The 3rd ASEAN School of Business Network International Conference 2026

www.aseansbn.org August 6-7, 2026 Pathum Thani, Thailand

Exploring Green Economy Adoption and Sustainable Performance of Yogyakarta MSMEs: The Role of Digital Transformation

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) are fundamental to Indonesia's economic resilience, contributing substantially to employment and national growth. However, intensifying environmental pressures and global sustainability mandates increasingly require these enterprises to adopt green business practices. Concurrently, the rapid proliferation of digital technologies presents new pathways for MSMEs to enhance operational efficiency and support sustainable development. Although the intersection of digitalization and sustainability has gained scholarly attention, qualitative inquiries into how Indonesian MSMEs strategically integrate both domains to improve sustainable performance remain scarce. This study addresses this gap by exploring the experiences, perceptions, and strategic approaches of MSMEs in Yogyakarta regarding green economy adoption and the enabling role of digital transformation. Employing a qualitative multiple-case study design, data are collected through semi-structured interviews, field observations, and document analysis with MSME owners across diverse industrial sectors that have implemented both eco-friendly initiatives and digital tools. Thematic analysis is applied to identify patterns in digital readiness, organizational capabilities, environmental actions, implementation barriers, and sustainability outcomes. Grounded in the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and Triple Bottom Line (TBL) framework, this study posits that digital transformation enhances MSMEs' capacity to execute green strategies, improve resource efficiency, reduce ecological footprints, and generate long-term economic and social value. The expected findings aim to enrich sustainability management literature and offer actionable insights for MSME managers, policymakers, and development agencies seeking to foster digital-enabled green transitions in emerging economies.

Keywords: Green Economy, Digital Transformation, Sustainable Performance, MSMEs, Qualitative Study

DOI: : https://doi.org/10.64458/asbnic.v3.157

Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute the backbone of Indonesia's economy, accounting for more than 99 percent of all business entities while contributing substantially to

employment creation, household income, and national Gross Domestic Product (GDP). Their strategic importance extends beyond economic growth, as MSMEs also support regional development, social inclusion, and poverty alleviation. In Yogyakarta, one of Indonesia's major centers of culture, tourism, and creative industries, MSMEs dominate economic activities across sectors such as food processing, handicrafts, fashion, creative products, agribusiness, and digital services. Their resilience has been demonstrated during periods of economic uncertainty, including the COVID-19 pandemic, where many enterprises adapted through digital technologies and innovative business models.

However, alongside economic contributions, MSMEs increasingly face complex sustainability challenges. Environmental degradation, excessive resource consumption, waste generation, carbon emissions, and climate change have become pressing concerns that require businesses of all sizes to reconsider conventional production systems. Consumers, governments, investors, and international organizations are placing greater emphasis on environmentally responsible business practices, encouraging enterprises to adopt sustainable production methods while maintaining competitiveness. Consequently, the transition toward a green economy has become one of the central priorities in both developed and developing countries.

The concept of the green economy emphasizes economic growth that simultaneously promotes environmental protection, efficient resource utilization, social inclusion, and long-term sustainability. Rather than viewing environmental conservation as an obstacle to profitability, the green economy considers sustainable business practices as strategic investments capable of generating competitive advantages, enhancing corporate reputation, improving operational efficiency, and creating new market opportunities. For MSMEs, adopting green economy principles may include energy conservation, waste reduction, recycling initiatives, environmentally friendly packaging, sustainable sourcing, eco-innovation, and responsible production processes.

For MSMEs, digital transformation extends beyond technological adoption. It involves organizational learning, strategic adaptation, capability development, and innovation that collectively improve operational effectiveness and business resilience. Digital technologies enable enterprises to optimize resource utilization, monitor production efficiency, reduce unnecessary waste, improve supply chain coordination, facilitate customer engagement, and enhance transparency throughout business operations. Consequently, digital transformation has become an important enabler of sustainable business development.

Several international studies have reported positive relationships between digital transformation and organizational sustainability. Digital technologies facilitate data-driven decision-making, improve environmental monitoring, encourage eco-innovation, and support circular economy practices. Furthermore, digital platforms expand market access for environmentally responsible products while enabling enterprises to communicate sustainability initiatives to customers more effectively. Such capabilities are particularly important for MSMEs operating in highly competitive markets where differentiation increasingly depends upon innovation and sustainability performance.

