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Review

A Literature Review on the Application of Digital Technology in Achieving Green Supply Chain Management

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Abstract: Digitization and greening have become the characteristics of social and economic development. Digital technology, as a critical enabler of green supply chain management, has been widely considered and recognized by academia and business circles. With the advent of the Industry 4.0 era and the rapid development of digital technology, this emerging field of technology is constantly being updated, and so the academic research in this field is increasing but has yet to reach saturation. We systematically reviewed 144 relevant papers published in the last 14 years. We used qualitative analysis to classify, summarize and analyze the literature in two dimensions (i.e., digital technologies and green supply chain practices). Then, we continued the classification from each dimension. According to the basic characteristics, there are five digital technologies: the Internet of Things, big data, cloud computing, blockchain, and artificial intelligence. The green supply chain is divided into green procurement, green production, green consumption, and green logistics according to the essential practices of the supply chain. This study explores which digital technologies are needed in a green supply chain. The study also discusses how these technologies can reduce the input of resources and energy and the emission of pollutants, finally improving the operating efficiency of the green supply chain, and achieving economic, social, and environmental benefits.

Keywords: digital technology; green supply chain management; literature review

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1. Introduction

Digital technology involves the acquisition and integration of data and information by computer, multimedia, and communication technology. Data and information are introduced into programs to establish corresponding data models for subsequent analysis and application [1]. Green supply chain management is a trend and an innovative management tool. Most companies take "green" as the development trend, purchase raw materials with high environmental performance, produce low-carbon and recyclable finished products, sell the products consumers need, and share transportation services, finally achieving overall green development [2,3].

This study divides digital technology into the Internet of Things, big data, cloud computing, blockchain, and artificial intelligence. Specifically, the Internet of Things connects all things to transmit information between things. Then, it tracks and predicts data and information through a public information management system. These systems can be used to make accurate decisions [4–6]. Big data technology obtains a large amount of data from the Internet, selects valuable data from this large quantity, uses a model to conduct data analysis, and finds the general operation law of things. Such technology obtains the correlations between data, which provides valuable help for operators to make decisions [7–11]. Cloud computing is a form of Internet-based computing. It decomposes

vast data into a single data cluster through the network "cloud" and processes and analyzes the data cluster through a system composed of multiple servers. Finally, it integrates the calculation results [12–17]. Cloud computing has powerful computing capabilities that can process millions of data points in minutes and enable on-demand resource allocation. Blockchain technology uses the idea of decentralization and untampered data. It stores the data and information of every practice in the chain so that all stakeholders involved in the supply chain can check it, which solves the problem of mutual distrust in the supply chain and reduces the game cost. Finally, each node on the supply chain can cooperate to achieve maximum total revenue [18–24]. Artificial intelligence refers to the design of intelligent machines or algorithms with capabilities highly similar to or even far beyond the human brain. Such cutting-edge technology can realize the automation and intelligence of a particular practice [25–28].

Based on the literature, this research classifies green supply chain practices into four categories: procurement, production, consumption, and logistics [29–32]. Each practice is accompanied by capital flow and information flow. Green procurement should consider the quantity and quality of raw materials to avoid the waste of resources, which reduces costs and ensures the smooth progress of subsequent work to achieve environmental performance in procurement [33–36]. Green production refers to the practice of conducting green production processes or producing green products to meet the requirements of society and customers [37–39]. Consumers pay attention to health problems associated with food, and as a result strict checks are carried out on production practices [40–42]. Advanced production technologies could maximize the optimization of the operation process and reduce the waste of resources [43–45]. The essential thing in green consumption is on-demand production, which can accurately grasp consumers' preferences and consumption habits, developing an excellent cooperative relationship with consumers [46–48]. In the distribution stage of supply chain logistics, rapid response has become a major problem in the supply chain, and so most companies implement logistics-sharing services as a mode of green logistics. This mode can aid the choice of urgent logistics distribution services on sharing platforms and scientifically plan transportation routes [49–51].

