

Artificial Intelligence Driven Green Digital Transformation for Sustainable Business Development

Mestiana Br Karo¹ , Jessica G.P. Zandroto², Lili Suryani Tumanggor³ , Aulia Wellington^{4*} 

^{1, 2, 3}Department of Nursing, Institut Kesehatan Santa Elisabeth Medan, Indonesia

⁴Faculty of Economics and Business, Eesp Incorporation, Europe

¹felicbaroes@gmail.com, ²jazzicagiper4@gmail.com, ³lilitumanggor1@gmail.com, ⁴walington.aul@eesp.io

*Corresponding Author

Article Info

Article history:

Submission June 29, 2026

Revised July 03, 2026

Accepted August 24, 2026

Published August 25, 2026

Keywords:

Green Digital Transformation

Sustainable Business

Development

Digital Sustainability

Environmental Innovation



ABSTRACT

Green Digital Transformation has emerged as a strategic approach that integrates digital innovation with environmental sustainability to support sustainable business development. This study aims to examine how Advanced digital technologies, including Artificial Intelligence (AI), Big Data Analytics, Cloud Computing, and Internet of Things (IoT) capabilities, collectively drive Green Digital Transformation and contribute to sustainable business **development**. A qualitative conceptual literature review was conducted by synthesizing peer-reviewed studies published between 2022 and 2026 on **digital** transformation, sustainability, and related digital technologies. The findings indicate that these technologies improve operational efficiency, optimize resource utilization, reduce waste, enhance energy efficiency, and strengthen **organizational** competitiveness through data-driven decision-making and intelligent digital capabilities. Based on the literature synthesis, this study proposes an integrated conceptual **framework** that illustrates the pathway from digital technology adoption to Green Digital Transformation, leading to sustainable business outcomes while supporting SDGs 9, 12, and 13. The findings demonstrate that Green Digital Transformation serves as a strategic mechanism for creating long-term organizational value by integrating digital **innovation** with sustainability objectives. This study contributes to the literature by providing a clearer conceptual foundation and an integrated framework that can guide future empirical research and managerial **strategies** for sustainable business development.

This is an open access article under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



[This is an open-access article under the CC-BY license \(https://creativecommons.org/licenses/by/4.0/\)](https://creativecommons.org/licenses/by/4.0/)

©Authors retain all copyrights

1. INTRODUCTION

The continuous evolution of digital technologies has profoundly reshaped how organizations conduct their operations, interact with stakeholders, and generate business value [1]. Organizations across various industries are increasingly adopting digital solutions such as cloud computing, artificial intelligence, big data analytics, and the Internet of Things (IoT) to improve efficiency and competitiveness [2]. Among these technologies, Artificial Intelligence (AI) has emerged as a key driver of intelligent automation by enabling predictive analytics, real-time decision-making, process optimization, and automated resource management [3]. AI-powered systems allow organizations to identify operational inefficiencies, optimize energy consumption, reduce waste, and support sustainability-oriented decision-making [4]. Consequently, AI extends beyond its role as a digital technology by functioning as a strategic capability that accelerates Green Digital Transforma-

tion and enhances sustainable business development [5]. However, alongside these technological developments, concerns regarding environmental sustainability have also gained prominence. As a result, the framework of Green Digital Transformation has emerged as an approach that integrates digital innovation with environmental responsibility [6]. Unlike general digital transformation, which focuses on technological advancement, Green Digital Transformation integrates digital technologies with sustainability objectives to achieve both organizational performance and environmental responsibility. This transformation supports the achievement of Sustainable Development Goal (SDG) 9, which focuses on fostering innovation in industry and strengthening infrastructure resilience, while encouraging businesses to adopt sustainable and technologically advanced practices [7].

Inclusive Digital Transformation contributes significantly to advancing sustainable development by enabling broader access to digital capabilities and opportunities. According to the Indonesian Ministry of Economic Affairs, “Digital Transformation is required as an accelerator for national economic recovery and as a strengthening foundation for the economy to support sustainable development” [8]. This highlights that government-endorsed digital initiatives are designed not only to improve efficiency and competitiveness but also to drive economic resilience and sustainability.

