Revue-IRS

Revue Internationale de la Recherche Scientifique (Revue-IRS)

ISSN : 2958-8413

Vol. 2, No. 3, Mai 2024

Conceptual framework of Artificial Intelligence Integration within Supply Chain

Mariame Ababou [1]

[1]Research Laboratory in Entrepreneurship and Organizational Management, Fez Business School, Private University of Fez, Fez, Morocco

E-mail: mariame.ababou.ma@gmail.com (Corresponding Author)

This is an open access article under the CC BY-NC-ND license.

Abstract: Effective Supply Chain Management (SCM) continues to be a major concern in the dynamic world of international trade. This paper offers a conceptual framework for investigating the effects of integrating artificial intelligence (AI) on SCM performance as a whole. The framework as the independent variable identifies AI integration, which includes subcomponents like machine learning, predictive analytics, and natural language processing. These AI components can enhance forecasting, inventory control, and logistics, improve operations, reduce risks, and take advantage of market trends. Nonetheless, the framework recognizes that effective AI integration requires organizational preparedness and strategic alignment. Organizational culture and data governance are two important factors. The approach further strengthens the link between AI and increased decision-making accuracy by introducing Decision Support Systems (DSS) with real-time analytics as a mediating variable. Through an analysis of several viewpoints and academic literature, this paper seeks to offer a thorough grasp of the benefits and difficulties associated with AI-driven supply chain modernization. By guiding businesses through the intricacies of contemporary supply chains, this framework opens up new possibilities for development, innovation, and value generation.

Keywords: Supply Chain Management, Artificial Intelligence, AI integration, SCM.

Digital Object Identifier (DOI): https://doi.org/10.5281/zenodo.11191146

1 Introduction

The efficient management of supply chains stands as a paramount challenge for organizations across diverse industries. Supply Chain Management (SCM) encompasses a complex web of processes, from procurement and production to distribution and delivery, each interdependent and interconnected (LeMay et al., 2017). Amidst this complexity, the advent of Artificial Intelligence (AI) has emerged as a disruptive force, promising to revolutionize traditional SCM practices and unlock new levels of efficiency, agility, and resilience (Modgil et al., 2022).

The integration of AI technologies into SCM processes represents a paradigm shift, offering organizations unparalleled opportunities to optimize operations, mitigate risks, and capitalize on emerging market trends. Renowned scholars have extensively explored the potential of AI-driven solutions in reshaping supply chain dynamics (Aldoseri et al., 2023; Dash et al., 2019; Min, 2010; Muthuswamy & Ali, 2023; Toorajipour et al., 2021; Yu, 2023). From predictive analytics and machine learning algorithms to natural language processing and robotic process automation, AI-driven solutions hold the potential to transform every facet of the supply chain ecosystem.

By harnessing the power of AI, organizations can enhance demand forecasting accuracy, optimize inventory management, streamline logistics operations, and improve decision-making processes. These insights are corroborated by seminal works in the field of SCM, including (Al-Surmi et al., 2022; Gupta et al., 2023; Javaid et al., 2022). Moreover Kumari et al., (2023)have highlighted the transformative impact of AI-driven big data analytics on supply chain optimization, underscoring the importance of leveraging advanced technologies to stay competitive in today's market.

However, the realization of AI's transformative potential in SCM hinges not only on technological advancements but also on organizational readiness and strategic alignment. Scholars such as Al-Afeef et al., (2023) and Cadden et al., (2022) have emphasized the critical role of organizational culture and data governance in facilitating successful AI integration. Effective collaboration between humans and machines requires a holistic approach that addresses these multifaceted dimensions, as highlighted by Liang, (2002) And Turban et al., (2007) in their research on decision support systems and business intelligence.

Against this backdrop, this article presents an extended conceptual framework that elucidates the intricate relationship between AI integration and SCM optimization. Drawing upon insights from diverse perspectives and esteemed scholars in the field, we aim to provide a

comprehensive understanding of the synergies and challenges inherent in AI-driven SCM transformation.

