

# Digital Governance and Green Business: Efforts to Realize Sustainable MSMEs in Pekanbaru City from an SDG Perspective

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## Abstract.

*This study aims to analyze the implementation of digital governance and green business practices as a means to foster sustainable Micro, Small, and Medium Enterprises (MSMEs) in Pekanbaru City, viewed through the lens of the Sustainable Development Goals (SDGs). Digital transformation in governance and the adoption of eco-friendly business practices are crucial factors in enhancing MSME competitiveness while supporting inclusive and sustainable economic development. The study employs a qualitative approach with a descriptive method, utilizing in-depth interviews, observations, and document analysis involving MSME owners, local government officials, and relevant stakeholders. Data analysis was conducted through an interactive process of data reduction, data presentation, and conclusion drawing. The findings indicate that the implementation of digital governance has facilitated easier access to licensing services, business guidance, digital marketing, and business support for MSMEs. Meanwhile, the implementation of green business practices is becoming evident through the use of eco-friendly raw materials, energy efficiency, waste management, and heightened awareness regarding sustainable production practices. However, the implementation of these concepts still faces various challenges, such as limited digital literacy, restricted access to green financing, low technology adoption, and suboptimal synergy among stakeholders. The study concludes that integrating digital governance and green business practices contributes positively to achieving the SDGs—specifically Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation, and Infrastructure), Goal 11 (Sustainable Cities and Communities), Goal 12 (Responsible Consumption and Production), and Goal 13 (Climate Action). Therefore, strengthening policies, enhancing MSME capacity, and fostering collaboration among the government, the business sector, academia, and the community are essential to accelerate the development of competitive and sustainable MSMEs in Pekanbaru City.*

**Keywords:** digital governance, green business, Sustainable MSMEs and SDG.

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## I. INTRODUCTION

The advancement of digital technology and growing awareness of environmental issues have shifted the paradigm of economic development across various nations, including Indonesia. The era of digital transformation compels governments to develop governance systems that are more effective, transparent, accountable, and responsive through the implementation of digital governance. Meanwhile, escalating challenges related to climate change, environmental pollution, and the exploitation of natural resources are driving the business sector to adopt "green business" concepts—strategies that prioritize not only economic profit but also environmental and social considerations. Both concepts serve as vital elements in supporting sustainable development, as outlined in the United Nations' Sustainable Development Goals (SDGs) agenda.

In Indonesia, Micro, Small, and Medium Enterprises (MSMEs) play a strategic role as the backbone of the national economy. MSMEs make significant contributions to Gross Domestic Product (GDP), employment, income distribution, and the strengthening of regional economies. Beyond serving as drivers of the grassroots economy, MSMEs have also demonstrated relatively high resilience in the face of various economic crises. Nevertheless, the development of MSMEs continues to face numerous challenges, including low productivity, limited access to digital technology, a lack of innovation, low digital literacy, restricted access to financing, and the suboptimal adoption of business practices that prioritize environmental sustainability.

Digital transformation serves as a solution to enhance the competitiveness of MSMEs. Through various policies, the Indonesian government has driven the acceleration of MSME digitalization by developing electronic government services, digitizing business licensing and tax systems, providing digital entrepreneurship training, facilitating platform-based marketing, and expanding access to financing via financial technology. The implementation of digital governance enables public service processes to become faster, more efficient, transparent, and easily accessible to MSME players. Digital-based governance

minimizes bureaucratic hurdles, thereby improving the quality of public services and fostering a more conducive business ecosystem.

Nevertheless, the digitalization of MSMEs still faces various obstacles. Not all MSME operators possess the ability to utilize information technology optimally. Factors such as the digital literacy gap, limited technological infrastructure, low digital management capabilities, and a lack of guidance have resulted in uneven progress regarding digital transformation. Furthermore, most MSMEs still limit their use of digital technology to marketing activities via social media or online marketplaces, while the adoption of technology for financial management, supply chain operations, customer data analysis, and product innovation remains relatively low.