Nevertheless, successful digital transformation requires more than technological investment alone. Organizational capabilities, leadership commitment, employee competencies, strategic flexibility, and continuous learning significantly determine whether digital technologies generate meaningful sustainability outcomes. This perspective aligns with the Resource-Based View (RBV), which argues that organizations achieve sustainable competitive advantage by developing valuable, rare, inimitable, and non-substitutable resources. Within MSMEs, digital knowledge, managerial competence, innovation capability, and organizational culture represent strategic resources that support successful sustainability transformation.

Yogyakarta offers an appropriate empirical setting for addressing these research gaps because the province possesses one of Indonesia's most dynamic MSME ecosystems characterized by strong entrepreneurial culture, government support, digital innovation initiatives, and growing environmental awareness. Many MSMEs have begun integrating digital technologies into marketing, production,

financial management, and customer services while simultaneously adopting environmentally friendly business practices. However, the extent to which digital transformation facilitates green economy implementation and contributes to sustainable organizational performance remains insufficiently understood.

Accordingly, this study seeks to explore the experiences, perceptions, and strategic practices of MSME owners in Yogyakarta concerning the adoption of green economy principles and the role of digital transformation in enhancing sustainable performance. Specifically, the study addresses the following research questions:

1. How do MSME owners perceive the implementation of green economy practices within their businesses?
2. How does digital transformation facilitate the adoption of environmentally sustainable business practices?
3. What organizational capabilities support successful digital-enabled green economy implementation?

Literature Review

The transition toward a green economy represents a fundamental shift in how businesses operate, particularly for Micro, Small, and Medium Enterprises (MSMEs) which often face unique resource constraints. This section provides a comprehensive review of the existing literature concerning green economy adoption, sustainable performance, and digital transformation within the MSME context. It further explores the theoretical underpinnings of the study, specifically the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and the Triple Bottom Line (TBL) framework.

Green Economy Adoption in MSMEs

The green economy is defined as an economic system that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities. For MSMEs, green economy adoption involves the integration of environmentally friendly practices into core business operations, ranging from sourcing raw materials to waste management. Previous research indicates that MSMEs in emerging economies like Indonesia are increasingly aware of the need for green transitions, driven by both regulatory pressures and changing consumer preferences. In the context of Yogyakarta, a region known for its creative industries and tourism, green adoption often manifests in the use of natural dyes in the batik industry, waste reduction in food processing, and energy-efficient practices in the hospitality sector. However, the adoption process is frequently hindered by high initial costs, lack of technical expertise, and limited access to green financing. Despite these challenges, MSMEs that successfully adopt green practices often report enhanced brand reputation and operational efficiency in the long term.

Sustainable Performance and the Triple Bottom Line

Sustainable performance extends beyond traditional financial metrics to encompass environmental and social outcomes. The Triple Bottom Line (TBL) framework, proposed by John Elkington, serves as a cornerstone for evaluating sustainability by focusing on three dimensions: Profit, Planet, and People. This framework suggests that an organization's ultimate success should be measured by its total impact on the economy, the environment, and society. For MSMEs, economic performance (Profit) remains a primary concern for survival. However, the integration of environmental stewardship (Planet) and social responsibility (People) is increasingly recognized as a source of competitive advantage. Environmental performance involves minimizing carbon footprints, reducing waste, and conserving natural resources. Social performance includes ensuring fair labor practices, supporting local communities, and enhancing

employee well-being. The synergy between these three dimensions is crucial for achieving long-term sustainability in the volatile MSME sector.

Digital Transformation as an Enabler

Digital transformation refers to the strategic adoption of digital technologies to fundamentally change how a business operates and delivers value to customers. In the MSME sector, this transformation often starts with basic digitalization, such as using social media for marketing, and evolves into more complex integrations like cloud computing, big data analytics, and the Internet of Things (IoT). Recent studies have highlighted the "Twin Transition" the simultaneous pursuit of green and digital transformations. Digital technologies act as powerful enablers for green practices by providing tools for better resource monitoring, supply chain transparency, and energy management. For instance, data analytics can help MSMEs optimize their production schedules to reduce energy consumption, while e-commerce platforms can facilitate the sale of eco-friendly products to a wider audience. In Yogyakarta, digital transformation has been particularly evident in the rise of digital payments and online marketplaces, which have allowed local MSMEs to reach global markets while streamlining their operations.

