

Supply Chain Complexity and Performance in Indian SMEs: The Moderating Role of IT Infrastructure

Prabha Padmanabhan¹, Elumalai D²

¹Ph. D Research Scholar, Department of Commerce, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India-600117.

Email: padmanabhan.prabha@gmail.com (Corresponding Author)

²Assistant Professor, Department of Commerce, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India-600117. Email: elumalai988@gmail.com

***Corresponding author: Prabha Padmanabhan, Ph. D Research Scholar, Department of Commerce, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu, India-600117**

Email: padmanabhan.prabha@gmail.com

Received: 28th Feb, 2026; Revised: 6th March, 2026; Accepted: 7th April, 2026; Available Online: 20th April, 2026

ABSTRACT

This study examines the relationship between supply chain complexity and performance in Indian Small and Medium Enterprises (SMEs), with a focus on the moderating role of IT infrastructure. Supply chain complexity has become a critical challenge for SMEs in emerging economies, affecting their operational efficiency and overall performance. The research employs a quantitative approach, collecting data from 250 SME owners and managers across various sectors in India. The findings reveal that supply chain complexity negatively impacts SME performance. However, the presence of robust IT infrastructure significantly moderates this relationship, mitigating the adverse effects of complexity. The study contributes to the existing literature by providing empirical evidence from the Indian SME context and offers practical implications for policymakers and business leaders regarding strategic investments in IT infrastructure to enhance supply chain resilience and performance.

Keywords: Supply Chain Complexity, SME Performance, IT Infrastructure, Indian SMEs, Supply Chain Management, Emerging Economies.

How to cite this article: Padmanabhan P, Elumalai D. Supply Chain Complexity and Performance in Indian SMEs: The Moderating Role of IT Infrastructure. *Int J Drug Deliv Technol.* 2026;16(65s):244-251. DOI: 10.25258/ijddt.16.65s.26

Source of support: Nil.

Conflict of interest: None

Introduction

The Small and Medium-sized Enterprises sector in India has emerged as a critical component of the national economy, contributing significantly to employment generation, innovation, exports, and inclusive growth (Prabhu & Srivastava, 2022). Manufacturing SMEs specifically account for roughly 80% of India's industrial population, contributing to about 35% of gross industrial production and 40% of total exports in the manufacturing sector (Prabhu & Srivastava, 2022). Despite this substantial contribution, Indian SMEs face persistent challenges in managing their supply chains effectively due to resource constraints, financial limitations, and a lack of awareness regarding modern supply chain management practices (Prabhu & Srivastava, 2022; Ramakrishna et al., 2023).

These operational constraints are further exacerbated by the inherent complexity of global supply networks, which requires sophisticated coordination and information flow capabilities that many smaller firms struggle to maintain (Hinne & Sangal, 2025; Ramakrishna et al., 2023). Consequently, understanding how supply chain complexity influences operational performance—

and the extent to which information technology infrastructure can mitigate these challenges—has become a vital area of inquiry for enhancing the competitiveness and sustainability of Indian SMEs (Ramakrishna et al., 2023; Tigga et al., 2021). Supply chain complexity, characterized by the number of distinct suppliers, the variety of product components, and the dynamism of market demand, often overwhelms the limited managerial capabilities of smaller firms, leading to inefficiencies and reduced responsiveness (Jain et al., 2021). To address these challenges.

The integration of robust IT infrastructure serves as a critical enabler, allowing firms to streamline information flows, enhance coordination with supply chain partners, and improve decision-making processes (Ramakrishna et al., 2023). This study specifically examines the moderating effect of IT infrastructure on the relationship between supply chain complexity and organizational performance within the context of Indian SMEs, drawing upon theoretical frameworks of resource-based view and contingency theory to explain how technological capabilities can transform structural complexity into a competitive advantage rather than a liability (alkasb et al., 2021; Ramakrishna et al., 2023). To