Green Digital Transformation offers significant opportunities for businesses to reduce their environmental footprint while enhancing operational performance. Digital technologies can optimize resource utilization, minimize waste generation, and improve energy efficiency throughout business processes [9]. For example, smart monitoring systems and data-driven decision-making enable organizations to identify inefficiencies and implement sustainable solutions. These initiatives contribute directly to SDG 12, which focuses on responsible consumption and production, by encouraging companies to use resources more efficiently and adopt environmentally conscious production methods. Consequently, sustainability is increasingly becoming a strategic objective rather than merely a regulatory requirement [10].

Furthermore, Green Digital Transformation plays an essential role in addressing global climate challenges [11]. Businesses are under growing pressure from stakeholders, governments, and consumers to reduce greenhouse gas emissions and support environmental preservation. Digital technologies facilitate carbon tracking, renewable energy integration, and sustainable supply chain management, helping organizations align their operations with climate action objectives [12]. These efforts contribute to SDG 13, which emphasizes urgent action to combat climate change and its impacts [13]. Therefore, Green Digital Transformation represents a strategic opportunity for sustainable business development by balancing economic growth, technological advancement, and environmental stewardship [14–17]. While previous studies have primarily examined digital transformation and sustainability separately or focused on specific digital technologies, limited attention has been given to integrating these perspectives into a comprehensive conceptual framework [18]. Therefore, this study proposes an integrated conceptual framework that explains how AI, Big Data Analytics, Cloud Computing, and IoT collectively enable Green Digital Transformation and contribute to sustainable business development [19]. This integrated perspective represents the primary theoretical contribution of this study and provides a foundation for future empirical research.

2. LITERATURE REVIEW

Research on the relationship between digital transformation and sustainability has grown significantly in recent years. The role of digital transition in supporting sustainability and found that digital technologies contribute to environmental, economic, and social sustainability by improving efficiency and resource management. Similarly, Verhoef et al. highlighted that digital transformation has become a strategic mechanism for organizations seeking long-term sustainable growth and competitive advantage. Furthermore, introduced the concept of digital sustainability, emphasizing the integration of digital innovation and sustainability objectives within organizational strategies [20].

R. Ahli, et al. research increasingly focused on how digitalization supports sustainable business models. Digital technologies such as artificial intelligence, cloud computing, big data analytics, and the IoT were identified as key enablers of sustainable value creation [21]. H. W. Kamran, et al. studies showed that digitalization facilitates efficient resource utilization, reduces operational waste, and strengthens environmental performance. These findings indicate that sustainability and digitalization are mutually reinforcing concepts that can generate long-term business value [22].

During 2024 and 2025, scholars expanded the discussion by exploring sustainable digital transfor-

mation across various organizational contexts. Rawat, et al. reported that digital transformation positively influences sustainable business performance through environmental, economic, and social improvements [23]. Similarly, emphasized that Sustainable digital transformation supports Small and Medium-Sized Enterprises (SMEs) in their efforts to enhance innovation, improve decision-making, and achieve sustainable competitive advantages despite implementation challenges [24]. Sivaraman, et al. meta-analytic evidence from 2025 further confirmed that digital transformation significantly contributes to sustainable business performance by improving operational efficiency and organizational resilience. Additionally, studies on supply chain sustainability revealed that technologies such as AI, blockchain, big data, and IoT play an important role in promoting sustainable operations and environmental responsibility [25, 26].

A. S. Bist, B et al. most recently, research in 2026 has strengthened the connection between sustainable digital transformation and the SDGs. A demonstrated that digital transformation contributes not only to business performance but also to broader societal and sustainability objectives [27]. Their findings suggest that digital transformation serves as a bridge between technological advancement and sustainable development, supporting organizations in creating economic value while addressing environmental and social challenges. Based on these studies, Green Digital Transformation can be considered a strategic approach for achieving sustainable business development in the digital era.

