

Generative AI as a Catalyst for Sustainable Supply Chain Transformation: Integrating Dynamic Capabilities and Green Innovation

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Abstract

As sustainability pressures intensify across global supply chains, the integration of advanced digital technologies has become a strategic imperative. Among these technologies, Generative Artificial Intelligence (GenAI) offers transformative capabilities that extend beyond automation to include scenario simulation, content creation, and adaptive decision-making. Despite its growing significance, the role of GenAI in fostering sustainable supply chain performance remains underexplored in both theory and practice. This conceptual paper develops an integrated framework grounded in the Dynamic Capabilities View (DCV) to investigate how GenAI enhances supply chain sustainability through green innovation. The model posits that GenAI enables dynamic reconfiguration and proactive innovation, which drive environmental and operational improvements. This study expands the digital transformation literature by integrating GenAI into DCV, formulating new propositions, and highlighting practical and theoretical implications for achieving sustainability-driven supply chain excellence. The findings set the stage for future empirical research and strategic implementation in dynamic, resource-constrained environments.

Keywords: Generative AI, Green Innovation, Supply Chain Sustainability, Dynamic Capabilities, Digital Transformation

Introduction

Developing a sustainable supply chain has emerged as an increasingly vital priority for both scholars and practitioners (Nandi et al., 2021). Amid growing societal, regulatory, and

competitive pressures, organizations are compelled to consider not only the economic efficiency of their supply chains but also their environmental and social consequences (Abbate et al., 2023). In response, companies must adopt strategies that integrate the triple bottom line (TBL)—economic, environmental, and social performance—while ensuring the responsible use of resources to safeguard the needs of future generations (Costa, 2021). Supply chain sustainability is now considered a strategic imperative for firms aiming to manage costs, strengthen resilience, enhance customer satisfaction, and remain competitive in an increasingly volatile global environment (Bag & Rahman, 2025).

Despite its importance, achieving supply chain sustainability is fraught with challenges. These include resource inefficiencies, high carbon emissions, unethical labor practices, and disruptions caused by global crises such as pandemics or climate-related events (Xu et al., 2022). Addressing these challenges requires not only incremental improvements but also transformative solutions. Emerging digital technologies, particularly Generative Artificial Intelligence (GenAI), offer promising capabilities to support sustainability goals (Fosso Wamba et al., 2023). Unlike traditional AI—which focuses on classification, prediction, and optimization—GenAI leverages vast data sets and machine learning algorithms to generate novel content, simulate scenarios, and offer creative problem-solving capabilities (Mariani & Dwivedi, 2024). These generative features enable firms to dynamically adjust operations, reimagine resource configurations, and anticipate disruptions with greater agility (Pournader et al., 2021).

However, the use of GenAI in supply chain management (SCM) remains uneven due to disparities in technological readiness, organizational capabilities, and sectoral contexts (IBM, 2024). While AI literature has broadly demonstrated the value of traditional AI in enhancing supply chain agility, resilience, and operational efficiency (Dubey et al., 2022; Gupta et al., 2023), studies have rarely explored the strategic potential of GenAI specifically. This oversight is particularly salient given GenAI's capacity to generate innovative and adaptive responses, simulate supplier networks, optimize logistics in real time, and drive organizational learning (Belhadi et al., 2024; Zamani et al., 2023). Thus, understanding how GenAI can be effectively deployed to support sustainable supply chain performance (SSCP) is both timely and essential (Li et al., 2024).

In response to these emerging questions, this study draws on Dynamic Capabilities View (DCV) to conceptualize how GenAI can drive sustainable value in supply chains. Meanwhile, DCV provides a lens to understand how organizations build, integrate, and reconfigure capabilities—such as innovation to respond to rapidly changing environments (Teece et al., 1997; Modgil et al., 2022). Moreover, although the relationship between digital transformation and sustainable supply chain outcomes has gained momentum, the mediating mechanisms through which emerging technologies like GenAI contribute to these outcomes remain underexplored. Specifically, green innovation emerges as two critical mediating capabilities that explain how GenAI can transform sustainable supply chain performance (Bag et al., 2025; Dubey et al., 2024). Green innovation—reflected in eco-friendly product design, process optimization, and sustainability-oriented R&D—serves as a conduit through which GenAI's generative and simulation capabilities translate into environmental and social value (Mastrocinque et al., 2022; Mitchell et al., 2022). Anchored in the Dynamic Capabilities View,

these capabilities enable firms not only to cope with uncertainty but also to innovate proactively.