On the other hand, environmental sustainability has become a critical concern in global economic development. Business activities that disregard environmental considerations can lead to increased waste generation, excessive energy consumption, carbon emissions, and the uncontrolled exploitation of natural resources. These conditions have driven the emergence of the "green business" concept—a business model that integrates economic efficiency with environmental and social responsibility. Adopting green business practices focuses not only on mitigating negative environmental impacts but also on achieving production cost efficiencies, enhancing corporate image, expanding market access, and building trust among consumers who are increasingly conscious of eco-friendly products.

In practice, the implementation of green business practices among MSMEs remains low. Many business owners believe that adopting eco-friendly business models entails high investment costs and complex technology, without yielding immediate economic returns. Furthermore, limited knowledge of green economy concepts, a lack of government incentives, and restricted access to green financing serve as obstacles to the adoption of sustainable business practices.

As the capital of Riau Province, Pekanbaru is a key economic growth hub on the island of Sumatra, boasting rapid development in the MSME sector. Various business sectors—ranging from culinary arts, fashion, and handicrafts to trade, services, and the creative industries—continue to expand and contribute to regional economic growth. The Pekanbaru City Government has actively promoted the digitalization of public services through various electronic-based innovations while simultaneously fostering MSME empowerment programs that include training, mentoring, and digital marketing promotion. Nevertheless, significant challenges remain in establishing sustainable MSMEs, particularly regarding the lack of comprehensive digital technology adoption, limited human resource capacity, and the suboptimal implementation of environmentally sustainable business practices.

From the perspective of the Sustainable Development Goals (SDGs), the development of MSMEs is not merely aimed at boosting economic growth but must also take social and environmental aspects into account. Integrating digital governance and green business practices is a relevant strategy for supporting the achievement of several SDGs—specifically Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation and Infrastructure), Goal 11 (Sustainable Cities and Communities), Goal 12 (Responsible Consumption and Production), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). Consequently, MSME development focuses not only on enhancing productivity and economic profit but also on creating social value, preserving the environment, and strengthening regional economic resilience.

Based on the foregoing, a gap persists between government digitalization policies, the adoption of green business practices, and the actual conditions of MSMEs in Pekanbaru City. While various digitalization and sustainability programs have been initiated, their implementation has not yet been fully integrated or optimized to support MSME competitiveness. Therefore, comprehensive research is needed to examine how the implementation of digital governance and green business practices supports the development of sustainable MSMEs in Pekanbaru City. This study is expected to contribute academically to the fields of digital governance and sustainable business, while also offering recommendations to local government, MSME players, academics, and other stakeholders for formulating policies and development strategies that align with the achievement of the SDGs.

Shifts in the global economic landscape—driven by the Fourth Industrial Revolution, advancements in information technology, and growing demands for sustainable development practices—have prompted

governments worldwide to transform their governance and business sector development. Digitalization is no longer viewed merely as a technological innovation; rather, it has become a strategic instrument for enhancing public service effectiveness, bureaucratic efficiency, and government transparency, while also strengthening national economic competitiveness. Concurrently, heightened concern regarding climate change and environmental degradation has altered global market preferences, driving an increasing demand for products and services generated through processes that are environmentally friendly, resource-efficient, and socially responsible.

As a developing nation, Indonesia faces complex challenges in achieving sustainable economic development. On one hand, the government is tasked with boosting economic growth, expanding employment opportunities, and reducing poverty levels. On the other hand, economic development must also maintain ecological balance to prevent further severe environmental degradation. Consequently, current national development strategies are focused on strengthening the digital economy while integrating green economy principles as the foundation for sustainable development.

In this context, the concept of digital governance is highly relevant, as it enhances the quality of relationships among the government, the public, and the business sector through the use of information technology. The digitalization of public services simplifies and accelerates administrative processes while increasing transparency and reducing transaction costs—factors that have historically posed obstacles for MSMEs. The government no longer acts solely as a regulator but also as a facilitator, providing a digital ecosystem that enables businesses to grow and compete more effectively.