Table 1. Summary of Existing Literature Regarding Green Digital Transformation and Sustainable Development

Authors	Year	Method	Research Context	Technology Focus	Sustainability Dimension	Key Findings	Research Gap
A. T. Ros'ario et al. [28]	2022	Literature Review	General Organizations	Digital Transformation	Environmental, Economic, Social	Digital transformation supports sustainability.	Does not propose an integrated conceptual framework.
E. Latacz, et al. [29]	2022	Conceptual Study	Business Organizations	Digital Transformation	Organizational Sustainability	Digital transformation enhances competitiveness.	Limited discussion of environmental sustainability.
S. Kraus, et al [30]	2022	Literature Review	Business Management	Digital Sustainability	Strategic Sustainability	Introduced digital sustainability concept.	Does not explain technology integration.
A. A. Morris, et al. [31]	2024	Systematic Review	Various Industries	Digital Transformation	Triple Bottom Line	Improves sustainable business performance.	Limited explanation of AI-driven sustainability.
G. Farhadian et al. [32]	2024	Empirical Study	SMEs	AI, Digital Technologies	Economic & Environmental	Improves innovation and decision-making.	Focused on SMEs only.
V. Agarwal et al. [33]	2026	Systematic Literature Review	Cross-sector	Digital Transformation	SDGs	Supports sustainable development.	No integrated pathway linking digital technologies to Green Digital Transformation.

Table 1 provides a comparative analysis of previous studies by summarizing their methods, research contexts, technology focus, sustainability dimensions, and research gaps. This comparison highlights the research gap addressed by the proposed conceptual framework [34].

3. METHODOLOGY

A qualitative conceptual literature review approach was utilized in this study to investigate the role of Green Digital Transformation in fostering sustainable business development. This methodological approach was considered appropriate because the research focuses on establishing a theoretical framework that explains how digital technologies can drive environmental sustainability, improve operational efficiency, and create

sustainable value for organizations long-term business value. Rather than collecting primary empirical data, this research synthesizes existing academic discussions, theoretical perspectives, and previous research findings related to digital transformation, green technology, digital sustainability, and sustainable business performance.

The literature reviewed in this study was carefully selected based on its alignment with the research focus, particularly the connection between digital transformation and sustainability. The literature retrieval process was performed through several academic databases, including Scopus, Web of Science, and Google Scholar. The search strategy utilized a combination of relevant keywords to identify studies that support the research objectives including "Green Digital Transformation", "Digital Transformation", "Artificial Intelligence", "Digital Sustainability", "Sustainable Business Development", "Green Technology", and "Intelligent Automation". The inclusion criteria comprised peer-reviewed journal articles published between 2022 and 2026, written in English, and directly addressing the relationship between digital transformation and sustainability. Conference papers, book chapters, Duplicate records, articles published in languages other than English, and studies that did not sufficiently align with the research objectives were removed during the selection process. After completing the screening and eligibility assessment, a total of 25 relevant articles were retained for further thematic synthesis and conceptual examination. The main focus was placed on studies discussing Green Digital Transformation, digital sustainability, environmental innovation, sustainable business models, and the contribution of digital technologies to Sustainable Development Goals. The reviewed literature included studies from recent years, particularly research published between 2022 and 2026, to ensure that the discussion reflects current developments in digital sustainability. Key digital technologies examined in this study include Artificial Intelligence, Big Data Analytics, Cloud Computing, and the Internet of Things, as these technologies are widely recognized as important enablers of green digital transformation [35, 36].

The data analysis was conducted through thematic synthesis. First, the literature was reviewed to identify major themes related to digital transformation and sustainability. Second, the identified themes were grouped into several analytical categories, including digital technology adoption, operational efficiency, resource optimization, waste reduction, energy efficiency, and sustainable business development. Third, these categories were connected to relevant Sustainable Development Goals, particularly SDGs 9 on industry, innovation, and infrastructure, SDG 12, which emphasizes responsible consumption and production practices, as well as SDG 13, which focuses on addressing climate change through climate action initiatives.

Based on the synthesis process, a conceptual framework was developed to explain how digital technologies drive Green Digital Transformation and contribute to sustainable business outcomes. The framework positions digital technologies as strategic enablers that help organizations improve business performance while reducing environmental impact. Through this framework, the study demonstrates that Green Digital Transformation is not only a technological process but also a strategic approach that integrates innovation, environmental responsibility, and sustainable value creation [37].