The application of digital technology in the green supply chain has been a hot topic in academia in recent years [52]. Many scholars have extensively researched the advantages of digital technology in the green supply chain [53–55]. Traditional supply chains include push-type and pull-type supply chains. However, digital technology perfectly combines the push- and pull-type supply chains to achieve efficient operation. It changes the previous push-type supply chain with an inventory squeeze phenomenon caused by uncertain demand and a pull-type supply chain with high customer response [56–61]. A great deal of research focuses on the performance evaluation of digital technology in green supply chains and the feasibility of investing in digital technology in green supply [62–64]. Indeed, the design cost of digital technology is relatively high, and the benefits brought by digital technology are still being considered by many enterprises [65–67]. However, the application of digital technologies in the green supply chain is still in its infancy, and most practices are still in their early stages [68,69]. Many scholars have carried out digital reform, but they needed help to put the concept of digital technology into the deep implementation of green supply chains [70,71]. Much work is limited to designing and applying a specific digital technology instead of integrating various digital technologies to achieve overall intelligence [72,73]. There needs to be more research on universal mathematical models of data that can be implanted. Specific models can only solve specific problems, which increases the difficulty of information processing [74–76]. Finally, these gaps and deficiencies encourage us to review the existing literature systematically, integrate the existing knowledge, understand the research progress, and explore the future research direction [77–79].

The literature review in this paper tries to answer the following questions: (1) What digital technologies are needed in a green supply chain? (2) How can these technologies affect the green supply chain? Based on 144 relevant papers published in the last 14 years,

this study systematically draws conclusions regarding the key findings and proposes the direction of future study.

The research structure is as follows (see Figure 1): The first section introduces the background, motivation and research questions of this study. The second section describes the methods and process of searching the literature and of filtering and analyzing the key literature. The third section presents findings from the literature review and summarizes the main contents which are currently in focus in the literature. In the fourth section, the study concludes the key findings, proposes the direction of future research, and explains the significance and limitations of the research.

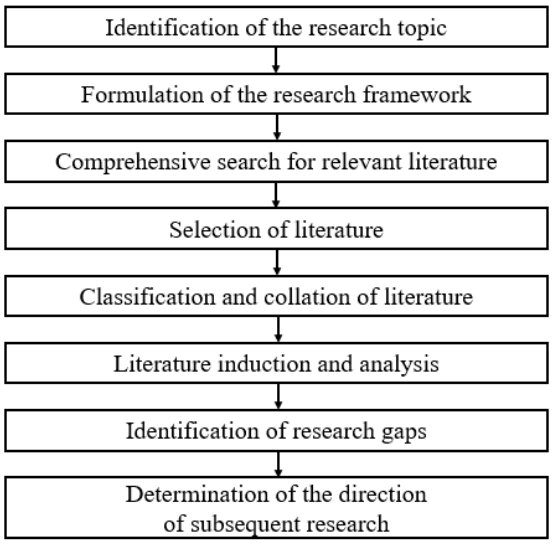


Figure 1. The research structure of this study.

2. Literature and Methods

The following is roughly divided into two parts: (1) We provide an explanation of the method of searching the literature and the reasons for selecting the corresponding databases and journals. (2) We summarize and sort the data in the search process in the form of a graph, so that readers can intuitively see the development trend of the research topic; this provides specific data support for subsequent research on this topic.

2.1. Search and Read

In order to obtain the literature related to our research topic, we searched many literature databases and conducted summaries. The specific process of searching, reviewing, and screening was as follows: (1) We searched the relevant literature related to digital technologies and green supply chain in the three databases of Web of Science, Science Direct, and Wiley, which are large-scale and comprehensive databases with multi-disciplinary and core journal citation indexes. We then began to search the top-tier OM journals in the databases (e.g., *Production and Operations Management*, *Journal of Marketing Research*, *European Journal of Operational Research*) to guarantee the quality of this study. (2) Further, we applied the retrospective method to search for the relevant literature in the above top-tier journals. Specifically, we searched topics related to digital technologies and green supply chain management and excluded the literature that only focused on environmental problems and digital algorithms. We traced the original articles and then expanded the scope of literature information one by one from the reference lists listed in this highly relevant literature. The advantages of the method include time savings, the avoidance of blind and purposeless searches, as well as the ensured quality of references and accuracy of conclusions. However, the single search method needed to be revised because it was necessary that the literature searched reflected the subject's development trend. Therefore, we searched for articles on related topics chronologically. We found literature related to the

relevant topics published in a 14-year period, from January 2009 to December 2022. This process complements the cited literature and makes the present article more persuasive. (3) Finally, we deleted the literature published in the early years of the range as well as the literature that only focused on the improvement of a microscopic algorithm in digital technology and the simple empirical study of the environment. We excluded these studies to narrow the scope of the research to be close to the topic of interest. The main literature search process is shown in Figure 2.