Furthermore, the implementation of digital governance enables the generation of accurate data (data-driven governance), allowing for more targeted policymaking. Through the integration of information systems, the government can map the needs of MSMEs, identify sectors with high potential, distribute assistance effectively, and monitor and evaluate the impact of various economic empowerment programs. Thus, digital transformation in government not only enhances the quality of public services but also strengthens the governance of regional economic development.

In addition to digital transformation, the concept of "green business" serves as a crucial approach in the development of MSMEs. Green business is a model that integrates economic, social, and environmental aspects into every stage of business operations—ranging from raw material selection, production, distribution, and marketing to waste management. This concept aligns with the "triple bottom line" principle, which emphasizes a balance between profit (economic gain), people (community well-being), and the planet (environmental sustainability). By adopting these principles, MSMEs can not only boost their profits but also contribute to environmental conservation and the improvement of community welfare.

Shifting consumer behavior further underscores the urgency of adopting green business practices. Modern consumers increasingly prioritize sustainability when making purchasing decisions. Products that feature eco-friendly packaging, utilize local raw materials, employ energy-efficient production processes, and demonstrate a commitment to waste management tend to gain added value in the marketplace. Consequently, adopting green business practices is not merely a matter of corporate social responsibility; it is also a strategic move that enhances the competitiveness of MSMEs amidst an increasingly competitive market landscape.

In Pekanbaru City, the development of MSMEs shows a positive trend, driven by rising economic activity across the trade, culinary, service, creative industry, and digital economy sectors. Pekanbaru's position as a trade and service hub in Riau Province offers significant opportunities for MSME growth. However, this development is accompanied by various challenges, such as intensifying business competition, a shift in consumer behavior toward digital transactions, and demands for the adoption of more environmentally friendly business practices. These conditions require MSME players to undergo a transformation in order to survive and thrive within a dynamic business environment.

Another ongoing challenge is the uneven adoption of digital technology among MSMEs. The majority of MSMEs still utilize digital media solely for promotion and marketing, while the use of technology for business management, digital financial record-keeping, inventory management, market analysis, and integration with digital government systems remains relatively limited. Furthermore, the

adoption of green business principles has yet to become a strong business culture, hindered by limitations in knowledge, capital, technology, and incentives that would support the transition toward sustainable business practices.

This phenomenon demonstrates that digitalization and environmental sustainability are inseparable in the development of MSMEs. Digital governance can serve as a mechanism to accelerate the implementation of green business practices by providing regulations, digital services, information systems, mentoring, training, and technology-based incentives. Conversely, the adoption of green business practices enhances the quality of economic development resulting from digital transformation, ensuring that the benefits of development extend beyond the economic sphere to encompass social and environmental aspects as well.

From an academic perspective, extensive research has been conducted on both digital governance and green business. However, the majority of these studies examine the two concepts in isolation. Research on digital governance typically focuses on public service quality, bureaucratic innovation, or digital government transformation. Meanwhile, studies on green business tend to address the implementation of eco-friendly business practices, the green economy, or corporate social responsibility. There remains a relative scarcity of research integrating these two concepts as a strategy for the sustainable development of MSMEs, particularly within the context of Pekanbaru City and the framework of achieving the SDGs. This situation indicates a research gap that needs to be addressed through more comprehensive study.

Furthermore, this research holds practical significance, as its findings are expected to serve as a basis for formulating local government policies aimed at strengthening a digital-based and sustainable MSME ecosystem. The findings are also expected to provide recommendations for collaboration models involving the government, the business sector, higher education institutions, financial institutions, communities, and the general public to drive an MSME transformation that is both adaptive to technological advancements and oriented towards environmental preservation.

Based on the preceding discussion, it is evident that integrating digital governance and green business represents a strategic approach to fostering MSMEs that are resilient, innovative, competitive, and sustainable. Consequently, this research is significant for examining the implementation of these two concepts in Pekanbaru City, the factors influencing their success, the challenges encountered, and their contribution to achieving the Sustainable Development Goals. The study's findings are expected to offer theoretical contributions to the fields of public administration, digital governance, and sustainable business management, while also providing practical insights for formulating policies regarding MSME development in Pekanbaru City and other regions across Indonesia.