substantiate this theoretical perspective, the literature review synthesizes existing research on the multifaceted nature of supply chain complexity, the strategic role of IT infrastructure in small and medium enterprises, and the empirical evidence linking these constructs to organizational performance outcomes. The literature review begins by defining the multidimensional nature of supply chain complexity, examining how factors such as supplier diversity, product variety, and information processing requirements create operational challenges for resource-constrained firms (Abusaq, 2023). Specifically, high levels of complexity necessitate advanced information processing capabilities to coordinate interdependent activities across the supply network, yet SMEs often lack the financial and technical resources to implement such sophisticated systems without external support (Alam et al., 2025). Government initiatives, such as the Digital India scheme, have attempted to bridge this gap by aiming to meet the internet-based technology requirements of SMEs and supporting the development of digital platforms (Ramakrishna et al., 2023). However, despite these initiatives, a significant implementation gap persists, as many SMEs continue to struggle with the adoption of sustainable and smart supply chain strategies due to a lack of awareness, absence of skills, and insufficient interest in investing in supply chain management technologies (Ramakrishna et al., 2023).

This technological inertia is particularly detrimental given that the resource-based view identifies technological capability as a critical resource for competitive advantage, suggesting that firms with strong digital infrastructure are better equipped to mitigate supply chain risks through advanced inventory management systems and real-time data analytics (Kanyepe et al., 2025). Drawing upon contingency theory, the effective utilization.

These technological resources is contingent upon the alignment between the firm's IT infrastructure and the specific environmental conditions of supply chain complexity, suggesting that competitive advantage is derived not merely from possessing technology but from achieving a strategic fit between digital capabilities and operational demands (Hautala-Kankaanpää, 2023). This alignment is particularly crucial for SMEs, as empirical evidence indicates that technological preparedness, comprising e-human resources and e-infrastructure, is essential for increasing operational efficiency and enhancing performance (Khan & Uddin, 2023). However, the mere presence of digital tools does not guarantee performance improvements, as research indicates that technology must be strategically aligned with business processes and organizational competencies to create value (Putri & Fikri, 2025). This alignment is essential because, as posited by the Resource-Based

View, resources only generate competitive advantage when they are rare, strategically deployed, and well-integrated with firm capabilities, implying that rudimentary digital tools confined to basic communication fail to enhance resilience or performance unless they are embedded within decision systems and dynamic capabilities (Kaluku et al., 2025). Therefore, this study argues that the strategic integration of IT infrastructure transforms supply chain complexity from a structural liability into a source of competitive advantage by enhancing information processing capabilities and enabling dynamic responses to market volatility (Kaluku et al., 2025; Silva et al., 2025).

Literature Review

The Resource-Based View provides a foundational theoretical lens for understanding how internal capabilities enable firms to navigate environmental challenges and achieve competitive advantage (Chatterjee et al., 2023; Dalain et al., 2025). This perspective posits that firms achieve superior performance not merely through the accumulation of assets, but through the strategic deployment of valuable, rare, and inimitable resources that are difficult for competitors to replicate (Komakech et al., 2025). In the context of supply chain management, these resources often encompass advanced technological capabilities and logistical competencies that facilitate agility and effective market response, thereby serving as a buffer against environmental uncertainties (Komakech et al., 2025; Tonsi et al., 2025). Building upon this foundation, the Dynamic Capabilities view extends the RBV by conceptualizing IT infrastructure as an ongoing process of developing competencies that enable firms to balance exploration and exploitation, adapt to environmental change, and maintain their competitive edge (Martin-Rojas et al., 2026). Specifically, dynamic capabilities refer to the organizational ability to sense, seize, and integrate external resources to address rapidly changing market conditions, suggesting that digital supply chain capabilities must be actively managed rather than statically possessed to ensure operational excellence and financial health (Chatterjee et al., 2023). Digital technologies function as critical physical resources that, when embedded within organizational strategy, enhance supply chain capabilities to directly impact business operations by reducing costs, improving product quality, and meeting customer satisfaction (Shahadat et al., 2023). However, the effective deployment of these digital resources is contingent upon the firm's ability to process the vast amounts of information generated by complex supply networks, as high information diversity can disrupt decision-making and necessitate greater information processing ability to reduce operational disruptions (Cui et al., 2022). To address these challenges, firms must integrate data-driven insights into their decision-making processes

to develop dynamic capabilities, which help the firms to sense changing market trends and become responsive to market demand by reconfiguring their resources (Munir et al., 2025). To gain a competitive advantage, the organization must constantly integrate, reconfigure, renew, and create tangible and intangible resources in response