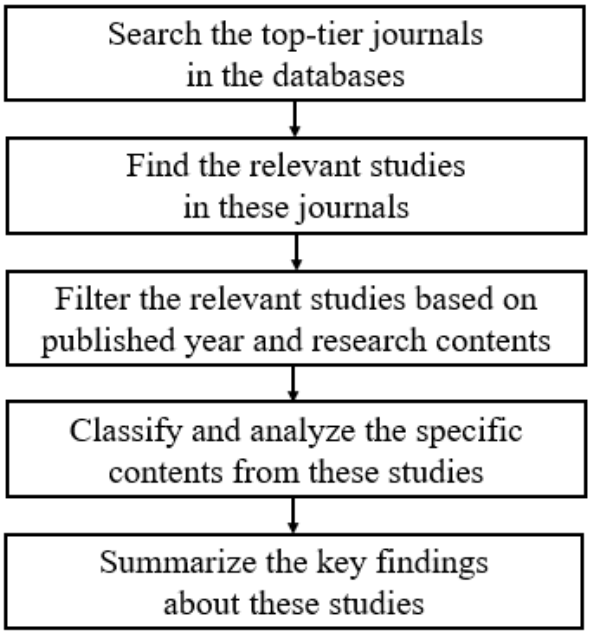


Figure 2. The literature search process.

The 144 selected research papers met the following criteria: The paper is written in English. The identified keywords (e.g., green supply chain, digital technology) appear in the title, keywords, and abstract. These kinds of study related to the application of digital technology in the green supply chain are more inclined to study the issue at the macro level—the management construction of information platforms, the layout and design of a specific digital technology in the green supply chain, and the analysis of the relevant organizational framework established by the application of digital technology in the green supply chain. It is convenient for us to find the obstacles to the implementation of digital technology in the application of green supply chains and explore the potential of this application to provide specific ideas for subsequent research.

2.2. Analysis and Synthesis

Figure 3 shows the number of relevant articles that the research initially searched for in the database using the keywords "Digital Technology" and "Green Supply Chain" in the three databases, finally yielding an initial 497 articles. Subsequently, 353 articles were read deeply and excluded from the study following consideration of their publication year and scope. We aimed to ensure that this study has a more general and complete understanding of the research topic and an overall high quantity. The application of digital technology in the green supply chain is a relatively new topic, and the number of papers related to this topic is small, which provides a quantitative basis for the feasibility of subsequent research. This figure also classifies and organizes these 497 articles according to five essential digital technologies to intuitively display which digital technologies are more prevalent in the existing research and, in contrast, which fields are currently less researched and need further development.

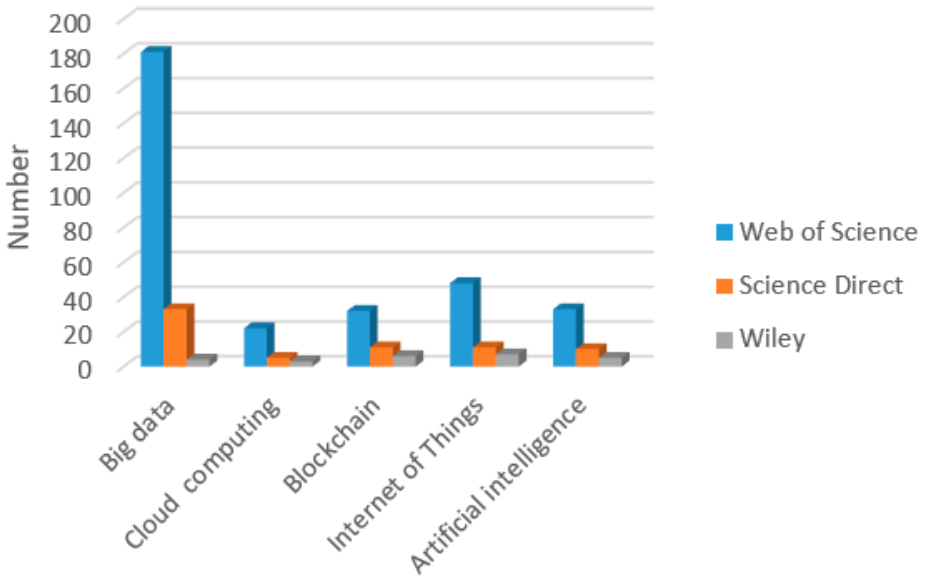


Figure 3. Quantitative distribution according to digital technologies.

