DSI DATA SCIENCE AND INFORMETRICS
VOL.3, NO.3, AUG. 2023

RESEARCH ARTICLE

Decision–making in blockchain–enabled supply chain: A systematic literature review

Jianhu Cai[a], Mengyuan Yang[a], Feiying Jiang[b*], Zhengang Cao[a], Lishuang Jia[c]

a. School of Management, Hangzhou Dianzi University, Hangzhou, China
b. School of Management, Huazhong University of Science & Technology, Wuhan, China
c. School of Management, Zhejiang University of Technology, Hangzhou, China

ABSTRACT

In the digital economy era, the blockchain-enabled supply chain (SC) has become a popular research topic. However, systematic research on the application of blockchain technology in SCs remains inadequate. Accordingly, this study aims to review the literature on the blockchain-enabled SC from the following three perspectives: (*i*) application of blockchain traceability in SC management, (*ii*) model of blockchain-enabled SC competition, and (*iii*) design of coordination mechanism in the blockchain-enabled SC. Several future research directions related to the blockchain-enabled SC are also presented. The findings provide academic and practical insights into the blockchain-enabled SC.

KEYWORDS

Blockchain; Supply chain management; Coordination mechanism; Supply chain competition; Model

1 Introduction

Information technology, such as ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management), has been widely used and has proven to benefit companies (Ruivo et al., 2020; Sun & Tan, 2022). However, given the development in the economy and technology, companies need the inflow of more technical factors to maintain their competitive edge (X. Li et al., 2022). Currently, digital technology, such as cloud computing, big data, Internet of Things, and blockchain, is becoming increasingly mature (Iansiti & Lakhani, 2014; Paschou et al., 2020; Wang & Chang, 2021). Following the deep evolution of information technology, digital technology is seen as an effective approach for improving the operational efficiency of companies. For instance, investigating data on 1065 French companies, Cette et al. (2022) find that the adoption of digital technology increases the production efficiency of companies by around 17%. Digital technology can change the operation mode of traditional and modern service industries. In economic development, the changes caused by the application of digital technology are leading to fundamental transformations in almost all economic entities driven by digital technology. Digitalization is triggering various changes in the

* Corresponding Author: jiangfy_2022@yeah.net

market (Matt et al., 2015). With the gradual penetration of digital technology in various fields, the application of digital transformation in the supply chain (SC) is becoming an inevitable trend (Jabbour et al., 2020).

Blockchain is a typical digital technology (Nakamoto, 2008; Casey & Wong, 2017). At present, there is widespread adoption of blockchain technology (BT) in SC management. Empirical evidence suggests that BT can help achieve SC resilience. For example, BT has the potential to enhance food safety and quality. Jingdong collaborates with some food companies (e.g. Danone and Ocean Spray) to leverage BT for cross-border traceability, enabling the tracking of processing, transportation, and sales[1]. Information about the source of food products and their testing reports can be obtained by scanning the product's QR code. Blockchain can also be used in SC finance. FreightWaves and Mastercard partner to enhance transparency and security in freight payment through the utilization of BT, thereby ensuring secure and trustworthy transactions among all involved parties[2]. Against this background, we conduct a detailed investigation into BT based on existing literature, to explore the potential applications and challenges that may arise in SC transformation under the rapid development of digital technology.

The rest of this paper is organized as follows. We provide a blockchain overview and literature classification in Section 2. The research methodology is presented in Section 3. Section 4 analyzes this literature review. Section 5 derives the future directions and research implications.

2 Blockchain overview

Blockchain is a typical digital technology initially proposed by Japanese scholar Satoshi Nakamoto in 2008 (Nakamoto, 2008). BT can benefit companies because companies can disclose relevant information more easily and accurately by applying BT. After gradually clarifying the application prospects of BT, scholars at home and abroad are conducting extensive research related to the blockchain (Casey & Wong, 2017). To address the information asymmetry issue in the rental services industry, Choi et al. (2020), Xu and He (2021), and Wang et al. (2021) investigate how BT affects information disclosure among SC members. In a duopoly competition context, Song et al. (2022) explore the conditions under which two competing e-commerce sellers implement BT. They show that e-commerce sellers choose to implement BT as long as the product trust of consumers is low or the cost of implementing BT is low. Yan et al. (2022) construct a competitive SC model with one manufacturer, two suppliers, and a group of retailers to explore the impact of BT on information collaboration and SC operating costs. Further analysis reveals that BT is effective in lowering SC operating costs; however, the presence of too many or too few information-sensitive retailers can reduce the value of blockchain usage.