This paper addresses this gap by developing a conceptual framework that integrates GenAI into the dynamic capabilities paradigm to explain how organizations can foster green innovation and achieve supply chain sustainability. Specifically, it posits that GenAI enhances firms' ability to sense sustainability-related signals, seize innovation opportunities, and transform their operations to meet environmental and social expectations. Furthermore, the study theorizes that green innovation serves as a key mediating mechanism linking GenAI to sustainable supply chain performance.

The contributions of this study are threefold. First, it extends the application of DCV by embedding GenAI as a capability-enabling technology in sustainability-driven contexts. Second, it articulates the mechanisms through which GenAI fosters green innovation within supply chains. Third, it advances theoretical propositions to guide future empirical research and managerial practice. By bridging the digital-sustainability divide, this paper offers new insights into how generative technologies can be strategically leveraged to transform supply chains for a greener, more resilient future.

Theoretical Background and Literature Review

Dynamic Capabilities View (DCV)

Dynamic capabilities (DCs) theory provides a robust theoretical foundation for understanding how organizations adapt and thrive within rapidly changing business environments. Initially introduced by Teece and Pisano (2003), DCs emphasize an organization's ability to purposefully integrate, build, and reconfigure both internal and external resources to effectively respond to environmental uncertainties (Helfat, 2010). These capabilities—comprising routines and strategic processes—enable firms to proactively sense threats and opportunities, seize strategic initiatives, and maintain sustainable competitive advantages (Teece et al., 1997). Central to the theory is the assertion that firm resources form the basis for capability development, whereas capabilities themselves directly contribute to competitive advantage (Grant, 1991).

Within supply chain contexts, dynamic capabilities are particularly relevant due to their emphasis on agility and responsiveness. Supply chains today operate amidst increasing complexity and volatility, necessitating continuous adaptation and reconfiguration (Wu et al., 2023). In this regard, DCs manifest as the organizational capacity to sense disruptions, effectively respond to environmental uncertainties, and maintain sustained operational performance (de Moura & Saroli, 2020). These capabilities include scanning the environment, analyzing potential risks, and orchestrating resources and relationships across the supply chain to ensure resilience and sustained value creation (Kwak et al., 2018). DCs not only leverage a firm's existing core competencies to navigate short-term market shifts but also serve as strategic instruments to secure long-term competitive positioning and organizational sustainability (Beske et al., 2014).

The relevance of dynamic capabilities became especially pronounced during the COVID-19 pandemic, a period characterized by unprecedented disruptions and heightened uncertainty across global supply chains. Organizations equipped with strong DCs demonstrated superior

adaptability, swiftly reconfiguring their supply chain processes to maintain continuity and resilience (Modgil et al., 2022). This period underscored the importance of strategic resource alignment and dynamic adaptation, highlighting that firms with superior sensing, seizing, and transforming capabilities were better positioned to survive and even thrive during crisis conditions (Kamble et al., 2020).

Despite extensive exploration of dynamic capabilities across multiple domains, the role of advanced digital technologies, particularly artificial intelligence (AI), within the DC framework remains underexplored in supply chain contexts. AI technologies offer powerful tools for operationalizing DCs, significantly enhancing firms' ability to dynamically sense, seize, and transform in response to changing environmental conditions (Modgil et al., 2022). Unlike traditional AI, which often focuses on classification, prediction, and automation, GenAI enables creative problem-solving, content generation, and scenario simulation. These features empower firms to explore new strategic options, simulate disruptions, design greener products, and dynamically optimize supply chain operations in response to market shifts. For instance, GenAI can reimagine inventory configurations, predict environmental outcomes of logistics choices, and prototype sustainable packaging—all in real time. These adaptive capabilities are vital for firms striving to integrate sustainability into the core of their supply chain strategy (Sharma et al., 2022).

Moreover, GenAI's dynamic nature aligns well with the DCV's emphasis on continuous learning and reconfiguration. The implementation of GenAI capability requires not just technical tools, but also strategic intent, stakeholder collaboration, and organizational learning infrastructure (Le & Behl, 2024). By developing this capacity, firms enhance their ability to sense external signals, seize innovation opportunities, and transform their processes and business models to achieve both operational excellence and sustainable development goals.

