for business expansion. According to (Maleha, 2025) , building digital trust among small entrepreneurs requires consistent education, user-friendly systems, and tangible success stories from peers.

3.4 Dimensions of Culture and Behavior

This research also uncovered cultural and behavioral barriers to digital transformation. Rural entrepreneurs in Ciasihan tended to prioritize stability and familiarity over innovation. Many viewed technology as "something for young people" or "for city dwellers." This perception reflects aspects of social identity theory in innovation adoption, where an individual's sense of

belonging to a social group influences their openness to change.

Older entrepreneurs often associate technology with risk or complexity. For example, one respondent said:

"I don't want to sell online because I don't understand how to handle complaints or deliveries. I prefer meeting customers in person."

This conservative mindset is reinforced by the limited examples of successful digital adoption from peers. Without visible local role models, the spread of innovation will be slow. In this regard, community-based interventions are crucial to foster collective learning.

Educational and religious leaders can play a crucial role in changing perceptions. By framing technology as a tool for barakah (sustainable well-being) and amanah (responsibility), digital literacy programs can better align with local cultural and moral values, especially in communities with strong Islamic traditions like Ciasihan Village.

3.5 Opportunities for Digital Empowerment

Despite the challenges, this study identified several opportunities to promote digital empowerment among rural MSMEs:

1. Youth Involvement
   Younger citizens, especially those with secondary or tertiary education, possess basic digital literacy and can act as catalysts for transformation. Engaging them in training or peer-to-peer mentoring programs can bridge the generation gap.
2. University-Community Collaboration
   Partnerships between universities such as *Nahdlatul Ulama University of Indonesia* and local communities can enhance knowledge transfer through field programs, workshops, and digital entrepreneurship incubators.
3. Government and Private Sector Support
   Public-private partnerships can improve digital infrastructure, subsidize data costs, and provide accessible platforms for MSME marketing. Initiatives like "MSMEs Go Digital" can be localized to rural areas through village-level cooperatives.
4. Principles of Islamic Economics
   Integrating *the maqāḍīd al-syarīah* (objectives of Islamic law) into digital empowerment strategies can strengthen ethical entrepreneurship. An emphasis on *adl* (justice), *maslahah* (public good), and *trust* can inspire MSMEs to adopt technology, not only for profit but also for community development.

Through this strategy, technological backwardness can be transformed into an opportunity for collective empowerment and not a barrier to growth.

3.6 Comparative Analysis with Other Rural Areas

To provide broader context, findings from Ciasihan Village are consistent with similar studies in other rural areas in Indonesia. (Nareswari & Artikel, 2024) reported that MSMEs in Central Java face similar constraints: weak infrastructure, low literacy, and fragmented institutional support . However, areas with stronger community organizations, such as cooperatives and youth groups, show faster rates of digital adoption.

This demonstrates the crucial role *social capital* plays in accelerating technology adoption. In Ciasihan Village, the active youth organization and religious study groups can be leveraged as informal digital training channels. This collaborative effort between community groups and academic institutions will create a more sustainable digital education model.

3.7 Summary of Findings

The overall findings of this study can be summarized as follows:

1. Technological backwardness in Ciasihan Village is mainly caused by low digital literacy, unstable infrastructure, and inadequate institutional support.
2. MSMEs that adopt even basic digital tools demonstrate better business continuity and adaptability compared to those that rely on traditional methods.
3. Cultural attitudes and generational differences greatly influence technology adoption.
4. Lack of coordinated support from governments and educational institutions perpetuates the digital divide.

Digital transformation in rural areas requires local strategies that integrate technological, social, and cultural dimensions

4. Conclusion

This study concludes that technological underdevelopment has a significant impact on the sustainability of MSMEs and provides strategic recommendations for increasing digital inclusion in rural Indonesia.

This study examines the impact of technological underdevelopment on the sustainability of Micro, Small, and Medium Enterprises (MSMEs) in Ciasihan Village, Bogor Regency, Indonesia. The research findings indicate that technological inequality remains a serious obstacle to achieving inclusive rural development. A lack of digital literacy, inadequate infrastructure, and limited institutional support collectively hamper the ability of rural MSMEs to innovate, compete, and sustain business growth in the digital era.