Currently, more and more scholars are focusing on the impact of BT on SCs. Accordingly, a series of research works have been conducted. There exists literature that presents the current status and future development trend of BT applications in SCs based on an analysis of specific cases (Pournader et al., 2018; Nir Kshetri, 2018; Queiroz et al., 2020). Pournader et al. (2018) outline the current status of BT application in SC management and examine the possibilities of BT in industry and services. Nir Kshetri (2018) cites specific cases regarding BT ap-

1 https://www.sohu.com/a/227159344_237556

2 https://www.freightwaves.com/news/2017/10/31/mastercard-opens-its-blockchain-to-developers-for-cross-border-payments

plications in some companies (such as Alibaba, Walmart, and Everledger) to propose how BT affects SC management objectives (such as SC operating cost, reliability, risk, sustainability, and flexibility). By summarizing and analyzing the relevant literature from 2008 to 2018, Queiroz et al. (2020) propose that the integration of BT and SC management is in its infancy, and scholars and practitioners have yet to fully realize how BT will disrupt traditional business models. Additionally, it is expected that BT can be used in SC finance (Dong et al., 2022; Saberi et al., 2019), combating copycats (Shen et al., 2021), et cetera. Research in these fields also requires attention. In SC management, blockchain traceability has received major attention from companies (Niya et al., 2019; Zhu & Kouhizadeh, 2019; Dai et al., 2020). For example, Walmart partners with IBM to enable BT that reduces the tracking time of food products from days to minutes, thereby improving the safety and traceability of food products (Kshetri, 2018). Using blockchain traceability to enable products anti-counterfeit traceability, Jingdong has increased the repurchase rate of fresh products by 47.5% and sales of nutritional health products by 29.4%. Moreover, because BT is a distributed digital ledger technology that allows transparency, traceability, and security, blockchain traceability can play an essential role in global SC management (Wang et al., 2019).

Overall, BT is effective in improving the transparency of information among SC members to a certain extent, supporting SC members to obtain information more accurately and make more accurate operational decisions. However, the application of BT is complex and influenced by various factors such as BT input cost (Giovanni et al., 2020), product greenness (Xu et al., 2021), consumers' sensitivity to product traceability (Zhang et al., 2022), and government subsidies (Xu & Duan, 2022). Therefore, with the introduction of BT, how to optimize and coordinate the SC remains a key issue for companies to consider (Liu, 2022; Z. Li et al., 2022). To address the aforementioned issues, this study carries out a literature overview from three main research directions, as shown in Figure 1.

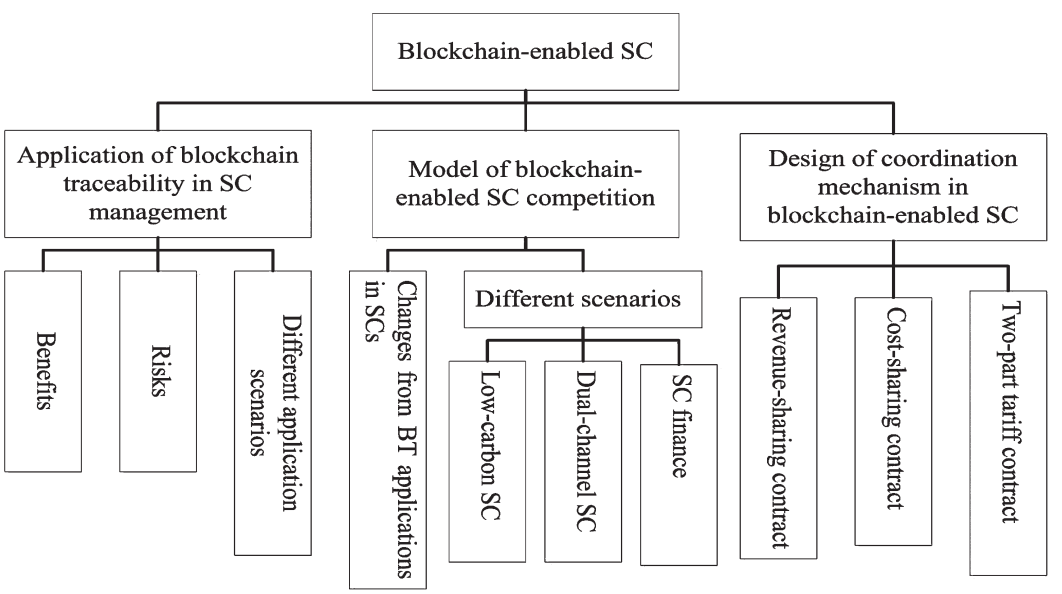

Figure 1 Literature classification

3 https://baijiahao.baidu.com/s?id=1662664563931938736&wfr=spider&for=pc.

3 Research methodology

The main purpose of this study is to review existing literature on blockchain-enabled SC, thereby determining key issues and directions for future research on blockchain-enabled SC.

3.1 Research scope

We gain a comprehensive understanding of the current research status through the delimitation of the research scope. Since blockchain is initially proposed by Satoshi Nakamoto in 2008, we review papers published between 2008 and February 2023. A search for studies using the keywords "blockchain" and "supply chain" on the Web of Science yielded 2821 papers. Consistent with previous literature (Das & Jharkharia, 2018), we only select papers published in peer-reviewed academic journals. we focus on operations management and consequently select the most relevant papers, resulting in a final sample of 60 suitable papers. The subsequent analysis is based on the 60 sample papers.