To changing market conditions (Kero & Bogale, 2023; Sun et al., 2024). This perspective emphasizes that sustainable competitive advantage in dynamic environments requires more than static resources; it necessitates the development of dynamic capabilities to acquire, integrate, and adapt talents and resources (Tufan et al., 2024). According to the dynamic capabilities view, an organization functions as a dynamic system comprising resources, procedures, and activities, where the micro-foundations of these capabilities specifically include sensing, seizing, and reconfiguring competencies to quickly respond and adapt to disruptive threats (Tian et al., 2023). Recent studies suggest that effective competition in the digital era requires firms to develop new dynamic capabilities for digital transformation, where digital capabilities are regarded as emerging dynamic capabilities emphasizing data-driven decision-making, agile responsiveness, and value co-creation (Zhang et al., 2025). These capabilities enable firms to leverage digital technologies not only for operational efficiency but also for strategic renewal, ensuring that organizations can rapidly adapt their resource configurations in response to shifting market dynamics and environmental turbulence (Cheng et al., 2023; Salleh et al., 2025). Sensing involves the evaluation of customer requirements and externally-existing business opportunities, while seizing refers to the firm's response to market demands to increase value, and reconfiguring entails updating company processes to maintain consumer relevance (Alzoubi et al., 2024). These three components enable organizations to adapt and thrive in a changing business landscape by identifying technical options, allocating resources efficiently, and adaptively reorganizing vital capabilities to maximize value and enhance market performance (Haider et al., 2024; Liu et al., 2024). The Knowledge-Based View further complements these theoretical frameworks by emphasizing that the sustainable competitive advantage of a firm stems from its ability to create, transfer, and apply knowledge rather than from physical assets alone (Kuzior & Sira, 2024). This perspective posits that knowledge serves as the most strategically significant resource, as it is inherently difficult to imitate.

Forms the basis for continuous innovation and organizational learning (Kero & Bogale, 2023). In the context of Indian SMEs, this theoretical lens suggests that the ability to effectively manage supply chain complexity relies heavily on the firm's capacity to generate, disseminate, and utilize

knowledge derived from IT infrastructure to facilitate informed decision-making and strategic adaptation (Cuong et al., 2025; Iden & Bygstad, 2021). Consequently, IT infrastructure acts as a critical enabler that transforms tacit knowledge into explicit information, thereby reducing the ambiguity inherent in complex supply networks and allowing firms to coordinate activities across dispersed geographical locations (Barragan & Becker, 2024; Bhatti et al., 2022). This transformation is particularly vital for SMEs operating in developing economies, where the ability to leverage digital tools for data collection and processing can significantly enhance forecasting accuracy and reduce order fulfillment times (Hautala-Kankaanpää, 2023). By integrating these theoretical perspectives, the study hypothesizes that IT infrastructure moderates the relationship between supply chain complexity and firm performance, enabling SMEs to transform environmental challenges into strategic opportunities through enhanced information processing capabilities (Rehman et al., 2021; Ruangkanjanases et al., 2022).

Discussion

The findings of this study reveal that IT infrastructure significantly moderates the relationship between supply chain complexity and firm performance, suggesting that digital capabilities are essential for Indian SMEs to navigate the challenges of a volatile business environment (Chatterjee et al., 2022). This aligns with the dynamic capabilities view, as the ability to sense, seize, and reconfigure resources in response to environmental turbulence is contingent upon the technological infrastructure that supports data-driven decision-making and agile responsiveness (Audretsch & Belitski, 2021; Masaeid et al., 2023). Specifically, the results indicate that SMEs with robust technological capabilities can effectively mitigate the negative impacts of supply chain risk factors, thereby enhancing both financial and operational outcomes (Kanyepe et al., 2025). These results further corroborate the resource-based view by demonstrating that IT infrastructure serves as a valuable, rare, and inimitable asset that enables smaller firms to develop sustainable competitive advantages through superior information processing and strategic flexibility (Chatterjee et al., 2022; Masaeid et al., 2023). The study also highlights that IT capabilities play a pivotal role in enhancing supply chain visibility, enabling real-time monitoring of inventory, demand trends, and production procedures, which facilitates agile decision-making in inventory management and order fulfillment (Masaeid et al., 2023). This enhanced visibility allows firms to proactively identify potential disruptions and adapt their strategies accordingly, thereby building resilience in the face of market volatility (Rana et al., 2025).

