



Optimization Strategy of Logistics Supply Chain Management in Internet Environment

Yue Wang^{1,2,a,*}, Jingwen Zhang^{1,b} and Xiaoxiao Pu^{1,c}

¹School of Management, Heilongjiang Institute of Finance and Economics, Harbin, Heilongjiang, 150000, China

²School of Economics and Management, Qiqihar University, Qiqihar, Heilongjiang, 161000, China

^{a*}Email: 1789656371@qq.com, ^bEmail: 1652509580@qq.com, ^cEmail: 1652509580@qq.com

Abstract. The purpose of this article is to discuss the optimization strategy of logistics supply chain management under the Internet environment. First, the article analyzes the application of Internet technologies in logistics supply chain, including how technologies such as Internet of Things, cloud computing, big data analysis and artificial intelligence can improve the transparency and efficiency of supply chain. Then, the article discusses the challenges faced by logistics supply chain management, such as data security, supply chain complexity, sustainability issues, and technological upgrades. Then, the article compares and analyzes the differences in logistics supply chain management at home and abroad, pointing out the differences between domestic and foreign enterprises at the level of supply chain management concepts, technologies and practices. On this basis, the article proposes a series of optimization strategies, including information sharing and collaborative optimization, supply chain network optimization, logistics cost control, supply chain risk management and green supply chain management. These strategies aim to help enterprises improve the efficiency and competitiveness of their supply chains while realizing sustainable development. Finally, the article summarizes the main findings of the study and makes suggestions for future research directions.

Keywords: logistics supply chain management; internet technology; optimization strategies

1 Introduction

With the rapid development of Internet technology, logistics supply chain management is experiencing unprecedented changes. The traditional logistics supply chain management model has been unable to meet the high standard requirements of modern enterprises for efficiency, cost and customer service. The application of technologies such as real-time sharing of information, big data analysis, cloud computing and artificial intelligence in the Internet environment provides new optimization strategies and tools

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for logistics supply chain management. These technologies not only improve the transparency and responsiveness of the supply chain, but also enhance the synergistic effect and overall efficiency of the supply chain. However, logistics supply chain management in the Internet environment also faces new challenges, such as data security, supply chain complexity, sustainability issues and technological updates. Therefore, it is of great significance to study and explore the optimization strategy of logistics supply chain management under the Internet environment to improve the competitiveness of enterprises and achieve sustainable development.

2 Analysis of the Current Situation of Logistics Supply Chain Management Under the Internet Environment

2.1 Application of Internet Technology in Logistics Supply Chain

Driven by Internet technology, logistics supply chain management has realized the transformation from traditional mode to intelligentization and informationization. The application of Internet technology, especially the Internet of Things (IoT), cloud computing, big data analysis and artificial intelligence (AI), provides powerful data support and decision-making tools for logistics supply chain management. IoT technology improves the transparency and responsiveness of the supply chain by monitoring the flow of goods in real time through sensors and smart devices. Cloud computing platforms, on the other hand, provide flexible data storage and processing capabilities for each link in the supply chain, making supply chain management more efficient. Big data analytics help companies dig deeper into the value of data, optimize inventory management, and forecast market demand, thus improving supply chain flexibility and customer satisfaction. The application of artificial intelligence technologies, such as machine learning and intelligent algorithms, further enhances the level of automation and intelligence in the supply chain, enabling more accurate demand forecasting and resource allocation. The comprehensive application of these technologies not only improves the efficiency of the logistics supply chain, but also reduces operating costs and enhances the competitiveness of enterprises. [1]

2.2 Challenges of Logistics Supply Chain Management

Although Internet technology has brought many conveniences to logistics supply chain management, it also brings a series of challenges. First, data security and privacy protection have become a major issue in supply chain management. With the proliferation of data volume in the supply chain, how to ensure the safe transmission and storage of data and prevent data leakage and misuse has become a challenge that enterprises must face. Second, the complexity of supply chains has increased with globalization and networking, which requires supply chain managers to have higher coordination and control capabilities. In addition, the sustainability of supply chain is getting more and more attention. How to realize environmental friendliness and social responsibility while en-

uring economic benefits is an important aspect to be considered in supply chain management. Finally, the rapid updating of technology requires supply chain managers to continuously learn and adapt to new technologies in order to maintain the competitiveness of the supply chain. [2]

