



Digital Platforms Help Organization Management and Resolve Supply Chain Disruptions

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Abstract. The outbreak of the epidemic has led to the risk of disruption in supply chains in various industries, and even the supply chain is difficult to survive. In order to pursue the sustainable development of supply chain, resources and society, we should adhere to the guidance of digital technology and promote digital transformation under the opportunity of the industrial Internet. As an important area of digital transformation, digital platforms have great potential in various industries. Currently, large digital platforms have made small gains, but there is little research on how digital platforms can be used to help organizations manage supply chain disruptions. This article explores how digital platforms can help organizations manage and survive supply chain disruptions. On this basis, we screened 478 articles from the Web of Science (WoS) database to map co-word clusters and analyze their annual trends, knowledge structure, focus areas, publication sources, etc., and make effectiveness recommendations for digital platforms to provide direction for future supply chain disruption research and fill research gaps. These areas will also help logistics managers master digital platform development technologies to achieve sustainable development and take reasonable measures accordingly.

Keywords: Supply chain disruption · Digital platforms · Digital transformation · Systematic literature review

1 Introduction

In the 21st century, all walks of life have gradually integrated with digital platforms, bringing considerable data benefits. No matter which region, supply chain information obtained through enormous data efficiency is much higher than that of a non-data era. Big data has added value to supply chain information and made a new guarantee for sustainable supply chain development [1]. Initially, the development of the supply chain could be accompanied by the continuous expansion of the digital age. However, due to the sudden attack of the epidemic, the original digital development of the supply chain was broken, resulting in a series of urgent problems. For example, the most severe problems of masks [2] and medications [3]. To this end, Zhihan scholars have developed a digital twin model of supply chain resilience to solve the problem of supply chain disruption in real life [4].

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Supply chain disruption is an obstacle in the production or distribution of a supply chain, usually caused by unforeseen events or risks [5]. Globalization and digitalization have continuously increased customer demand for logistics-related services. Supply chain development have also attracted widespread attention [6]. However, logistical issues are among the leading causes of supply chain disruptions. In addition, scholars say that supply and demand mismatches and process and transportation risks at various stages can cause supply chain disruptions [5]. At the same time, shrinking labor, security needs, and inventory shortages can all impact the responsiveness and resilience of supply chains [7]. Based on the research on the supply chain disruptions experienced by omnichannel retailers in South Africa from internal, front-end, and back-end operations during the epidemic, the scholars proposed that retailers need to flexibly free up investment and expand capacity, as well as carry out long-term planning and strategies [8]. Ultimately, Savini scholars say that drawing points from the challenges, governments and companies need to reassess supply chain risks and determine supply chain designs. It ensures that supply chains are designed to provide the most resiliency in the event of another large-scale supply chain disruption [9].

Many research has focused on predicting the probability of disruption. They have used data analysis capabilities in digital manufacturing and developed hybrid techniques to decipher deviation between resilient supply chain performance and supplier performance risk status [10]. In addition, scholars such as Ngo Vu Minh have shown that digital supply chain transformation has become a way to improve information sharing, better manage demand, and reduce supply chain management costs, and have identified the key drivers of digital supply chain transformation [11]. Therefore, this study has significant research value for the risk of supply chain disruption.

2 Data and Methods

This study follows bibliometric-based scientific and technical mapping conventions to provide evidence for the roadmap, with knowledge mapping based on bibliometric data. A knowledge graph, or scientific graph, provides a visualization of knowledge in a structured way. The research data used in this study is from the WoS database. Table 1 shows basic information on the resulting dataset, including 478 bibliometric records retrieved in late February 2023, covering the period from 1996 to 2023.

3 Fundings

3.1 Annual Trends

According to annual scientific publications, the number of literature on supply chain disruption and supply chain management showed a slow increase before 2018. After 2018, the rate of increase in the number of publications increased dramatically and peaked in 2022. In 2022 alone, 106 papers were published. This should be closely linked to the severe supply chain disruptions caused by the outbreak in 2019. It also means that the subject of supply chain disruption is strongly motivated by research. Table 1 shows the basic information about the dataset.