## **II. METHODS**

This study employs a qualitative approach using a descriptive method. The qualitative approach was selected to gain an in-depth understanding of the implementation of digital governance and green business practices in fostering sustainable MSMEs in Pekanbaru City. The research not only examines government-implemented policies but also explores the experiences, perceptions, and practices of MSME actors and stakeholders in supporting the achievement of the Sustainable Development Goals (SDGs). A descriptive method is employed to systematically describe the actual conditions regarding the implementation of digital governance, the adoption of eco-friendly business practices, supporting and inhibiting factors, and their contribution to the sustainability of MSMEs. This approach is expected to yield a comprehensive picture of the empirical conditions in the field.

## **III. RESULT AND DISCUSSION**

Research findings indicate that digital governance plays a strategic role in establishing government administration that is more effective, transparent, and responsive to the needs of MSMEs. Digital transformation not only streamlines public service processes but also enhances bureaucratic efficiency and expands business owners' access to various empowerment programs. These findings align with digital governance theory, which emphasizes the use of information technology to improve the quality of public

services and foster public participation in development. Meanwhile, the adoption of green business practices demonstrates that business sustainability is determined not only by economic factors but also by the ability of business owners to integrate environmental responsibility into their operations. Practices such as using eco-friendly packaging, improving energy efficiency, and managing waste effectively provide added value to MSMEs, benefiting both operational efficiency and corporate image. This aligns with the "triple bottom line" concept, which emphasizes a balance between economic gain (profit), social well-being (people), and environmental sustainability (planet).

This study also demonstrates that the successful implementation of digital governance and green business relies heavily on synergy among stakeholders. The government acts as a regulator and facilitator by providing policies, digital services, and support programs. MSMEs serve as the primary actors in adopting innovations, while higher education institutions, communities, and the private sector contribute to capacity building, innovation, and access to finance. Such collaboration is a crucial prerequisite for establishing a resilient and sustainable MSME ecosystem. However, the study identifies persistent challenges that must be addressed, including low digital literacy, infrastructure limitations, a lack of green financing, and suboptimal inter-agency coordination. Therefore, more integrated policies are required, encompassing the enhancement of MSME digital competencies, the development of incentives for green business adoption, the provision of financing that supports green innovation, and the strengthening of cross-sector collaboration. Through these measures, the implementation of digital governance and green business is expected to accelerate the development of competitive and resilient MSMEs that make a tangible contribution to achieving the Sustainable Development Goals (SDGs).

Research findings indicate that the implementation of digital governance and green business practices are complementary in fostering sustainable MSMEs in Pekanbaru City. The digital transformation undertaken by the local government—through the provision of electronic-based public services—has facilitated MSME operators' access to a range of services, including business licensing, information on development programs, entrepreneurship training, product promotion, and access to various assistance and financing schemes. This demonstrates that the use of information technology in governance not only enhances bureaucratic efficiency but also strengthens the capacity of MSMEs to adapt to the evolving digital economy. From a public administration perspective, digital governance represents a paradigm shift from a procedure-oriented government to a service-oriented one (citizen-centered governance). The utilization of digital technology enables the government to deliver services that are faster, more transparent, accountable, and easily accessible. For MSMEs, this ease of access reduces transaction costs, accelerates administrative processes, and opens up broader opportunities to engage with various business development programs. Consequently, government digitalization serves not merely as a technological innovation but also as an instrument for improving public service quality, thereby directly impacting the business climate.

Research findings also indicate that the successful implementation of digital governance is heavily influenced by human resource readiness. Not all MSME operators possess the same level of proficiency in utilizing digital technology. While some business owners already use digital applications for marketing, electronic payments, financial record-keeping, and customer communication, others still face limitations regarding digital literacy—particularly concerning the use of government administrative applications, the utilization of business data, and business management technologies. This demonstrates that digital transformation cannot rely solely on the provision of infrastructure and applications; it also requires enhancing human resource capabilities through continuous training, mentoring, and education.