3.2 Sample analysis

We first analyze the research trend in blockchain-enabled SC. As shown in Figure 2, in terms of the publication year, the earliest significant contribution can be traced back to 2017. This is because the practical applications of BT are not clearly delineated until after 2017 (Casey & Wong, 2017). 85% of the papers reviewed in this paper are published after 2020, which is consistent with the fact of the growing emphasis on blockchain-enabled SC.

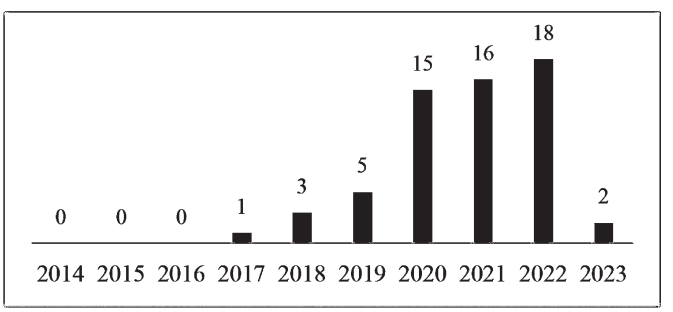

Figure 2 Distribution of studies by publication year (as of February 2023)

As stated in Section 3.1, we prioritized peer-reviewed journal papers to ensure data quality. The 60 sample papers are published across 38 different journals. Figure 3 shows the top 10 journals published in the blockchain-enabled SC. It can be inferred that blockchain-enabled SC is an interdisciplinary research field, as evident from the fact that the journals that published relevant articles are primarily from operations and supply chain management (e.g., *International Journal of Production Research*), environmental science (*Journal of Cleaner Production*), and decision science (e.g., *Annals of Operations Research*). Among 38 journals, the quartet consisting of *International Journal of Production Research, Transportation Research Part E: Logistics and Transportation Review, Annals of Operations Research*, and *International Journal of Production Economics* (i.e., top 4 journals) constitutes a significant proportion, accounting for one-third of the total journals. Notably, *International Journal of Production Research* provides the most papers.

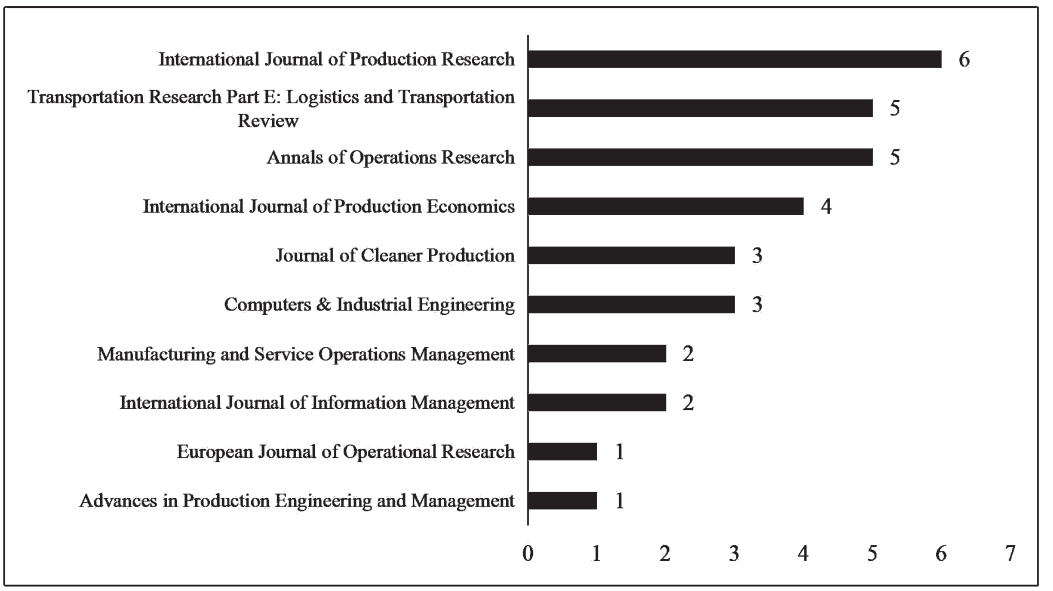

Figure 3 Distribution of studies by journal (Top 10)

4 Literature overview

This study is related to the following three streams of research: application of blockchain traceability in SC management, model of blockchain-enabled SC competition, and design of coordination mechanism in the blockchain-enabled SC. Next, we conduct a detailed analysis based on the sample literature.

4.1 Application of blockchain traceability in SC management

Given that the information on the blockchain cannot be tampered with, using BT for traceability can ensure the authenticity of product information. More and more scholars are studying the prospects of blockchain traceability in SC management from different perspectives. Niya et al. (2019) propose that BT can help companies track their products through the stages of production, processing, transportation, storage, and sales in the SC. Given that product management requires information and data support from all components in the SC, Zhu and Kouhizadeh (2019) stress that BT can support efficient product management work through its characteristics of traceability, transparency, security, and accuracy. In a competitive SC with product recalls, Dai et al. (2020) show that two competing manufacturers can invest in blockchain traceability to reduce the product's recalling probability.

