Artificial Intelligence and Green Innovation: A Pathway to Sustainable Business Practices

Nasim Roustapisheh
Halmstad University, School of Business, Innovation and Sustainability, Halmstad, Sweden.

Nasrou23@student.hh.se
https://orcid.org/0009-0002-6847-1047

Abstract: Companies today face growing challenges in becoming sustainable. Sustainable business models help companies address environmental, social, and economic problems in creative and responsible ways. This study looks at how artificial intelligence (AI) supports sustainable business models, with a focus on the role of green innovation (such as eco-friendly technologies) in this process. A correlational research design, structural equation modelling (SEM) was applied to survey data collected from 118 senior managers and executives working in science and technology parks across Iran. The findings reveal that AI significantly strengthens both green innovation practices and sustainable business model. Furthermore, green innovation not only directly enhances sustainable business models but also acts as a mediator in relationship between AI and long-term sustainability outcomes. This suggests a sequential relationship: AI adoption drives advancements in green innovation, which in turn enables organizations to reimagine their business models to align with global sustainability goals.

Keywords: Artificial Intelligence, Green Innovation, Sustainable Business Model Innovation; SEM

1. Introduction

The most significant challenge facing organizations today is the reality of transformation and change. Undoubtedly, an organization's ability to adapt to such changes is critical to its long-term survival. In today's dynamic and highly competitive market, innovation is crucial for organizational sustainability (Noruzy et al., 2013). Moreover, environmental performance and compliance with ecological regulations now serve as competitive advantages for businesses (Tseng et al., 2013; Wiredu et al., 2024). Consequently, aligning innovations with environmental considerations is imperative. This necessity has given rise to the concept of sustainable innovation, which emphasizes that all innovations must contribute to improving an organization's environmental efficiency. Examples include innovations in production processes that reduce energy and natural resource consumption, enhance recycling efficiency, or minimize environmental pollution (Adomako & Tran, 2024; Ribeiro et al., 2024).

1.1 Sustainable Business Model Innovation

Business model innovation is critical for corporate survival, business performance, and as a source of competitive advantage (Casadesus-Masanell & Zhu, 2013; Ramdani et al., 2019; Gholami et al., 2013). By pursuing innovation in their business models, companies explore novel ways to redefine value propositions, create value, and deliver value to customers, suppliers, and partners (Nazari-Shirkouhi et al., 2015; Bock et al., 2012). Business model innovation is defined as "intentional, innovative, and non-marginal changes to a *firm's core business model elements and/or the architecture linking these elements"* (Foss & Saebi, 2017, p. 201). Business model innovations potentially yield higher returns than product or process innovations (Lindgardt et al., 2012), and sustainable business models may provide additional advantages, such as risk reduction and enhanced resilience (Tavana et al., 2021; Choi & Wang, 2009), while creating opportunities for diversification and shared value (Porter & Kramer, 2011). To realize these benefits, organizations are increasingly adopting sustainable solutions (Geissdoerfer et al., 2018). Sustainable business model innovation has emerged as a promising approach to advancing corporate sustainability (Guo et al., 2022), which prioritizes generating economic, environmental, and social benefits for all stakeholders over traditional profit-maximization objectives (Bocken et al., 2014; Roshan & Balodi, 2024).

1.2 Green Innovation

Green innovation refers to innovations in products, processes, and management that enable organizations to achieve environmentally sustainable competitive advantages (Agrawal et al., 2024). Seman et al. (2012) define green innovation as software- or hardware-based technological innovations tied to green products or processes, such as energy conservation, waste recycling, eco-friendly product design, or organizational environmental management. Additionally, organizational innovation is regarded as a new perspective, idea, product, service, or process aimed at reducing negative environmental impacts (Liu et al., 2021). Broadly, the goal of green innovation is to mitigate adverse environmental effects (Tseng et al., 2013; Alipour et al., 2022; Zameer et al., 2020), and it plays a critical role across the entire value chain, from suppliers to consumers (Zhu et al., 2010; Nazari-Shirkouhi et al., 2023a). Studies have demonstrated that green innovation significantly and positively influences sustainable business performance (Heidari et al., 2025; Baeshen et al., 2021; Zhao & Huang, 2022; Liu et al., 2023; Borah et al., 2025).