Figure 4 shows the final 144 articles retained following exclusion of the studies not meeting the necessary criteria, organized by journal. It clearly and intuitively shows that most of the literature from journals was related to the environment and manufacturing, and there were also papers published in journals in the field of operations management. However, they were less in number than those from the first two journals (i.e., Computers and Operations Research and Journal of International Business Studies). In the classification process, we found that the application of digital technology in the production and manufacturing process of the entire supply chain was the main research focus, indicating that the previous research on digital technology in the green supply chain has been largely concerned with how to save energy, reduce emissions, and protect the environment. Breakthrough research is needed on cost-saving and efficiency. This provides the basis for the ideas in our article's third part.

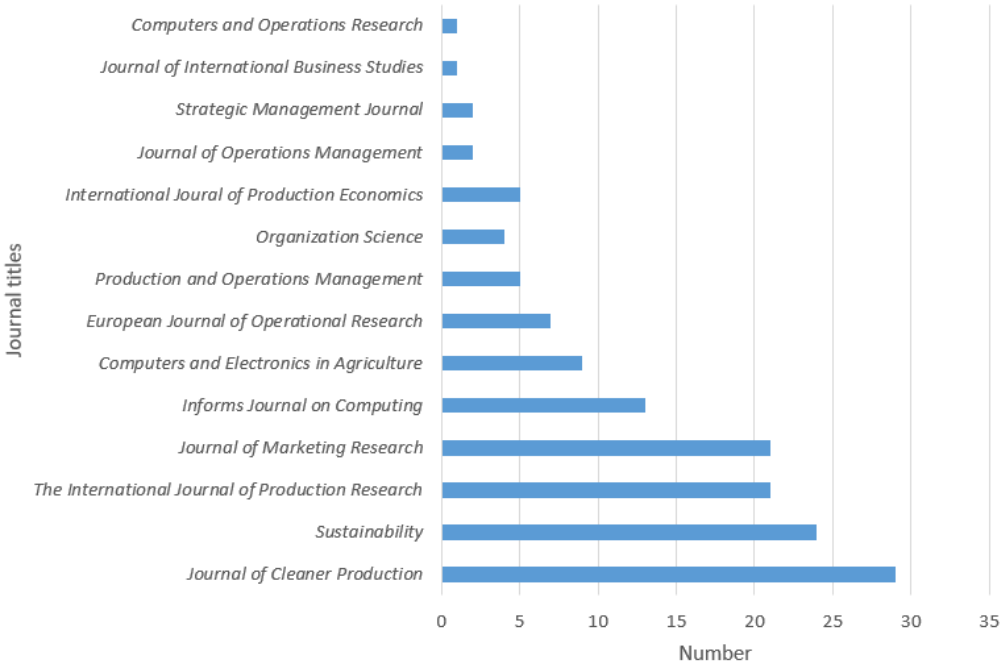


Figure 4. The 144 papers included in the present study, organized by journal.

A total of 144 articles were included in this paper, distributed from January 2009 to December 2022. Figure 5 shows the development trend of articles from 2015 to 2022 because the number of articles linking digital technology with green supply chains before 2015 was generally stable between 0 and 1, and these articles mainly focus on unilateral research on green logistics, reverse logistics, green supply chain, or digital technology. This study found that the number of papers in the past seven years has continued to increase. The growth ratio after 2019 is even faster, which indicates the continuous introduction of digital technologies in various fields due to the drive of Industry 4.0. During the pandemic, from 2020–2022, the uncertain environment forced many medium-sized businesses to adopt digital technology to achieve competitive advantages. Moreover, in line with the general trend, the concept of low-carbon green is deeply rooted in industrial development, and keeping a green supply chain is also a hot spot.