It is necessary to highlight that blockchain traceability can be applied to solve the problems of counterfeit and copycat products that are apparent in the current market. Luxury companies often face challenges caused by counterfeiting. BT can prevent data tampering and enable transaction traceability; therefore, it can be applied to conduct anti-counterfeiting activities (Toyoda et al., 2017). In response to the challenges of counterfeiting, De Boissieu et al. (2017) argue that luxury companies can adopt BT to ensure the traceability of luxury products, consequently building consumer trust and improving companies' profitability. Shen et al. (2021) investigate the effectiveness of BT in combating imitators of branded companies in the SC. Their results show that selling products on a blockchain-enabled plat-

form can effectively combat imitators when there is a sufficient number of novice consumers in the market.

The aforementioned studies have proven that, under different scenarios, blockchain traceability can benefit SCs to some extent. However, blockchain traceability can also bring potential risks for SC management, which is alarming. For example, given the development in the economy and technology, new capital investments are required from companies to solve the scalability-related issues in blockchain traceability (Helo & Hao, 2019). High visibility in blockchain traceability may result in problems related to data security and privacy (Karakas et al., 2021). In the case of incorrect data entry, the data cannot be corrected because of the immutable nature of the blockchain traceability system (Kamble et al., 2020).

There is variability in the application of BT across different scenarios. Therefore, many scholars are studying blockchain-enabled SC operations for specific industry contexts. In the luxury SC, Choi (2019) applies BT to the process of diamond identification and certification, and emphasizes the value of blockchain-enabled platforms by comparing SC performance under traditional retail networks and blockchain-enabled platforms. Feng et al. (2020) argue that traceability plays a crucial role in food quality and safety management. Moreover, they explore the future directions and challenges of blockchain-enabled food traceability systems. Niu et al. (2021c) investigate how blockchain-based traceability systems can be applied to address agricultural pollution in an agricultural SC. Furthermore, by applying BT to the medicine SC, Niu et al. (2021a) assume that consumers have access to information about the whole process of medicine distribution. Based on this assumption, they suggest that the application of BT always benefits consumers and society.

The aforementioned literature shows that blockchain traceability can provide SC members and consumers with clear and authentic information, which enables SCs to gain considerable economic benefits and effectively enhance social benefits in most cases. However, it is also necessary to pay attention to the potential risks of BT applications. After weighing the inputs and outputs, BT is being applied to more and more SC operations, and companies in the blockchain-enabled SC are gradually starting to compete and cooperate in the context of BT.

4.2 Model of blockchain–enabled SC competition

BT can lead to changes in the competition and cooperation strategies among SC members. The study on combining BT with SC management to build competitive models is becoming popular. In a SC involving a group of sellers, a platform selling secondhand products, and a supplier offering new products, Shen et al. (2020) explore the competition between new and secondhand products with BT. They find that the blockchain-enabled platform is inclined to sell secondhand products with medium and true perceived quality with BT, while the platform without BT support is inclined to sell secondhand products with low uniqueness and low quality (or high uniqueness and high quality). Giovanni et al. (2020) investigate the supplier's optimal service effort level and the retailer's optimal order quantity and sales price in a competitive SC. They find that SC members face delivery and service risks and higher transaction costs without BT; however, using BT, these risks are mitigated and transaction costs are reduced. Wu et al. (2020) study the application of BT in two competing SCs. They construct two SCs with one manufacturer and one retailer to discuss conditions where two competing SCs adopt BT. Moreover, their findings further suggest that when both SCs adopt BT, one SC can gain a competitive advantage if its retailer pays a higher cost for blockchain-enabled traceability than the other.

Some scholars have studied the competitive model of the low-carbon SC based on BT. Currently, reducing carbon emissions is becoming a social consensus. An increasing number of companies and consumers are focusing on low-carbon products. Given the situation, BT can be expected to play a key role in supporting the low-carbon transformation process of companies (Khan et al., 2021). Xu and Duan (2022) establish a SC with one manufacturer and one retailer to address the uncertainty of consumer valuation on green products. They find that the retailer and consumers can always benefit from BT adopted by the manufacturer. P. Liu et al. (2021) propose that the cooperation between the manufacturer and retailer to invest in-demand information and traceability services is the best strategy for enabling a low-carbon SC. Constructing game models, several scholars research the impact of BT on low-carbon SC members' operational decisions and environmental performance under different carbon regulatory policies, such as cap-and-trade regulation (Xu & Choi, 2021) and carbon tax (Choi, 2022; Prajapati et al., 2022).

BT also provides important implications for decision-making in the dual-channel SC, and the relevant research in this area has received many scholars' attention. Y. Liu et al. (2021) and Zhang et al. (2023) investigate how BT affects the choice of selling channels for dual-channel SC members. In a dual-channel SC where a multinational company can sell its product to customers through its own retail division or an e-tailer, Niu et al. (2021a) investigate the effects of channel competition and regional tax disparity on multinational companies' preference regarding BT application in the SC where a multinational company can sell its product to customers through its own retail division or an e-tailer. Zhang et al. (2022) investigate a dual-channel SC where one manufacturer can sell standard products through an offline retailer or sell traceable products through a blockchain-enabled online channel. Based on three dual-channel models (i.e., traditional retailer model, manufacturer online direct sales model, and third-party e-commerce distribution model), Jiang and Liu (2022) investigate SC members' optimal strategies for joint investment in abatement technology and BT.