Table 1. Basic information about the dataset

Bibliographic Data Source	Web of Science Core Collection
Search query	TS = (“Supply Chain Disruption”)
Timespan	1996:2023
Sources (Journals, Books, etc.)	255
Documents	478
Average citations per doc	26.63
References	17971
Keywords Plus (ID)	802
Author’s Keywords (DE)	1385
Authors	1267
Co-Authors per Doc	3.14
TYPES—article	318
TYPES—proceedings paper	75
TYPES—review	14

3.2 Three Field Plot

Three Field Plot shows an overall overview of 478 articles about author country (left column), author (middle), and keywords (right column). As shown in Fig. 1, the United States, China, Poland, and Singapore rank high for academic contributions to supply chain disruptions. Among them, Sawik T scholars from Poland have made the greatest contribution to the study of supply chain disruption, with 16 papers. In addition, other scholars have focused on supply chain disruptions, risk management, and the interconnections between the latest supply chain disruptions and outbreaks. Also, it includes not only developing countries, but also developed countries. These findings reveal global knowledge networks, demonstrating the importance attached to the risks posed by supply chain disruptions in both developed and developing countries.

3.3 Analysis of Authors Keywords

Using VOSviewer software to construct a co-citation graph of author keywords, as shown in Fig. 2, to study the connection of related author keywords. This time, the first 27 important keywords were selected for visual analysis and divided into 6 color clusters. The purple cluster has the most obvious proportion but fewer nodes in the graph. Within the cluster, supply chain disruption, COVID19 and AI are respectively. Among them, the two nodes of supply chain disruption and COVID19 have become the most popular keywords cited, which shows that researchers attach great importance to this field driven by the epidemic environment. The red cluster acts as a bridge between the purple and green clusters, linking the two more closely, covering topics such as supply chain management, disruption management, and supply chain coordination, thus