2.3 Comparative Analysis of Domestic and Foreign Logistics Supply Chain Management

There are certain differences between domestic and foreign logistics supply chain management at the conceptual, technological and practical levels. In terms of concept, foreign enterprises tend to focus more on the overall optimization of the supply chain and long-term cooperation, while domestic enterprises may focus more on short-term interests and cost control. In terms of technology application, logistics supply chain management in developed countries is more mature in terms of automation, informatization and intelligence, while developing countries are in the rapid development stage. [3] For example, logistics enterprises in developed countries generally adopt advanced logistics management systems and automation equipment, while developing countries may still be gradually introducing these technologies. At the practical level, foreign enterprises are more inclined to adopt lean management and continuous improvement methods in supply chain management, while domestic enterprises may pay more attention to cost control and quick response to market changes. In addition, there are also differences in supply chain sustainability, compliance and risk management at home and abroad. Through comparative analysis, the advantages and shortcomings of domestic and foreign logistics supply chain management can be found, providing domestic enterprises with the direction and reference for improvement.

3 Chapter 3 Optimization Strategy of Logistics Supply Chain Management Under Internet Environment

3.1 Information Sharing and Cooperative Optimization

Under the Internet environment, information sharing, and cooperative optimization is the core of logistics supply chain management optimization strategy. By establishing an integrated information platform, each participant in the supply chain can share key information such as order processing, inventory status, transportation situation and so on in real time, so as to realize the optimal allocation of resources and efficient collaboration of processes. [4] This information transparency not only reduces the uncertainty and bullwhip effect in the supply chain, but also enhances the response speed and flexibility of all parties. The collaborative optimization strategy further integrates the resources and capabilities of the upstream and downstream of the supply chain through cross-enterprise cooperation to achieve the synergistic effect of the entire supply chain. For example, through collaborative models such as Vendor Managed Inventory (VMI) and Collaborative Planning, Forecasting, and Replenishment (CPFR), enterprises can more accurately forecast market demand, reduce inventory backlogs, and improve the

overall efficiency of the supply chain. In addition, using cloud computing and big data analytics, enterprises can analyze supply chain data more deeply, discover potential improvement opportunities, and achieve more refined supply chain management.

3.2 Supply Chain Network Optimization

Supply chain network optimization is a key strategy to improve logistics supply chain efficiency and reduce costs. Under the Internet environment, by applying advanced optimization algorithms and simulation techniques, companies can meticulously analyze and design supply chain networks to achieve the best balance of cost and service level. This includes optimizing the location of nodes in the supply chain (e.g., warehouses, distribution centers), planning transportation routes, and adjusting inventory levels. [5] Through these optimization measures, companies are able to reduce transportation costs, shorten delivery times, and improve service levels. In addition, supply chain network optimization involves consideration of the flexibility and robustness of the supply chain to cope with fluctuations in market demand and the risk of supply chain disruption. By establishing a multi-modal transportation network and diversified supplier relationships, enterprises can improve the adaptability and risk resistance of the supply chain.

3.3 Logistics Cost Control Strategy

Supply chain network optimization is a strategic approach that goes beyond mere cost reduction and efficiency enhancement; it's about building a resilient, agile, and competitive supply chain that can adapt to the dynamic market conditions of the 21st century. Supply chain network optimization is crucial for aligning supply chain activities with business goals and strategies. It involves the careful planning and management of all activities across the supply chain to enhance customer satisfaction and shareholder value. By leveraging advanced algorithms and simulation techniques, companies can model different scenarios, assess risks, and make data-driven decisions. Under the Internet environment, companies can apply cutting-edge optimization algorithms and simulation techniques to analyze and design supply chain networks. These tools enable the detailed analysis of various network configurations, allowing for the identification of inefficiencies and the exploration of potential improvements. An overarching supply chain network model that deals with longer time horizons can be created, which aggregates uncertainty on higher levels. This approach reduces complexity and computational effort while setting an overall strategy for the supply chain. A recommended approach is to introduce solution layers based on covered supply chain scope, decision horizons, and uncertainty. This hierarchical layering addresses both computational challenges and aligns the mathematical complexity of the problems to be solved at each layer. Recent technological advances such as Combinatorial Optimization with Physics-Inspired Graph Neural Networks and Deep Reinforcement Learning are poised to further speed up optimizations and support more complex models, which can be partic-