To strengthen the validity of the conceptual analysis, this study compared findings from multiple previous studies and aligned them with established sustainability concepts. The consistency of findings across the literature indicates that digital transformation can support sustainable business development by improving efficiency, reducing waste, optimizing resource use, and supporting climate-related actions. Therefore, the methodology used in this study provides a systematic basis for understanding Green Digital Transformation as an opportunity for businesses to achieve both competitiveness and sustainability in the digital era.

4. RESULT AND DISCUSSION

This section presents the findings of the literature review and discusses how Green Digital Transformation contributes to sustainable business development. The results are synthesized from recent studies published between 2022 and 2026, focusing on the adoption of emerging digital technologies and their impacts on environmental, economic, and social sustainability. The discussion highlights the relationship between digital transformation initiatives and the achievement of selected SDGs, particularly SDGs 9 (Industry, Innovation and Infrastructure), SDGs 12 (Responsible Consumption and Production), and SDGs 13 (Climate Action).

4.1. Results

The literature review reveals several key outcomes regarding Green Digital Transformation and its role in sustainable business development. First, the adoption of digital technologies such as AI, Big Data Analytics, Cloud Computing, and the IoT consistently improves operational efficiency and resource optimization. Studies

published between 2022 and 2026 indicate that organizations leveraging these technologies achieve measurable improvements in process efficiency, waste reduction, and energy management. Specifically, AI supports predictive analytics and process optimization, Big Data Analytics enables informed decision-making, IoT facilitates real-time monitoring of resources and operations, and Cloud Computing provides scalable infrastructure for efficient digital management. Collectively, these technologies help identify operational inefficiencies and enhance overall sustainability performance.

Second, digitalization supports responsible production and consumption practices, contributing to SDGs 12. Smart monitoring and predictive systems enable organizations to optimize resource utilization, minimize waste, and reduce environmental impacts, while cloud computing further enhances resource management through scalable and energy-efficient digital infrastructure.

Third, Green Digital Transformation strengthens climate action, contributing to SDGs 13. Digital technologies facilitate carbon tracking, renewable energy integration, and sustainable supply chain management. Recent studies demonstrate that these capabilities help organizations reduce greenhouse gas emissions and improve resilience to climate-related operational risks.

Finally, the reviewed literature indicates that Green Digital Transformation generates both economic and social benefits. Organizations adopting sustainable digital practices are better positioned to enhance innovation, strengthen stakeholder engagement, and achieve long-term competitive advantage. However, SMEs often face implementation challenges, highlighting the need for appropriate strategies to support successful digital transformation.

4.2. Discussion

The results indicate that Green Digital Transformation functions as a strategic approach that bridges technological innovation with sustainability goals. Emerging digital technologies, including Artificial Intelligence, Big Data Analytics, Cloud Computing, and Internet of Things (IoT), play a significant role in enabling organizations to enhance operational capabilities while supporting sustainable practices act as enablers that not only improve operational performance but also embed sustainability into organizational strategy. As illustrated in Figure 1, these technologies collectively drive Green Digital Transformation, resulting in operational efficiency, resource optimization, waste reduction, and energy efficiency, which ultimately contribute to sustainable business development.

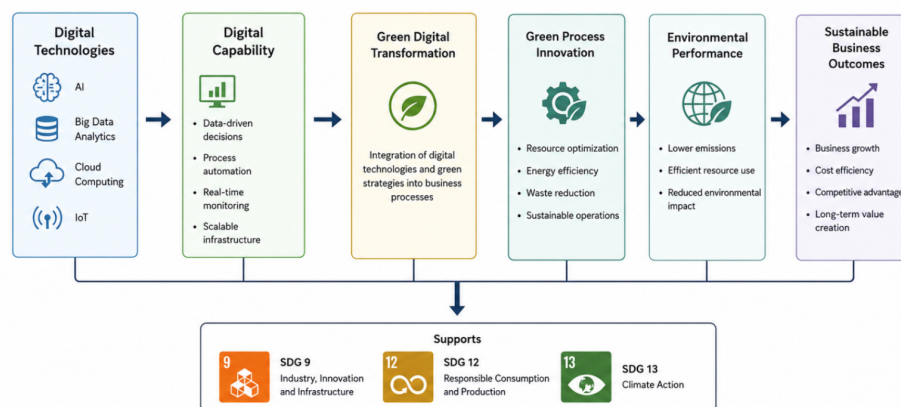


Figure 1. Pathway of Digital Technologies Driving Green Digital Transformation and Sustainable Business Outcomes.

