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Analysis of Intelligent Logistics and Supply Chain Management Reform in the Digital Era

Yan Zhang[1,2]*

[1]Endicott College of International Studies, Woosong University, Daejon 34607, South Korea

[2]Shandong Electronic Vocational and Technologic College, Jinan 250200, Shandong Province, China

***Corresponding author:** Yan Zhang, zyan85057@gmail.com

Abstract: Owing to the constant progress and application of information technology, the digital transformation of intelligent logistics and supply chain management has become an inevitable trend. In the digital era, enterprises need to rely on various technical means to build intelligent logistics and supply chain management systems, improve operational efficiency and management level, to adapt to market changes and customer needs.

Keywords: Digital era; Intelligent logistics; Supply chain management

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1. Introduction

Intelligent logistics and supply chain management in the digital era is a comprehensive upgrade and transformation in the field of logistics and supply chain management, using information technology, big data, and other technical means. Owing to the constant innovation and progress of logistics technology, supply chain management models, and business models, intelligent logistics and supply chain management have become a vital strategy for enterprise competition. The digital transformation of intelligent logistics and supply chain management is crucial for the competitiveness and progress of enterprises [1]. Through the application of digital technology, enterprises can achieve visualization and transparency of logistics and supply chains, improve management efficiency and accuracy, optimize processes and reduce costs, and achieve sustained business growth and progress [2].

2. Transformation of resource allocation capability in the digital era

2.1. Data sharing

In the digital era, data sources have become more abundant and available, while technological advances have also made data collection and analysis easier and more efficient. This sharing and utilization of data improves the efficiency of resource utilization and also brings new business models and opportunities [3].

2.2. Virtualization and cloud computing

In the digital era, cloud computing and virtualization technologies have been widely used, making resource utilization more flexible and efficient. For instance, cloud computing allows enterprises to rent computing resources on demand based on their own needs, without having to purchase, configure, and maintain a large number of servers and network devices [4].

2.3. Artificial intelligence and big data

In the digital era, the progress of artificial intelligence and big data technology has enabled enterprises to predict market demand more accurately, optimize production and operational processes, and make better strategic decisions [5]. The application of this technology makes the allocation of resources more intelligent and efficient [6].

2.4. Distributed systems and blockchains

In the digital era, distributed systems and blockchain technology have been widely used, making resource allocation more decentralized and secure. For instance, blockchain technology can provide more secure and trusted data exchange and sharing, thereby achieving more efficient and transparent resource allocation [7].

3. Strategies for building a smart supply chain system in the digital era

The intelligent supply chain in the digital era refers to the use of information technology and data analysis technology to achieve comprehensive coordination, transparency, and optimization from the production and procurement links to the sales and after-sales service links of the supply chain. Below are some strategies for building a smart supply chain system in the digital era [8].

3.1. Data-based management

Establishing a data-based management system and adopting technologies such as the Internet of Things, cloud computing, big data, and artificial intelligence can achieve data sharing and optimization in all aspects of the supply chain. A detailed introduction to the system is given below [9].

3.1.1. Internet of Things

Through the Internet of Things, intelligent management and monitoring of items and equipment can be achieved. Collecting and transmitting logistics information, production information, and other data through sensors, labels, and other devices can achieve real-time monitoring and management of all aspects of the supply chain [10]. Data analysis and forecasting can improve the responsiveness and flexibility of the supply chain, reduce costs, and improve efficiency [11].

3.1.2. Cloud computing

Through cloud computing, centralized storage and processing of supply chain data can be achieved, while providing high availability, elastic scaling, and flexible computing resources [12]. Therefore, supply chain data sharing and collaboration can be achieved, and data processing efficiency and security can be improved [13].

3.1.3. Big data analytics

Through big data analytics, massive supply chain data can be deeply mined and analyzed to provide more accurate data prediction and decision support. By establishing a data model, bottlenecks and problems in the supply chain can be identified and optimized, and the efficiency and profit of the supply chain can be improved [14].

3.1.4. Artificial intelligence

Through artificial intelligence, automated analysis and decision support of supply chain data can be achieved. For example, machine learning algorithms can classify, predict, and recommend supply chain data, improving the intelligence and automation level of the supply chain [15].

3.2. Fine production

Several measures can be adopted to achieve refined management of the production process, improve production efficiency and quality, reduce costs, and enhance the responsiveness and flexibility of the supply chain [16].

3.2.1. Production automation

By using various equipment and robots, automation and intelligent control of the production process can be achieved, thus improving production efficiency and quality. For instance, by automating assembly lines, production cycles can be greatly shortened, and production efficiency and accuracy can be enhanced [17].

3.2.2. Digital management

Through digital management, digital control and management of the production process can be achieved. For instance, through a digital production management system, the production process can be monitored in real time, and precise scheduling and control can be carried out to enhance production efficiency and quality [18].

3.2.3. Supply chain collaboration

Through supply chain collaboration, it is possible to achieve collaborative coordination among all aspects of the supply chain, enhancing the response speed and flexibility of the supply chain. For instance, through a supply chain management platform, management and collaboration among suppliers, logistics companies, warehousing companies, and other parties can be achieved, thus enhancing the overall efficiency and quality of the supply chain [19].

3.2.4. Data-based analysis

Data analysis and mining can be carried out on each link in the production process, providing a scientific basis for production decision-making. For instance, through big data analysis and forecasting, it is possible to optimize and adjust the production process, thereby enhancing production efficiency and quality [20].

3.3. Supply chain collaboration

3.3.1. System function and design

When establishing a supply chain collaboration platform, it is essential to consider its functions needed and usability of the system. The functions of the system should include information exchange, collaboration, and optimization in all aspects of the supply chain, such as order management, inventory management, logistics, and distribution. The system should also be made as simple and easy to use as possible, and it should be able to provide scalability and customizable functions to meet the needs of different enterprises.

3.3.2. Data sharing and security

Data sharing is crucial in a supply chain collaboration platform. To ensure the security of data, it is essential to adopt secure data transmission protocols and take appropriate measures to protect the confidentiality, integrity, and availability of data. It is also essential to specify the ownership and usage rules of data to avoid data leakage and abuse.

3.3.3. Partner management

The establishment of a supply chain collaboration platform requires close cooperation between suppliers, customers, and logistics service providers to achieve supply chain information sharing and optimization. A partner management mechanism needs to be established to ensure that partners can use the system normally,

while protecting the security and stability of the system.

3.3.4. Personnel training and support

Training and support should be provided to employees to ensure that they can fully utilize the functions of the system and continuously improve efficiency and quality. In addition, it is also necessary to establish a technical support team to resolve system failures and user feedback issues efficiently.

3.4. Customer orientation

Customer needs and feedback can be understood and obtained through digital technology and data analysis. With the information obtained, targeted marketing and service can be carried out to improve customer satisfaction and loyalty. Besides, supply chain processes can be optimized, thereby increasing efficiency and profit of supply chains.

3.5. Risk management

A supply chain risk management system can be established where supply chain risks can be identified and addressed through data analysis and prediction. In this way, the uncertainties in supply chains can be reduced, thus enhancing the stability and reliability of the supply chain.

4. Conclusion

In short, the transformation of intelligent logistics and supply chain management in the digital era is a comprehensive transformation and upgrade. Enterprises need to strengthen innovation and application of digital technology in logistics management. Besides, it is also important to build intelligent, digital, and sustainable logistics and supply chain management systems. In addition, enterprises should also establish collaborative, efficient, and safe operation modes, to enhance their competitiveness and market influence.

Disclosure statement

The author declares no conflict of interest.

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