Generative AI for Supply Chain Sustainability

Limited Theoretical Attention to Advanced Technologies

Traditionally, supply chain management (SCM) emphasized profitability through efficiency, cost reduction, coordination, and innovation (Stindt, 2017). However, recent sustainability-driven pressures—including climate change, resource depletion, and ethical considerations—have expanded firms' SCM focus beyond economic performance towards comprehensive environmental and social outcomes (Carter et al., 2020; Krishnan et al., 2025). Although emerging technologies like the Internet of Things (IoT), blockchain, and big data analytics have begun shaping sustainability practices within SCM (Yousefi & Tosarkani, 2022; Raut et al., 2021), limited scholarly attention has explicitly addressed the role of advanced generative artificial intelligence (GenAI) in achieving sustainable supply chain outcomes (Li et al., 2024). Considering GenAI's distinctive capabilities, exploring its transformative potential within the sustainability domain presents a significant research opportunity.

Unique Capabilities of Generative AI

Generative AI, a novel subset within artificial intelligence technologies, refers to algorithms capable of generating new and creative content—including images, texts, simulations, and predictive models—based on extensive training datasets (Piprani et al., 2023). The fundamental distinction between traditional AI and generative AI lies in the latter's ability to

produce novel and creative outputs rather than merely analyzing existing data. Unlike traditional AI, which requires explicit task-oriented programming, generative AI leverages large language models (LLMs), neural networks, and deep learning algorithms to autonomously generate content through human-machine interactions (Fosso Wamba et al., 2024). Due to these advanced capabilities, GenAI facilitates rapid solution generation, predictive modeling, and sophisticated simulations, enabling firms to evaluate numerous scenarios quickly and accurately.

Transformative Potential of Generative AI toward Sustainable Supply Chains

Given its advanced capabilities, Generative AI holds transformative potential for enhancing sustainability in supply chain activities across various dimensions. First, GenAI significantly accelerates eco-friendly innovation by rapidly developing and evaluating sustainable product designs, such as biodegradable packaging or energy-efficient production methods, aligning closely with market demands and environmental standards. Second, GenAI's predictive modeling capabilities allow firms to accurately anticipate environmental impacts and social risks by simulating multiple supply chain scenarios, thus proactively mitigating adverse consequences (Deloitte, 2023). For instance, generative AI-powered simulations can help optimize logistics routes, manufacturing processes, and resource allocation, thus significantly reducing carbon footprints and waste generation.

Moreover, GenAI's sophisticated analysis of personalized data and dynamic market trends supports the development of tailored, responsive, and agile supply chain strategies, fostering a more flexible and sustainable response to changing consumer preferences and regulatory pressures (IBM, 2024). Consequently, generative AI can profoundly transform sustainable SCM practices, enhancing innovation capabilities and delivering highly personalized sustainability solutions (Dubey et al., 2024). These transformative capabilities position generative AI not merely as an efficiency tool but as a strategic enabler capable of systematically embedding sustainability across the triple bottom line in contemporary supply chains.

Conceptual Model and Propositions

The conceptual model connects GAI as a driver for green innovation, leading to sustainable supply chains.

Generative AI (GAI) has emerged as a transformative technology significantly enhancing sustainability outcomes in supply chains by optimizing resource use, driving eco-innovation, and facilitating transparency across supply chain operations. Li et al. (2024) empirically found that Generative AI usage directly contributes to sustainable supply chain performance by enabling rapid generation and evaluation of innovative solutions, such as eco-friendly product designs, efficient energy management, and circular economy practices. Specifically, Generative AI supports firms in proactively addressing sustainability challenges by creating realistic simulations and scenarios, which enables proactive risk mitigation, waste reduction, and improved resource allocation, ultimately promoting environmental sustainability within the supply chain (Li et al., 2024).

Moreover, Mariani and Dwivedi (2024) emphasize that Generative AI applications in supply chains enhance operational efficiency through better forecasting and demand management, reducing unnecessary resource consumption and waste, which directly aligns with

sustainability goals. They argue that Generative AI significantly reduces costs and enhances sustainability by improving resource accuracy and inventory control, thus reducing the environmental impact and enabling a more responsible use of resources throughout the supply chain.

Additionally, recent research by Maghsoudi et al. (2023) highlights that AI applications, including generative models, facilitate greater sustainability in supply chains by optimizing operations and logistics to reduce environmental footprints and enhance transparency. AI-driven algorithms help companies efficiently manage supply chain processes, identify potential inefficiencies, and suggest actionable solutions for achieving higher sustainability.

Hence, integrating Generative AI into supply chain practices demonstrates substantial potential to enhance sustainability performance by fostering innovation, improving decision-making, and enabling more effective management of environmental and social impacts.

P1: Generative AI positively influences Supply Chain Sustainability.