Despite these obstacles, the study also revealed signs of emerging digital adaptation among local entrepreneurs. Some MSMEs have begun using basic digital tools like WhatsApp Business, Facebook Marketplace, and mobile payment apps. These simple yet meaningful steps illustrate the potential for rural digital transformation if adequate training, mentoring, and infrastructure are provided.

Technological underdevelopment in rural Indonesia is not only a technical issue, but also structural and cultural. Addressing it requires an integrated effort that combines technology investment with social empowerment and education. Digital inclusion initiatives must be localized and designed in a participatory manner through collaboration with local governments, universities, religious institutions, and the private sector.

For policymakers, this study highlights the importance of building sustainable digital ecosystems that serve not only urban centers but also rural communities. For educators, it underscores the role of community-based learning and digital mentoring in improving literacy. For entrepreneurs, it provides evidence that adopting even simple technologies can increase competitiveness and resilience.

Future research could expand this study through a comparative approach involving several rural areas in Indonesia. Quantitative data could also complement qualitative findings to measure the direct impact of digital adoption on business performance indicators such as sales growth, employment, and income stability.

Ultimately, promoting technological equity among MSMEs is not just about modernizing rural economies, but also ensuring fairness, inclusivity, and achieving sustainable development goals for all

References

Farida, EA, Fathoni, M., Fitria, TD, & Firdaus, MA (2025). *Inclusive Strategy for Strengthening MSMEs and Optimizing the Role of Technology in Increasing Competitiveness in the Digital Era* . *3* , 695–709.

Fathoni, I., & Asfiah, N. (2024). *Digital Transformation of MSME Businesses in Indonesia After the Pandemic* . *4* (2), 10219–10236.

Jahalia, DT La, & Nafiati, L. (2021). Intention to Use E-Commerce Using the Technology Acceptance Model (TAM) in MSMEs. *Journal of Business and Entrepreneurship* , *17* (1), 24–31. https://doi.org/10.31940/jbk.v17i1.2327

Maleha, NY (2025). *Exploration of Trust, Ease of Transaction, and Perceived Risk in Digital Wallet User Experience* . *2* (3).

Nareswari, AH, & Artikel, I. (2024). *Journal of Economic and Business Research on MSME finance in Central Java. The influence of financial literacy, accounting information systems, IT adoption and Green Innovation Performance on the financial performance of MSMEs in Central Java* . *17* (1), 51–66.

Octiva, CS, Haes, PE, Fajri, TI, Eldo, H., & Hakim, ML (2024). *Implementation of Information*

Technology in MSMEs: Challenges and Opportunities . *13* , 815–821.

Oktavianoor, R., Library, I., & Social, I. (2020). *Digital Gap Caused by Demographic Conditions among Rural Communities* . *11* (1), 10–23.

Rika, AD, Sekar, LUA, & Mashudi. (2025). Digital Literacy and MSME Empowerment: A Theoretical Review of Empowerment Strategies in Remote Areas. *Paraduta: Journal of Economics and Social Sciences* , *3* (2), 55–60. https://ojs.umada.ac.id/index.php/Paraduta/article/view/913

Sapthiarsyah M Faizal, & Junita. (2024). The Influence of Social Media and Digital Marketing on MSME Performance. *Scientific Journal of Economics and Business* , *21* (2), 330–337.

Simamora, CM, & Ningsih, R. (2020). Digital Economy Inclusiveness in Indonesia: Gender Perspective and Job Creation. *Cendekia Niaga* , *4* (2), 39–53. https://doi.org/10.52391/jcn.v4i2.507

Sitompul, PS, Sari, MM, Miranda, C., & Lumban, B. (2025). Digital Transformation of Indonesian MSMEs: Challenges and Adaptation Strategies in the Digital Economy Era. *Journal of Current Digital Business Management* , *2* (April), 09–18.

Soekandar, AJ, & Pratiwi, P. (2023). Diffusion of Innovation for Small Retail Business Sustainability: Digital Marketing Strategy. *Scientific Journal of Management, Economics and Business* , *2* (1), 81–99. https://doi.org/10.51903/jimeb.v2i1.596

Sutopo, DS (2025). *Empowering Rural Women Through the MSME Digitalization Program in Support of Sustainable Development Goals* . *2* , 1–11.