Figure 1 presents a sequential conceptual pathway illustrating how AI, Big Data Analytics, Cloud Computing, and IoT enable Green Digital Transformation through intelligent automation, data-driven decision-making, and resource optimization. This process improves operational efficiency, reduces waste, and enhances energy efficiency, thereby supporting SDGs 9 through innovation and production efficiency, SDGs 12 through responsible resource utilization and waste reduction, and SDGs 13 through improved environmental performance. Ultimately, Green Digital Transformation strengthens sustainable business development by creating long-term organizational value and competitive advantage.

Moreover, the mutual reinforcement between digitalization and sustainability underscores a strategic shift: sustainability is no longer a regulatory or ethical obligation alone but a core business strategy. Organizations can leverage digital solutions to simultaneously achieve environmental responsibility and economic value creation. In addition, Green Digital Transformation strengthens business competitiveness by improving cost efficiency, supporting innovation, enhancing market positioning, and creating long-term organizational value through more adaptive and data-driven business strategies.

The discussion also highlights sectoral and contextual considerations. While large organizations may have extensive resources to implement complex digital sustainability solutions, SMEs may require tailored approaches that balance technological feasibility and sustainability outcomes. Policymakers and industry associations can support broader adoption by providing guidelines, incentives, and knowledge-sharing platforms. From a managerial perspective, organizations should assess digital readiness, prioritize strategic digital investments, strengthen employee digital capabilities, and continuously monitor sustainability performance to ensure successful Green Digital Transformation implementation. In conclusion, Green Digital Transformation, as depicted in Figure 1, is a critical pathway for achieving sustainable business development in the digital era, enhancing efficiency, reducing environmental impact, and creating long-term value, while providing guidance for future empirical research to quantify the impact of specific digital technologies on sustainability performance.

5. MANAGERIAL IMPLICATIONS

The proposed conceptual framework provides practical guidance for business managers in implementing Green Digital Transformation as a strategic initiative for sustainable business development. Organizations should begin by assessing their digital readiness, prioritizing investments in digital technologies such as Artificial Intelligence, Big Data Analytics, Cloud Computing, and IoT, while strengthening employee digital capabilities to support technology adoption. Continuous monitoring of sustainability performance is also essential to ensure that digital transformation initiatives generate both business value and environmental benefits, including improved operational efficiency, resource optimization, and long-term organizational competitiveness.

6. CONCLUSION

The study demonstrates that Green Digital Transformation serves as a strategic approach to sustainable business development by integrating digital innovation with environmental responsibility. By adopting technologies such as Artificial Intelligence, Big Data Analytics, Cloud Computing, and the Internet of Things, organizations can improve operational efficiency, optimize resource utilization, reduce waste, and enhance energy efficiency. These outcomes directly contribute to SDGs, particularly SDGs 9, 12, and 13, demonstrating that sustainability can be embedded into business strategy rather than treated as an optional consideration.

Moreover, the synthesis of the literature highlights that digitalization and sustainability are mutually reinforcing. Organizations implementing Green Digital Transformation not only achieve environmental benefits but also gain economic and social advantages, including improved decision-making, competitive advantage, and stronger stakeholder engagement. This finding underscores that sustainability has become a core component of long-term organizational success, supported by digital technologies as key enablers of innovation and responsible business practices.

This study provides a theoretical contribution by proposing an integrated conceptual framework that explains how digital technologies collectively drive Green Digital Transformation and sustainable business development. From a practical perspective, the proposed framework offers guidance for organizations in implementing digital technologies to enhance both business performance and environmental sustainability. However, as this study is conceptual in nature, its findings have not been empirically validated. Therefore, future research should empirically examine the proposed framework across different industries and organizational contexts, while also investigating barriers and enablers, such as those faced by SMEs and the adoption of emerging technologies for sustainable business practices.