1.3 Artificial Intelligence

Artificial intelligence (AI) refers to machines designed to perform intelligent tasks traditionally carried out by humans (Karizaki et al., 2024; Wang et al., 2022). Today, AI and blockchain technologies can revolutionize existing processes, develop innovative business models, and transform industries (Ertel, 2024). AI adoption reduces costs and enhances business forecasting and operations (Agarwal et al., 2021). Consequently, organizations increasingly focus on AI due to its high potential for improving performance (Badghish & Soomro, 2024). AI offers opportunities to address modern societal challenges, significantly contributing to quality of life and environmental conservation (de Andreis et al., 2024). AI can optimize production processes, enhance resource efficiency, and facilitate the creation of eco-friendly materials. By leveraging AI, manufacturers can reduce environmental footprints while improving operational efficiency and product quality. AI enables effective resource management, minimizes waste, optimizes production, and supports sustainable material development—key factors in advancing industries toward more sustainable production paradigms (Lodhi et al., 2024; Wang & Zhang, 2025; de Andreis et al., 2024). Furthermore, studies highlight AI's role in driving green innovation (Wang et al., 2025; Cheng et al., 2025; Farmanesh et al., 2025). Recent studies, such as Latifi et al. (2024), emphasize the importance of technological quality frameworks—similar to those applied in virtual reality contexts—in understanding how technological attributes influence user perceptions and behavioral intentions, which can be extended to green innovation and sustainable practices.

1.4 Conceptual Model

In today's world, AI stands as one of the most transformative modern technologies, reshaping numerous facets of business. This technology enables organizations to achieve significant improvements in their processes, products, and services. However, alongside AI's numerous advantages, challenges persist in implementing sustainable business models. Sustainable business models are designed to benefit not only organizations but also society and the environment. In this context, green innovation is recognized as a key approach that empowers organizations to optimize natural resource utilization and reduce adverse environmental impacts. Consequently, this study investigates AI's role in driving sustainable business model innovation, with a specific focus on analyzing the mediating role of green innovation in this process. The findings can guide organizations in designing more effective strategies to integrate AI and green innovation into their business models, thereby advancing sustainable development and minimizing environmental harm. Figure 1 illustrates the research's conceptual model.

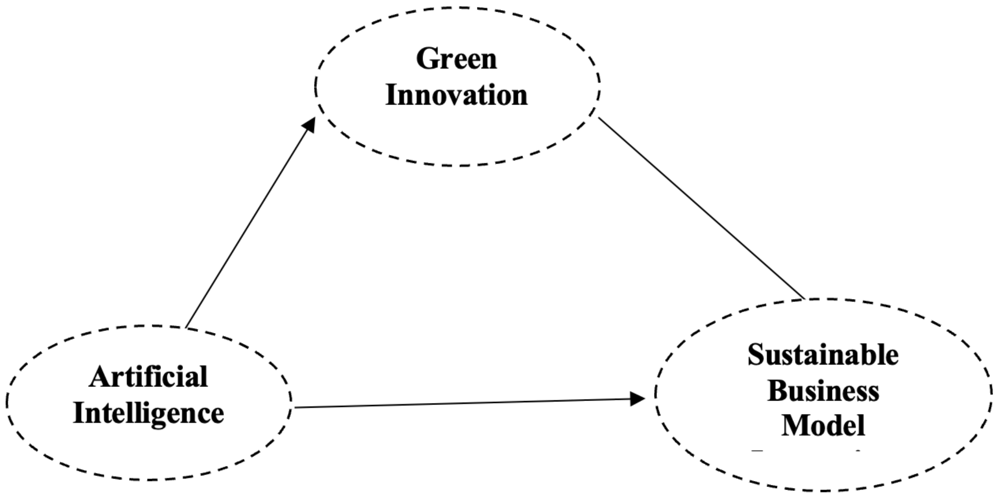

Figure 1: Research Conceptual Model

2. Research Methodology

The present study employs a descriptive-correlational methodology based on structural equation modeling (SEM), as it investigates relationships between variables through a structural equation modeling framework.

2.1 Statistical Population and Sample

The statistical population consisted of managers and deputy managers of Iranian science and technology companies. A total of 130 questionnaires were distributed among this population in 2024, of which 118 were returned and analyzed.