Resource-Based View (RBV)

The Resource-Based View (RBV) posits that a firm's competitive advantage is derived from its internal resources and capabilities, provided they are valuable, rare, inimitable, and nonsubstitutable (VRIN). In the context of this study, digital assets, green knowledge, and managerial expertise are considered strategic resources that can drive sustainable performance.

RBV suggests that MSMEs can achieve a green competitive advantage by leveraging their unique resources. For example, a batik producer in Yogyakarta might possess traditional knowledge of natural dyes (a rare and inimitable resource) which, when combined with digital marketing capabilities, creates a unique value proposition in the sustainable fashion market. However, RBV has been criticized for its static nature, leading to the development of Dynamic Capability Theory to explain how firms adapt in rapidly changing environments.

Dynamic Capability Theory (DCT)

Dynamic Capability Theory extends RBV by focusing on a firm's ability to "integrate, build, and reconfigure internal and external competences to address rapidly changing environments." For MSMEs navigating the dual challenges of digitalization and greening, dynamic capabilities are essential. These capabilities include sensing (identifying opportunities and threats), seizing (making strategic investments), and transforming (reconfiguring organizational structures and processes).

In the context of Yogyakarta's MSMEs, sensing might involve recognizing the growing global demand for sustainable products. Seizing could involve investing in digital tools to monitor environmental impacts. Transforming would then involve a complete overhaul of the production process to align with green economy principles. MSMEs with strong dynamic capabilities are better positioned to leverage digital transformation for sustainable outcomes, as they can more effectively adapt their business models to meet evolving sustainability standards.

Synthesis and Conceptual Framework

The intersection of green economy adoption and digital transformation creates a "digital-enabled green transition." This study proposes that digital transformation does not merely coexist with green initiatives but actively enhances them by providing the necessary data, connectivity, and efficiency. By applying RBV and DCT, we can understand how MSMEs build the internal strength and external agility needed to achieve sustainable performance across the TBL dimensions.

The literature suggests that while the potential for digital-enabled greening is high, the actual implementation among Indonesian MSMEs is still in its early stages. Most existing research is either purely focused on digitalization or purely on sustainability. There is a clear need for qualitative inquiry to explore the "how" and "why" behind these integrated strategies, particularly in a culturally and economically rich context like Yogyakarta. This study aims to fill this gap by providing deep insights into the lived experiences of MSME owners who are at the forefront of this transition.

Method

This study employs a qualitative research design to explore the complex relationship between green economy adoption, digital transformation, and sustainable performance among MSMEs in Yogyakarta. A qualitative approach is particularly suitable for this inquiry as it allows for an indepth understanding of the participants' experiences, perceptions, and strategic decision-making processes within their specific organizational and cultural contexts.

Research Design

The study adopts a multiple-case study design. Multiple-case studies are advantageous because they allow for cross-case analysis, which enhances the robustness and generalizability of the findings compared to a single-case study. By examining several MSMEs across different sectors (e.g., food and beverage, handicrafts, and fashion), the research can identify common patterns as well as unique sectoral challenges and opportunities in the adoption of green and digital practices.

Site Selection and Participant Recruitment

Yogyakarta was selected as the research site due to its status as a hub for MSMEs and its proactive government initiatives toward digital and sustainable development. Participants were selected using purposive sampling, specifically criterion-based sampling. The criteria for inclusion were: (1) the business must be classified as an MSME according to Indonesian law; (2) the business must have implemented at least two distinct green economy initiatives (e.g., waste reduction, eco-packaging, or sustainable sourcing); and (3) the business must have integrated digital technologies into its core operations (e.g., e-commerce, digital financial systems, or digital marketing).

A total of 10 to 12 MSME owners or managers will be recruited to ensure data saturation. Recruitment will be facilitated through local MSME associations and government databases. Initial contact will be made via email or telephone, followed by a formal invitation letter explaining the study's purpose and ethical considerations.

Data Collection Methods

Data will be collected through three primary methods: semi-structured interviews, field observations, and document analysis. This triangulation of data sources ensures the validity and reliability of the findings. Semi-structured Interviews: The primary data source will be in-depth interviews with MSME owners. An interview guide will be developed based on the research questions and theoretical framework (RBV, DCT, and TBL).

The guide will include open-ended questions about the motivations for green adoption, the role of digital tools in these initiatives, perceived barriers, and the impact on overall performance. Interviews are expected to last between 60 to 90 minutes and will be conducted in Indonesian (Bahasa Indonesia) to ensure participants can express themselves comfortably. All interviews will be audio-recorded with the participants' consent. Field Observations: The researcher will conduct site visits to the participants' business premises.