On the other hand, the adoption of green business practices indicates that MSMEs are beginning to recognize the importance of environmental considerations in their operations. This awareness is evident in efforts to reduce single-use plastic consumption, utilize local raw materials, improve energy efficiency, and better manage production waste. Although these practices are currently implemented on a limited scale, they signal a shift in mindset: business success is no longer measured solely by economic profit but also by contributions to environmental conservation and community well-being. The adoption of green business practices can also be understood through the "triple bottom line" approach, which emphasizes a balance

between profit, people, and the planet. This concept posits that business success is determined not only by financial gains but also by a company's ability to deliver social benefits and maintain environmental sustainability. In the context of MSMEs in Pekanbaru City, implementing these principles can enhance operational cost efficiency through energy and raw material savings, strengthen the business's image among consumers, and boost product competitiveness in a market that increasingly prioritizes sustainability.

This study also demonstrates that the implementation of digital governance can accelerate the adoption of green business practices. The government can leverage digital platforms to disseminate information on eco-friendly business practices, provide online training, expand access to green product certifications, and facilitate business access to information regarding incentive programs and green financing. Thus, government digitalization not only enhances the quality of public services but also serves as a vehicle for fostering a more sustainable business culture. Nevertheless, the implementation of these two concepts faces various obstacles. Internally, factors such as limited capital, low educational attainment, a lack of technological proficiency, and a business orientation focused on short-term profits hinder the transformation of MSMEs. Externally, challenges requiring attention include suboptimal coordination among regional government agencies, a scarcity of sustained support programs, and unequal access to digital technology and green financing. These findings indicate that the transformation toward sustainable MSMEs is a process requiring consistent policy support and collaboration among diverse stakeholders.

Within the framework of the Sustainable Development Goals (SDGs), research findings indicate that integrating digital governance and green business contributes to several sustainable development objectives. The digitalization of public services supports the achievement of SDG 8 by boosting productivity and employment opportunities, as well as SDG 9 by strengthening innovation and digital infrastructure. Meanwhile, the adoption of green business practices contributes to SDG 12 through responsible consumption and production, SDG 13 through efforts to reduce environmental impact, and SDG 11 through the development of more sustainable cities. Furthermore, collaboration among government, the business sector, higher education institutions, and communities reflects the implementation of SDG 17 regarding partnerships to achieve development goals. These findings reinforce the view that the sustainability of MSMEs cannot be achieved solely by enhancing the internal capacity of business owners; rather, it requires the development of a supportive ecosystem. Local governments play roles as regulators, facilitators, and catalysts in creating an environment conducive to digital transformation and the adoption of sustainable business practices. The business sector can strengthen partnerships with MSMEs by developing greener supply chains, while higher education institutions contribute through research, innovation, and science-based guidance. Such synergy will result in governance that is more adaptive to technological changes and the demands of sustainable development.

From a public policy perspective, this study indicates a need to strengthen the integration between policies for MSME digitalization and the green economy. Digitalization programs should not focus solely on increasing the use of information technology but should also be directed toward supporting sustainable business practices. For instance, local governments could develop digital platforms that provide not only administrative services but also information on energy efficiency, waste management, eco-friendly product certification, and access to green financing. Such an integrated approach would yield a greater impact than implementing the two policies in isolation. Furthermore, the research findings offer academic implications, suggesting that the concepts of digital governance and green business can be developed into complementary analytical frameworks within the fields of public administration and regional development. To date, these two concepts have frequently been discussed separately, despite their close interconnection in achieving inclusive and sustainable economic development. Consequently, this study makes a conceptual contribution by demonstrating that the digitalization of government governance can serve as a strategic instrument to accelerate the adoption of sustainable business practices among MSMEs.

Overall, this discussion demonstrates that successfully establishing sustainable MSMEs in Pekanbaru City depends not only on the ability of business owners to adopt technology and implement eco-friendly practices but also on the local government's commitment to providing adaptive regulations, adequate digital infrastructure, continuous support programs, and incentive mechanisms that foster innovation. With

the support of such an ecosystem, integrating digital governance and green business practices can serve as an effective strategy to enhance MSME competitiveness while accelerating the achievement of sustainable development goals in line with the SDGs agenda.