2.2 Data Collection Tools

Sustainable Business Model Innovation (SBMI) was measured using the 9-item questionnaire developed by Bhatti et al. (2021). Green Innovation (GI) was assessed via the 6-item questionnaire by Chang (2011). AI was evaluated using the 22-item questionnaire by Chen et al. (2022). This tool measures five dimensions: AI Management (3 items); AI-Based Decision-Making (4 items); AI Infrastructure (5 items); AI Skills (5 items); AI Readiness (5 items). All items were rated on a five-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5).

3. Findings

3.1 Measurement Model Test

The measurement model evaluates the reliability (internal consistency) and discriminant validity of constructs and instruments. Based on Nazari-Shirkouhi et al. (2023b) framework, three criteria were applied: Item reliability: Confirmatory factor analysis (CFA) factor loadings ≥ 0.6, with statistical significance ($p<0.01$) validated via a 500-subsample bootstrap test (Gefen & Straub, 2005; Tavana et al., 2021; Tavana et al., 2022). Composite reliability: Assessed using Dillon-Goldstein's rho (ρc), requiring values ≥ 0.7. Average variance extracted (AVE): Threshold of ≥ 0.50, indicating the construct explains ≥50% of indicator variance (Chin, 1988). As shown in Table 1, all constructs met these criteria, confirming robust reliability and validity of the measurement model.

Table 1: Factor Loadings, Composite Reliability, and Average Variance Extracted (AVE) of Research Variables

Variable	Item	Factor Loading	Cronbach's alpha	Composite reliability	Average variance extracted
AI Management	1	0.947	0.868	0.921	0.798
	2	0.95			
	3	0.771			
AI-Based Decision-Making	1	0.894	0.890	0.924	0.754
	2	0.892			
	3	0.889			
	4	0.794			
AI Infrastructure	1	0.795	0.807	0.868	0.571
	2	0.646			
	3	0.653			
	4	0.817			
	5	0.843			
AI Skills	1	0.806	0.905	0.929	0.724
	2	0.841			
	3	0.848			
	4	0.885			
	5	0.874			

Variable	Item	Factor Loading	Cronbach's alpha	Composite reliability	Average variance extracted
AI Readiness	1	0.83	0.865	0.903	0.650
	2	0.787			
	3	0.825			
	4	0.758			
	5	0.828			
Green Innovation	1	0.837	0.913	0.933	0.699
	2	0.891			
	3	0.842			
	4	0.84			
	5	0.87			
	6	0.729			
Sustainable Business Model Innovation	1	0.887	0.944	0.953	0.692
	2	0.875			
	3	0.795			
	4	0.803			
	5	0.778			
	6	0.794			
	7	0.882			
	8	0.853			
	9	0.81			

Discriminant validity was evaluated using two criteria outlined by Chin (1988): first, item alignment, which requires that indicators load most strongly on their assigned construct—meaning higher factor loadings on their own construct than on others—with minimal cross-loadings; and second, the AVE comparison, where the square root of the AVE for each construct must exceed its correlations with all other constructs.

Table 2: Cross-Factor Loadings for Assessing Questionnaire Validity

	AI	Green Innovation	Sustainable Business Model Innovation
AI1	**0.947**	0.468	0.413
AI2	**0.950**	0.450	0.424
AI3	**0.771**	0.461	0.385
AI4	**0.894**	0.480	0.338
AI5	**0.892**	0.610	0.451
AI6	**0.889**	0.538	0.414
AI7	**0.794**	0.434	0.406
AI8	**0.817**	0.604	0.425
AI9	**0.843**	0.606	0.344
AI10	**0.795**	0.627	0.444
AI11	**0.646**	0.289	0.329
AI12	**0.653**	0.498	0.354
AI13	**0.806**	0.481	0.402
AI14	**0.841**	0.460	0.533
AI15	**0.848**	0.447	0.446

	AI	Green Innovation	Sustainable Business Model Innovation
AI16	**0.885**	0.435	0.437
AI17	**0.874**	0.531	0.471
AI18	**0.787**	0.342	0.351
AI19	**0.825**	0.411	0.282
AI20	**0.758**	0.438	0.345
AI21	**0.830**	0.531	0.524
AI22	**0.828**	0.439	0.398
GI1	0.560	**0.837**	0.516
GI2	0.600	**0.891**	0.546
GI3	0.554	**0.842**	0.481
GI4	0.536	**0.840**	0.500
GI5	0.595	**0.870**	0.474
GI6	0.524	**0.729**	0.409
SBMI2	0.540	0.518	**0.887**
SBMI3	0.434	0.453	**0.875**
SBMI4	0.378	0.414	**0.795**
SBMI5	0.478	0.482	**0.803**
SBMI6	0.521	0.465	**0.778**
SBMI7	0.464	0.482	**0.794**
SBMI8	0.532	0.547	**0.882**
SBMI9	0.505	0.448	**0.853**
SBMI1	0.349	0.426	**0.810**

As shown in Table 2, all dimensions demonstrate the highest factor loadings on their respective constructs, with a minimum gap of 0.1 between their own construct's loadings and those of others. This confirms the adequate discriminant validity of the research constructs.