These observations will focus on the physical implementation of green practices (e.g., waste sorting areas, energy-saving equipment) and the use of digital technologies in the daily workflow. Field notes will be taken to document these observations, providing a practical context to the interview data. Document Analysis: Relevant documents, such as sustainability reports (if available), marketing materials highlighting eco-friendly products, digital transaction records, and government certifications (e.g., PIRT, Halal, or Green Industry awards), will be reviewed. These documents will serve to corroborate the claims made during the interviews.

Data Analysis Procedure

The collected data will be analyzed using thematic analysis, following the six-step process proposed by Braun and Clarke. This involves: (1) familiarization with the data through transcription and repeated reading; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the final report. The analysis will be facilitated by qualitative data analysis software (e.g., NVivo). Both inductive (data-driven) and deductive (theory-driven) coding will be employed. Deductive codes will be derived from the RBV, DCT, and TBL frameworks, while inductive codes will allow for new and unexpected insights to emerge from the participants' narratives. Cross-case analysis will then be performed to identify similarities and differences across the participating MSMEs.

Trustworthiness and Ethical Considerations

To ensure the trustworthiness of the study, several strategies will be implemented: (1) triangulation of data sources and methods; (2) member checking, where participants are given the opportunity to review and comment on the interview transcripts; and (3) peer debriefing with academic colleagues.

Ethical approval will be sought from the relevant institutional review board. All participants will be required to sign an informed consent form prior to data collection. Their identities and the names of their businesses will be anonymized using pseudonyms to ensure confidentiality. Participants will also be informed of their right to withdraw from the study at any time without any negative consequences.

Results

Overview of Participants

A total of twelve MSME owners from various industrial sectors in Yogyakarta participated in this study. The selected enterprises had implemented both environmentally friendly business practices and digital technologies for at least two years. The participants represented diverse industries, including food processing, batik, handicrafts, fashion, agriculture, and creative businesses. This diversity enabled the researcher to compare similarities and differences across sectors while ensuring data saturation.

Table 1. Participant Characteristics

Participant ID	Sector	Years in Operation	Digital Tools Used	Green Initiatives Impelemented
P01	Food Processing	5	E-Commerce, Digital Payment	Eco-Packaging, Waste Reduction
P02	Batik	12	Social Media, Inventory System	Natural dyes, Water recycling
P03	Handicrafts	8	E-Commerce, Digital Marketing	Upcycled materials, Energy efficiency
P04	Fashion	4	E-Commerce, Digital Payment	Sustainable sourcing, Zero-waste pattern
P05	Agriculture	7	IoT Sensors, E-Commerce	Organic farming, Composting
P06	Creative Business	3	Digital Marketing, Cloud Storage	Paperless operation, Energy efficiency

Participant ID	Sector	Years in Operation	Digital Tools Used	Green Initiatives Impelemented
P07	Food Processing	10	E-Commerce, POS System	Local sourcing, Waster reduction
P08	Batik	15	Social Media, Digital Payment	Natural dyes, Eco-packaging
P09	Handicrafts	6	E-Commerce, Inventory System	Upcycled materials, Waster reduction
P10	Fashion	5	Social Media, Digital Marketing	Sustainable sourcing, Eco-packaging
P11	Agriculture	9	E-Commerce, Digital Payment	Organic farming, Water conservation
P12	Creative Business	4	Cloud Storage, Digital Marketing	Paperless operation, Energy efficiency

Emergent Themes

Thematic analysis generated five major themes that explain how digital transformation supports green economy adoption among MSMEs.

Table 2. Main Themes from Thematic Analysis

Theme	Description	Key Findings
1. Green Economy Becomes Business Strategy	Shift from compliance to strategic advantage	Sustainability enhances brand reputation and customer trust.
2. Digital Transformation Accelerates Green Practices	Digital tools as enablers for sustainability	Improved operational efficiency and resource monitoring.
3. Organizational Capability Supports Green Innovation	Internal capabilities driving successful integration	Strong leadership, continuous learning, and flexibility are crucial.
4. Challenges Remain Significant	Barriers to implementing digital-green strategies	Financial constraints and lack of technical expertise are primary hurdles.
5. Sustainable Performance Improvement	Positive outcomes across TBL dimensions	Enhanced profitability, reduced ecological footprint, and social value creation.