#### IV. CONCLUSION

Based on the research findings and discussion, it can be concluded that the implementation of digital governance and green business represents two complementary approaches to fostering sustainable MSMEs in Pekanbaru City. The adoption of digital governance has positively impacted the quality of public services by digitizing licensing processes and facilitating the provision of information, capacity building, and support for MSME operators. The use of digital technology has streamlined business access to various government services, thereby enhancing administrative efficiency, expanding market access, and boosting MSME competitiveness amidst the growth of the digital economy. However, the implementation of digital transformation still faces several challenges, including low digital literacy, limited technological infrastructure, and uneven capabilities among MSME operators in optimally utilizing information technology. The study also indicates that successfully establishing sustainable MSMEs depends not only on the ability of business operators to adopt digital technology or implement eco-friendly business practices but is also influenced by the quality of government governance, policy support, infrastructure availability, and collaboration among stakeholders.

Local governments play a strategic role as regulators, facilitators, and catalysts in building an ecosystem that supports digital transformation and the green economy. This is achieved through the formulation of adaptive policies, the provision of digital-based public services, human resource capacity building, and the development of partnerships with the business sector, higher education institutions, and the community. From the perspective of the Sustainable Development Goals (SDGs), the integration of digital governance and green business contributes significantly to achieving inclusive, innovative, and sustainable economic development. The synergy between these two concepts boosts the productivity and competitiveness of MSMEs, drives innovation and digitalization within the business sector, strengthens responsible production and consumption practices, and contributes to environmental conservation efforts. Consequently, MSME development in Pekanbaru City is no longer solely focused on economic growth; it is also directed toward creating a balance among economic, social, and environmental aspects in accordance with sustainable development principles. Overall, this study affirms that integrating digital governance and green business is a relevant and necessary strategy for addressing economic development challenges in the digital era. Implementing these concepts is expected to foster MSMEs that are more resilient, adaptive, innovative, and competitive, while simultaneously making a tangible contribution to achieving sustainable development goals. Therefore, sustained commitment from all stakeholders is essential to strengthen policies, enhance MSME capacity, expand access to technology and financing, and build synergistic collaborations, thereby ensuring the optimal realization of the transformation toward sustainable MSMEs in Pekanbaru City.

#### REFERENCES

- [1] Ali, Achmad. *Uncovering Legal Theory and Jurisprudence*. Jakarta: Kencana Prenada Media Group, 2009.
- [2] Banerjee, A., Duflo, E., Imbert, C., Mathew, S., & Pande, R. (2020). E-governance, accountability, and leakage in public programs: Experimental evidence from a financial management reform in India. *American Economic Journal: Applied Economics*, 12(4), 39–72.
- [3] Castro, G. D. R., González, J. A., & Sáez-Martínez, F. J. (2021). Unleashing the convergence amid digitalization and sustainability towards pursuing the Sustainable Development Goals (SDGs): A holistic review. *Journal of Cleaner Production*, 280, 124559.
- [4] Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296.
- [5] ElMassah, S., & Mohieldin, M. (2020). Digital transformation and localizing the Sustainable Development Goals (SDGs). *Ecological Economics*, 169, 106490.