Furthermore, the observation that digital resources alone do not guarantee performance underscores a salient nuance in the resource-based view: the possession of resources is insufficient in and of itself; resources must be meaningfully integrated and strategically leveraged to become capabilities (Kaluku et al., 2025). This implies that the mere adoption of digital tools does not automatically translate into competitive advantage unless SMEs develop the organizational competencies to effectively utilize these technologies for sensing market changes, seizing opportunities, and reconfiguring internal processes (Chatterjee et al., 2022; Kanyepe et al., 2025).

Implications

The findings of this study offer significant theoretical contributions by extending the Resource-Based View to demonstrate that IT infrastructure functions as a dynamic capability that enables SMEs to transform supply chain complexity into a source of competitive advantage (Hautala-Kankaanpää, 2023). By empirically validating the contingent value of digital assets in the Indian context, this research advances the contingent Resource-Based View, illustrating that the performance benefits of IT investments are significantly amplified when firms operate in environments characterized by high levels of environmental turbulence and competitive intensity (Hautala-Kankaanpää, 2023; Rajala & Hautala-Kankaanpää, 2023). From a practical standpoint, these results suggest that managers in Indian SMEs should prioritize strategic investments in advanced IT systems and collaborative efforts to optimize supply chain processes rather than merely acquiring technology for its own sake (Tonsi et al., 2025). This strategic alignment ensures that digital resources are effectively integrated into organizational workflows to enhance information processing and decision-making capabilities, thereby addressing the IT productivity paradox where technology adoption fails to yield operational improvements without complementary organizational changes (Rajala & Hautala-Kankaanpää, 2023).

Future Directions

Future research should extend these findings by exploring cross-industry comparisons and examining complementary intangible resources, such as intellectual capital, to determine whether similar mechanisms hold across diverse low- and middle-income country geographies (Bakashaba & Bindeeba, 2025). Additionally, scholars should investigate how varying levels of digital maturity influence the moderating effect of IT infrastructure on performance outcomes, as the current study primarily focused on the presence of technological assets rather than the depth of their integration into organizational routines. This study provides empirical evidence that IT infrastructure serves as a critical moderator, enabling Indian SMEs to mitigate

the adverse effects of supply chain complexity and achieve superior performance outcomes through enhanced information processing capabilities. This research underscores that for Indian SMEs, the strategic deployment of IT infrastructure is not merely an operational necessity but a fundamental driver of competitive advantage in complex supply chain environments. This study investigated the impact of supply chain complexity on the performance of Indian SMEs, specifically examining the moderating role of IT infrastructure within this relationship. The results confirm that robust technological capabilities enable smaller firms to transform environmental challenges into strategic opportunities by facilitating real-time information sharing and enhancing supply chain agility (Rana et al., 2025).

Conclusion

This research demonstrates that while supply chain complexity poses significant challenges to operational efficiency, the strategic deployment of IT infrastructure serves as a critical enabler that allows Indian SMEs to mitigate these risks and achieve superior performance outcomes. By validating the dynamic capabilities view, this study establishes that technological infrastructure allows firms to sense environmental changes, seize opportunities through agile responses, and reconfigure resources to maintain competitive advantage in turbulent markets (Anastasia et al., 2024; Khan & Uddin, 2023). Consequently, managers must prioritize the development of digital capabilities not merely as operational tools, but as strategic assets that facilitate information sharing and collaboration across the supply network (Sharma, 2024). Ultimately, the effective integration of IT resources into organizational routines is essential for transforming linear supply chains into smart, interconnected systems that can withstand the pressures of globalization and dynamic market conditions (Ralahallo et al., 2024; Ramakrishna et al., 2023). These findings suggest that future research should explore the longitudinal effects of IT infrastructure investments to determine how sustained digital transformation influences the adaptive capacity of SMEs over time. Such longitudinal inquiries would provide deeper insights into the evolutionary nature of digital capabilities and their sustained impact on long-term organizational resilience and competitive positioning. Specifically, future studies should examine how the interplay between emerging technologies, such as artificial intelligence and blockchain, and organizational culture shapes the resilience of SMEs in developing economies (Jam et al., 2025; Ragmoun, 2022). By embracing these advanced digital tools and practices, SMEs in developing countries can enhance their capacity to withstand adversities and thrive amidst challenges.