7. DECLARATIONS

7.1. About Authors

Mestiana Br Karo (MK)  <https://orcid.org/0000-0002-3633-5692>

Jessica G.P. Zandroto (JZ)  -

Lili Suryani Tumanggor (LT)  <https://orcid.org/0009-0004-4966-5983>

Aulia Wellington (AW)  <https://orcid.org/0009-0004-4536-4729>

7.2. Author Contributions

Conceptualization: MK and AW; Methodology: MK, AW, and LT; Software: AW; Validation: MK and LT; Formal Analysis: AW and JZ; Investigation: MK and JZ; Resources: LT; Data Curation: JZ and LT; Writing Original Draft Preparation: AW and MK; Writing Review and Editing: AW, MK, and LT; Visualization: AW; Visualization: MK; All authors (MK, JZ, LT, and AW) have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The datasets generated and analyzed during this study can be obtained from the corresponding author upon reasonable request.

7.4. Funding

This research received no specific grant or financial assistance from any public, commercial, or non-profit funding organization.

7.5. Declaration of Conflicting Interest

The authors declare that there are no competing interests, financial conflicts, or personal relationships that could have influenced the research, interpretation, or reporting of the findings presented in this manuscript.

REFERENCES

- [1] S. Wu, P. Cheng, and F. Yang, "Study on the impact of digital transformation on green competitive advantage: The role of green innovation and government regulation," *Plos one*, vol. 19, no. 8, p. e0306603, 2024.
- [2] H. Feng, F. Wang, G. Song, and L. Liu, "Digital transformation on enterprise green innovation: Effect and transmission mechanism," *International journal of environmental research and public health*, vol. 19, no. 17, p. 10614, 2022.
- [3] R. Widayanti, H. Setiyowati, M. Yusup, and M. Rodriguez, "Predicting supply chain risks using machine learning for resilient operations," *ADI Journal on Recent Innovation (AJRI)*, vol. 7, no. 2, pp. 137–148, 2026.
- [4] L. Xia, Z. Cao, and M. Bilawal Khaskheli, "How digital technology and business innovation enhance economic–environmental sustainability in legal organizations," *Sustainability*, vol. 17, no. 14, p. 6532, 2025.
- [5] S. Setiawan, M. S. Gunawan, T. S. Maulani, N. Rangi, and N. A. Santoso, "Evaluating the impact of vr, ar, and wearable devices on outcome-driven learning in engineering education," *International Transactions on Education Technology (ITEE)*, vol. 4, no. 1, pp. 49–65, 2025.
- [6] M. H. R. Chakim, Q. Aini, P. A. Sunarya, N. P. L. Santoso, D. A. R. Kusumawardhani, and U. Rahardja, "Understanding factors influencing the adoption of ai-enhanced air quality systems: A utaut perspective," in *2023 Eighth International Conference on Informatics and Computing (ICIC)*. IEEE, 2023, pp. 1–6.
- [7] Q. Aini, I. Sembiring, A. Setiawan, I. Setiawan, and U. Rahardja, "Perceived accuracy and user behavior: Exploring the impact of ai-based air quality detection application (aiku)," *Indonesian Journal of Applied Research (IJAR)*, vol. 4, no. 3, pp. 209–224, 2023.
- [8] Coordinating Ministry for Economic Affairs of the Republic of Indonesia, "Inclusive digital transformation accelerates sustainable development," <https://www.ekon.go.id/publikasi/detail/330/transformatasi-digital-yang-inklusif-turut-percepat-pembangunan-berkelanjutan>, Jun. 2020, press Release No. HM.4.6/63/SET.M.EKON.2.3/06/2020. Accessed: Aug. 6, 2026.
- [9] U. Rahardja, S.-C. Chen, Y.-C. Lin, T.-C. Tsai, Q. Aini, A. Khan, F. P. Oganda, E. R. Dewi, Y.-C. Cho, and C.-H. Hsu, "Evaluating the mediating mechanism of perceived trust and risk toward cryptocurrency: An empirical research," *SAGE Open*, vol. 13, no. 4, p. 21582440231217854, 2023.