Generative AI significantly promotes green innovation by providing capabilities to explore and develop novel sustainable solutions in products, processes, and services. Wang and Zhang (2025) highlight that Generative AI facilitates sustainable innovation within supply chains by enhancing exploratory and exploitative innovation processes, thereby enabling firms to better identify and implement new environmentally friendly practices. The capabilities of Generative AI, such as content creation, pattern recognition, and predictive modeling, allow businesses to design innovative green products and optimize processes that significantly reduce environmental footprints. Similarly, Wang and Zhang (2024) also found that generative AI aids SMEs in enhancing their green knowledge management capabilities, which directly boosts green innovation by accelerating the integration of sustainable practices into core operations and strategies. This enhancement through Generative AI aligns closely with sustainable development goals, demonstrating its value in driving eco-friendly innovation in SMEs.

Furthermore, empirical research provides robust evidence that Generative AI's content generation capability notably influences firms' green innovation performance by supporting exploratory innovation efforts. These efforts enable businesses to identify previously unseen opportunities for environmental improvement and sustainability innovation, highlighting the transformative potential of Generative AI in fostering green innovation (Wang & Zhang, 2025). In parallel, Wang and Zhang (2025) emphasized the critical role of AI-driven innovations in promoting sustainable internationalization by significantly improving green innovation outcomes. Consequently, the advanced analytical capabilities of Generative AI are instrumental in enhancing eco-innovative capacity, underscoring its direct and positive influence on green innovation.

Green innovation serves as a critical mediating mechanism that channels the capabilities of Generative AI into enhanced supply chain sustainability. Wang and Zhang (2024) clearly demonstrate that green innovation, driven by the capabilities of Generative AI, significantly elevates the success rates of sustainability-oriented entrepreneurial activities by facilitating effective green knowledge management and innovation practices. Through the application of

Generative AI, companies not only develop innovative solutions but also systematically integrate these innovations into sustainable business processes, thus amplifying the sustainability impacts (Wang & Zhang, 2024). Additionally, Le et al. (2022) support this argument by highlighting that green innovation plays a pivotal role in enhancing sustainable corporate performance through effective green supply chain management practices, particularly when firms leverage advanced technologies such as AI. Green innovations, developed through Generative AI, systematically reduce negative environmental impacts, optimize resource use, and enhance overall sustainability performance.

Moreover, Bhatti et al. (2023) provide empirical support that eco-innovation significantly mediates the relationship between sustainable procurement and distribution practices, highlighting the transformative role of innovative environmental practices in achieving sustainability outcomes. Generative AI amplifies this relationship by providing enhanced capabilities to develop, optimize, and implement these eco-innovations within firms' supply chains (Bhatti et al., 2023). Tu and Wu (2021) reinforce this mediating role by demonstrating how innovation capabilities, facilitated by AI-driven adaptive supply chains, effectively enhance environmental, social, and governance (ESG) performance. Such innovations are critical in achieving operational and strategic sustainability outcomes across supply chains, emphasizing green innovation's role as a necessary pathway linking Generative AI with sustainable supply chain practices.

P2: Green Innovation mediates the relationship between Generative AI and Supply Chain Sustainability, such that Generative AI enhances sustainability through fostering Green Innovation.

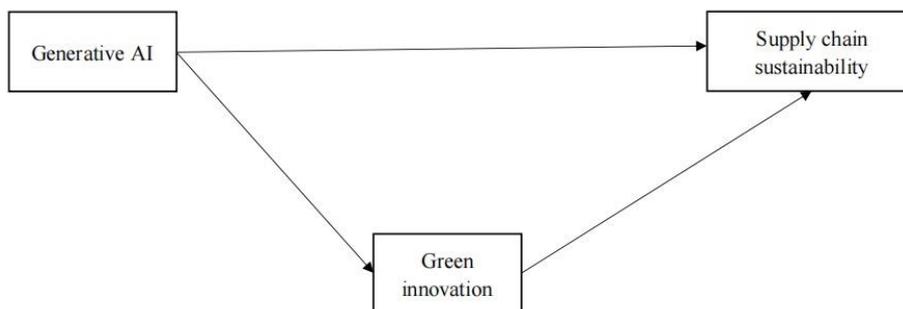


Figure 1 illustrates the conceptual framework

Discussion

This paper introduces a conceptual integration of Generative AI (GenAI) and the Dynamic Capabilities View (DCV) to explain how firms can enhance supply chain sustainability through green innovation. GenAI, when embedded in a firm's dynamic capabilities, enhances its ability to sense, seize, and transform in response to environmental and market uncertainties, thereby reshaping sustainability strategies.

