

ANNOTATED BIBLIOGRAPHY

BIG DATA AND SUPPLY CHAIN

Abdalla, A. A., Abdalla, Y. A., Haddad, A. M., Bhavani, G., & Zabalawi, E. (2022). Connections between Big Data and Smart Cities from the Supply Chain Perspective: Understanding the Impact of Big Data. *Sustainability*, 14(23), 16161.

<https://doi.org/10.3390/su142316161>

This paper reviews the increase in the application of big data in improving the supply chain management of smart cities. According to the authors, big data can solve some of the biggest complexities prevalent in cities, including traffic management, environmental pollution, and issues related to last-mile delivery. Real-time data are important in optimizing the supply chain in urban areas to come up with better routes for transport, less fuel consumption, and increased overall performance. The paper also provides a detailed outline of sustainability in urban logistics, where big data acts to help reduce carbon footprint and energy consumption. In addition, the authors propose that the use of big data results in new opportunities for innovation within the supply chain due to predictive analytics of market demand. This research is beneficial to the general topic of big data in supply chain management because it presents realistic uses of big data in urban logistics where information processing is critical for operations. Most of the highlighted issues reflect modern approaches to the formation of a sustainable supply chain management system. The emphasis on the creation of an environmentally friendly supply chain management system makes this paper

timely for organizations that seek to achieve both supply chain profitability and sustainability.

Ajay Kumar Behera, Sasmita Mohapatra, Rabindra Mahapatra, Harish Das: Journal Articles.

(2022). Effect of Big Data Analytics in Reverse Supply Chain: An Indian Context *Irma-International.org*. <https://www.irma-international.org/article/effect-of-big-data-analytics-in-reverse-supply-chain/287128/>

The present article examines the application of BDA in enhancing reverse supply chains in India. Supply chains include reverse supply chains that comprise policies of returns, recycling, and waste management in the supply chain. The authors emphasize how BDA can enhance the decision-making on issues to do with the returned goods, waste, and the use of resources. Using real-time data that is collected from different points in the reverse logistics cycle it is possible to realize improvements in performance and overall costs. For instance, the study demonstrates how return forecasting can be used to predict return volumes to enhance inventory and transportation resource allocation. Moreover, this paper examines the sustainability vent of reverse logistics where Big Data has the potential to promote a circular economy by enhancing the identification of materials that can be recycled or reused. This work is important, particularly to organizations that are concerned with sustainable management and disposal of resources because it reveals how scientific approaches to effective resource management can enhance supply chains with minimal wastage. Therefore, this paper brings important findings from an emerging economy context, particularly

the Indian context, regarding the role of big data in managing reverse logistics in supply chains.

Bag, S., Gupta, S., Choi, T.-M., & Kumar, A. (2021). Roles of Innovation Leadership on Using Big Data Analytics to Establish Resilient Healthcare Supply Chains to Combat the COVID-19 Pandemic: A Multimethodological Study. *IEEE Transactions on Engineering Management*, 1–14. <https://doi.org/10.1109/tem.2021.3101590>

In this study, the authors explain how big data analytics (BDA) can be used to build sustainable health care SCs more so in the context of COVID-19. In detail, the research employs a multimethodological approach to explore how innovative leadership enhances BDA for real-time decision-making of supply chain.

Healthcare SC were significantly exposed during the pandemic, and flexibility to changing demand patterns were important during this period. The paper also explains how BDA helped healthcare organizations improve demand planning specifically for the critical products like PPEs, ventilators, and vaccines. Through the application of analytical models, healthcare organizations were able to optimize their stores, staff their organizations, and prevent supply chain disruptions. The authors also discuss the lack of data visibility and recommend sharing information about orders, delivery, and inventory status between suppliers, manufacturers, and healthcare providers as being critical for the real-time supply chain resilience. This paper is more central to the topic of big data in supply chain management in as much as it presents the use of BDA in crises.

These research findings can be valuable to other industries as they experience

disruptions; it will highlight the positive impact of big data in strengthening supply chain sustainability across sectors.

Gautam, P. (2020). Role of Big Data Analytics in supply chain management: current trends and future perspectives. *International Journal of Production Research*, 59(6), 1875–1900.
https://www.academia.edu/97698410/Role_of_Big_Data_Analytics_in_supply_chain_management_current_trends_and_future_perspectives

This paper explores the increasing importance of BDA in SCM, logistics management, and inventory management. The authors identified 58 papers from the total of 260 papers obtained from the Web of Science database, published between 2015 and 2019, and analyzed their literature review. The work presents an understanding of the importance of BDA for maintaining and improving organizational functions and the identification of clients within supply chains. Some of the studies discover that BDA has the potential to optimize supply chain transparency, and risk management, and offer competitive advantages to organizations. The paper also presents the current problems in implementing BDA for SCM, which are divided into organizational factors (time limitations, security, lack of qualified personnel) and technical factors (data size, standardization of data quality). The authors also illuminate novel avenues for future research by offering reflections on how BDA is currently being extended, for example, through the combination with blockchain and the Internet of Things (IoT) in environments of smart manufacturing. This review provides significant insights for researchers and practitioners into the future directions and advancements in the use of BDA for supply chain management. In sum, the paper reflects the

unprecedented role of BDA in driving improvements in terms of form, responsiveness, and data the supply chain systems.