Table 3 reveals that the square roots of AVE for all research variables are greater than their correlations with other variables, satisfying the second criterion for discriminant validity. Additionally, the sub-diagonal correlation coefficients indicate positive and significant relationships between all variables.

Table 3: Correlation Matrix and Square Roots of AVE

	AI	Green Innovation	Sustainable Business Model Innovation
AI	**0.861**		
Green Innovation	0.672	**0.836**	
Sustainable Business Model Innovation	0.569	0.585	**0.832**

3.2 Structural Model Test

The proposed conceptual model for predicting sustainable business model innovation was evaluated using SEM. To test the hypotheses, the Partial Least Squares (PLS) method was employed for model estimation. A bootstrap test (with 500 subsamples) was applied to calculate t-statistics for determining the significance of path coefficients. Figure 2 illustrates the tested model, depicting relationships between variables, with values inside circles representing the explained variance of the constructs.

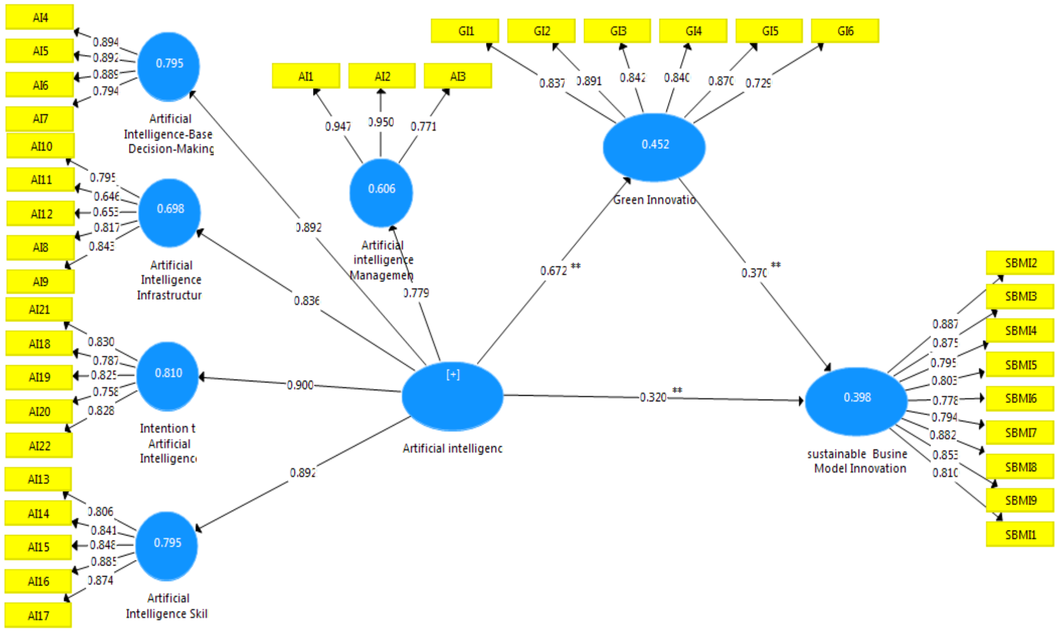

Figure 2: Tested Model

Table 4 reports the estimated path coefficients and explained variance of the research variables.

Table 4: Path Coefficients and Explained Variance

Variables	Path Coefficients	t-Values	Explained Variance
On Sustainable Business Model Innovation from:			
Green Innovation	0.37**	3.153	0.398
AI	0.32**	3.361	0.398
On Green Innovation from:			
AI	0.67**	11.688	0.45

*p<0.05, **p<0.01

As shown in Table 4, the effects of AI on green innovation and sustainable business model innovation are positive and statistically significant. Similarly, the impact of green innovation on sustainable business model innovation is also positive and significant. Furthermore, the model explains 40% of the variance in sustainable business model innovation and 45% of the variance in green innovation. Table 5 presents the indirect coefficients.