GenAI is positioned not just as a tool but as a strategic enabler that strengthens DCV foundations. It enhances sensing by enabling real-time data analysis and disruption forecasting, seizing by supporting rapid innovation and decision-making, and transforming by

enabling adaptive planning and sustainable process redesign. These functions align with DCV's emphasis on agility and reconfiguration in dynamic environments. Green innovation serves as a mediating mechanism between GenAI and sustainability outcomes. GenAI accelerates ideation, simulation, and sustainability assessment, allowing firms to pursue eco-innovation at scale. This shifts sustainability from a compliance task to a strategic capability, emphasizing the need to align GenAI deployment with organizational learning and long-term environmental goals.

Theoretical Implications

Theoretically, this paper contributes to the literature by extending the Dynamic Capabilities View to account for the role of next-generation digital technologies—particularly GenAI—in sustainability transitions. Most existing applications of DCV in supply chain management focus on traditional IT, ERP, or big data analytics. By contrast, this study emphasizes the creative, generative, and adaptive qualities of GenAI that make it uniquely suited to enabling rapid sustainability-oriented transformation. Furthermore, the study advances the theoretical understanding of technology-enabled green innovation by identifying GenAI as a capability amplifier rather than a standalone innovation solution.

This integration also responds to recent scholarly calls for deeper exploration into how digital technologies intersect with sustainability imperatives (Dubey et al., 2021). The proposed framework provides a foundation for future research that explores additional mediators (e.g., organizational learning, digital maturity) or moderators (e.g., environmental dynamism, institutional pressure) that may shape the GenAI–sustainability linkage.

Managerial Implications

For practitioners, this paper highlights the strategic necessity of adopting GenAI not just for efficiency or cost reduction, but for long-term sustainability and innovation objectives. Supply chain managers should prioritize GenAI investments that support environmental performance tracking, product lifecycle optimization, and green process redesign. However, realizing these benefits requires more than technological deployment—it demands organizational readiness, including cross-functional collaboration, data governance, ethical guidelines, and alignment with ESG strategies.

In addition, the shift to GenAI-enabled sustainability transformation requires capacity building in areas such as AI literacy, sustainability analytics, and responsible innovation management. Firms that proactively develop these competencies will be better positioned to meet stakeholder expectations, regulatory demands, and market shifts related to climate action and social responsibility.

Limitations and Future Research

As a conceptual paper, this study is limited by its theoretical nature and the absence of empirical testing. Future research should validate the proposed propositions through qualitative case studies or quantitative surveys across different industries and regions. Researchers may also explore how contextual factors such as regulatory stringency, industry digitalization level, or firm size moderate the impact of GenAI on green innovation and sustainability performance.

First, empirical validation of the proposed framework is necessary to confirm the theorized relationships across diverse industrial sectors and geographical contexts. Longitudinal case studies and survey-based structural equation modeling (SEM) approaches can be particularly useful to examine causal pathways and moderating effects.

Second, future research should investigate additional moderating and mediating variables—such as organizational culture, ethical AI governance structures, data quality, and employee digital literacy—that may influence the effectiveness of GAI in sustainability-driven innovation and resilience.

Finally, exploring barriers to GAI implementation in sustainable supply chains—especially in developing economies—can provide critical insights into infrastructural, technical, and institutional limitations. Understanding these challenges will contribute to more inclusive and realistic digital sustainability strategies, especially for resource-constrained small and medium-sized enterprises (SMEs).

Conclusions

As sustainability becomes a strategic imperative for supply chain management, firms must develop the capacity to adapt, innovate, and transform in response to evolving environmental and societal expectations. This paper has proposed a conceptual framework integrating Generative Artificial Intelligence (GenAI) with the Dynamic Capabilities View (DCV) to explain how organizations can build sustainability-oriented supply chains through enhanced sensing, seizing, and transforming capabilities. By embedding GenAI within the DCV framework, we argue that firms can unlock new levels of responsiveness and creativity in addressing sustainability challenges.

A central proposition of this paper is that green innovation serves as a key mediating mechanism through which GenAI influences sustainable supply chain outcomes. GenAI empowers firms to explore novel solutions, simulate environmental impacts, and implement adaptive strategies, thereby moving beyond incremental improvements toward transformative change. This positions GenAI not merely as a technological tool, but as a dynamic enabler of eco-innovation and organizational renewal.

The study contributes to theory by extending DCV to the domain of advanced artificial intelligence and sustainability, and to practice by highlighting the strategic importance of aligning GenAI adoption with long-term environmental objectives. Future empirical research is encouraged to test the proposed relationships and examine contextual factors—such as industry dynamics, regulatory environments, and digital maturity—that may influence the effectiveness of GenAI in driving sustainability.