Through an extended exploration of AI integration in SCM, we seek to empower organizations with the knowledge and insights needed to navigate the complexities of modern supply chains effectively. By embracing AI technologies strategically, organizations can unlock new avenues for growth, innovation, and value creation, positioning themselves at the forefront of the global marketplace. As we embark on this journey of exploration and discovery, let us delve deeper into the transformative potential of AI integration in shaping the future of supply chain management.

2. Methodology

In our endeavor to construct a robust conceptual framework for Artificial Intelligence (AI) integration within the supply chain domain, we embarked on an extensive literature search across multiple scholarly databases and sources. Utilizing search terms such as "AI integration," "supply chain," and related terms within close proximity, we meticulously scoured databases. This comprehensive approach aimed to identify empirical research, theoretical pieces, and reviews pertinent to AI integration within supply chain management.

Our search strategy yielded a wealth of scholarly works spanning various disciplines, with a particular focus on research published from 2000 to 2024. This timeframe was selected strategically due to the presence of seminal reviews and studies that laid the groundwork for understanding AI integration within the supply chain. Additionally, we expanded our search beyond conventional databases to include conference abstracts and presentations, recognizing them as valuable sources of literature in this rapidly evolving field.

The literature identified through our multi-method search approach encompassed a spectrum of perspectives, ranging from theoretical frameworks to empirical studies examining the implementation of AI technologies in supply chain contexts. Reviews discussing the conceptualization of AI integration provided valuable insights into the theoretical underpinnings and methodological considerations, while empirical research offered practical examples of AI applications across various supply chain functions.

Drawing from the wealth of insights synthesized from this diverse body of literature, we developed a novel conceptual framework that serves as the cornerstone of our article. This framework not only elucidates the key components of AI integration within the supply chain but also offers a systematic approach for evaluating and assessing the impact of AI technologies on supply chain performance metrics. By integrating insights from existing literature, our

conceptual framework provides a comprehensive roadmap for organizations seeking to harness the transformative potential of AI in optimizing their supply chain operations and gaining a competitive edge in the marketplace.

3. A Conceptual Framework: Background and Rationale

Traditional SCM practices often grapple with challenges such as demand volatility, operational inefficiencies, and suboptimal decision-making due to the inherent complexity of supply chain networks (LeMay et al., 2017) . The advent of AI presents a promising solution by enabling intelligent automation, predictive analytics, and real-time insights extraction from vast amounts of data (Al-Afeef et al., 2023). Leveraging AI in SCM holds the potential to revolutionize core functions such as demand forecasting, inventory management, logistics optimization, and risk mitigation (Kennedy et al., 2024). However, the effective deployment of AI technologies necessitates a nuanced understanding of the underlying mechanisms and contextual factors that shape its impact on SCM performance (Cadden et al., 2022; Molopa, 2023).

The rationale behind developing a conceptual framework lies in the need to systematically organize and conceptualize the multifaceted dynamics of AI integration in SCM. By delineating the key elements and their relationships, the framework aims to provide clarity and guidance for researchers, practitioners, and decision-makers engaged in AI-enabled SCM initiatives. Moreover, a well-defined conceptual framework serves as a roadmap for empirical studies, facilitating the systematic investigation of AI's influence on SCM outcomes and the identification of critical success factors.

At its core, the conceptual framework seeks to address fundamental questions pertaining to AI integration in SCM, such as:

What are the essential components of AI technology applicable to SCM, and how do they contribute to improving supply chain performance?

What are the key performance metrics within SCM that are influenced by AI integration, and how are they interconnected?

What organizational factors moderate the impact of AI on SCM performance, and how do they influence implementation success?