Table 5: Indirect Coefficients

Indirect Paths	Indirect Effects	T Statistics	P Values
AI -> Green Innovation -> sustainable Business Model Innovation	0.249	2.997	0.003

As observed in Table 5, green innovation plays a significant and positive mediating role in the effect of AI on sustainable business model innovation. For the tested model in this study, the absolute Goodness-of-Fit Index (GOF) value was 0.66, indicating a strong model fit. Values above 0.36 are considered acceptable and reflect adequate model quality.

4. Discussion

The present study aimed to investigate the impact of AI on sustainable business model innovation through the mediating role of green innovation using SEM. Results indicated that the proposed model demonstrated a relatively good fit with the data, explaining 40% of the variance in sustainable business model innovation and 45% of the variance in green innovation.

The results revealed a positive and significant effect of AI on green innovation. This finding aligns with studies by Wang et al. (2025), Cheng et al. (2025), and Farmanesh et al. (2025). AI's ability to provide innovative solutions for environmental challenges—such as optimizing energy consumption, streamlining supply chains, and minimizing waste—plays a critical role in advancing sustainable technologies. For instance, AI-driven simulations and predictive analytics enable organizations to forecast environmental impacts, facilitating data-driven decisions for eco-friendly strategies. Furthermore, AI enhances cross-organizational collaboration, accelerating the development and adoption of green innovations.

AI also exerted a positive and significant influence on sustainable business model innovation, consistent with findings from Lodhi et al. (2024), Wang & Zhang (2025), and de Andreis et al. (2024). As a transformative technology, AI empowers businesses to redesign operational processes, reduce costs, and align economic goals with environmental sustainability. Machine learning algorithms enable organizations to identify inefficiencies, optimize resource use, and tailor customer-centric solutions that balance profitability with ecological responsibility and business performance (Bagherabad et al., 2025). By analyzing consumer behavior, AI tools helps firms develop products and services that meet market demands while adhering to sustainability principles (Saremi et al., 2024).

Green innovation significantly mediated the relationship between AI and sustainable business model innovation. This result corroborates research by Baeshen et al. (2021), Zhao & Huang (2022), Liu et al. (2023), and Borah et al. (2025). Green innovation drives systemic changes in organizational processes, products, and services, reducing ecological footprints while enhancing economic efficiency. By integrating clean technologies and sustainable practices, businesses achieve cost savings, strengthen brand reputation, and unlock new market opportunities. Continuous improvements in supply chain management and waste reduction further solidify the alignment between innovation and long-term sustainability (Nazari-Shirkouhi and Samadi, 2025).

5. Conclusion

This study aimed to investigate the impact of AI on sustainable business model innovation and the mediating role of green innovation. Findings revealed that AI has a positive and significant effect on green innovation, aligning with prior research. AI serves as a creative and effective tool for addressing environmental challenges, fostering technologies that reduce resource consumption and minimize ecological footprints. For instance, AI optimizes energy management, supply chains, and waste reduction while enabling predictive simulations for sustainable decision-making. AI also directly enhances sustainable business model innovation by empowering organizations to design novel solutions that create customer value and achieve economic, social, and environmental sustainability. Key mechanisms include process optimization, cost reduction, and data-driven insights into consumer preferences, enabling firms to balance profitability with ecological responsibility. The mediating role of green innovation underscores its importance in translating AI's potential into sustainable business practices. By integrating clean technologies and circular economy principles, organizations reduce operational waste, strengthen brand reputation, and unlock new market opportunities. In summary, this research highlights the critical role of AI and green innovation in advancing sustainable development goals. These findings emphasize the need for businesses to prioritize AI-driven strategies and green practices to remain competitive while fulfilling their social and environmental responsibilities.

In contrast to prior research that primarily examines the direct effects of AI or green innovation separately, our study investigates the mediating role of green innovation in the relationship between AI and sustainable business model innovation. Unlike earlier studies limited to specific technological applications or industry contexts, our research provides a comprehensive model based on data collected from Iranian science and technology parks, offering regional insights into how AI-driven green innovation facilitates sustainable business transformation. Additionally, by employing SEM approach, we quantitatively demonstrate the sequential process through which AI adoption fosters green innovation, which subsequently leads to sustainable business model innovation, thus advancing theoretical understanding of these interconnected phenomena.