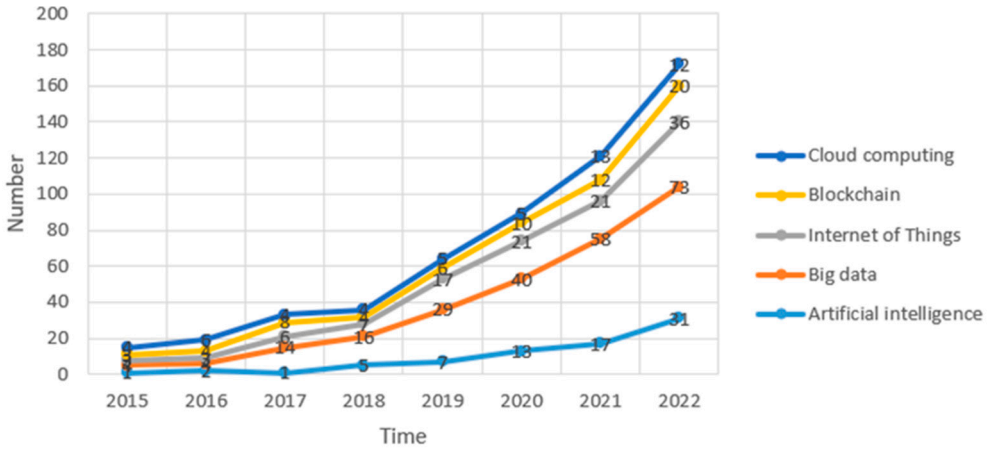


Figure 5. Trends in the topic distribution of the included 144 papers on digital technologies from 2015 to 2022.

3. Results and Discussion

This section describes our use of qualitative analysis to summarize and analyze the reviewed literature. The analysis can be categorized based on two dimensions, namely digital technology and green supply chain. We continue to subdivide them separately, ensuring the completeness of the research questions [80,81]. The specific classification is as follows: (1) The content of the research study is the application of digital technology in green supply chain; first, we split the digital technology according to five main categories, namely the Internet of Things, big data, cloud computing, blockchain, and artificial intelligence. We then summarize the application of these technologies in the specific practice of green supply chain. (2) We classify green supply chain according to the links involved, divided into four categories: green procurement, green production, green logistics, and green sales, then summarize the digital technologies that should be used in each link and draw tables for sorting.

3.1. The Application of Internet of Things Technology in Green Supply Chain

As shown in Table 1, the price and sales of raw materials in logistics procurement can be remotely understood through Internet of Things technology, so that suppliers can choose the best partners [82]. It is possible to remotely judge the quantity of shortage and demand through radio-frequency technology to accurately procure raw materials [83]. Wireless location technology can accurately predict the arrival time of raw materials.

Table 1. The application of Internet of Things technology.

Digital Technology	How to Link in Green Supply Chain	Benefits	Key References
Internet of Things technology	♢ Green procurement ♢ Green production ♢ Green consumption ♢ Green logistics	♢ The ability of the Internet of Things to obtain information in all practices of the supply chain is relatively mature, but the ability to integrate and analyze the acquired data and information needs to be improved. ♢ The construction of information platforms is extensive, but the standardization of the platforms and the subdivision of each role in the platforms need to be improved.	[82–89]

Internet of Things technology is used to track and monitor each step in the production practice. The semi-finished products are automatically identified from one process to the next according to the set procedures [67,84,90]. Therefore, the application of Internet of Things technology in procurement and production could avoid the quantity error of procurement and production caused by information asymmetry, thus preventing the waste of resources.

In consumption practices, there is the barcode information of the goods that people want to buy; people can easily enjoy door-to-door delivery by scanning the APP of the mobile terminal [3,64,85]. At this time, the customer's demand will be immediately reflected to the client of the logistics information system. The supplier will rapidly respond according to the logistics information system and carry out on-demand stock and route planning.

In the transportation process, Internet of Things technology could help to make the most accurate planning of the transportation line, carry out real-time positioning in transportation, and update the logistics [86,91]. The Internet of Things, meanwhile, keeps a real-time record of energy consumption during transportation and alerts suppliers when the wrong route is chosen, prompting them to design a new one [81,87,92].

Finally, green remanufacturing represents a higher form of reuse. In reverse logistics, the randomness of product return, the imbalance of return and demand rate, and the unknown status of recovered products make remanufacturing enterprises' production planning and control activities more complicated [88,93,94]. The Internet of Things is implemented at the beginning of the production practice, so that the original information can be obtained in the recycling process, and the recycling efficiency can be improved—the Internet of Things technology has utility for flexible application and the establishment of exclusive information systems [67,95]. Every practice, from green procurement to green production, green consumption, and logistics, is interlinked [89,96]. Information flows from one end to the other, avoiding information delay and asymmetry. Enterprises can make decisions through logistics information technology in each practice, then reflect them into the information system and then make decisions through the system's feedback.