Johnson, O., Brown, W., & Wilson, G. (2024). The Role of Big Data Analytics in Retail Marketing and Supply Chain Optimization.

<https://doi.org/10.20944/preprints202407.2058.v1>

This paper investigates the dual role of big data analytics (BDA) in optimizing both retail marketing and supply chain management. The authors discuss how BDA can provide critical insights into consumer behavior, enabling retailers to make data-driven decisions about product assortment, pricing strategies, and inventory management. By integrating BDA into their supply chains, retailers can forecast demand more accurately, reduce stockouts, and improve inventory turnover. The paper also highlights the role of machine learning algorithms in analyzing large datasets, allowing retailers to anticipate market trends and adjust their supply chain operations accordingly. One of the key advantages of BDA in retail supply chain management is its ability to enhance visibility across the entire supply chain, from suppliers to end consumers. This improved visibility helps retailers respond quickly to changes in consumer demand, reduce lead times, and optimize their logistics networks. The authors also discuss the cost-saving potential of BDA, noting that data-driven insights can lead to more efficient use of resources and reduced operational costs. This research is highly relevant to the topic of big data in supply chain management, as it provides practical examples of how BDA can be used to improve efficiency and profitability in the retail sector.

Ouro-Salim, O., Guarnieri, P., & Leitão, F. O. (2022). The use of Big Data to mitigate waste in agri-food supply chains. *World Food Policy*. <https://doi.org/10.1002/wfp2.12055>

This paper examines how big data can be used to reduce waste in agri-food supply chains, providing a framework for integrating data-driven insights into supply chain decision-making. It focuses on predictive analytics and real-time data tracking to minimize inefficiencies, which is a key concern in the perishable goods sector. The article is particularly relevant as it demonstrates the applicability of big data in niche areas of supply chain management, such as agri-food, and shows how data-driven approaches can yield improvements in efficiency, sustainability, and cost reduction. Examines how big data can be used to reduce waste in agri-food supply chains, providing a framework for integrating data-driven insights into supply chain decision-making. It focuses on predictive analytics and real-time data tracking to minimize inefficiencies, which is a key concern in the perishable goods sector. The article is particularly relevant as it demonstrates the applicability of big data in niche areas of supply chain management, such as agri-food, and shows how data-driven approaches can yield improvements in efficiency, sustainability, and cost reduction.

Seyedan, M., & Mafakheri, F. (2020). Predictive Big Data Analytics for Supply Chain Demand forecasting: methods, applications, and Research Opportunities. *Journal of Big Data*, 7(1), 1–22. Springeropen. <https://doi.org/10.1186/s40537-020-00329-2>

This paper provides a comprehensive overview of approaches and use cases of predictive big data analytics (BDA) in demand forecasting to supply chains. The authors also elaborate on how organizational knowledge and data mining tools

such as time series analysis, machine learning, and other forecast models can be used to predict future needs with enhanced accuracy to help organizations manage their inventory, production, and distribution functions. The paper also explores the ability of these methods to minimize supply chain risk associated with unpredictability, especially in commoditized markets. With the help of BDA, companies can forecast customers' demand, minimize the risk of stockouts and the opposite, and thus, save money and make their customers happier. Altogether the findings of this study can be considered relevant to the wider subject matter of big data in supply chain as it has underlined the significance of predictive analytics in fashioning less rigid and quicker to adapt supply chain networks. The authors also present the implementation limitations of BDA where some of which are data quality problems, personnel and talent, and data heterogeneity. Nonetheless, the paper recommends that the benefits of predictive BDA far surpass the challenges and should serve as a useful tool for any organization wishing to enhance its supply chain performance.

Vieira, A. A., Dias, L. M., Santos, M. Y., Pereira, G. A., & Oliveira, J. A. (2020). On the use of simulation as a Big Data semantic validator for supply chain management. *Simulation Modelling Practice and Theory*, 98, 101985.
<https://doi.org/10.1016/j.simpat.2019.101985>

This paper aims at discussing the part played by simulation in the validation of big data in supply chain management. The authors posit that although big data is highly valuable in increasing supply chain speed, the quality of the data is key. In using simulation models, it is possible to check the accuracy of big data allowing

analytics derived there from to be usable. The authors present a framework where simulation can act as a semantic validator to assist organizations in identifying data quality problems in their modeling and decision-making. This is particularly crucial in global supply chains since data is normally obtained from several sources, and its quality may be different. The paper also considers such issues as the difficulties inherent in integrating the simulation models into supply chain management systems like the need to seek special skills and the problem of modeling complicated extensive logistics systems. This study is relevant to big data in supply chain management because it addresses a critical challenge: ensuring data quality. By synthesizing simulation as a validation tool, the paper provides a direct answer to what organizations can do to increase the accuracy of their big data findings, thus making the paper of significance to SC managers.