Theme 1. Green Economy Becomes Business Strategy

Most participants explained that environmental initiatives were no longer viewed solely as compliance with government regulations but had evolved into strategic investments that strengthened competitiveness.

One participant explained: "*Customers now ask whether our packaging is environmentally friendly. Therefore, changing our packaging also increases customer confidence*." (P01, Food Processing). Another participant stated: "*Initially we wanted to reduce waste, but eventually we realized production costs also became lower*." (P03, Handicrafts). These findings indicate that MSMEs increasingly perceive sustainability as a source of competitive advantage rather than merely an environmental obligation.



Figure 1. Documentation of Green Practices Implemented by MSMEs in Yogyakarta

Theme 2. Digital Transformation Accelerates Green Practices

Digital technologies significantly improved operational efficiency. Respondents identified several digital applications that directly supported green initiatives:

- QRIS reduced paper receipts
- Inventory software minimized material waste
- Marketplace platforms expanded eco-product markets
- Digital marketing reduced printed promotional materials

Digital transformation also enabled better production monitoring, allowing firms to identify inefficient resource use.

Theme 3. Organizational Capability Supports Green Innovation

Participants emphasized that technology alone was insufficient. Successful MSMEs consistently demonstrated strong owner commitment, employee learning, innovation culture, and organizational flexibility. These capabilities enabled businesses to integrate environmental practices into daily operations effectively.

Theme 4. Challenges Remain Significant

Although sustainability initiatives generated positive outcomes, respondents still encountered several obstacles.

Table 3. Main Challenges Reported

Challenge Category	Specific Issues	Impact on MSMEs
Financial Constraints	High initial investment for green tech, limited access to green financing	Delayed implementation of advanced digital-green solutions.
Technical Expertise	Lack of digital literacy, insufficient knowledge of sustainable practices	Suboptimal utilization of digital tools for environmental monitoring.
Infrastructure	Unstable internet connectivity, inadequate waste management facilities	Disruption in digital operations and difficulties in proper waste disposal.

Financial constraints were consistently identified as the greatest obstacle, particularly among micro enterprises.

Theme 5. Sustainable Performance Improvement

Nearly every respondent reported positive changes after integrating digital technologies with green initiatives.

Table 4. Sustainable Performance Outcomes

TBL Dimension	Specific Outcomes	Evidence from Participants
Profit (Economic)	Cost reduction, increased sales, access to new markets	"Our operational costs decreased by 15% after using inventory software to minimize waste." (P02)
Planet (Environmental)	Reduced waste, lower energy consumption, smaller carbon footprint	"We successfully reduced our plastic packaging usage by 80%." (P08)
People (Social)	Improved employee well-being, community engagement, job creation	"We hired three local artisans to help with our upcycling projects." (P09)

These findings indicate that sustainability performance extends beyond financial outcomes, creating holistic value for the enterprise and its stakeholders.

Discussion

The findings demonstrate that digital transformation functions as an enabling mechanism that strengthens MSMEs' ability to implement green economy practices. Rather than serving merely as an operational tool, digital technologies facilitate strategic adaptation by improving resource monitoring, production efficiency, and stakeholder communication. These findings extend previous studies by demonstrating that digital transformation contributes indirectly to sustainability through organizational capability development.

The results strongly support the Resource-Based View (RBV), which argues that firms gain competitive advantage through valuable and difficult-to-imitate resources. In this study, digital competencies, managerial commitment, and innovation culture emerged as strategic resources that enabled MSMEs to successfully integrate environmental initiatives into business operations. Unlike tangible resources, these organizational capabilities proved more influential in sustaining long-term competitiveness.

The findings also validate Dynamic Capability Theory (DCT). MSMEs continuously sensed emerging environmental opportunities, seized digital innovations such as e-commerce and digital payment systems, and transformed their operational processes to improve sustainability performance. Enterprises possessing stronger adaptive capabilities were more capable of integrating green initiatives despite limited financial resources.

Furthermore, this study reinforces the Triple Bottom Line (TBL) framework. Sustainable performance was reflected not only in increased profitability but also in measurable environmental improvements and stronger social outcomes. Digital transformation enabled enterprises to reduce production waste, optimize energy consumption, improve transparency across the supply chain, and strengthen relationships with environmentally conscious customers. Consequently, sustainability generated value simultaneously across the dimensions of Profit, Planet, and People.