3.2. Application of Big Data in Green Supply Chain

As shown in Table 2, big data in the procurement process accurately push relevant raw material suppliers according to the procurement needs and support the selection of the final raw material suppliers through comparison and analysis [97,98].

Table 2. The application of big data.

Digital Technology	How to Link in Green Supply Chain	Benefits	Key References
Big data	♢ Green procurement ♢ Green production ♢ Green consumption	♢ A large number of researchers have studied models for data analysis and feasibility suggestions for data analysis, but few scholars have studied models for data quality detection. ♢ A large number of studies use only big data independently and lack the support of corresponding sub-technologies.	[97,99–104]

In production practice, the research can accurately judge the quantity of demand based on big data. To date, research has covered the purchase of raw materials according to actual needs, saving procurement costs and avoiding resource waste [99,105]. When deciding whether to produce a specific product or operate a particular business, the supplier can evaluate the project's performance, implemented and developed through extensive data analysis to make a feasibility investment. At the same time, more and more enterprises use extensive data analysis to evaluate whether a specific production practice is energy-saving and providing sufficient environmental protection in line with green development.

However, through the click rate of the Internet, consumer consumption records, and other data, it is possible to understand consumers' preferences to accurately forecast and analyze their preferences to provide them with more timely and personalized services [69,100,106]. In line with the development of the times, people are increasingly indifferent to the ownership of commodities and more so enjoy the services brought by commodities. Therefore, the development of commodity leasing is very rapid, significantly improving the supply chain's flexibility [88,107,108]. Only rapid data analysis and processing can improve the order response degree and give customers a better experience [101,109–111]. Finally, big data can continue to create consumer experiences by studying consumers' purchasing patterns through long-term consumption habits to predict their preferences and produce products that satisfy them. Enterprises constantly adjust and change their business models according to such predictions, forming a virtuous circle between enterprises and customers [102,112]. This differs from the previous model of an enterprise guiding customers to choose their products following the enterprise's ideas. Enterprises now follow the customers' needs to produce the products needed by the customers and finally serving them. In this way, enterprises not only have a loyal buying group but can also avoid the phenomenon of supply without demand due to oversupply [103]. The most important thing is to avoid the production of unnecessary inventory as a result of not meeting customers' needs, helping to realize green operation [104].

3.3. Application of Cloud Computing in Green Supply Chain

As shown in Table 3, cloud manufacturing in the production process connects manufacturing resources related to production to establish a resource-sharing platform [113–115]. In production, some equipment is expensive, with high purchasing costs and a low utilization rate. Enterprises can use the shared platform to rent production equipment in this case. With the help of a cloud platform, enterprises can reduce fixed costs and enjoy personalized, integrated services [116,117]. Due to the rapid development of the green supply chain, a new service has been added to the cloud platform that will record the energy consumption of every practice in the production process in real-time. Then, based on the cloud optimization and simulation software module ecosystem, practices with serious energy consumption in the production process will be optimized, and the whole process will be simulated. In this continuous optimization process, enterprises can achieve

the lowest possible resource consumption, align with the current green trend, and reduce production costs. At the same time, the platform integrates various technologies to achieve a high degree of automation in multiple processes, avoiding losses caused by manual errors [118,119]. The development of green logistics promotes green cloud services.

Table 3. The application of cloud computing.

Digital Technology	How to Link in Green Supply Chain	Benefits	Key References
Cloud computing	♢ Green production ♢ Green logistics	♢ There are many studies on the operating model of sharing platforms, but few studies on the pricing of services provided by sharing platforms.	[113,114,116,118,120,121]

In logistics distribution, many small and medium-sized enterprises need more equipment to respond quickly to customer needs. At this time, they can allocate resources and provide personalized services by understanding the needs of the sharing platform of cloud services. In the practice of logistics and transportation, speed meters and cameras are used to collect the essential information about the road, build the traffic cloud, store the relevant video data, facilitate the data analysis, and generate the corresponding dynamic shortest-path algorithm based on the transportation demand [107,120]. Under the cloud service platform, we can use various services as quickly as water, electricity, and gas. For the whole supply chain, cloud services can integrate related resources in the whole life cycle of procurement, production, logistics, and other related practice and provide a standardized and shareable supply chain service mode [121,122].