By conceptualizing the role of GenAI through a dynamic capabilities lens, this paper offers a pathway for rethinking how digital technologies can be leveraged to achieve resilient, innovative, and environmentally responsible supply chains in an era of global uncertainty and ecological urgency.

This study contributes theoretically by extending the Dynamic Capabilities View (DCV) to the domain of next-generation artificial intelligence, positioning Generative AI (GenAI) not as a

stand-alone technology but as a capability amplifier that enriches the microfoundations of sensing, seizing, and transforming. It advances supply-chain sustainability scholarship by articulating a dual pathway through which GenAI improves sustainable supply chain performance: a direct effect on sustainability outcomes and an indirect, mechanism-rich effect via green innovation, which we theorize as the dynamic conduit that translates GenAI's simulation, ideation, and rapid evaluation affordances into eco-efficient products and processes. Conceptually, this clarifies how digital technologies become embedded in capability reconfiguration rather than remaining at the level of process automation, and it specifies empirically testable propositions that bridge digital transformation and sustainability literatures. Contextually, the framework is significant for volatile, resource-constrained settings—such as SMEs and sectors facing regulatory and market turbulence—by showing how organizations can leverage GenAI to accelerate eco-design, lifecycle optimization, and adaptive planning even under data, talent, and capital constraints. It thus offers a practice-oriented roadmap for aligning digital investments with ESG imperatives and policy pressures while providing researchers with clear boundary conditions (e.g., digital maturity, data governance, regulatory stringency) to examine effect heterogeneity across industries and regions.

References

- Abbate, S., Centobelli, P., Cerchione, R., Nadeem, S. P., & Riccio, E. (2023). Sustainability Trends and gaps in the textile, apparel and Fashion Industries. *Environment, Development and Sustainability*, 26(2), 2837–2864. <https://doi.org/10.1007/s10668-022-02887-2>
- Bag, S., Rahman, M. S., Routray, S., Roubaud, D., & Mangla, S. K. (2025). Integrating big data and artificial intelligence technology to build Renewable Energy Supply Chain Resilience: An empirical study. *Business Strategy and the Environment*. <https://doi.org/10.1002/bse.70052>
- Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A., & Verma, S. (2024). Artificial intelligence-driven innovation for Enhancing Supply Chain Resilience and performance under the effect of Supply Chain Dynamism: An empirical investigation. *Annals of Operations Research*, 333(2–3), 627–652. <https://doi.org/10.1007/s10479-021-03956-x>
- Beske, P., Land, A., & Seuring, S. (2014). Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature. *International Journal of Production Economics*, 152, 131–143. <https://doi.org/10.1016/j.ijpe.2013.12.026>
- Bhatti, S. H., Rashid, M., Arslan, A., Tarba, S., & Liu, Y. (2023). Servitized smes' performance and the influences of sustainable procurement, packaging, and distribution: The mediating role of eco-innovation. *Technovation*, 127, 102831. <https://doi.org/10.1016/j.technovation.2023.102831>
- Carter, C. R., Hatton, M. R., Wu, C., & Chen, X. (2020). Sustainable Supply Chain Management: Continuing evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 50(1), 122–146. <https://doi.org/10.1108/ijpdlm-02-2019-0056>
- Costa, J. (2021). Carrots or sticks: Which policies matter the most in Sustainable Resource Management? *Resources*, 10(2), 12. <https://doi.org/10.3390/resources10020012>
- Deloitte, 2023. Compilation of generative artificial intelligence use cases: high-impact application cases in consumer and financial industries. <https://www2.deloitte>.