5.1 Limitations and Future Directions

A primary limitation of this study is its reliance on self-reported data collected through questionnaires, which may be influenced by respondents' biases. To enhance the validity of findings, future research could adopt mixed-methods approaches (qualitative and quantitative) to gain deeper insights into the relationships between variables. Additionally, this study focused on managers and deputy managers of Iranian science and technology companies, and the results may be shaped by cultural, economic, and social factors specific to this region. Future studies could explore how these factors influence variable relationships across diverse contexts to improve generalizability.

Another limitation is the cross-sectional design, which restricts conclusions to a specific time frame. Longitudinal designs in future research could examine how innovation-related behaviors and variable impacts evolve over time. Finally, the correlational nature of this study must be acknowledged. While results indicate relationships between variables, causal inferences should be drawn cautiously.

Acknowledgments

I would like to express my appreciation to all those who inspired and motivated me during this journey. I am especially grateful for the academic environment that fosters exploration and independent thought.

Ethics Declaration

This research did not involve any human or animal subjects requiring formal ethical clearance. All data were collected through voluntary, anonymous surveys and complied with institutional and professional ethical standards.

AI Declaration

Artificial intelligence tools were not used in the generation of content or analysis in this paper. All writing, data collection, and analysis were conducted manually by the authors.

References

Adomako, S., & Tran, M. D. (2024). Exploring the effect of R&D support, green technology transfer, sustainable innovation. *Sustainable Development*, *32*(5), 4758-4769.

Agarwal, V.; Mathiyazhagan, K.; Malhotra, S.; Saikouk, T.(2021). Analysis of challenges in sustainable human resource management due to disruptions by Industry 4.0: An emerging economy perspective. *Int. J. Manpow*. 43, 513–541.

Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2024). Adoption of green finance and green innovation for achieving circularity: An exploratory review and future directions. *Geoscience frontiers*, *15*(4), 101669.

Alipour, N., Nazari-Shirkouhi, S., Sangari, M. S., & Vandchali, H. R. (2022). Lean, agile, resilient, and green human resource management: the impact on organizational innovation and organizational performance. Environmental Science and Pollution Research, 29(55), 82812-82826.

Badghish, S., & Soomro, Y. A. (2024). Artificial intelligence adoption by SMEs to achieve sustainable business performance: application of technology–organization–environment framework. Sustainability, 16(5), 1864.

Baeshen, Y., Soomro, Y. A., & Bhutto, M. Y. (2021). Determinants of green innovation to achieve sustainable business performance: Evidence from SMEs. *Frontiers in psychology*, *12*, 767968.

Bagherabad, M. B., Rivandi, E., & Mehr, M. J. (2025). Machine Learning for Analyzing Effects of Various Factors on Business Economic. *Authorea Preprints*. https://doi.org/10.36227/techrxiv.174429010.09842200/v1

Bhatti, S. H., Santoro, G., Khan, J., & Rizzato, F. (2021). Antecedents and consequences of business model innovation in the IT industry. *Journal of Business Research*, *123*, 389-400.

Bock, A. J., Opsahl, T., George, G., & Gann, D. M. (2012). The effects of culture and structure on strategic flexibility during business model innovation. *Journal of Management studies*, *49*(2), 279-305.

Bocken, N. M., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of cleaner production*, *65*, 42-56.

Borah, P. S., Dogbe, C. S. K., & Marwa, N. (2025). Green dynamic capability and green product innovation for sustainable development: Role of green operations, green transaction, and green technology development capabilities. *Corporate Social Responsibility and Environmental Management*, *32*(1), 911-926.

Casadesus-Masanell, R., & Zhu, F. (2013). Business model innovation and competitive imitation: The case of sponsor-based business models. *Strategic management journal*, *34*(4), 464-482.

Chang, C. H. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of business ethics*, *104*, 361-370.

Chen, D., Esperança, J. P., & Wang, S. (2022). The impact of artificial intelligence on firm performance: an application of the resource-based view to e-commerce firms. *Frontiers in Psychology*, *13*, 884830.

Cheng, J., Xu, N. R., Khan, N. U., & Singh, H. S. M. (2025). The impacts of artificial intelligence literacy, green absorptive capacity, and green information system on green innovation. *Corporate Social Responsibility and Environmental Management*, *32*(2), 2375-2389.