Wong, D. T. W., & Ngai, E. W. T. (2022). Linking data-driven innovation to firm performance: a theoretical framework and case analysis. *Annals of Operations Research*.

<https://doi.org/10.1007/s10479-022-05038-y>

This paper examines the link between DDI and firm performance and provides a theoretical framework that has been tested using a manufacturing firm in the Chinese textile and apparel industry. According to the authors DDI can contribute positively to the firm performance by a probability of efficiency gains in operational activities and quality decisions due to automation and data analytics. This research seeks to establish how two contextual factors, namely organizational and individual context, present a view of how DDI could be successfully implemented. The level of innovation that DDI achieves depends on

factors at the organizational level including the size and structure of the company, the technology used as well as the corporate culture that exists in the organization and personal factors including motivation, creativity and task novelty. After arguing about how the dynamic capabilities and strategic fit perspectives are relevant to increasing the levels of DDI alignment with the internal and external environment of a firm, this paper reflects on the importance of DDI alignment in terms of improving organizational profitability, competitiveness and sustainability. In the textile industry applicable case of DDI is that how it was helpful to increase operational efficiencies, decrease costs and improved the customers' satisfaction through real-time business intelligence and future estimations. The subject of this research is highly pertinent to SC management as the adoption of the DDI framework demonstrates how it can revolutionize conventional frameworks to make firms more flexible and rely on data when making supply chain decisions. The paper contributes the current knowledge on how firms may contain data and innovative technology to keep up with the evolving industry systems.

Xu, J., Pero, M., & Fabbri, M. (2023). Unfolding the link between big data analytics and supply chain planning. *Technological Forecasting and Social Change*, 196, 122805–122805. <https://doi.org/10.1016/j.techfore.2023.122805>

Specifically, in this paper, the author analyses the relationship between BDA and SCP focusing on how BDA would help in enhancing different aspects of the supply chain including sales and operations planning and distribution operations. The authors use the Delphi technique and responses of 35 participants in three

rounds to identify the impact of BDA on SCP. This process highlighted the fact that the dependence of BDA on the SCP activity under consideration is very high. For example, the use of simulation and optimization was identified as being particularly timely for strategic planning spanning several years in the production and distribution areas, whereas the use of forecasting was crucial at both tactical and strategic planning levels that are looking at planning periods of varying durations less than several years. The paper highlights various advantages of BDA in enhancement of the forecast precision, inventory control, and real-time decision-making in supply chain. Further, elicited through the Delphi technique that provides the perception of experts, identified the author the strategic value of BDA in managing uncertainties and increasing SCP adaptability. This research advances understanding about how data-driven technologies are transforming traditional supply chain management disciplines. Real-time access to data and predictive modeling enables a firm to maximize productivity and operating efficiency while at the same time containing operating expenses and responding to dynamic market conditions. Overall, the study offers a guide to allocation of BDA investments in SCP and fits well as a reference guide to organizations that are aspiring to improve their supply chain performance.

Yang, C. (2024). Innovation in Cross-Border Supply Chain Inventory Management Driven by Big Data. *Advances in Economics, Management and Political Sciences*, 76, 66–73.
<https://doi.org/10.54254/2754-1169/76/20241882>

In this paper, Yang focuses on how Big Data Analytics (BDA) has affected cross-border supply chain inventory management as an effective tool for enhancing

operation and managing risk. JD E-commerce and NongFu Spring are used in the paper to showcase how big data improves inventory management within firms. Such factors show how the industry pioneer JD E-commerce staff is cutting on the turnover days digesting and analyzing big data analytics to achieve enhanced cost-effectiveness and overcome such barriers as operational lag and wastage. On the other hand, NongFu Spring uses big data for scenario marketing and supply chain management to show how inventory plans can be adjusted based on demand prediction. These examples are meant to illustrate how BDA is being used in practice to transform inventory management in the global supply chain. Moreover, the article puts into perspective more issues about BDA to support real-time monitoring and increase openness and business planning by using data-driven decision-making. It therefore becomes possible for organizations to make effective decisions regarding global supply chain management in a bid to achieve maximal effectiveness and tightened responsiveness. In conclusion, through Yang's papers, we can see how the application of big data to inventory work not only optimizes the business processes but also provides tools to improve the company's competitiveness in the globalizing world.