- com/content/dam/Deloitte/cn/Documents/deloitte-analytics/deloitte-cn-dai-gai-use-case-competition-2-consumer-fsi-zh-231115.pdf.
- de Moura, G. B., & Saroli, L. G. (2020). Sustainable value chain management based on dynamic capabilities in small and medium-sized enterprises (smes). *The International Journal of Logistics Management*, 32(1), 168–189. <https://doi.org/10.1108/ijlm-01-2020-0044>
- Dubey, R., Bryde, D. J., Dwivedi, Y. K., Graham, G., & Foropon, C. (2022). Impact of artificial intelligence-driven big data analytics culture on Agility and resilience in Humanitarian Supply Chain: A practice-based view. *International Journal of Production Economics*, 250, 108618. <https://doi.org/10.1016/j.ijpe.2022.108618>
- Dubey, R., Gunasekaran, A., & Papadopoulos, T. (2024). Benchmarking operations and supply chain management practices using Generative AI: Towards a theoretical framework. *Transportation Research Part E: Logistics and Transportation Review*, 189, 103689. <https://doi.org/10.1016/j.tre.2024.103689>
- Fosso Wamba, S., Guthrie, C., Queiroz, M. M., & Minner, S. (2023). Chatgpt and Generative Artificial Intelligence: An exploratory study of key benefits and challenges in operations and Supply Chain Management. *International Journal of Production Research*, 62(16), 5676–5696. <https://doi.org/10.1080/00207543.2023.2294116>
- Fosso Wamba, S., Queiroz, M. M., Chiappetta Jabbour, C. J., & Shi, C. (Victor). (2024). Are both Generative AI and Chatgpt Game Changers for 21st-century operations and Supply Chain Excellence? *International Journal of Production Economics*, 265, 109015. <https://doi.org/10.1016/j.ijpe.2023.109015>
- Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33(3), 114–135. <https://doi.org/10.2307/41166664>
- Gupta, S., Modgil, S., Choi, T.-M., Kumar, A., & Antony, J. (2023). Influences of artificial intelligence and Blockchain technology on financial resilience of Supply Chains. *International Journal of Production Economics*, 261, 108868. <https://doi.org/10.1016/j.ijpe.2023.108868>
- Helfat, C. E. (2010). *Dynamic capabilities: Understanding strategic change in organizations*. Blackwell Publ.
- IBM, 2024. The CEO's guide to generative AI: leveraging generative AI for revolution. Accessed February, 2024, at <https://www.ibm.com/downloads/cas/>.
- Kamble, S. S., Gunasekaran, A., & Gawankar, S. A. (2020). Achieving sustainable performance in a data-driven Agriculture Supply Chain: A review for Research and Applications. *International Journal of Production Economics*, 219, 179–194. <https://doi.org/10.1016/j.ijpe.2019.05.022>
- Krishnan, R., Phan, P. Y., Krishnan, S. N., Agarwal, R., & Sohal, A. (2025). Industry 4.0-Driven Business Model Innovation for Supply Chain Sustainability: An exploratory case study. *Business Strategy and the Environment*, 34(1), 276–295. <https://doi.org/10.1002/bse.3970>
- Kwak, D.-W., Seo, Y.-J., & Mason, R. (2018). Investigating the relationship between Supply Chain Innovation, risk management capabilities and competitive advantage in global supply chains. *International Journal of Operations & Production Management*, 38(1), 2–21. <https://doi.org/10.1108/ijopm-06-2015-0390>
- Le, T. T., & Behl, A. (2024). Linking artificial intelligence and supply chain resilience: Roles of dynamic capabilities mediator and open innovation moderator. *IEEE Transactions on Engineering Management*, 71, 8577–8590. <https://doi.org/10.1109/tem.2023.3348274>