Chin, W. W. (1988). Issues and opinion on structural equation modelling. *MIS Quarterly*, 22(1),vii–xvi.

Choi, J., & Wang, H. (2009). Stakeholder relations and the persistence of corporate financial performance. *Strategic management journal*, *30*(8), 895-907.

de Andreis, F., Comite, U., & Gallo, A. M. (2024). Sustainable business model, artificial intelligence, and sustainable practices: A possible strategy for tomorrow. *International Journal of Academic Research in Business and Social Sciences*, *14*(1), 60-73.

Ertel, W. (2024). *Introduction to artificial intelligence*. Springer Nature.

Farmanesh, P., Solati Dehkordi, N., Vehbi, A., & Chavali, K. (2025). Artificial Intelligence and Green Innovation in Small and Medium-Sized Enterprises and Competitive-Advantage Drive Toward Achieving Sustainable Development Goals. *Sustainability*, *17*(5), 2162.

Foss, N. J., & Saebi, T. (2018). Business models and business model innovation: Between wicked and paradigmatic problems. *Long range planning*, *51*(1), 9-21.

Geissdoerfer, M., Vladimirova, D., & Evans, S. (2018). Sustainable business model innovation: A review. *Journal of cleaner production*, *198*, 401-416.

Gholami, M. H., Asli, M. N., Nazari-Shirkouhi, S., & Noruzy, A. (2013). Investigating the influence of knowledge management practices on organizational performance: an empirical study. *Acta Polytechnica Hungarica*, *10*(2), 205-216.

Guo, L., Cao, Y., Qu, Y., & Tseng, M. L. (2022). Developing sustainable business model innovation through stakeholder management and dynamic capability: A longitudinal case study. *Journal of Cleaner Production*, *372*, 133626.

Heidari, S., Zarei, M., Rad, S. S., Sanaei, F., Hajian, E., & Boti, M. (2025). Integrating Green Supply Chain Management and Total Quality Management: A SEM-ANN Analysis of Performance Enhancement in SMEs. *Computer and Decision Making: An International Journal*, *2*, 558-569.

Karizaki, M. S., Gnesdilow, D., Puntambekar, S., & Passonneau, R. J. (2024, July). How Well Can You Articulate that Idea? Insights from Automated Formative Assessment. In *International Conference on Artificial Intelligence in Education* (pp. 225-233). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-64299-9_16

Latifi, T., Li, J., Blum, S. C., & Fowler, D. (2024). Determinants of Users' Intention to Visit a Destination: A Virtual Reality Quality Framework. *Journal of Quality Assurance in Hospitality & Tourism*, 1-25. https://doi.org/10.1080/1528008X.2024.2440010

Lindgardt, Z., Reeves, M., Stalk, Jr, G., & Deimler, M. (2012). Business model innovation: When the game gets tough, change the game. *Own the future: 50 ways to win from The Boston Consulting Group*, 291-298.

Liu, R., Yue, Z., Ijaz, A., Lutfi, A., & Mao, J. (2023). Sustainable business performance: Examining the role of green HRM practices, green innovation and responsible leadership through the lens of pro-environmental behavior. *Sustainability*, *15*(9), 7317.

Liu, Z., Yang, L., & Fan, L. (2021). Induced Effect of Environmental Regulation on Green Innovation: Evidence from the Increasing-Block Pricing Scheme. *International journal of environmental research and public health*, *18*(5), 2620.

Lodhi, S. K., Gill, A. Y., & Hussain, H. K. (2024). Green innovations: Artificial intelligence and sustainable materials in production. *BULLET: Jurnal Multidisiplin Ilmu*, *3*(4), 492-507.

Nazari-Shirkouhi, S., & Samadi, S. (2025). Enhancing healthcare supply chains: A comprehensive evaluation of lean, agile, resilient and green paradigms. *Engineering Applications of Artificial Intelligence*, *145*, 110204.

Nazari-Shirkouhi, S., Badizadeh, A., Dashtpeyma, M., & Ghodsi, R. (2023b). A model to improve user acceptance of e-services in healthcare systems based on technology acceptance model: an empirical study. Journal of Ambient Intelligence and Humanized Computing, 14(6), 7919-7935.

Nazari-Shirkouhi, S., Jalalat, S. M., Sangari, M. S., Sepehri, A., & Vandchali, H. R. (2023a). A robust-fuzzy multi-objective optimization approach for a supplier selection and order allocation problem: Improving sustainability under uncertainty. *Computers & Industrial Engineering*, *186*, 109757.