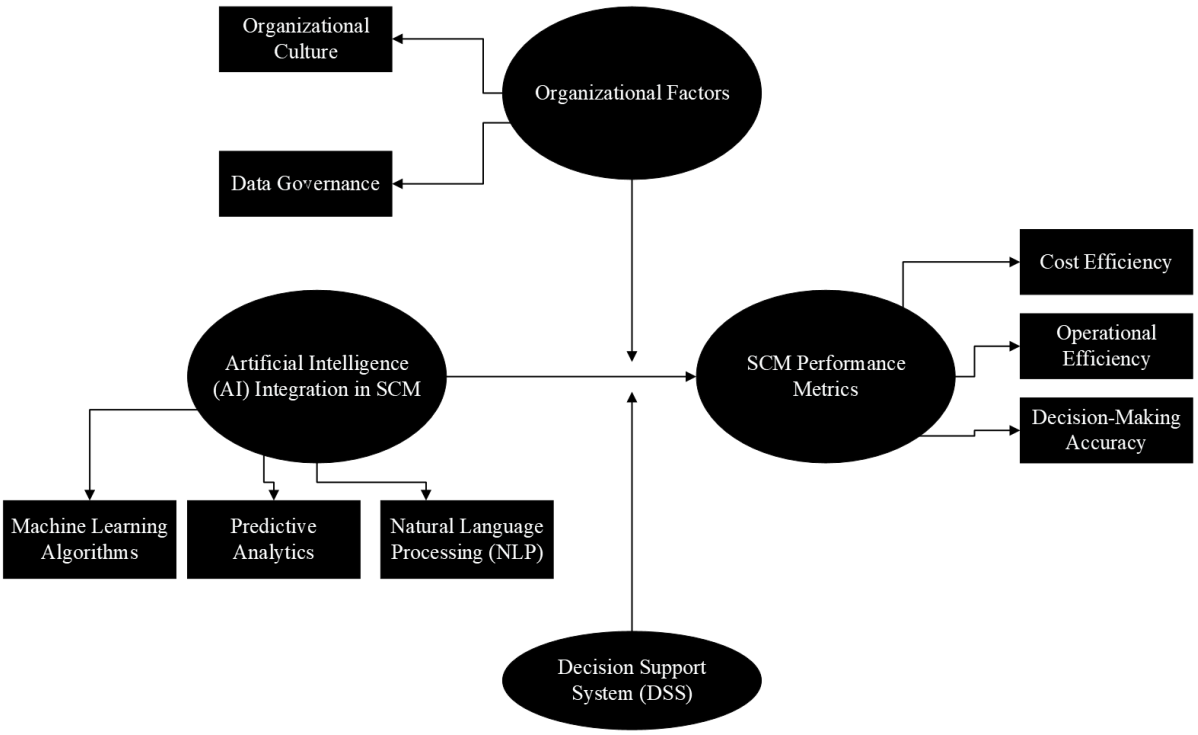
By elucidating these questions and synthesizing existing knowledge, the conceptual framework serves as a foundational structure for advancing research, informing strategic decision-making, and driving the adoption of AI technologies in SCM. Through its comprehensive approach, the framework aims to unlock the full potential of AI in reshaping the future of supply chain

operations, fostering resilience, agility, and competitive advantage in an increasingly digitalized world.

4. Proposed framework

All of the elements to evaluate IA integration are and the relationships between them are shown in the framework depicted in Figure 1.This conceptual framework provides a structured overview of the key components related to AI integration in SCM, highlighting the relationships between these variables. The independent variable of AI integration in SCM is supported by machine learning algorithms, predictive analytics, and natural language processing, which contribute to various aspects of SCM performance. The dependent variables, including cost efficiency, operational efficiency, and decision-making accuracy, are positively influenced by AI integration. Organizational factors such as culture and data governance moderate the impact of AI on SCM performance, while the decision support system mediates the relationship between AI integration and decision-making accuracy.

Figure 1: Conceptual Framework for IA integration in SCM



5. A conceptual framework: elements and relationships

Table 1 summarizing the conceptual framework for AI integration in Supply Chain Management (SCM), including the independent variable, subcomponents, dependent variables, moderating variables, and mediating variable.