- Le, T. T., Vo, X. V., & Venkatesh, V. G. (2022). Role of green innovation and Supply Chain Management in Driving Sustainable Corporate Performance. *Journal of Cleaner Production*, 374, 133875. <https://doi.org/10.1016/j.jclepro.2022.133875>
- Li, L., Zhu, W., Chen, L., & Liu, Y. (2024). Generative AI usage and Sustainable Supply Chain Performance: A practice-based view. *Transportation Research Part E: Logistics and Transportation Review*, 192, 103761. <https://doi.org/10.1016/j.tre.2024.103761>
- Maghsoudi, M., Shokouhyar, S., Ataei, A., Ahmadi, S., & Shokoohyar, S. (2023). Co-authorship network analysis of AI applications in sustainable supply chains: Key players and themes. *Journal of Cleaner Production*, 422, 138472. <https://doi.org/10.1016/j.jclepro.2023.138472>
- Mariani, M., & Dwivedi, Y. K. (2024). Generative Artificial Intelligence in Innovation Management: A preview of Future Research Developments. *Journal of Business Research*, 175, 114542. <https://doi.org/10.1016/j.jbusres.2024.114542>
- Mastrocinque, E., Ramírez, F. J., Honrubia-Escribano, A., & Pham, D. T. (2022). Industry 4.0 enabling sustainable supply chain development in the Renewable Energy Sector: A multi-criteria intelligent approach. *Technological Forecasting and Social Change*, 182, 121813. <https://doi.org/10.1016/j.techfore.2022.121813>
- Mitchell, D., Blanche, J., Harper, S., Lim, T., Gupta, R., Zaki, O., Tang, W., Robu, V., Watson, S., & Flynn, D. (2022). A review: Challenges and opportunities for artificial intelligence and robotics in the Offshore Wind Sector. *Energy and AI*, 8, 100146. <https://doi.org/10.1016/j.egyai.2022.100146>
- Modgil, S., Singh, R. K., & Hannibal, C. (2022). Artificial Intelligence for Supply Chain Resilience: Learning from covid-19. *The International Journal of Logistics Management*, 33(4), 1246–1268. <https://doi.org/10.1108/ijlm-02-2021-0094>
- Nandi, S., Sarkis, J., Hervani, A. A., & Helms, M. M. (2021). Redesigning supply chains using blockchain-enabled circular economy and covid-19 experiences. *Sustainable Production and Consumption*, 27, 10–22. <https://doi.org/10.1016/j.spc.2020.10.019>
- Piprani, A. Z., Khan, S. A., Salim, R., & Khalilur Rahman, M. (2023). Unlocking sustainable supply chain performance through Dynamic Data Analytics: A multiple mediation model of Sustainable Innovation and supply chain resilience. *Environmental Science and Pollution Research*, 30(39), 90615–90638. <https://doi.org/10.1007/s11356-023-28507-8>
- Pournader, M., Ghaderi, H., Hassanzadegan, A., & Fahimnia, B. (2021). Artificial Intelligence Applications in Supply Chain Management. *International Journal of Production Economics*, 241, 108250. <https://doi.org/10.1016/j.ijpe.2021.108250>
- Raut, R. D., Mangla, S. K., Narwane, V. S., Dora, M., & Liu, M. (2021). Big Data Analytics as a mediator in lean, Agile, resilient, and Green (larg) practices effects on sustainable supply chains. *Transportation Research Part E: Logistics and Transportation Review*, 145, 102170. <https://doi.org/10.1016/j.tre.2020.102170>
- Sharma, M., Luthra, S., Joshi, S., & Kumar, A. (2022). Developing a framework for enhancing survivability of sustainable supply chains during and Post-covid-19 pandemic. *International Journal of Logistics Research and Applications*, 25(4–5), 433–453. <https://doi.org/10.1080/13675567.2020.1810213>
- Stindt, D. (2017). A generic planning approach for sustainable supply chain management - how to integrate concepts and methods to address the issues of sustainability? *Journal of Cleaner Production*, 153, 146–163. <https://doi.org/10.1016/j.jclepro.2017.03.126>
- Teece, D. J., & Pisano, G. P. (2003). *The dynamic capabilities of firms*. s.n.

- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(sici\)1097-0266\(199708\)18:7<509::aid-smj882>3.0.co;2-z](https://doi.org/10.1002/(sici)1097-0266(199708)18:7<509::aid-smj882>3.0.co;2-z)
- Tu, Y., & Wu, W. (2021). How does green innovation improve enterprises' competitive advantage? the role of Organizational Learning. *Sustainable Production and Consumption*, 26, 504–516. <https://doi.org/10.1016/j.spc.2020.12.031>
- Wang, S., & Zhang, H. (2025). Enhancing environmental, social, and governance performance through artificial intelligence supply chains in the energy industry: Roles of innovation, collaboration, and Proactive Sustainability Strategy. *Renewable Energy*, 245, 122855. <https://doi.org/10.1016/j.renene.2025.122855>
- Wu, Q., Yan, D., & Umair, M. (2023). Assessing the role of competitive intelligence and practices of dynamic capabilities in business accommodation of smes. *Economic Analysis and Policy*, 77, 1103–1114. <https://doi.org/10.1016/j.eap.2022.11.024>
- Xu, X., Chung, S.-H., Lo, C. K. Y., & Yeung, A. C. L. (2022). Sustainable Supply Chain Management with ngos, npos, and Charity Organizations: A systematic review and research agenda. *Transportation Research Part E: Logistics and Transportation Review*, 164, 102822. <https://doi.org/10.1016/j.tre.2022.102822>
- Yousefi, S., & Mohamadpour Tosarkani, B. (2022). An analytical approach for evaluating the impact of blockchain technology on Sustainable Supply Chain Performance. *International Journal of Production Economics*, 246, 108429. <https://doi.org/10.1016/j.ijpe.2022.108429>
- Zamani, E. D., Smyth, C., Gupta, S., & Dennehy, D. (2023). Artificial Intelligence and big data analytics for supply chain resilience: A systematic literature review. *Annals of Operations Research*, 327(2), 605–632. <https://doi.org/10.1007/s10479-022-04983-y>