- [10] G. Zhang, Y. Gao, and G. Li, "Research on digital transformation and green technology innovation—evidence from china's listed manufacturing enterprises," *Sustainability*, vol. 15, no. 8, p. 6425, 2023.
- [11] M. Wahyudi, W. Bismi, M. Raharjo, U. Rahardja, L. Pujiastuti *et al.*, "Gender recognition based on face image using deep learning method," in *2023 11th International Conference on Cyber and IT Service Management (CITSM)*. IEEE, 2023, pp. 1–6.
- [12] J. Xu, Y. Yu, M. Zhang, and J. Z. Zhang, "Impacts of digital transformation on eco-innovation and sustainable performance: Evidence from chinese manufacturing companies," *Journal of Cleaner Production*, vol. 393, p. 136278, 2023.
- [13] I. Shantilawati, J. Zanubiya, F. Fanani, H. Jensen, S. Millah, and N. Lutfiani, "Challenges in securing data and networks from modern cyber threats," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 4, no. 2, pp. 88–96, 2024.
- [14] D. Abbas, K. Siahaan, and M. Yusup, "Design thinking as a business model for empowering creative entrepreneurs in the digital era," *Startupreneur Business Digital (SABDA Journal)*, vol. 4, no. 2, pp. 124–133, 2025.
- [15] H. Hamdan, H. Cahyadi, K. Vaher, and A. Ratih, "Ai-driven optimization of pulsed dc sputtering for enhanced indium tin oxide films," *International Transactions on Artificial Intelligence*, vol. 4, no. 1, pp. 85–94, 2025.
- [16] A. Jaya, H. Zainarthur, A. Sijabat, A. R. Dina, and A. Faturahman, "Assessing user satisfaction in hadirku through an extended tam framework," *International Transactions on Artificial Intelligence*, vol. 4, no. 1, pp. 73–84, 2025.
- [17] Q. Aini, D. Manongga, U. Rahardja, I. Sembiring, and Y.-M. Li, "Understanding behavioral intention to use of air quality monitoring solutions with emphasis on technology readiness," *International Journal of Human–Computer Interaction*, pp. 1–21, 2024.
- [18] L. Li and J. Lin, "Digital transformation for the sustainable development of firms: The role of green capability and green culture," *Sustainable Development*, vol. 32, no. 3, pp. 1861–1875, 2024.
- [19] V. E. Ardeliya, J. Taylor, and J. Wolfson, "Exploration of artificial intelligence in creative fields: Generative art, music, and design," *International Journal of Cyber and IT Service Management (IJCITSM)*, vol. 4, no. 1, pp. 40–46, 2024.
- [20] O. Apata, "Exploring the nexus between digital transformation and sustainability," in *2024 IEEE Conference on Technologies for Sustainability (SusTech)*. IEEE, 2024, pp. 120–127.
- [21] R. Ahli, M. F. Hilmi, and A. Abudaqa, "Moderating effect of perceived organizational support on the relationship between employee performance and its determinants: A case of entrepreneurial firms in uae," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 2, pp. 199–212, 2024.
- [22] H. W. Kamran, M. Rafiq, A. Abudaqa, and A. Amin, "Interconnecting sustainable development goals 7 and 13: the role of renewable energy innovations towards combating the climate change," *Environmental Technology*, vol. 45, no. 17, pp. 3439–3455, 2024.
- [23] B. Rawat, A. S. Bist, H. Nusantara, M. D. Soleman, P. A. Sunarya, and I. D. Girinzio, "Impact of massive tourist and vehicles flow on air and water quality of uttarakhand," in *2023 11th International Conference on Cyber and IT Service Management (CITSM)*. IEEE, 2023, pp. 1–4.
- [24] B. Rawat, A. S. Bist, P. A. Sunarya, M. Hardini, N. A. Santoso, and R. Tarmizi, "Unveiling happiness disparities: A machine learning approach to city-village comparison," in *2023 11th International Conference on Cyber and IT Service Management (CITSM)*. IEEE, 2023, pp. 1–5.
- [25] R. Sivaraman, M.-H. Lin, M. I. C. Vargas, S. I. S. Al-Hawary, U. Rahardja, F. A. H. Al-Khafaji, E. V. Golubtsova, and L. Li, "Multi-objective hybrid system development: To increase the performance of diesel/photovoltaic/wind/battery system," *Mathematical Modelling of Engineering Problems*, vol. 11, no. 3, 2024.
- [26] T. Hidayat, D. Manongga, Y. Nataliani, S. Wijono, S. Y. Prasetyo, E. Maria, U. Raharja, I. Sembiring *et al.*, "Performance prediction using cross validation (gridsearchcv) for stunting prevalence," in *2024 IEEE International Conference on Artificial Intelligence and Mechatronics Systems (AIMS)*. IEEE, 2024, pp. 1–6.
- [27] A. S. Bist, B. Rawat, S. Kosasi, Q. Aini, F. P. Oganda, and A. B. Yadila, "Proposing a novel framework for prediction of stock using machine learning," in *2023 11th International Conference on Cyber and IT Service Management (CITSM)*. IEEE, 2023, pp. 1–5.