3.4. The Application of Blockchain in Green Supply Chain

As shown in Table 4, blockchain in green procurement can make suppliers' data, raw materials, and costs transparent, select the most suitable options based on the comparison of multiple suppliers, and establish long-term cooperative relationships [123,124]. Often, in the procurement process, for their vested interests, procurement personnel cover up and collude with each other in some illegal situations in the process of procurement activities. They may conceal the actual situation or collude with the supplier to deliver benefits in the form of incorrect prices and obtain their own kickbacks [80,125,126]. Blockchain helps to construct what we call a "transparent veil" on the abuse of power in the procurement practice of the supply chain to control these behaviors and reduce enterprises' procurement risks.

Table 4. The application of blockchain.

Digital Technology	How to Link in Green Supply Chain	Benefits	Key References
Blockchain	♢ Green procurement ♢ Green production ♢ Green consumption	♢ The management systems of decentralized platforms are not perfect. ♢ The comprehensiveness and universality of the data of the whole chain are still not sufficient. ♢ The speed of data update is fast, but the cost of data maintenance is high. ♢ Most of the research on blockchain is in the financial field, and the research on environmental protection is not perfect.	[123,125,127–131]

In green production, blockchain makes the entire production process transparent and visual. The entire production process can be traced back to when something goes wrong in a particular production practice [127,132]. In this way, specific unfair practices in production can be identified, and targeted improvements can be made. With the deepening of people's safety concept, people are not very sensitive to the price of products, and are concerned with ensuring that product composition is environmentally friendly and healthy. Blockchain can ensure the traceability of food "from farm to table," where consumers can see the whole process, from farm picking to reprocessing, to meet the needs of consumer safety and public health [105,128]. The whole process of traceability is collected in the cloud database, which can be directly viewed on a mobile APP through a mobile terminal. Blockchain technology can store all the data publicly for the client, and the emissions of polluting and waste gases in the production process will be displayed to the client to prevent enterprises from tampering with data by recklessly discharging pollutants for profit [112,129]. Blockchain technology provides convenience for the government in controlling environmental pollution in the production processes of enterprises. It can be used to carry out effective governance and promote the sustainable development of green supply chains.

In the consumption practice, blockchain technology in intelligent contracts makes all costs from procurement to production transparent, ensuring the transparency of product distribution structure, preventing companies from pursuing excessive profits and building trust between enterprises and customers [130,131]. In addition, consumers' attitudes towards products, degree of psychological satisfaction, and consumption habits can also be reflected on the platform in real-time. These suggestions will continue to influence the production of enterprises' products.

3.5. Application of Artificial Intelligence in Green Supply Chain

As shown in Table 5, artificial intelligence is widely used in production practice. Robots can replace human beings to carry out the most basic operations. As long as a robot is continuously charged, it will keep working. Robots operate with the most standard actions when working, while humans are more flexible, which will inevitably cause mistakes in production practice [115,133]. Due to the rapid development of machine production in artificial intelligence, replacing ordinary front-line workers with intelligent robots has become a trend, so many enterprises are constantly laying off workers [134]. However, manufacturing with robots is not necessarily the best choice for companies. Robots' design and development require precise control of the entire production process.

Table 5. The application of artificial intelligence.

Digital Technology	How To Link In Green Supply Chain	Benefits	Key References
Artificial intelligence	♢ Green production ♢ Green logistics	♢ Automation has been realized in some specific production practices, but the benefits may not be greater than the previous human labor. There are few studies that systematically weigh the advantages of artificial intelligence in various aspects.	[133–139]

Sometimes, when funds are invested in artificial intelligence, they cannot be used to the maximum effect and can only be fixed for a particular operation [135]. Once there is innovation in this practice, the machine will be eliminated. Therefore, it is an urgent problem to improve the universality of artificial intelligence machines [136,140]. Green environmental protection and energy saving have become new assessment factors to be added to production practices. Intelligent equipment can judge the relationship between energy consumption and product output through the input and output of parameters in operation practice, constantly adjust production processes, and eliminate unnecessary work practices, to achieve efficient production while reducing the energy consumption in the interest of environmental protection. Inventory practice is essential in the supply chain [137,141]. Lean inventory management can achieve a relative balance between supply and demand, reduce inventory costs, and improve production efficiency. The logic of all important warehouse design covers from site layout to the selection of storage and order-picking systems, batch processing, and distribution, all of which must be reconsidered in intelligent operation. Therefore, new models and methods are needed to solve these systems' design and operation control challenges, especially the integration of subsystems, only by designing subsystems of each practice. Through mutual compatibility, integration forms a complete automation system designed into a complete intelligent warehouse [93,138].