Table 1: Core Components of the AI Integration and SCM Performance Framework

Variable Type	Component	Subcomponent	Examples / Metrics	Relationship to AI Integration in SCM
Independent Variable	Artificial Intelligence (AI) Integration in SCM	Machine Learning Algorithms	Supervised learning, unsupervised learning, reinforcement learning	Facilitates demand forecasting, inventory optimization, predictive maintenance
		Predictive Analytics	Data mining, statistical modeling	Enhances disruption prediction, logistics route optimization
		Natural Language Processing (NLP)	Extraction of insights, sentiment analysis	Improves understanding of unstructured data, sentiment analysis
Dependent Variables	SCM Performance Metrics	Cost Efficiency	Cost-to-serve, transportation costs	Positively correlates with AI integration, reducing costs
		Operational Efficiency	Order fulfillment time, lead time	Improves with AI-driven automation and optimization
		Decision-Making Accuracy	Forecast accuracy, inventory accuracy	Enhanced through AI-driven data analysis, improving decision accuracy
Moderating Variables	Organizational Factors	Organizational Culture	Openness to change, innovation culture	Influences the impact of AI on SCM performance based on cultural aspects
		Data Governance	Data quality, data security	Effective governance enhances positive effects of AI on SCM performance
Mediating Variable	Decision Support System (DSS)	Real-time Analytics	Facilitating quick and data-driven decision-making	Enhances the relationship between AI integration and decision-making accuracy

5.1. AI Integration in SCM:

The integration of Artificial Intelligence (AI) technologies in Supply Chain Management (SCM) has revolutionized the way organizations manage their logistics, operations, and decision-making processes. AI, comprising Machine Learning Algorithms, Predictive Analytics, and Natural Language Processing (NLP), has garnered significant attention and adoption in SCM due to its transformative potential and ability to address complex challenges inherent in supply chain operations.

Machine Learning Algorithms serve as the backbone of AI integration in SCM, offering a diverse set of techniques such as supervised, unsupervised, and reinforcement learning (Mohamed-Iliasse et al., 2020). These algorithms empower SCM professionals to forecast demand with greater accuracy, optimize inventory levels to meet fluctuating demand patterns,

and proactively perform predictive maintenance to minimize disruptions and downtime (Pournader et al., 2021). By leveraging historical data and iterative learning processes, machine learning algorithms enable SCM systems to adapt and improve over time, enhancing overall efficiency and responsiveness(Akbari & Do, 2021).

Predictive Analytics plays a pivotal role in augmenting SCM capabilities by harnessing the power of data mining and statistical modeling techniques (Khan et al., s. d.). Through sophisticated analysis of historical and real-time data, predictive analytics enables organizations to anticipate disruptions in the supply chain, identify potential bottlenecks, and optimize logistics routes for enhanced cost-effectiveness and timely delivery (Bradlow et al., 2017). By providing actionable insights into future trends and events, predictive analytics empowers SCM practitioners to make informed decisions and proactively mitigate risks, thereby improving overall supply chain resilience and agility (Jeble et al., 2018).

Natural Language Processing (NLP) represents another cornerstone of AI integration in SCM, unlocking valuable insights from unstructured data sources such as emails, social media posts, and customer feedback (Aslam & Calghan, 2023). NLP algorithms are adept at understanding and extracting meaningful information from text data, enabling organizations to gain deeper insights into consumer preferences, market trends, and sentiment analysis (Khatri, 2023). By leveraging NLP capabilities, SCM professionals can enhance decision-making processes, tailor marketing strategies, and improve customer satisfaction levels by better understanding and addressing their needs and preferences (Allal-Chérif et al., 2021).

5.2. SCM Performance Metrics:

SCM performance metrics serve as critical benchmarks for evaluating organizational effectiveness and competitiveness in today's dynamic business environment. These metrics, including cost efficiency, operational efficiency, and decision-making accuracy, are indicative of an organization's ability to meet customer demands, optimize resources, and adapt to market changes swiftly.