Given that BT has been proven to facilitate SC finance, some scholars start to conduct research on blockchain-enabled SC finance. For example, Hofmann et al. (2018) argue that BT has a significant effect on optimizing companies' business processes, improving SC finance operations, and reducing financing costs. Saberi et al. (2019) find that BT can eliminate the information barriers among SC members, which helps optimize the operational process of SC finance and reduces transaction costs. Constructing a three-stage SC consisting of a tier 1 supplier, a tier 2 supplier, and a manufacturer, Dong et al. (2022) find blockchain-enabled entrustment financing can benefit all SC members when the tier 2 supplier is severely capital-constrained.

4.3 Design of blockchain–enabled SC coordination mechanism

BT enables new challenges in the design of SC coordination mechanisms. Currently, some scholars are designing relevant contracts to enhance the cooperative relationship among SC members and SCs'competitiveness. Among various contracts, revenue-sharing and cost-sharing contracts have been widely used by scholars to enhance blockchain-enabled SC performance. R. Liu et al. (2021), Z. Li et al. (2022), and Fan et al. (2022) design a revenue-sharing contract that enables the blockchain-enabled SC to achieve Pareto improvement under certain conditions. Liu et al. (2020) and Hayrutdinov et al. (2020) design a revenue-sharing contract and a cost-sharing contract to coordinate the blockchain-enabled SC, and then discuss the coordination effects of the two contracts. Liu et al. (2020) show that

both contracts can coordinate the blockchain-enabled SC. Hayrutdinov et al. (2020) explore the coordination mechanism in a blockchain-enabled SC consisting of one supplier and one retailer and find that both revenue-sharing and cost-sharing contracts can help SC members maintain a long-term cooperative relationship.

In addition to the revenue-sharing and cost-sharing contracts, the two-part tariff contract is also used in blockchain-enabled SC coordination mechanisms (Xu et al., 2021; Zhou et al., 2022). Xu et al. (2021) study a blockchain-enabled SC consisting of a manufacturer and a retailer and analyze SC members' optimal pricing decisions. They have found that the two-part tariff contract can achieve a "win-win" outcome for both the manufacturer and retailer in terms of profits. Given that BT contributes to product information disclosure, Zhou et al. (2022) design a two-part tariff contract to coordinate blockchain-enabled SC members and find that the two-part tariff contract can effectively incentivize platforms to improve the quality of the disclosed information.

Given that this study concerns decision-making in the blockchain-enabled SC and model construction is a very common approach to conducting decision-making research, we further summarize the representative model-based literature in Table 1 to pinpoint the differences.

Table 1 Summary of some representative model-based literature

Articles	SC industry	Research area	Coordination mechanism			The impact of BT application
			Revenue–sharing contract	Cost–sharing contract	Two–part tariff contract	
Shen et al. (2021)	No specific industry	Combating imitators	×	×	×	BT is effective in combating imitators.
Niu et al. (2021c)	Agricultural SC	Agricultural pollution	×	×	×	BT enables better SC economic sustainability and customer surplus performance.
Niu et al (2021a)	Medicine SC	Medicine distribution	×	×	×	BT always benefits consumers and society.
Giovanni et al. (2020)	No specific industry	Choice of BT adoption	√	×	×	Delivery and service risks are avoided and transaction costs are reduced with BT.
Xu and Choi (2021)	Low–carbon SC	Carbon emission reduction	×	×	√	The ability of BT to enhance profitability and consumer surplus depends on the cross – channel effect.
Y. Liu et al. (2021)	Fresh SC	Dual–channel competition	√	×	×	BT enables increased profits in the SC.
Xu and Duan (2022)	Low–carbon SC	Pricing and greenness investment	×	×	×	Social welfare will be improved when the manufacturer invests in BT.
Z. Li et al. (2022)	Luxury SC	Information disclosure	√	×	×	BT enables companies to benefit from product information disclosure.
Zhou et al. (2022)	Tourism O2O SC	Information disclosure	×	×	√	Adopting BT is beneficial to SC members under certain conditions.

Articles	SC industry	Research area	Coordination mechanism			The impact of BT application
			Revenue–sharing contract	Cost–sharing contract	Two–part tariff contract	
Fan et al. (2022)	No specific industry	Choice of BT adoption	√	×	×	BT can fulfil consumers´ requirement for product traceability.
Choi (2019)	Luxury SC	Authentication and certification	×	×	×	Selling products through a blockchain –enabled platform can bring more benefits to manufacturers and consumers than traditional jewelry retail stores.
Hayrutdinov et al. (2020)	No specific industry	Contractual coordination	√	√	×	Sharing product lifecycle information through a blockchain –enabled system increases the whole SC´s profit.