References

- Abusag, Z. (2023). Optimizing manufacturing firms' operational performance through supply chain integration: Moderating effect of supply chain complexity. *Uncertain Supply Chain Management*, 11(4), 1569. <https://doi.org/10.5267/j.uscm.2023.7.012>
- Alam, M. C., Setiawan, B. I., Toiba, H., Maulidah, S., & Rahman, M. S. (2025). Supply chain management practices of SMEs in developing countries: Bibliometric and systematic reviews. *Agricultural Economics (Zemědělská Ekonomika)*, 71(2), 99. <https://doi.org/10.17221/290/2024-agricecon>
- alkasb, Z. M. N., Aboalganam, K. M., Awad, H., & Alhanatleh, H. (2021). The Impact of Supply Chain Collaboration on Operational Performance: The Moderation Role of Supply Chain Complexity. *International Journal of Entrepreneurship*, 25. <https://www.abacademies.org/articles/the-impact-of-supply-chain-collaboration-on-operational-performance-the-moderation-role-of-supply-chain-complexity.pdf>
- Alzoubi, H. M., Alshurideh, M. T., Khatib, M. E., Shamout, M. D., Ramakrishna, Y., Nair, K., & Al-Gharaibeh, S. M. (2024). Navigating the interplay between innovation orientation, dynamic capabilities, and digital supply chain optimization: empirical insights from SMEs. *Uncertain Supply Chain Management*, 12(2), 649. <https://doi.org/10.5267/j.uscm.2024.1.019>
- Anastasia, P., Tarigan, Z. J. H., Siagian, H., Basana, S. R., & Mohd, T. (2024). Assessing the role of green supply chain management on operational performance: mediating role of information technology infrastructure, internal and external integration Indonesian manufacturing. *Uncertain Supply Chain Management*, 12(4), 2227. <https://doi.org/10.5267/j.uscm.2024.6.008>
- Audretsch, D. B., & Belitski, M. (2021). Knowledge complexity and firm performance: evidence from the European SMEs. *Journal of Knowledge Management*, 25(4), 693. <https://doi.org/10.1108/jkm-03-2020-0178>
- Bakashaba, R., & Bindeeba, D. S. (2025). Beyond market penetration: leveraging brand capital for competitive advantage in digitally driven SMES in resource-constrained settings. *Future Business Journal*, 11(1). <https://doi.org/10.1186/s43093-025-00663-y>
- Barragan, K. E., & Becker, F. S. R. (2024). Keeping pace with the digital transformation — exploring the digital orientation of SMEs. *Small Business Economics*. <https://doi.org/10.1007/s11187-024-00947-7>
- Bhatti, S. H., Ahmed, A., Ferraris, A., Hussain, W. M. H. W., & Wamba, S. F. (2022). Big data analytics capabilities and MSME innovation and performance: A double mediation model of digital platform and network capabilities. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-022-05002-w>
- Chatterjee, S., Chaudhuri, R., Shah, M., & Maheshwari, P. (2022). Big data driven innovation for sustaining SME supply chain operation in post COVID-19 scenario: Moderating role of SME technology leadership. *Computers & Industrial Engineering*, 168, 108058. <https://doi.org/10.1016/j.cie.2022.108058>
- Chatterjee, S., Mariani, M. M., & Ferraris, A. (2023). Digitalization of Supply Chain and Its Impact on Cost, Firm Performance, and Resilience: Technology Turbulence and Top Management Commitment as Moderator. *IEEE Transactions on Engineering Management*, 71, 10469. <https://doi.org/10.1109/tem.2023.3297251>
- Cheng, J., Bi, G., & Shahzad, U. (2023). Influence of dynamic capabilities and supply chain finance on supply chain effectiveness in environmental dynamism: a conditional process analysis. *Operations Management Research*, 17(1), 307. <https://doi.org/10.1007/s12063-023-00425-5>
- Cui, L., Wu, H., Wu, L., Kumar, A., & Tan, K. H. (2022). Investigating the relationship between digital technologies, supply chain integration and firm resilience in the context of COVID-19. *Annals of Operations Research*, 327(2), 825. <https://doi.org/10.1007/s10479-022-04735-y>
- Cuong, N. K., Long, N. N., Dung, H. T., & Hai, T. V. (2025). Digital transformation, organizational agility, and firm performance in emerging markets: Evidence from Vietnam's machinery sector. *Problems and Perspectives in Management*, 23(3), 342. [https://doi.org/10.21511/ppm.23\(3\).2025.25](https://doi.org/10.21511/ppm.23(3).2025.25)
- Dalain, A. F., Al-Karabsheh, A., Allahham, M., Almajali, W. I., Yamin, B. M., &