- [6] Estevez, E., Janowski, T., & Dzhupova, Z. (2013). Electronic governance for sustainable development: Conceptual framework and state of research. *Government Information Quarterly*, 30(Suppl. 1), S94–S109.
- [7] Hanisch, M., Goldsby, C. M., Fabian, N. E., & Oehmichen, J. (2023). Digital governance: A conceptual framework and research agenda. *Journal of Business Research*, 162, 113868.
- [8] Hardin-Ramanan, S., & Mathew, V. (2018). A Green Information Technology governance model for large Mauritian companies. *Journal of Cleaner Production*, 198, 488–497.
- [9] Hartanto, D., Sulistyono, H., & Nugroho, R. (2021). Perceived effectiveness of e-governance as an underlying mechanism between good governance and public trust. *Regulation & Governance*.
- [10] Khalil, S., Khalid, M., & Khan, M. (2020). Dynamic capabilities for firm performance under the information technology governance framework. *European Business Review*, 32(6), 1047–1067.
- [11] Kwilinski, A., Lyulyov, O., & Pimonenko, T. (2023). The coupling and coordination degree of digital business and digital governance in the context of sustainable development. *Information*, 14(12), 651.
- [12] Medaglia, R., & Misuraca, G. (2024). Introduction to the special section on digital government and Sustainable Development Goals. *Information Polity*, 29(1).
- [13] Myeong, S., Kwon, Y., & Seo, H. (2014). Sustainable e-governance: The relationship among trust, digital divide, and e-government. *Sustainability*, 6(9), 6049–6065.
- [14] Sofyani, H., Riyadh, H. A., & Fahlevi, H. (2020). Improving service quality, accountability and transparency of local government: The intervening role of information technology governance. *Cogent Business & Management*, 7(1).
- [15] Tariq, W., Chen, Y., Tariq, A., & Sumbal, M. S. (2026). Digital governance for sustainable development: A holistic review, framework, and roadmap. *Technology in Society*, 84, 103135.
- [16] Varriale, L., Michelino, F., Cammarano, A., & Caputo, M. (2025). Unleashing digital transformation to achieve the Sustainable Development Goals across multiple sectors. *Sustainable Development*.
- [17] Adjei-Bamfo, P., Maloreh-Nyamekye, T., & Ahenkan, A. (2019). The role of e-government in sustainable public procurement: A systematic literature review. *Resources, Conservation and Recycling*, 142, 189–203.
- [18] Adam, I. O. (2020). Examining e-government development effects on corruption in Africa. *Technology in Society*, 63, 101–387.
- [19] Adnan, M., et al. (2022). E-participation within the context of e-government initiatives: A systematic review. *Telematics and Informatics Reports*, 8, 100021.
- [20] Alcaraz-Quiles, F. J., Navarro-Galera, A., & Ortiz-Rodríguez, D. (2014). Factors influencing the transparency of sustainability information in regional governments. *Journal of Cleaner Production*, 76, 179–191.
- [21] Dabić, M., Stojčić, N., Simić, M., Potocan, V., Slavković, M., & Nedelko, Z. (2021). Intellectual agility and innovation in micro and small businesses. *Journal of Business Research*, 123, 683–695.
- [22] Ukko, J., Saunila, M., Nasiri, M., & Rantala, T. (2022). The importance of sustainability engagement in small business supplier collaboration. *Sustainable Development*, 30(1), 1–9.
- [23] Singh, H. P., & Alhulail, H. N. (2023). Information technology governance and corporate boards' relationship with companies' performance. *Sustainability*, 15(8).
- [24] Umbach, G., & Tkalec, I. (2022). Evaluating e-governance through e-government. *Evaluation and Program Planning*, 93, 102118.
- [25] Chatterjee, S., Kar, A. K., & Gupta, M. P. (2018). Success of IoT in smart cities of India. *Government Information Quarterly*, 35(3), 349–361.
- [26] Axelsson, K., & Granath, M. (2018). Stakeholders' stake and relation to smartness in smart city development. *Government Information Quarterly*, 35(4), 693–702.
- [27] Buyannemekh, B., & Chen, C. (2021). Digital governance in Mongolia and Taiwan: A gender perspective. *Information Polity*, 26(3), 327–343.
- [28] Behrooz, A., et al. (2023). E-governance: Concept, practice and ethics. *Public Management and Governance*.
- [29] Beshi, T. D., & Kaur, R. (2020). Public trust in local government: Explaining the role of good governance practices. *Public Organization Review*, 20(2), 337–350.
- [30] Rachmawati, R., et al. (2025). Digitalization of MSME in green campaign activities, supply chain, and quality control. *International Journal of Asian Business and Information Management*, 16(1).