Nazari-Shirkouhi, S., Keramati, A., & Rezaie, K. (2015). Investigating the effects of customer relationship management and supplier relationship management on new product development. *Tehnički vjesnik*, *22*(1), 191-200.

Noruzy, A., Dalfard, V. M., Azhdari, B., Nazari-Shirkouhi, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms. *The International Journal of Advanced Manufacturing Technology*, *64*, 1073-1085.

Porter, M. E., & Kramer, M. R. (2018). Creating shared value: How to reinvent capitalism—And unleash a wave of innovation and growth. In *Managing sustainable business: An executive education case and textbook* (pp. 323-346). Dordrecht: Springer Netherlands.

Ramdani, B., Binsaif, A., & Boukrami, E. (2019). Business model innovation: a review and research agenda. *New England Journal of Entrepreneurship*, *22*(2), 89-108.

Ribeiro, I. S., Maciel, G. M., Bortolini, D. G., Fernandes, I. D. A. A., Maroldi, W. V., Pedro, A. C., ... & Haminiuk, C. W. I. (2024). Sustainable innovations in edible films and coatings: An overview. *Trends in Food Science & Technology*, *143*, 104272.

Roshan, R., & Balodi, K. C. (2024). Sustainable business model innovation of an emerging country startup: An imprinting theory perspective. *Journal of Cleaner Production*, *475*, 143687.

Saremi, Y., Aghaei, M., Esfid, M. R., Hasangholipour, T., & Ansari, M. (2024). Providing Digital Marketing Model with Customer Participation Approach with intervening role of knowledge management. *International Journal of Knowledge Processing Studies*, *4*(2), 148-167. https://doi.org/10.22034/kps.2023.410230.1154

Seman, N. A. A., Zakuan, N., Jusoh, A., Arif, M. S. M., & Saman, M. Z. M. (2012). The relationship of green supply chain management and green innovation concept. *Procedia-Social and Behavioral Sciences*, *57*, 453-457.

Tavana, M., Nazari-Shirkouhi, S., & Farzaneh Kholghabad, H. (2021). An integrated quality and resilience engineering framework in healthcare with Z-number data envelopment analysis. Health care management science, 24, 768-785.

Tavana, M., Nazari-Shirkouhi, S., Mashayekhi, A., & Mousakhani, S. (2022, March). An integrated data mining framework for organizational resilience assessment and quality management optimization in trauma centers. In Operations Research Forum (Vol. 3, No. 1, p. 17). Cham: Springer International Publishing.

Tseng, M. L., Wang, R., Chiu, A. S., Geng, Y., & Lin, Y. H. (2013). Improving performance of green innovation practices under uncertainty. *Journal of Cleaner Production*, *40*, 71-82.

Wang, Q., Sun, T., & Li, R. (2025). Does artificial intelligence promote green innovation? An assessment based on direct, indirect, spillover, and heterogeneity effects. *Energy & Environment*, *36*(2), 1005-1037.

Wang, S., & Zhang, H. (2025). Leveraging generative artificial intelligence for sustainable business model innovation in production systems. *International Journal of Production Research*, 1-26.

Wang, Z., Li, M., Lu, J., & Cheng, X. (2022). Business Innovation based on artificial intelligence and Blockchain technology. *Information Processing & Management*, *59*(1), 102759.

Wiredu, J., Yang, Q., Sampene, A. K., Gyamfi, B. A., & Asongu, S. A. (2024). The effect of green supply chain management practices on corporate environmental performance: Does supply chain competitive advantage matter?. *Business Strategy and the Environment*, *33*(3), 2578-2599.

Zameer, H., Wang, Y., Yasmeen, H., & Mubarak, S. (2020). Green innovation as a mediator in the impact of business analytics and environmental orientation on green competitive advantage. *Management Decision*.

Zhao, W., & Huang, L. (2022). The impact of green transformational leadership, green HRM, green innovation and organizational support on the sustainable business performance: Evidence from China. *Economic research-Ekonomska istraživanja*, *35*(1), 6121-6141.

Zhu, Q., Dou, Y., & Sarkis, J. (2010). A portfolio-based analysis for green supplier management using the analytical network process. *Supply Chain Management: An International Journal*, *15*(4), 306-319.