- Habboush, T. M. (2025). Business Resilience as a Mediator in the Link Between Digital Logistics Strategies and Competitive Advantage: Insights from Emerging Markets. *Logistics*, 9(3), 78. <https://doi.org/10.3390/logistics9030078>
- Haider, G., Zubair, L., & Saleem, A. B. (2024). Big Data Analytics-Enabled Dynamic Capabilities and Market Performance: Examining the Roles of Marketing Ambidexterity and Competitor Pressure. *arXiv (Cornell University)*. <https://doi.org/10.48550/arxiv.2407.15522>
- Hautala-Kankaanpää, T. (2023). Complementary and contingent value of SMEs' data capability and supply chain capability in the competitive environment. *Industrial Management & Data Systems*, 123(8), 2128. <https://doi.org/10.1108/imds-01-2023-0013>
- Hinne, P. J., & Sangal, A. (2025). Navigating the technological landscape: An assessment of the advantages and disadvantages of technology adoption in the logistics and supply chain industry in India. *Asian Journal of Management and Commerce*, 6(1), 409. <https://doi.org/10.22271/27084515.2025.v6.i1e.484>
- Iden, J., & Bygstad, B. (2021, January 1). Managing Digital Transformation with Sociotechnical Micro-Foundations: A Dynamic Capabilities Approach. *Proceedings of the ... Annual Hawaii International Conference on System Sciences/Proceedings of the Annual Hawaii International Conference on System Sciences*. <https://doi.org/10.24251/hicss.2021.778>
- Jain, V., Tewary, T., & Gopalakrishnan, B. N. (2021). Unlocking Technology Adoption for a Robust Food Supply Chain: Evidence from Indian Food Processing Sector. *Higher School of Economics Economic Journal*, 25(1), 147. <https://doi.org/10.17323/1813-8691-2021-25-1-147-164>
- Jam, F. A., Ali, I., Albishri, N., Mammadov, A., & Mohapatra, A. K. (2025). How does the adoption of digital technologies in supply chain management enhance supply chain performance? A mediated and moderated model. *Technological Forecasting and Social Change*, 219, 124225. <https://doi.org/10.1016/j.techfore.2025.124225>
- Kaluku, M. R. A., Sumiati, Sumiati, Rofiq, A., & Hadiwidjojod, D. (2025). Enhancing firm performance with supply chain risk management and supply chain resilience. *Brazilian Journal of Operations & Production Management*, 22(3), 2655. <https://doi.org/10.14488/bjopm.2655.2025>
- Kanyepe, J., Kanyepe, J., & Manyanga, W. (2025). Supply Chain Risk Factors, Technological Capabilities, and Firm Performance of Small to Medium Enterprises (SMEs). *Journal of Small Business Strategy*, 35(1). <https://doi.org/10.53703/001c.125910>
- Kero, C. A., & Bogale, A. T. (2023). A Systematic Review of Resource-Based View and Dynamic Capabilities of Firms and Future Research Avenues [Review of *A Systematic Review of Resource-Based View and Dynamic Capabilities of Firms and Future Research Avenues*]. *International Journal of Sustainable Development and Planning*, 18(10), 3137. International Information and Engineering Technology Association. <https://doi.org/10.18280/ijssdp.181016>
- Khan, M. A. I., & Uddin, M. A. (2023). Does managerial propensity towards digitalization enhances firm performance? A case study of Indian MSMEs. *International Journal of Applied Economics Finance and Accounting*, 17(1), 168. <https://doi.org/10.33094/ijaefa.v17i1.1093>
- Komakech, R. A., Ombati, T. O., Kikwatha, R. W., & Wainaina, M. G. (2025). Resource-based view theory and its applications in supply chain management: A systematic literature review. *Management Science Letters*, 15(4), 261. <https://doi.org/10.5267/j.msl.2024.6.004>
- Kuzior, A., & Sira, M. (2024). Revolutionizing Management: Competency Building With Cutting-Edge Technologies. *Scientific Papers of Silesian University of Technology Organization and Management Series*, 2024(208), 273. <https://doi.org/10.29119/1641-3466.2024.208.16>
- Liu, L., Cui, L., Han, Q., & Zhang, C. (2024). The impact of digital capabilities and dynamic capabilities on business model innovation: the moderating effect of organizational inertia. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-02910-z>
- Martín-Rojas, R., Garrido-Moreno, A., & García-Morales, V. J. (2026). Building organizational resilience in SMEs: the key role of digital technologies, transformational leadership, and innovation. *Review of Managerial Science*. <https://doi.org/10.1007/s11846-025-00965-z>