Artificial intelligence can also be used to predict future product demand and logistics transport vehicles. Alibaba Group, for example, pioneered an integrated online-to-offline retail model that allows customers to order goods they need at home or in a restaurant, promising delivery within 20 min after the order is placed [139]. In order to meet these service commitments, Alibaba has developed software specifically for vehicle scheduling and the shortest route, which can quickly utilize surrounding resources to provide the fastest service. In logistics, robotic handling systems are increasingly used in distribution centers, which require little floor space and can work effectively.

4. Conclusions

We reviewed 144 articles on the impact of digital technologies on green supply chains. The research organizes the major digital technologies into five categories: the Internet of Things, big data, cloud computing, blockchain, and artificial intelligence. First, this study considers the application of these digital technologies in different supply chain practices, i.e., green procurement, green production, green consumption, and green logistics. The significance of this study is that digital technology connects with the green supply chain to form a multidisciplinary research topic. Second, environmental protection is the general trend in today's society. Digital technology can be introduced into the entire supply chain, which can reduce energy consumption to the greatest extent, finally achieving a green and energy-saving supply chain.

Our literature review has three contributions: (1) We systematically reviewed 144 pieces of literature related to digital technology and green supply chain, summa-

rized and classified them, and identified the current research progress in applying digital technology in the supply chain. (2) By reading the literature, this research has deepened our understanding of digital technology and green supply chain concepts, clarifying the current situation and development trend of digital technology and the specific environmental requirements of green supply chains. (3) By summarizing the existing literature related to digital technology and green supply chain, we found that there is a gap related to the application of digital technology in green supply chains, which needs to be further studied by experts and scholars. This paper provides four research directions for future research.

4.1. Direction I

This literature review found that digital technology has a significant impact on the development of the supply chain in terms of rapid response, personalized service, resource sharing, and cost reduction. Under the influence of the green supply chain, more and more physical goods are transferred from the previous purchase-based model to the lease model. Charges are based on frequency and time of use. The transformation of the service model makes establishing the sharing platform particularly important. Therefore, the current hot spot is research on the pricing of the services and the operation mode of the sharing platforms.

4.2. Direction II

The current research focuses on applying a single digital technology to a particular supply chain practice. Since each technology in digitization is interrelated, multiple digitization technologies can be applied to the same practice in the green supply chain. Therefore, the needs of each practice can be met by understanding the intrinsic function and future development trends of digital technology. Future research could design a complete digital system for the whole supply chain.

4.3. Direction III

Although digital thinking has been formed in most fields, most scholars have realized the importance of digital transformation in emerging fields. Many scholars study the establishment of relevant information platforms. However, the research on information platforms only exists to establish a basic framework without in-depth research on every practice—for example, there is a need for more relevant normative research on the integration and analysis of information obtained. Internet of Things platforms often lead to the loss of information, errors, and, eventually, information asymmetry. For the decentralized blockchain platforms, corresponding management research is needed. Due to the old game behavior between enterprises, there is still a major problem related to the degree of trust of all entrepreneurs, and the whole nature of data cannot be realized. In follow-up research, more attention should be paid to platform construction.

4.4. Direction IV

At present, state-of-the-art digital technologies and their role in the green supply chain may go far beyond what is mentioned in our academic literature. Research should continue to pay attention to the innovation of digital technology to bring more enlightenment to the development of green supply chains. The research field produces a great deal of data every day, which is efficient. In order to reduce the cost of data implantation, research is needed related to the design of a general mathematical model for a specific field, which can conduct data analysis at a low cost.

5. Limitation

This article has the following limitations: (1) This is not an opinion article, providing arguments and objectivity throughout the paper. However, there were inevitably subjective tendencies when analyzing data in the second part. (2) A total of 144 papers were included, but many recently published studies were omitted.

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