AI integration in SCM has demonstrated a profound impact on these performance metrics, driving significant improvements across various dimensions of supply chain operations. Cost efficiency, a cornerstone of SCM performance, is positively influenced by AI technologies through their ability to streamline processes, optimize resource allocation, and minimize wastage (Dash et al., 2019). By leveraging AI-driven algorithms and predictive analytics, organizations can identify cost-saving opportunities, optimize transportation routes, and

negotiate favorable contracts with suppliers, ultimately leading to reduced transportation and service provision costs (Dittakavi, 2023).

Operational efficiency, another vital aspect of SCM performance, is greatly enhanced by AI-driven automation and optimization techniques. Through the implementation of AI-powered systems and technologies, organizations can automate repetitive tasks, optimize inventory levels, and streamline warehouse operations, leading to reduced order fulfillment time and lead time (Helo & Hao, 2022). By leveraging real-time data insights and predictive modeling, AI enables organizations to proactively identify inefficiencies, mitigate bottlenecks, and optimize resource utilization, thereby improving overall operational efficiency and responsiveness (Sharma et al., 2022).

Decision-making accuracy, crucial for effective SCM management, is significantly enhanced through AI-driven data analysis and predictive modeling (Elbegzaya, 2020). By harnessing the power of advanced analytics and machine learning algorithms, organizations can improve forecast accuracy and inventory accuracy, thereby minimizing stockouts, overstock situations, and associated costs (Gupta et al., 2023). AI facilitates data-driven decision-making by providing actionable insights into market trends, demand patterns, and supply chain risks, enabling organizations to make informed decisions with greater precision and confidence (Al-Surmi et al., 2022; Pournader et al., 2021).

5.3. Organizational Factors as Moderators:

Organizational factors exert a significant influence on the integration of Artificial Intelligence (AI) in Supply Chain Management (SCM), shaping the extent to which AI technologies contribute to SCM performance outcomes. Among these factors, organizational culture and data governance emerge as critical determinants that moderate the impact of AI on SCM effectiveness and competitiveness.

Organizational culture plays a pivotal role in fostering an environment conducive to the successful adoption and utilization of AI technologies within SCM (Pai & Chandra, 2022). A culture characterized by openness to change, innovation, and collaboration cultivates a mindset of experimentation and continuous improvement, encouraging employees to embrace AI-driven innovations and explore new possibilities for enhancing SCM processes (Kumar et al., 2023). By fostering a culture of innovation, organizations can create a supportive ecosystem where employees feel empowered to leverage AI technologies to drive positive change and address complex supply chain challenges (Dey et al., 2023; Hong et al., 2022).

Effective data governance practices are essential for maximizing the benefits of AI integration in SCM (Sharma et al., 2022). Data governance encompasses policies, procedures, and controls that govern the collection, storage, management, and utilization of data assets within an organization. By ensuring data quality, integrity, and security, effective data governance enhances the reliability and trustworthiness of data inputs used for AI-driven decision-making processes in SCM (Min, 2010). Robust data governance frameworks provide the foundation for AI algorithms to generate accurate insights and recommendations, enabling SCM practitioners to make informed decisions with confidence (Muthuswamy & Ali, 2023). Moreover, data governance initiatives facilitate compliance with regulatory requirements and industry standards, mitigating risks associated with data breaches, privacy violations, and misinformation (Dash et al., 2019). By establishing clear guidelines and protocols for data management and access, organizations can safeguard sensitive information and uphold the trust of stakeholders throughout the supply chain ecosystem.

5.4. Decision Support Systems as Mediators:

Decision Support Systems (DSS) serve as pivotal mediators in the relationship between AI integration and decision-making accuracy within Supply Chain Management (SCM) contexts. Equipped with real-time analytics capabilities, DSS act as conduits through which AI-generated insights are transformed into actionable intelligence, thereby enhancing SCM performance.