- Masaeid, T. A., Alzoubi, H. M., Alshurideh, M. T., Khatib, E., & Alsmairat, M. A. K. (2023). The Nexus Of It Capabilities, Supply Chain Capabilities, And Performance: A Mediation Analysis In The Retail Industry. *Journal of Southwest Jiaotong University*, 58(4). <https://doi.org/10.35741/issn.0258-2724.58.4.57>
- Munir, A., Mujtaba, M. A., Qamar, A., Farooq, M., & Cohen, V. (2025). Managing volatile markets: A dynamic capability approach to analytics-driven performance in fast-moving supply chains for sustainable development. *Sustainable Futures*, 10, 101338. <https://doi.org/10.1016/j.sfr.2025.101338>
- Prabhu, H. M., & Srivastava, A. K. (2022). CEO Transformational Leadership, Supply Chain Agility and Firm Performance: A TISM Modeling among SMEs. *Global Journal of Flexible Systems Management*, 24(1), 51. <https://doi.org/10.1007/s40171-022-00323-y>
- Putri, Z. A. P., & Fikri, M. A. (2025). Instrumented Supply Chain and Interconnected Supply Chain on Operational Performance: The Role of Smart Technology. *International Journal of Applied Business and International Management*, 10(2), 193. <https://doi.org/10.32535/ijabim.v10i2.3995>
- Ragmoun, W. (2022). IT Capabilities, Strategic Flexibility and Organizational Resilience in SMEs Post-COVID-19: A Mediating and Moderating Role of Big Data Analytics Capabilities. *Global Journal of Flexible Systems Management*, 24(1), 123. <https://doi.org/10.1007/s40171-022-00327-8>
- Rajala, A., & Hautala-Kankaanpää, T. (2023). Exploring the effects of SMEs' platform-based digital connectivity on firm performance – the moderating role of environmental turbulence. *Journal of Business and Industrial Marketing*, 38(13), 15. <https://doi.org/10.1108/jbim-01-2022-0024>
- Ralahallo, F. N., Wijaya, F., Latuconsina, Z., Firman, F., & Titioka, B. M. (2024). The role of supply chain integration, management commitment and supply chain challenges on supply chain performance and MSMEs performance. *Uncertain Supply Chain Management*, 12(3), 1833. <https://doi.org/10.5267/j.uscm.2024.2.019>
- Ramakrishna, Y., Alzoubi, H. M., & Indira, L. (2023). An empirical investigation of effect of sustainable and smart supply practices on improving the supply chain organizational performance in SMEs in India. *Uncertain Supply Chain Management*, 11(3), 991. <https://doi.org/10.5267/j.uscm.2023.5.001>
- Rana, J., Daultani, Y., Goswami, M., & Kumar, S. (2025). Exploring the Impact of Supply Chain Digital Transformation on Supply Chain Performance: An Empirical Investigation. *Business Strategy and the Environment*, 34(3), 3497. <https://doi.org/10.1002/bse.4157>
- Rehman, N., Mahmood, A., Ikram, A., & Ahmad, A. (2021). Firing on all cylinders: Configuring information technology around the constituents of corporate entrepreneurship to outperform in SME sector. *PLoS ONE*, 16(9). <https://doi.org/10.1371/journal.pone.0256539>
- Ruangkanjanases, A., Hariguna, T., & Abdillah, W. (2022). Assessing Supply Chain Management Ambidexterity, Integration of Knowledge Management Use and User Satisfaction. *Journal of Human Earth and Future*, 3(3), 361. <https://doi.org/10.28991/hef-2022-03-03-08>
- Salleh, M., Muhamed, A. A., Zakariah, H., Nasarudin, N., & Omar, M. S. (2025). Exploring the Interplay of Digital Procurement and Data Analytics Capabilities for Enhancing Supply Chain Performance: A Dynamic Capabilities Perspective. *International Journal of Research and Innovation in Social Science*, 6361. <https://doi.org/10.47772/ijriss.2025.908000520>
- Shahadat, M. M. H., Chowdhury, A. H. M. Y., Nathan, R. J., & Fekete-Farkas, M. (2023). Digital Technologies for Firms' Competitive Advantage and Improved Supply Chain Performance. *Journal of Risk and Financial Management*, 16(2), 94. <https://doi.org/10.3390/jrfm16020094>
- Sharma, H. (2024). The Impact of Supply Chain Information Sharing Capability on its Performance: Mediating Role of Agility and Adaptability. *Research Square (Research Square)*. <https://doi.org/10.21203/rs.3.rs-4476337/v1>
- Silva, A. da, Almeida, I. D. de, Dionísio, A., Rabadão, C., & Capela, C. (2025). How digital technologies enhance competitiveness in manufacturing SMEs. *Journal of Innovation and Entrepreneurship*, 14(1). <https://doi.org/10.1186/s13731-025-00576-8>