5 Conclusion

From a comprehensive overview of the aforementioned literature, it is obvious that numerous scholars have conducted several studies on blockchain-enabled SC management. They study the competition and cooperation mechanisms among blockchain-enabled SC members from novel perspectives. However, combining the aforementioned literature analysis with the comparison of current SC practices, we find that there remain many research directions related to the blockchain-enabled SC that are worthy of continued exploration.

First, BT can be applied across different industries that have received less coverage in the aforementioned literature. BT can accurately record a variety of information, which helps SC members to make more profitable decisions (e.g., pricing, production, ordering, etc.), meanwhile, the demand for BT exists in all industries. Scholars are currently studying issues related to blockchain-enabled competition and cooperation in different SCs, such as the agricultural SC (Niu et al., 2021c), luxury SC (Choi, 2019; Z. Li et al., 2022), and medicine SC (Niu et al., 2021a). However, the apparel SC and new energy vehicle SC remain underexplored. SCs often exhibit distinctive industry characteristics, and the role played by BT varies across different types of SCs. The impact of BT applications on blockchain-enabled SC operations needs to be comprehensively analyzed based on their practice. Therefore, future research can be extended to address industry-specific issues, such as those pertaining to the apparel and new energy vehicle SC.

Second, scholars have mainly studied the issues related to blockchain-enabled SC management under information symmetry, and rarely under information asymmetry. In fact, the introduction of BT does not fully enable information-sharing among SC members. For example, product quality information is private information for companies, and as long as companies are unwilling to share it, even if BT is introduced, this information cannot be accessed by other members (Chod et al., 2020). Therefore, future research can further focus on information-sharing among SC members with the introduction of BT.

Third, some scholars are starting to focus on mechanisms regarding how BT affects the application of SC finance models. However, further research is needed in this field. The current research mainly considers that the capital of SC members is sufficient. It is also less likely to

use a model construction approach to study companies' financing strategies in a blockchain-enabled SC. In fact, the combination of SC finance and BT is of great significance in addressing many common problems in traditional finance, such as information asymmetry and mismatch between supply and demand. It has been shown that BT can optimize the operational processes in SC finance (Saberi et al., 2019). Therefore, future research can also focus on mechanisms regarding how BT affects the financing mode of SCs across different industries and use the model construction method to study how to effectively address the financing problems of companies with BT support.

References

Boissieu, E., Kondrateva, G., Baudier P., & Ammi, C. (2021). The use of blockchain in the luxury industry: Supply chains and the traceability of goods. *Journal of Enterprise Information Management, 34* (5), 1318–1338.

Casey, M.J., & Wong, P. (2017). Global supply chains are about to get better, thanks to blockchain. *Harvard business review, 13*, 1–6.

Cette, G., Nevoux, S., & Py, L. (2022). The impact of ICTs and digitalization on productivity and labor share: Evidence from French firms. *Economics of Innovation and New Technology, 31* (8), 669–692.

Chod, J., Trichakis, N., Tsoukalas, G.,Aspegren, H., & Weber, M. (2020). On the financing benefits of supply chain transparency and blockchain adoption. *Management Science, 66* (10), 4378–4396.

Choi, T.M., Feng, L., & Li, R. (2020). Information disclosure structure in supply chains with rental service platforms in the blockchain technology era. *International Journal of Production Economics, 221*, 107473.

Choi, T.M. (2019). Blockchain–technology–supported platforms for diamond authentication and certification in luxury supply chains. *Transportation Research Part E: Logistics and Transportation Review, 128*, 17–29.

Choi, T.M. (2022). Values of blockchain for risk–averse high–tech manufacturers under government´s carbon target environmental taxation policies. *Annals of Operations Research*, In Press. doi: 10.1007/s10479–022–05030–6.

Cui, Y., Hu, M., & Liu, J. (2023). Value and design of traceability–driven blockchains. *Manufacturing and Service Operations Management*. In press. doi: 10.1287/msom.2022.1161.

Dai, B., Nu, Y., Xie, X., & Li, J. B. (2020). Interactions of traceability and reliability optimization in a competitive supply chain with product recall. *European Journal of Operational Research, 290* (1), 116–131.

Das, C., & Jharkharia, S. (2018). Low carbon supply chain: A state–of–the–art literature review. *Journal of Manufacturing Technology Management, 29* (2), 398–428.

Dong, L., Qiu, Y., & Xu, F. (2022). Blockchain–enabled deep–tier supply chain finance. *Manufacturing and Service Operations Management*, In Press. doi: 10.1287/msom.2022.1123.

Fan, Z., Wu, X., & Cao, B. (2022). Considering the traceability awareness of consumers: Should the supply chain adopt the blockchain technology?. *Annals of Operations Research, 309* (2), 837–860.

Feng, H., Wang, X., Duan, Y., Zhang, J., & Zhang, X. (2020). Applying blockchain technology to improve agri–food Trace ability: A review of development methods, benefits and challenges. *Journal of Cleaner Production. 260,* 121031.

Giovanni, P.D. (2020). Blockchain and smart contracts in supply chain management: A game theoretic model. *International Journal of Production Economics, 228*, 107855.

