

Analytical Review of the Impact of Digital Transformation on Small and Medium Industrial Enterprises in the UAE

Noura Khamis Bin Sowaif*, Dr. Hashem Osama
Faculty of Economics and Muamalat, Universiti Sains Islam Malaysia
Email: *nawaribinsuwaif@gmail.com

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v15-i6/25724> DOI:10.6007/IJARBSS/v15-i6/25724

Published Date: 19 June 2025

Abstract

This paper aims to elucidate the impact of digital transformation on enhancing supply chain management and improving the performance of small and medium industrial enterprises (SMEs) in the United Arab Emirates (UAE). The study is based on a comprehensive analysis of quantitative research employing structural equation modeling. The research focuses on testing hypotheses related to the influence of digital transformation on organizational performance and supply chain efficiency, as well as the mediating role of supply chain management in the relationship between digital transformation and overall performance. The review demonstrates that adopting digital technologies, such as artificial intelligence, the Internet of Things, and big data analytics, contributes to enhancing operational efficiency, increasing flexibility, and fostering innovation within the UAE's industrial sector. As a result, digital transformation directly enhances service quality, boosts profitability, and drives business growth within the industrial sector of the UAE. The review also highlights gaps in the existing literature, such as the limited studies linking digital transformation to supply chain management and SME performance. Therefore, this paper offers a comprehensive analysis of the study's findings and theoretical frameworks, highlighting their significance in advancing business practices during the Fourth Industrial Revolution.

Keywords: Analytical Review, Impact of Digital Transformation, Small and Medium Industrial Enterprises

Introduction

Recent years have witnessed a rapid acceleration in the adoption of digital transformation across various sectors. However, the industrial sector, particularly small and medium enterprises (SMEs), has faced diverse challenges in adapting to these changes. Digital transformation is not merely about upgrading tools and processes but represents a fundamental shift in business models and competitive strategies. Amid these changes, supply chain management has emerged as a critical factor in enabling companies to sustain and expand their operations. Digital coordination among suppliers, manufacturers, and

distributors has become a strategic necessity rather than an option. The UAE, as a dynamic economic environment, has significantly invested in developing its digital and logistical infrastructure, making it a fertile ground for studying the interplay between digital transformation, supply chains, and industrial performance. This study focuses on analyzing the intricate relationship between digital transformation, supply chain management, and industrial performance, testing hypotheses that directly relate to these variables within the UAE's business landscape. The paper aims to scientifically review and analyze the study's content by revisiting foundational theoretical concepts, discussing the methodology, and evaluating the findings and hypotheses, with an emphasis on identifying knowledge gaps in contemporary literature. It also seeks to underscore the importance of digital transformation as an enabler of efficiency and innovation in industrial supply chains while highlighting challenges that may hinder full transformation in this sector.

Theoretical Background

Digital Transformation

The emergence of technologies like artificial intelligence, cloud computing, the Internet of Things, and big data is a key factor reshaping the contemporary business environment (Parviainen et al., 2017). At its core, digital transformation involves leveraging technology to redefine how businesses operate and deliver value to customers. This study emphasizes that digital transformation extends beyond adopting digital tools to encompass profound changes in operational models, organizational culture, and process structures. Verina and Titko (2019) note that digital transformation impacts multiple facets of organizations, from internal operations to customer behavior. According to studies from Fari (2021) and Al-Anzi (2023), successful digital transformation can improve supply chain systems, increase efficiency, and lower operational costs. Within the UAE's industrial SMEs, the study highlights digital transformation as a strategic necessity amid intense competition and volatile conditions, enabling organizations to make swift decisions and boost productivity (Mari, 2021).