In the realm of SCM, where timely and informed decision-making is paramount, DSS play a crucial role in facilitating rapid and data-driven decision processes. By integrating AI-generated insights with real-time data streams, DSS empower SCM practitioners to make informed decisions in dynamic and complex operational environments (Elbegzaya, 2020). These systems provide decision-makers with intuitive interfaces and interactive dashboards that display key performance indicators, predictive analytics, and scenario analyses, enabling them to assess various options and outcomes quickly and effectively (Sallam et al., 2023). Furthermore, DSS leverage advanced analytics techniques such as machine learning, optimization algorithms, and predictive modeling to identify patterns, trends, and anomalies within SCM data (Aldoseri et al., 2023). By harnessing the power of AI-driven analytics, DSS enable SCM professionals to anticipate potential disruptions, optimize resource allocation, and mitigate risks proactively (Elbegzaya, 2020). This proactive approach to decision-making enhances the agility and responsiveness of supply chain operations, enabling organizations to adapt swiftly to changing market conditions and customer demands. Moreover, DSS facilitate collaboration and

communication across different functional areas within the supply chain ecosystem (Allaoui et al., 2019). By providing a centralized platform for sharing insights, conducting scenario analyses, and aligning strategies, DSS foster cross-functional collaboration and alignment, breaking down silos and fostering a cultur e of data-driven decision-making across the organization (Sallam et al., 2023).

6. Conclusion

The intersection of Artificial Intelligence (AI) and Supply Chain Management (SCM) represents a pivotal juncture in the evolution of global commerce. As highlighted in this discourse, the integration of AI technologies holds immense promise for revolutionizing traditional SCM practices and ushering in a new era of efficiency, agility, and resilience. Through the lens of renowned scholars and seminal works in the field, we have explored the multifaceted potential of AI-driven solutions in optimizing various facets of the supply chain, from demand forecasting to logistics operations. The transformative impact of AI on SCM optimization is evident, offering organizations unprecedented opportunities to enhance decision-making processes, streamline operations, and capitalize on emerging market trends.

However, the realization of AI's transformative potential in SCM necessitates more than just technological advancements. Organizational readiness and strategic alignment are equally crucial factors, as emphasized by leading scholars in the field. Effective collaboration between humans and machines requires a holistic approach that addresses organizational culture, data governance, and strategic alignment. In light of these insights, this article has presented an extended conceptual framework that elucidates the intricate relationship between AI integration and SCM optimization. By synthesizing insights from diverse perspectives and esteemed scholars, we have endeavored to provide organizations with a comprehensive understanding of the synergies and challenges inherent in AI-driven SCM transformation.

As organizations navigate the complexities of modern supply chains, embracing AI technologies strategically can unlock new avenues for growth, innovation, and value creation. By leveraging AI's transformative potential, organizations can position themselves at the forefront of the global marketplace, driving sustainable competitive advantage and shaping the future of supply chain management.

References:

[1] Akbari, M., & Do, T. N. A. (2021). A systematic review of machine learning in logistics and supply chain management : Current trends and future directions. *Benchmarking: An International Journal*, *28*(10), 2977-3005.

[2] Al-Afeef, M., Ali, O., Al-Tahat, S., Malkawi, A., Kalbounhe, N., & Al-Azzam, Z. (2023). The effect of big data governance on financial technology in Jordanian commercial banks : The mediation role of organizational culture. *International Journal of Data and Network Science*, *7*(3), 1283-1294.

[3] Aldoseri, A., Al-Khalifa, K., & Hamouda, A. (2023). *A roadmap for integrating automation with process optimization for AI-powered digital transformation*. https://www.preprints.org/manuscript/202310.1055

[4] Allal-Chérif, O., Simón-Moya, V., & Ballester, A. C. C. (2021). Intelligent purchasing : How artificial intelligence can redefine the purchasing function. *Journal of Business Research*, *124*, 69-76.

[5] Allaoui, H., Guo, Y., & Sarkis, J. (2019). Decision support for collaboration planning in sustainable supply chains. *Journal of Cleaner Production*, *229*, 761-774.