Hayrutdinov, S., Saeed, M.S.R., & Rajapov, A. (2020). Coordination of supply chain under blockchain system–based product lifecycle information sharing effort. *Journal of Advanced Transportation, 2020*, 5635404.

Helo, P., & Hao., Y. (2020). Blockchains in operations and supply chains: A model and reference implementation. *Computers & Industrial Engineering, 136*, 242–251.

Hofmann, E., Strewe, U.M., & Bosia, N. (2018). *Supply chain finance and blockchain technology*. Springer.

Iansiti. M., & Lakhani, K.R. (2014). Digital ubiquity: How connections, sensors, and data are revolutionizing business. *Harvard Business Review, 92* (11), 90– 99.

Jabbour, C.J.C, Fiorini, P.D., Ndubisi, N.O., Queiroz, M.M., & Piato, E.L. (2020). Digitally–enabled sustainable

supply chains in the 21st century: A review and a research agenda. *Science of the Total Environment, 725,* 138177.

Jiang, R., Kang, Y., Liu, Y., Liang, Z., Duan, Y., Sun, Y., & Liu, J. (2022). A trust transitivity model of small and medium–sized manufacturing enterprises under blockchain–based supply chain finance. *International Journal of Production Economics, 247*, 108469.

Jiang. Y., & Liu, C. (2022). Research on carbon emission reduction and blockchain investment under different dual–channel supply chains. *Environmental Science and Pollution Research, 29* (3), 1–18.

Karakas, S., Acar, AZ., & Kucukaltan, B. (2021). Blockchain adoption in logistics and supply chain: A literature review and research agenda. *International Journal of Production Research*, In Press. doi:10.1080/00207543.2021.2012613.

Kamble, S.S, Gunasekaran, A., & Sharma, R. (2020). Modeling the blockchain enabled traceability in agriculture supply chain. *International Journal of Information Management, 52*, 101967.

Khan, S.A.R, Godil, D.I., Jabbour, C.J.C, Shujaat, S., Razzaq, A., & Yu, Z. (2021). Green data analytics, blockchain technology for sustainable development, and sustainable supply chain practices: Evidence from small and medium enterprises. *Annals of Operations Research, 2021*. doi: 10.1007/s10479–021–04275–x.

Kshetri, N. (2018). 1 Blockchain´s roles in meeting key supply chain management objectives. *International Journal of Information Management, 39*, 80–89.

Li, X., Wang, Q., Huang, S., Shi, R., Han, C., & Gao, Y.(2022). The transfer strategy of digital information technology for heterogeneous manufacturers. *Journal of Organizational and End User Computing, 34* (8),1–22.

Li, Z., Xu, X., Bai, Q., & Chen., C. (2022). Optimal joint decision of information disclosure and ordering in a blockchain–enabled luxury supply chain. *Annals of Operations Research, 2022*. doi: 10.1007/s10479–022–04703–6.

Liu, H. (2022). Combating unethical producer behavior: The value of traceability in produce supply chains. *International Journal of Production Economics, 244*, 108374.

Liu, P., Cui, X., Zhang, Z., Zhou, W., & Long, Y. (2021). Pricing strategies of low–carbon enterprises in the Yellow River Basin considering demand information and traceability services. *Kybernetes, 52* (1), 304–327. doi: 10.1108/K–06–2021–0529.

Liu, P. (2022). Investment strategies and coordination for green food supply chain: A further research considering the inputs of the blockchain–based traceability system. Available at SSRN: http://dx.doi.org/10.2139/ssrn.4105132

Liu, P., Long, Y., Song, H., & He, Y. (2020). Investment decision and coordination of green agri–food supply chain considering information service based on blockchain and big data. *Journal of Cleaner Production, 277*, 123646.

Liu, Y., Ma, D., Hu, J., & Zhang, Z. (2021). Sales mode selection of fresh food supply chain based on blockchain technology under different channel competition. *Computers & Industrial Engineering, 162*, 107730.

Liu, R., Tan, C., & Zhao, C. (2021). Pricing and coordination of vaccine supply chain based on blockchain technology. *Internet Research, 31* (6), 2096–2119.

Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business and Information Systems Engineering, 57*, 339–343.

Nakamoto, S. (2008). *Bitcoin: A peer–to–peer electronic cash system.* White Paper, from https://bitcoin.org/bitcoin.pdf.

Niu, B., Dong J., & Liu, Y. (2021a). Incentive alignment for blockchain adoption in medicine supply chains. *Transportation Research Part E: Logistics and Transportation Review, 152*, 102276.

Niu, B., Mu, Z., Cao, B., & Gao, J. (2021b). Should multinational firms implement blockchain to provide quality verification?. *Transportation Research Part E: Logistics and Transportation Review, 145*, 102121.

Niu, B., Shen, Z., & Xie, F. (2021c). The value of blockchain and agricultural supply chain parties´ participation confronting random bacteria pollution. *Journal of Cleaner Production, 319*, 128579.

Niya, S.R, Dordevic, D., Nabi, A.G, Mann, T., & Stiller, B. (2019). A platform–independent, generic–purpose, and blockchain–based supply chain tracking. *IEEE International Conference on Blockchain and Cryptocurrency ICBC19,* 2019, 11–12.