Supply Chain Management

Supply chain management refers to the strategic coordination of activities encompassing procurement, production, storage, distribution, and customer service (Tafni, 2018; Al-Zazou, 2015). This concept is pivotal in ensuring the seamless flow of goods and services, minimizing waste, and achieving customer satisfaction. The study indicates that UAE companies face challenges in maintaining supply chain efficiency due to global disruptions, necessitating modernization through digital transformation tools (Shi et al., 2023). Integrating smart technologies into supply chains enables full transparency and real-time tracking of resources and processes, reducing logistical risks. The study further notes that modern supply chain management demands high flexibility to address fluctuating demand and effective coordination among suppliers, manufacturers, and distributors, directly influencing overall company performance.

Industrial Enterprise Performance

Organizational performance is a critical indicator of a company's efficiency in achieving its strategic objectives, encompassing financial performance, business growth, customer satisfaction, and innovation (Bhola & Basu, 2015). This study focuses on the performance of small and medium industrial enterprises in the UAE, which form a cornerstone of the national economy (Wheelen & Hunger, 2010). According to the literature, operational efficiency,

market adaptability, and innovation are all factors that affect performance (Qistina & Khashini, 2017). Digital transformation and supply chain management directly contribute to improving profitability, accelerating production cycles, and enhancing customer satisfaction. Recent studies, such as Al-Rahmani (2019) and Nourhan (2022), confirm that institutional digitization not only boosts efficiency but also establishes a robust foundation for sustainability and growth in competitive environments.

Literature Review

Numerous studies have explored the impact of digital transformation on organizational performance and supply chain management across various sectors, providing a robust theoretical foundation for understanding these relationships. Fari (2021) demonstrated that digital transformation enhances customer satisfaction and accelerates innovation within organizations. Al-Anzi (2023) highlighted that digital transformation develops human capabilities and digital skills, positively impacting job performance. In the UAE context, Jaballah (2023) examined the impact of digital transformation in postal and shipping companies, confirming a statistically significant positive relationship between digital transformation and sustainable performance. Other studies, such as Tayseer (2022), explored the role of digital transformation in improving organizational performance dimensions, including innovation, productivity, and profitability. Regarding supply chain management, Al-Amri (2011) showed that digital technology significantly enhances supply chain integration. Meanwhile, Al-Lababidi (2022) emphasized the role of digital transformation in fostering business resilience during crises. Al-Jazzar (2021) noted that the lack of methodology and high costs are key barriers to digital transformation in supply chains, recommending the adoption of smart systems for sustainability and efficiency. These findings underscore that digital transformation yields tangible results only when effectively integrated into the supply chain business model.

Concerning company performance, Abdul Mohsen (2020) highlighted the importance of adopting modern business models to drive growth in competitive markets. Magdi et al. (2021) explored the relationship between digital transformation and performance indicators in the tourism sector, with implications applicable to other sectors like industry. The literature review reveals a growing interest in the impact of digital transformation on industrial company performance and supply chain management. However, several research gaps persist, including a lack of studies examining the mediating role of supply chain management in the relationship between digital transformation and SME performance, particularly in the UAE context. Additionally, the limited use of advanced analytical tools like structural equation modeling (SEM) hinders a deeper understanding of causal relationships.