ularly beneficial for large-scale supply chain problems. To effectively utilize optimization techniques, organizations need to reassess their operational models, workforce skillsets, and alignment of objectives across key supply chain functions. Structuring specific functions around smaller sets of processes can simplify objectives and enhance the decision-making process. Supply chain network optimization also involves considering the flexibility and robustness of the supply chain to cope with market demand fluctuations and the risk of supply chain disruption. A multi-modal transportation network and diversified supplier relationships can improve the adaptability and risk resistance of the supply chain. The essence of layering the network optimizations is based on the timing aspect of decision-making and the level of uncertainty. Focusing on aggregated and more deterministic data before considering uncertainties helps in balancing the mathematical complexity and computational efforts across the layers.

3.4 Supply Chain Risk Management

Supply chain risk management is the key to ensure the stability and reliability of the supply chain. In the Internet environment, enterprises face more complex and variable risks, including fluctuations in market demand, supply disruptions, price fluctuations, and transportation delays. Effective risk management strategies can help enterprises identify, assess and mitigate these risks. [6] First, by establishing a risk identification mechanism, enterprises can identify potential risk factors in a timely manner. Second, through risk assessment, enterprises can quantitatively analyze the likelihood and impact of risks and formulate corresponding countermeasures. In addition, by establishing risk mitigation and contingency plans, enterprises can reduce the impact of risk events on the supply chain. Under the Internet environment, enterprises can also utilize big data analysis and artificial intelligence technology to monitor and predict risks in real time and improve the initiative and foresight of risk management.

3.5 Green Supply Chain Management

Green supply chain management is an important strategy for realizing sustainable development. In the Internet environment, enterprises are paying more and more attention to the environmental impact of the supply chain by taking a series of measures to reduce energy consumption and waste emissions and improve resource utilization efficiency. This includes adopting environmentally friendly materials, optimizing packaging design, improving energy efficiency, and reducing transportation distances. Through these measures, companies can not only reduce the negative impact on the environment, but also improve their brand image and attract more environmentally conscious consumers. In addition, green supply chain management involves the consideration of social responsibility in the supply chain, such as ensuring that labor conditions in the supply chain are ethical and avoiding the use of child and forced labor. Through the implementation of green supply chain management, enterprises can realize economic benefits while assuming social responsibility and achieve long-term sustainable development.

4 Conclusion

In the Internet environment, the optimization strategy of logistics supply chain management is crucial for improving the competitiveness of enterprises and achieving sustainable development. This paper proposes a series of optimization strategies, including information sharing and cooperative optimization, supply chain network optimization, logistics cost control, supply chain risk management and green supply chain management, by analyzing the application of Internet technology in the logistics supply chain, the challenges faced and the comparison of logistics supply chain management at home and abroad. These strategies not only help to improve the efficiency and cost-effectiveness of the supply chain, but also help to improve the flexibility and sustainability of the supply chain. With the continuous progress of technology and changes in the market environment, the optimization strategies of logistics supply chain management also need to be updated and improved. Future research can further explore the effectiveness of these strategies in different industries and enterprises of different sizes, as well as how to optimize supply chain management by incorporating the latest technological developments. Through continuous research and practice, we can expect logistics supply chain management to better adapt to market changes in the future and create greater value for enterprises and society.

References

1. Feng Rui. Optimization Strategy of Logistics Supply Chain Management in E-commerce Environment [J]. *China Logistics and Purchasing*, 2024, (17): 71-72.
2. Zhang Chang, Lin Zijing, Dong Yijun. Logistics management in supply chain management environment [J]. *China Storage and Transportation*, 2024, (09): 104-105.
3. Zhang Fenfen. Dilemma and way out of rural e-commerce logistics development in the field of supply chain management [J]. *Journal of Changzhou Institute of Technology*, 2024, 37 (04): 80-84+99.
4. Qiao Xiaojuan. The development of e-commerce on the leather enterprise logistics mode of the impact of research [J]. *China Leather*, 2024, 53 (09): 39-42.
5. Dong Siqing. Discussion on the application of logistics supply chain management in electric power enterprises [J]. *China Shipping Weekly*, 2024, (34): 63-65.
6. Zhang Yifan. Efficiency improvement and cost control of logistics supply chain management in engineering industry [J]. *China Logistics and Purchasing*, 2024, (16): 65-66.

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