Paschou, T., Rapaccini, M., Adrodegari, F., & Saccani, N. (2020). Digital servitization in manufacturing: A systematic literature review and research agenda. *Industrial Marketing Management, 89*, 278–292.

Pournader, M., Shi, Y., Seuring, S., & Koh, S.C.L. (2020). Blockchain applications in supply chains, transport and logistics: A systematic review of the literature. *International Journal of Production Research, 58* (7), 2063–2081.

Prajapati, D., Jauhar, S. K., Gunasekaran, A., Kamble, S. S., & Pratap, S. (2022). Blockchain and IoT embedded sustainable virtual closed–loop supply chain in E–commerce towards the circular economy. *Computers & Industrial Engineering, 172*, 108530.

Queiroz, M. M, Telles, R., & Bonilla, S. H. (2020) Blockchain and supply chain management integration: A systematic review of the literature. *Supply Chain Management, 25*(2), 241–254.

Ruivo, P., Johansson, B., Sarker, S., & Oliveira, T. (2020). The relationship between ERP capabilities, use, and value. *Computers in Industry, 117*, 103209.

Saberi, S., Kouhizadeh, M., Sarkis, J, & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research, 57*(7), 2117–2135.

Shen, B., Dong, C., & Minner, S.(2021). Combating copycats in the supply chain with permissioned blockchain technology. *Production and Operations Management, 31*(1), 138–154.

Shen, B., Xu, X., & Yuan, Q. (2020). Selling secondhand products through an online platform with blockchain. *Transportation Research Part E: Logistics and Transportation Review, 124,* 102066.

Song, Y., Liu, J., Zhang, W., & Li, J. (2022). Blockchain´s role in e–commerce sellers´ decision–making on information disclosure under competition. *Annals of Operations Research, 2022*. doi: 10.1007/s10479–021–04276–w.

Sun, Y., & Tan, X. (2022). Customer relationship management based on SPRINT classification algorithm under data mining technology. *Computational Intelligence and Neuroscience, 31* (8), 669–692.

Toyoda, K., Mathiopoulos, P.T., Sasase I., & Ohtsuki, T. (2017). A novel blockchain–based product ownership management system (POMS) for anti–counterfeits in the post supply chain. *IEEE Access, 5*, 17462–17477

Wang, Y., & Chang, J. (2021). Future development trend of "New Retail" and E–commerce based on big data. *Journal of Physics: Conference Series, 1852* (3), 032029.

Wang, Y., Han, J. H., & Beynon–Davies, P. (2019). Understanding blockchain technology for future supply chains: A systematic literature review and research agenda. *Supply Chain Management, 24*, 62–84.

Wang, Y., Tao, F., & Wang, J. (2021). Information disclosure and blockchain technology adoption strategy for competing platforms. *Information and Management, 59* (7), 103506.

Wu, X., Fan, Z., & Li, G. (2022). Strategic analysis for adopting blockchain technology under supply chain competition. *International Journal of Logistics: Research and Application, 26* (10), 1384–1407. doi: 10.1080/13675567.2022.2058473.

Xu, J., & Duan, Y. (2022). Pricing and greenness investment for green products with government subsidies: When to apply blockchain technology?. *Electronic Commerce Research and Applications, 51*, 101108.

Xu, Q., & He, Y. (2021). Optimal information disclosure strategies for a retail platform in the blockchain technology era. *International Journal of Production Research, 61* (11), 3781–3792. doi: 10.1080/00207543.2021.1976434.

Xu, X., & Choi, T.M. (2021). Supply chain operations with online platforms under the cap–and–trade regulation: Impacts of using blockchain technology. *Transportation Research Part E: Logistics and Transportation Review, 155*, 102491.

Xu, X., Zhang, M., Dou, G., & Yu, Y. (2021). Coordination of a supply chain with an online platform considering green technology in the blockchain era. *International Journal of Production Research, 61* (11), 3793–3810. doi: 10.1080/00207543.2021.1894367.

Yan, K., Cui, L., Zhang, H., Liu, S., & Zuo, M. (2022). Supply chain information coordination based on blockchain technology: A comparative study with the traditional approach. *Advances in Production Engineering and Management, 17* (1), 5–15.

Zhang, T., Dong, P., Chen, X., & Gong, Y. (2023). The impacts of blockchain adoption on a dual–channel supply chain with risk–averse members. *Omega–International Journal of Management Science, 114*, 102747.

Zhang, R., Xia, Z., & Liu, B. (2022). Optimal pricing decisions for dual–channel supply chain: Blockchain adoption and consumer sensitivity. *Complexity, 6*, 1–9.

Zhou, L., Tan, C., & Zhao, H. (2022). Information disclosure decision for tourism O2O supply chain based on blockchain technology. *Mathematics, 10* (12), 2119.

Zhu, Q., & Kouhizadeh, M. (2019). Blockchain technology, supply chain information, and strategic product deletion management. *IEEE Engineering Management Review, 47* (1), 36–44.