Table 1

Summary of Previous Studies and Gaps

Source	Variables	Findings
Khan et al., 2021	Digital supply chain management, organizational performance	Supply chain flexibility and proactivity have the highest impact on performance.
Centobelli & Cerchione, 2020	Agile supply chain management, digital transformation	Technology is a necessary but insufficient enabler for agile supply chain management.
AlMulhim, 2021	Agile supply chain management, firm performance, digital technology	Digital transformation has no significant direct impact on firm performance, but smart technologies enhance the link.
Nayal et al., 2022	Sustainable development strategy, sustainable supply chain performance	Collaboration and coordination in supply chains positively impact sustainable development and digital transformation.
Rehman et al., 2022	Digital transformation, smart technologies, eco-innovation, sustainable supply chain performance	Strong positive relationships between eco-innovation, sustainability strategy, digital transformation, and smart technologies.
Ning & Yao, 2023	Digital transformation, supply chain capabilities, competitive supply chain performance	Statistically significant relationships between digital transformation, supply chain capabilities, and competitive performance.
Yang & Lin, 2023	Digital transformation, digital logistics platform, organizational performance	Digital transformation directly impacts logistics firms' performance via digital platforms.
Lee et al., 2022	Digital supply chain management, organizational performance	Digital supply chain adoption enables Malaysian manufacturing firms to compete and improve performance.
Chouaibi et al., 2022	Digital transformation, organizational performance	Digital transformation enhances organizational performance while providing insights into associated risks.
Osman, 2023	Supply chain integration, organizational culture, firm performance	Supply chain integration is statistically correlated with flexible organizational culture and firm performance.
Al-Jazzar, 2021	Digital transformation, digital supply chain	Digital transformation provides solutions for supply chains and stimulates economic growth.
Saeed, 2022	Digital transformation, sustainability performance	Digital transformation requirements are linked to the economic dimension of supply chain sustainability.
Al-Balushi, 2020	Digital transformation, e-governance	Digital transformation enhances the performance of Omani public institutions via digital platforms.
Tayseer, 2022	Digital transformation, organizational performance, sustainable development	Digital transformation enables advanced economies to achieve sustainable business development.
Masarwa, 2019	Supply chain integration, information technology	Information technology significantly impacts supply chain integration in Jordanian industrial firms.

Al-Bataina et al., 2021	Business intelligence, supply chain performance	Business intelligence significantly impacts supply chain performance across its dimensions.
Al-Mutairi, 2016	Supply chain flexibility, organizational performance	Supply chain flexibility is statistically linked to performance indicators in Kuwaiti industrial firms.
Al-Jabouri, 2020	Information technology, sustainability, supply chain integration	Information technology and supply chain integration significantly impact sustainability in Iraqi oil companies.
Abdul Rabb, 2019	Supply chain management practices, firm performance	Supply chain practices significantly improve operational performance in Yemeni industrial firms.
Al-Rifai, 2022	Supply chain management, operational performance	Significant correlation between supply chain success factors and operational performance in an oil refinery.

Discussion of Findings

The study's findings indicate that digital transformation is a critical factor in enhancing industrial performance, particularly when effectively integrated with supply chain management. The results show a direct and positive relationship between adopting digital solutions and improved performance in terms of operational efficiency and customer satisfaction. Through digital transformation, companies can enhance product tracking, demand forecasting, and real-time decision-making. Additionally, supply chain management plays a mediating role between digital transformation and performance, enabling firms to translate digital gains into tangible market outcomes. This supports the study's hypothesis that supply chains play a strategic role as value-creating elements, not just operational channels. These findings align with prior literature emphasizing the importance of integrating technology with operational management while adding a new dimension by focusing on UAE's industrial SMEs. Therefore, integrating digital transformation strategically within a framework focused on optimizing supply chains is crucial for enhancing flexibility and fostering innovation in the industrial setting.

The literature review underscores a significant surge in interest regarding the impact of digital transformation on organizational performance and supply chain management. However, several research gaps remain:

1. Many studies concentrate on general aspects of digital transformation without delving into the mediating role of supply chain management, resulting in a gap in understanding how digital transformation translates into measurable performance outcomes.
2. The limited focus on industrial SMEs, specifically in the UAE context, significantly hinders the generalizability of findings, despite the pivotal role SMEs play as the backbone of the national economy.
3. Few studies employ advanced statistical models like structural equation modeling (SEM) to measure causal relationships, which this study addresses by testing an integrated conceptual model in an advanced industrial environment.
4. Most studies overlook the direct exploration of the interactive effect between digital transformation and supply chain effectiveness, a gap addressed by this research through hypotheses that integrate mediating variables into advanced causal relationships, enriching the theoretical framework.