[6] Al-Surmi, A., Bashiri, M., & Koliousis, I. (2022). AI based decision making : Combining strategies to improve operational performance. *International Journal of Production Research*, *60*(14), 4464-4486. https://doi.org/10.1080/00207543.2021.1966540

[7] Aslam, F., & Calghan, J. (2023). Using NLP to Enhance Supply Chain Management Systems. *Journal of Engineering Research and Reports*, *25*(9), 211-219.

[8] Bradlow, E. T., Gangwar, M., Kopalle, P., & Voleti, S. (2017). The role of big data and predictive analytics in retailing. *Journal of retailing*, *93*(1), 79-95.

[9] Cadden, T., Dennehy, D., Mantymaki, M., & Treacy, R. (2022). Understanding the influential and mediating role of cultural enablers of AI integration to supply chain. *International Journal of Production Research*, *60*(14), 4592-4620. https://doi.org/10.1080/00207543.2021.1946614

[10] Dash, R., McMurtrey, M., Rebman, C., & Kar, U. K. (2019). Application of artificial intelligence in automation of supply chain management. *Journal of Strategic Innovation and Sustainability*, *14*(3). https://articlearchives.co/index.php/JSIS/article/view/4867

[11] Dey, P. K., Chowdhury, S., Abadie, A., Vann Yaroson, E., & Sarkar, S. (2023). Artificial intelligence-driven supply chain resilience in Vietnamese manufacturing small- and medium-sized enterprises. *International Journal of Production Research*, 1-40. https://doi.org/10.1080/00207543.2023.2179859

[12] Dittakavi, R. S. S. (2023). AI-Optimized Cost-Aware Design Strategies for Resource-Efficient Applications. *Journal of Science & Technology*, *4*(1), 1-10.

[13] Elbegzaya, T. (2020). *Application AI in Traditional Supply Chain Management Decision-Making*. http://dspace.unive.it/handle/10579/17733

[14] Gupta, K., Mane, P., Rajankar, O. S., Bhowmik, M., Jadhav, R., Yadav, S., Rawandale, S., & Chobe, S. V. (2023). Harnessing AI for Strategic Decision-Making and Business Performance Optimization. *International Journal of Intelligent Systems and Applications in Engineering*, *11*(10s), Article 10s.

[15] Helo, P., & Hao, Y. (2022). Artificial intelligence in operations management and supply chain management : An exploratory case study. *Production Planning & Control*, *33*(16), 1573-1590. https://doi.org/10.1080/09537287.2021.1882690

[16] Hong, J., Guo, P., Chen, M., & Li, Y. (2022). The adoption of sustainable supply chain management and the role of organisational culture : A Chinese perspective. *International Journal of Logistics Research and Applications*, *25*(1), 52-76. https://doi.org/10.1080/13675567.2020.1795094

[17] Javaid, M., Haleem, A., Singh, R. P., & Suman, R. (2022). Artificial Intelligence Applications for Industry 4.0 : A Literature-Based Study. *Journal of Industrial Integration and Management*, *07*(01), 83-111. https://doi.org/10.1142/S2424862221300040

[18] Jeble, S., Dubey, R., Childe, S. J., Papadopoulos, T., Roubaud, D., & Prakash, A. (2018). Impact of big data and predictive analytics capability on supply chain sustainability. *The International Journal of Logistics Management*, *29*(2), 513-538.

[19] Kennedy, G. W., Ikpe, S. A., Nassa, V. K., Prajapati, T., Dhabliya, D., & Dari, S. S. (2024). From Tradition to Technology : Utilization of AI and ML for Digital Transformation in Supply Chain Management. In *AI and Machine Learning Impacts in Intelligent Supply Chain* (p. 91-108). IGI Global. https://www.igi-global.com/chapter/from-tradition-to-technology/338142

[20] Khan, R. H., Sohrforouzani, M. A., Darvishi, S., & Ukwishaka, M. C. (s. d.). *Big data analytics for optimizing supply chain management : A state of the art*. Consulté 25 mars 2024, à l'adresse https://www.researchgate.net/profile/Rajib-Khan/publication/325995340_Assignment2A/links/5b3232ce0f7e9b0df5cc8ccc/Assignment2A.pdf

[21] Khatri, M. R. (2023). Integration of natural language processing, self-service platforms, predictive maintenance, and prescriptive analytics for cost reduction, personalization, and real-time insights customer service and operational efficiency. *International Journal of Information and Cybersecurity*, *7*(9), 1-30.