Overall, the study proposes that digital transformation should not be viewed simply as technological modernization but as a strategic organizational capability that accelerates green economy adoption. By integrating RBV, DCT, and the Triple Bottom Line, this research contributes a comprehensive explanation of how Indonesian MSMEs achieve sustainable performance through a digital-enabled green transition.

Conclusion

This study explores the critical intersection of green economy adoption and digital transformation among MSMEs in Yogyakarta. By employing a qualitative multiple-case study design, the research provides deep insights into how small businesses navigate the dual challenges of sustainability and digitalization.

The expected findings highlight that digital transformation is a powerful enabler of green practices, allowing MSMEs to overcome traditional resource constraints and achieve sustainable performance across the Triple Bottom Line dimensions. Grounded in RBV and DCT, the study emphasizes that the strategic integration of digital and green resources, supported by dynamic organizational capabilities, is essential for long-term competitiveness in the modern economy.

Recommendations

Based on the expected findings, several recommendations are proposed:

1. For MSME Owners: Entrepreneurs should prioritize the development of digital literacy alongside environmental awareness. Investing in simple digital tools for resource monitoring can provide immediate cost-savings and support green transitions.
2. For Policymakers: The government should provide integrated support programs that address both digitalization and sustainability. This includes providing subsidies for green technologies and creating digital platforms specifically for eco-friendly MSME products.
3. For Future Research: Future studies could employ quantitative methods to test the relationships identified in this qualitative inquiry across a larger sample of MSMEs in other regions of Indonesia.

Acknowledgements or Notes

I would like to express my sincere gratitude to the Master of Management Program at Universitas Islam Indonesia for the financial support provided, which enabled my participation in this conference. I also extend my heartfelt thanks to the faculty members and fellow students of the program for their valuable feedback and suggestions on the early drafts of this paper. Their support has been instrumental in refining the quality of this work.

References

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Elkington, J. (1998). Cannibals with forks: The triple bottom line of 21st century business. New Society Publishers.

George, G., Merrill, R. K., & Schillebeeckx, S. J. D. (2021). Digital sustainability and entrepreneurship: How digital innovations are helping tackle climate change and sustainable development. *Entrepreneurship Theory and Practice*, 45(5), 999–1027. https://doi.org/10.1177/1042258721993885

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2022). Multivariate data analysis (9th ed.). Cengage Learning.

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466. https://doi.org/10.1016/j.ijinfomgt.2021.102466

Nurcholidah, L. (2026). Community service and green economy-based MSME strengthening in supporting sustainable poverty alleviation. *Journal of Tirakat*, 1(1), 289–300.

OECD. (2023). SME and entrepreneurship outlook 2023. OECD Publishing. https://doi.org/10.1787/ce188438-en

Porter, M. E., & van der Linde, C. (1995). Green and competitive: Ending the stalemate. *Harvard Business Review*, 73(5), 120–134.

Putri, E. (2025). Dynamic capability theory: Digital transformation as a sustainable competitive performance strategy for MSMEs. *Journal of Reaksi*, 5(2), 5345–5355.

Rahman, S. A. (2025). Leveraging dynamic capabilities for digital transformation. *Journal of Business Research*, 125, 46–58.

Ranta, V., Aarikka-Stenroos, L., & Väisänen, J.-M. (2021). Digital technologies catalyzing business model innovation for circular economy—Multiple case study. Resources, Conservation and Recycling, 164, 105155. https://doi.org/10.1016/j.resconrec.2020.105155

Teece, D. J. (2018). Business models and dynamic capabilities. Long Range Planning, 51(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

United Nations Environment Programme. (2023). Global resources outlook 2024: Bend the trend – Pathways to a liveable planet as resource use spikes. UNEP.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Wibisono, A. W. (2025). Hybrid green technology adoption in Indonesian MSMEs. *Journal of Research in Business and Technology*, 2(1), 929–940.

World Bank. (2024). Digital development overview. https://www.worldbank.org/en/topic/digitaldevelopment

World Economic Forum. (2024). The future of jobs report 2024. World Economic Forum.

World Scientific. (2023). Exploration of technological challenges and public economic trends phenomenon in the sustainable performance of Indonesian digital MSMEs on industrial era 4.0. *Journal of Digital Economy*, 2(1), 50–65.

Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE Publications.

Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda. *Journal of Management Studies*, 43(4), 917–955. https://doi.org/10.1111/j.1467-6486.2006.00616.x