Conclusion and Recommendations

This study concludes that digital transformation has a direct positive impact on the performance of small and medium industrial enterprises in the UAE, with supply chain management serving as an effective mediator in amplifying this impact. Digital transformation enhances efficiency, reduces costs, and improves relationships with customers and suppliers, leading to more stable and sustainable performance. The study recommends adopting integrated digital strategies encompassing both operational systems and supply chains, alongside investing in building employees' digital capabilities. Industrial firms should develop flexible business models that leverage technological capabilities and adapt to economic and market changes. Finally, the study encourages future researchers to expand the analysis to include other industrial sectors and countries, using comparative methodologies to understand the influence of cultural and regulatory contexts on the relationship between digital transformation and organizational performance.

References

- Abdul Rabb, J. A-K. O. (2019). *The role of supply chain management practices in improving the performance of Yemeni pharmaceutical manufacturing companies*. Yemeni University Journal.
- Al-Amri, H. A. K. (2011). *The impact of information technology effectiveness factors on improving electronic supply chain performance (field study on industrial companies listed on the Amman Stock Exchange)*. Master's thesis, Middle East University, Amman.
- Al-Anzi, S. M. M. (2023). Evaluating the transparency index to support the market performance of Kuwaiti companies' stocks in light of digital transformation. *Journal of Contemporary Business Studies*, 9(16), 204-238.
- Al-Balushi, N., Al-Harrasi, N., & Al-Awfi, A. (2020). The reality of digital transformation in Omani institutions. *Journal of Information Studies & Technology (JIS&T)*, 1(2), 14-16.
- Al-Bataina, S. R. S., Al-Bataina, A. R. S. L., & Zaidan, N. I. (2021). The impact of business intelligence on supply chain performance in Al-Yawm Dairy Company. *International Journal of Economics and Business*, 31-45.
- Al-Jabouri, H. N. A. S. (2020). The mediating role of information technology in the impact of supply chain integration on the sustainability of the Iraqi Oil Products Distribution Company. *Journal of the College of Education for Girls for Human Sciences*, 26, 123-175.
- Al-Jazzar, S. H. (2021). Toward digital supply chain transformation: An applied study. *Alexandria University Journal of Administrative Sciences*, 58(5), 139–170.
- Al-Lababidi, W. (2022). *Digital transformation enhances supply chain resilience*. Al-Bayan. <https://www.albayan.ae/economy/uae/2022-10-30-1.4547475>
- AlMulhim, A. F. (2021). Smart supply chain and firm performance: the role of digital technologies. *Business Process Management Journal*, 27(5), 1353-1372.
- Al-Mutairi, A. A. O.. (2016). *The impact of supply chain flexibility on the performance of Kuwaiti industrial companies*. Master's thesis, Al-Abyat University, Kuwait.
- Al-Rahmani, A. (2019). Human resource management and the challenges of digital transformation in business organizations. *Journal of Administrative and Economic Research*, 3(5), 207-219.
- Al-Rifai, A. A. A. (2022). Success factors of supply chain management and their role in improving operational performance: A case study in the Najaf oil refinery. *Journal of Management and Economics*, 3(12).
- Al-Zazou, O. K. (2015). *Barriers to applying sustainable development in supply chain*