- [28] A. T. Rosário and J. C. Dias, “Sustainability and the digital transition: A literature review,” *Sustainability*, vol. 14, no. 7, p. 4072, 2022.
- [29] E. Latacz, D. Höppener, A. Bohlok, S. Leduc, S. Tabariès, C. Fernandez Moro, C. Lugassy, H. Nyström, B. Bozoky, G. Floris *et al.*, “Histopathological growth patterns of liver metastasis: updated consensus guidelines for pattern scoring, perspectives and recent mechanistic insights: Cellular and molecular biology,” *British Journal of Cancer*, vol. 127, no. 6, pp. 988–1013, 2022.
- [30] S. Kraus, M. Breier, W. M. Lim, M. Dabić, S. Kumar, D. Kanbach, D. Mukherjee, V. Corvello, J. Piñeiro-Chousa, E. Liguori *et al.*, “Literature reviews as independent studies: guidelines for academic practice,” *Review of managerial science*, vol. 16, no. 8, pp. 2577–2595, 2022.
- [31] A. A. Morris, F. A. Masoudi, A. R. Abdullah, A. Banerjee, L. C. Brewer, Y. Commodore-Mensah, P. Cram, S. C. Desilvey, A. L. Hines, N. E. Ibrahim *et al.*, “2024 acc/aha key data elements and definitions for social determinants of health in cardiology: a report of the american college of cardiology/american heart association joint committee on clinical data standards,” *Circulation: Cardiovascular Quality and Outcomes*, vol. 17, no. 10, p. e000133, 2024.
- [32] G. Farhadian and M. Saeedi, “Sustainable digital transformation and the sdgs: a graph theoretic mapping of core theories and societal impact,” *Frontiers in Sustainability*, vol. 7, p. 1793316, 2026.
- [33] V. Agarwal, M. Lohani, and A. S. Bist, “A novel deep learning technique for medical image analysis using improved optimizer,” *Health Informatics Journal*, vol. 30, no. 2, p. 14604582241255584, 2024.
- [34] A. D. Garcia, A. M. Rosyid, M. Yusup, and M. Khasanah, “Product innovation of foodpreneurs towards customer loyalty,” *Startupreneur Business Digital (SABDA Journal)*, vol. 4, no. 2, pp. 104–113, 2025.
- [35] K. Sulastriningsih, M. Muninggar, R. Widayasari, A. F. Faradhila, and J. Zanubiya, “Leveraging data analytics to understand antenatal visit factors in midwifery care,” in *2024 3rd International Conference on Creative Communication and Innovative Technology (ICCIT)*. IEEE, 2024, pp. 1–7.
- [36] I. P. Gustiah and H. Newell, “Enhancing human resource management efficiency through scalable blockchain networks with an adaptive ai approach,” *Startupreneur Business Digital (SABDA Journal)*, vol. 4, no. 2, pp. 114–123, 2025.
- [37] C. Lukita, M. Hardini, S. Pranata, D. Julianingsih, and N. P. L. Santoso, “Transformation of entrepreneurship and digital technology students in the era of revolution 4.0,” *Aptisi Transactions on Technopreneurship (ATT)*, vol. 5, no. 3, pp. 291–304, 2023.