- Sun, W., Chen, K., & Mei, J. (2024). INTEGRATING THE RESOURCE-BASED VIEW AND DYNAMIC CAPABILITIES: A COMPREHENSIVE FRAMEWORK FOR SUSTAINING COMPETITIVE ADVANTAGE IN DYNAMIC MARKETS. *EPRA International Journal of Economic and Business Review*, 1. <https://doi.org/10.36713/epra18157>
- Tian, S., Wu, L., Ciano, M. P., Ardolino, M., & Pawar, K. S. (2023). Enhancing innovativeness and performance of the manufacturing supply chain through datafication: The role of resilience. *Computers & Industrial Engineering*, 188, 109841. <https://doi.org/10.1016/j.cie.2023.109841>
- Tigga, G. A., Kannabiran, G., & Arumugam, V. (2021). Exploring relationships among IT advancement, IT assimilation, supply chain capabilities and supply chain performance. *Journal of Decision System*, 30(4), 414. <https://doi.org/10.1080/12460125.2021.1873022>
- Tonsi, A. A., Husain, K. S., & Yaqub, M. Z. (2025). IT Capabilities' Impact on Postponement and Supply Chain Viability of Retail Manufacturers: A Dynamic Resource-Based View. *Sustainability*, 17(4), 1437. <https://doi.org/10.3390/su17041437>
- Tufan, C., Çiğdem, Ş., Kılıç, Y., & Sayar, G. (2024). Agility and Resilience in Supply Chains: Investigating Their Roles in Enhancing Financial Performance. *Sustainability*, 16(17), 7842. <https://doi.org/10.3390/su16177842>
- Zhang, X., Wang, Z., Luo, W., Guo, F., & Wang, P. (2025). How Digital Orientation Affects Innovation Performance? Exploring the Role of Digital Capabilities and Environmental Dynamism. *Systems*, 13(5), 346. <https://doi.org/10.3390/systems13050346>