- management*. Master's thesis, Engineering and Construction Management, University of Damascus, Syria.
- Bhola, P., & Basu, R. (2015). Exploring quality management practices and its pattern analysis in Indian service SMEs. *Journal of Enterprising Culture*, 23(02), 199-235.
- Centobelli, P., Cerchione, R., & Ertz, M. (2020). Agile supply chain management: where did it come from and where will it go in the era of digital transformation? *Industrial Marketing Management*, 90, 324-345.
- Chouaibi, S., Festa, G., Quaglia, R., & Rossi, M. (2022). The risky impact of digital transformation on organizational performance—evidence from Tunisia. *Technological Forecasting and Social Change*, 178, 121571.
- Fari, L. S. (2021). An analytical study of the determinants of successful digital transformation in companies. *Algerian Journal of Economics and Finance*, 8(1), 33-45.
- Jaballah, A. M. H. (2023). The impact of digital transformation on sustainable performance (field study). *International Journal of Administrative, Economic, and Financial Sciences*, 2(7), 57-90.
- Khan, S. A., Kusi-Sarpong, S., Gupta, H., Arhin, F. K., Lawal, J. N., & Hassan, S. M. (2021). Critical factors of digital supply chains for organizational performance improvement. *IEEE Transactions on Engineering Management*.
- Lee, K., Azmi, N., Hanaysha, J., Alzoubi, H., & Alshurideh, M. (2022). The effect of digital supply chain on organizational performance: An empirical study in Malaysia manufacturing industry. *Uncertain Supply Chain Management*, 10(2), 495-510.
- Magdi, S., Maher, A., & Ramadan Al-Azb, M. (2021). *The role of digital transformation in facilitating the performance of Egyptian tourism companies*, 5, 76-92.
- Mari, K. (2021). The Role of an Entrepreneurial Mindset in Digital Transformation - Case Study of the Estonian Business School. *Digital Entrepreneurship, Future of Business and Finance*, 159.
- Masarwa, Faris Hussam Ali. (2019). *The impact of information technology on supply chain integration in the Al-Manaseer Group, Jordan*. Master's thesis, Middle East University.
- Nayal, K., Raut, R. D., Yadav, V. S., Priyadarshinee, P., & Narkhede, B. E. (2022). The impact of sustainable development strategy on sustainable supply chain firm performance in the digital transformation era. *Business Strategy and the Environment*, 31(3), 845-859.
- Ning, L., & Yao, D. (2023). The Impact of Digital Transformation on Supply Chain Capabilities and Supply Chain Competitive Performance. *Sustainability*, 15(13), 10107.
- Nourhan, S. M. A. (2022). The impact of digital transformation on improving the strategic performance of industrial companies listed on the Egyptian Stock Exchange. *Scientific Journal of Financial and Administrative Studies and Research*, 13(2), 500-524.
- Parviainen, P., Tihinen, M., Kääriäinen, J., & Teppola, S. (2017). Tackling the digitalization challenge: How to benefit from digitalization in practice. *International Journal of Information Systems and Project Management*, 5(1), 63-77.
- Qistina, A. D. L. & Khashini, V. D. R. (2017). Transformational leadership and its functionality in arts organization. *International Journal of Business and Society*, 18(S4), 710-717.
- Rehman Khan, S. A., Ahmad, Z., Sheikh, A. A., & Yu, Z. (2022). Digital transformation, smart technologies, and eco-innovation are paving the way toward sustainable supply chain performance. *Science Progress*, 105(4), 00368504221145648.
- Saeed, I. A-F., Ezzedine, A., Allah Al-Mesmari, I., & Ahmed. (2022). The impact of smart port implementation on supply chain sustainability (case study: Misrata Free Zone, Libya). *Scientific Journal of Commercial and Environmental Studies*, 13(4), 640-693.

- Shi, Y., Zheng, X., Venkatesh, V. G., Humdan, E. A., & Paul, S. K. (2023). The impact of digitalization on supply chain resilience: an empirical study of the Chinese manufacturing industry. *Journal of Business & Industrial Marketing*, 38(1), 1-11.
- Tafni, A. S. (2018). *The role of supply chain management activities in enhancing competitive advantage*. Master's thesis, Business Administration, University of Ouargla, Algeria.
- Tayseer, A. Z. (2022). The role of digital transformation in business organizations' performance for sustainable development: Paper presented at the Fifth International Scientific Conference. *Iraqi Journal of Administrative Sciences*, 4(2), 24.
- Verina, N., & Titko, J. (2019). *Digital transformation: conceptual framework*. In Proc. of the Int. Scientific Conference Contemporary Issues in Business, Management and Economics Engineering 2019, Vilnius, Lithuania (pp. 9-10).
- Wheelen, T. L., & Hunger, J. D. (2010). Concepts in strategic management and business policy. *Language*, 41, 30.
- Yang, C. S., & Lin, M. S. M. (2023). The impact of digitalization and digital logistics platform adoption on organizational performance in maritime logistics of Taiwan. *Maritime Policy & Management*, 1-18.