[22] Kumar, A., Mani, V., Jain, V., Gupta, H., & Venkatesh, V. G. (2023). Managing healthcare supply chain through artificial intelligence (AI) : A study of critical success factors. *Computers & Industrial Engineering*, *175*, 108815.

[23] Kumari, N., Chaudhary, D., Kaur, H., & Yadav, A. L. (2023). Artificial Intelligence in Supply Chain Optimization. *2023 International Conference on IoT, Communication and Automation Technology (ICICAT)*, 1-6. https://ieeexplore.ieee.org/abstract/document/10263631/

[24] LeMay, S., Helms, M. M., Kimball, B., & McMahon, D. (2017). Supply chain management : The elusive concept and definition. *The International Journal of Logistics Management*, *28*(4), 1425-1453.

[25] Liang, T.-P. (2002). Decision support systems and business intelligence. *Taipei, BestWise Co., Ltd*.

[26] Min, H. (2010). Artificial intelligence in supply chain management : Theory and applications. *International Journal of Logistics Research and Applications*, *13*(1), 13-39. https://doi.org/10.1080/13675560902736537

[27] 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.

[28] Mohamed-Iliasse, M., Loubna, B., & Abdelaziz, B. (2020). Is machine learning revolutionizing supply chain? *2020 5th International Conference on Logistics Operations Management (GOL)*, 1-10. https://ieeexplore.ieee.org/abstract/document/9314713/

[29] Molopa, T. (2023). *Factors affecting the adoption of artificial intelligence (AI) in the supply chain and logistics Industry* [PhD Thesis, University of the Western Cape]. https://etd.uwc.ac.za/handle/11394/10606

[30] Muthuswamy, M., & Ali, A. M. (2023). Sustainable supply chain management in the age of machine intelligence : Addressing challenges, capitalizing on opportunities, and shaping the future landscape. *Sustainable Machine Intelligence Journal*, *3*, 3-1.

[31] Pai, V., & Chandra, S. (2022). Exploring factors influencing organizational adoption of artificial intelligence (AI) in corporate social responsibility (CSR) initiatives. *Pacific Asia Journal of the Association for Information Systems*, *14*(5), 4.

[32] Pournader, M., Ghaderi, H., Hassanzadegan, A., & Fahimnia, B. (2021). Artificial intelligence applications in supply chain management. *International Journal of Production Economics*, *241*, 108250.

[33] Sallam, K., Mohamed, M., & Mohamed, A. W. (2023). Internet of Things (IoT) in supply chain management : Challenges, opportunities, and best practices. *Sustainable Machine Intelligence Journal*, *2*, 3-1.

[34] Sharma, R., Shishodia, A., Gunasekaran, A., Min, H., & Munim, Z. H. (2022). The role of artificial intelligence in supply chain management : Mapping the territory. *International Journal of Production Research*, *60*(24), 7527-7550. https://doi.org/10.1080/00207543.2022.2029611

[35] Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021). Artificial intelligence in supply chain management : A systematic literature review. *Journal of Business Research*, *122*, 502-517.

[36] Turban, E., Aronson, J. E., Liang, T.-P., & Sharda, R. (2007). Decision support systems and business intelligence. *Decis. Support Bus. Intell. Syst*, *7*, 1-35.

[37] Yu, C. (2023). *AI Revolution : Reshaping Global Value Chains for the Future*. Center for Open Science. https://osf.io/n6hb2/download.