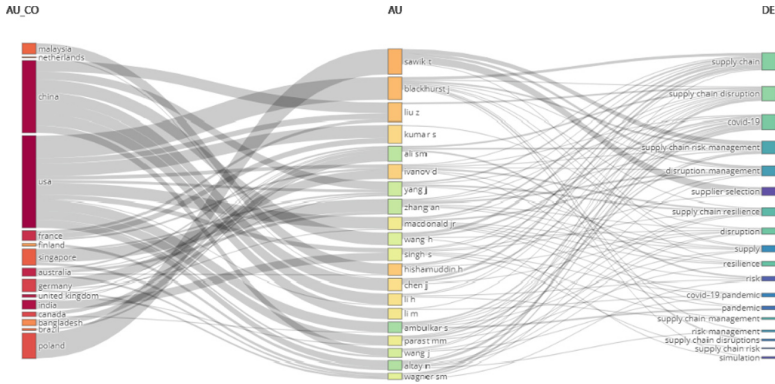


Fig. 1. Three Field Plot

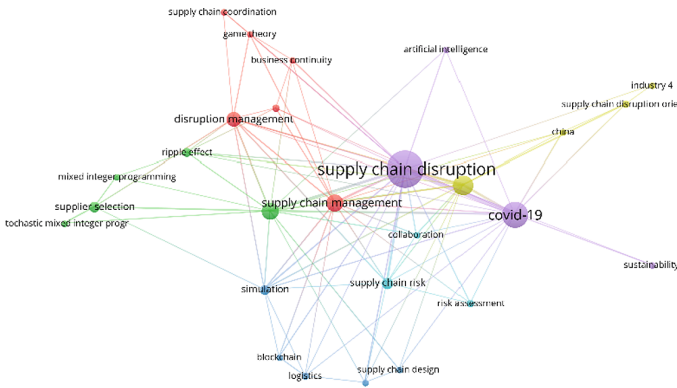


Fig. 2. Co-citation graph of author keywords

showing that researchers are well aware of the importance of managing decisions. The green cluster includes supply chain risk management, supply selection, and so on. The blue cluster contains supply chain risk, design, vulnerability, blockchain. Although the yellow cluster is inconspicuous regarding the number of citations, it maintains external linkages, including resilient supply chains, China and supply chain disruptions. Although it does not have much advantage in citation volume and external correlation density, it can independently become an important keyword on the visualization graph. It shows that the key research point of the emerging influx is a detail that cannot be ignored in this field in the future.

3.4 Factorial Analysis of Word Map

Figures 3 and 4 show the results of a factorial analysis of the research area and conceptual structure using the Multiple Correspondence Analysis (MCA) method provided by Bibliometrix software. Four sets of keywords were identified, corresponding to the most contributing papers, as follows: (1) global and industry; (2) disruption risk and

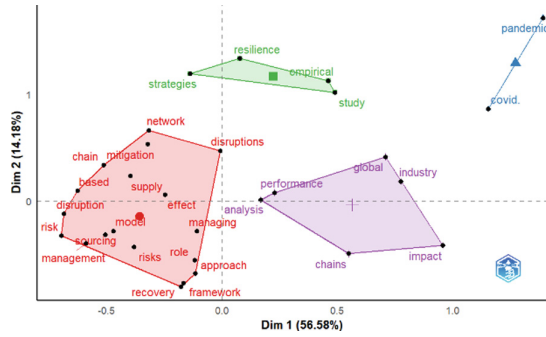


Fig. 3. Multiple Correspondence Analysis (MCA): word map

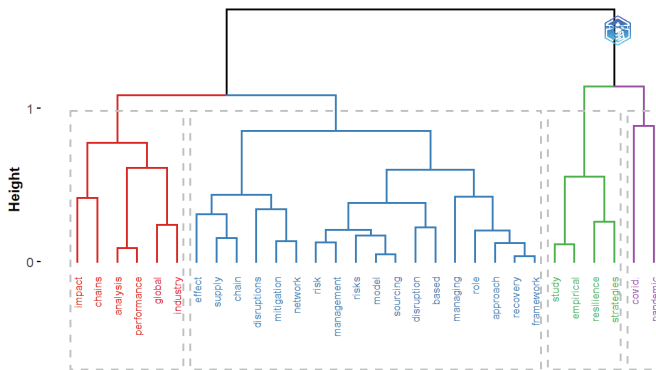


Fig. 4. Multiple Correspondence Analysis (MCA): topic dendrogram

management; (3) resilience and empirical research; (4) Epidemic. Given that the first dimension in the MCA results accounts for 55.86% of the total explanatory variance, the overall results of this analysis can be used to cluster popular keywords.

4 Conclusions

Digital platforms can provide organizations with the tools and capabilities they need to better manage and respond to supply chain disruptions, helping to ensure continuity of their operations and protect their bottom line. Digital platforms can help organizations manage and survive supply chain disruptions in several ways:

1. **Visibility:** Digital platforms can provide real-time visibility into order status, inventory levels, and other critical supply chain data. It can help organizations quickly identify potential disruptions and proactively mitigate their impact.
2. **Collaboration:** Digital platforms can facilitate communication and collaboration between parties in the supply chain, such as suppliers, manufacturers, and logistics providers. It can help organizations quickly coordinate efforts to address disruptions and ensure that products and materials flow smoothly through the supply chain.

3. Flexibility: Digital platforms can help organizations to quickly adjust their operations and supply chain strategies to respond to disruptions. They may use digital platforms to quickly transfer orders to alternative suppliers or reroute goods to avoid delays.
4. Predictive analytics: Digital platforms can leverage data analytics and machine learning to predict potential disruptions and help organizations proactively prepare.

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