

Optimization Strategies for Transportation Modes from the Perspective of Supply Chain Management

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Abstract: In the context of a new round of technological revolution, the application of digital technologies such as artificial intelligence, the Internet of Things, and big data has significantly improved product circulation efficiency, and consumers' expectations for immediate value are increasing. Shortening delivery time, improving product delivery quality standards, enhancing real-time data acquisition and processing capabilities, enhancing the competitive advantage of information-based transportation, and improving the risk resistance of the transportation chain have become practical issues faced by enterprises. Given the high proportion of logistics costs in the transportation link of the supply chain, optimizing the transportation mode in the supply chain is conducive to reducing costs and improving service quality. This article analyzes the problems of transportation mode management, explores specific ideas for improving transportation decision-making efficiency, enhancing supply chain resilience, and enhancing digital management capabilities, and helps enterprises improve real-time supervision and digital transportation management of products, achieve cost reduction and efficiency improvement, and enhance market competitiveness.

Keywords: supply chain management, transportation mode, optimization strategy.

1. Introduction

Modern logistics transportation modes are diverse, and modern enterprises often adopt highway, railway, aviation, and waterway transportation modes. Different transportation modes have different advantages and disadvantages. In actual product transportation, enterprises choose specific transportation modes or conduct combined transportation based on different levels of transportation standards and requirements. Nowadays, the logistics transportation industry is developing rapidly, and the focus of logistics transportation management has shifted from transportation time and transportation safety in the past to transportation cost, transportation efficiency, service quality, and real-time information needs in the present [1]. Customers' requirements for product transportation are not only limited to the safe and timely delivery of goods but relying solely on traditional third-party logistics transportation modes has been unable to meet these development needs. For example, in the transportation process of some chilled products, many customers often demand high data requirements for the storage temperature and humidity of goods during product transportation. In the rapidly developing logistics transportation industry, compared to the increasingly high transportation standards, logistics transportation management from a supply chain perspective is significantly

lagging behind. Moreover, with the development of e-commerce, logistics transportation cannot operate as a separate task, but rather as a link in the supply chain to connect enterprises, inventory, customers, and service suppliers [2]. There are certain defects in current logistics transportation management: it is difficult for the first party enterprise to achieve planning, control, command, and coordination of product transportation through third-party logistics transportation companies, which leads to an insufficient grasp of real-time information during the product transportation process and an increase in uncertain factors. Because under this third-party logistics transportation contracting mode, the quality of transportation services, information tracking, and risk response all depend on the capabilities of the third-party company. Relying solely on improving the requirements for the service level of logistics companies can only address the symptoms but not the root cause. Only when the first party enterprise effectively manages the logistics transportation in this link can it comprehensively improve the transportation quality and meet the needs of all parties. This article will explore the management model of logistics and transportation by enterprises from the perspective of supply chain, as well as how to integrate digital systems with logistics and transportation management. It aims to assist enterprises in optimizing their transportation models and management from a supply chain perspective. This article will explore the management model of logistics and transportation from the perspective of supply chain, as well as how to integrate digital systems with logistics and transportation management. It aims to assist enterprises in optimizing their transportation models and management from a supply chain perspective. This study aims to enhance the digital logistics and transportation management capabilities of enterprises by providing various solutions and suggestions. It helps enterprises develop different transportation model optimization plans under different circumstances, establish an integrated information platform for information collection, processing, and sharing, and improve the resilience of the logistics and transportation chain and information chain, thereby enhancing the adaptability and competitiveness of enterprises in the market.

2. Manuscript Preparation

2.1. Absence of emphasis in enterprise logistics management

Some enterprises focus on improving economic efficiency in their production and operation processes, solely concentrating on reducing product costs and increasing profits, while neglecting the potentially crucial aspect of logistics and transportation management [3]. For instance, many small and medium-sized enterprises do not attach importance to their own logistics and transportation management. Their technological research primarily focuses on reducing product costs and optimizing marketing models, but they perform poorly in transportation models and management. The decline in customer satisfaction, increase in product transportation costs, and overall deterioration in transportation quality caused by the use of third-party logistics companies have not been given due attention. Some enterprises have a shallow understanding of logistics and transportation management, believing that transportation management only refers to the management of product transportation. This is particularly evident under the current third-party contracting model. After contracting the transportation process to a third-party company, the enterprise's logistics management department only performs simple data collection and report summarization, neglecting the importance of suppliers and customers in the transportation process [4]. For example, the demand for real-time transportation data from customers and suppliers is not met, and the difficulty in conveying customer feedback on transportation work is particularly evident in the current logistics and transportation industry. The enterprise's approach often involves providing a certain level of compensation based on customer losses or providing customers with data summarized by the logistics partner after the transportation work is completed, but this data is not comprehensive or timely. Such a handling method not only indirectly increases transportation costs but also directly affects the corporate image

and consumers' perceptions and attitudes toward the enterprise, thereby impacting the enterprise's interests and competitiveness.

2.2. Low capability in digital management of logistics transportation informatization

Although the current level of information technology development has reached a certain level, with significant advancements in data collection, aggregation, analysis, and processing, many enterprises have not realized the potential of utilizing information technology capabilities to enhance their own logistics and transportation management levels. This leads to mere information reception during cooperation with third-party logistics companies, resulting in a series of serious issues. When enterprises have limited data collection and processing capabilities, the speed, quality, and quantity of information obtained depend on the data collection and analysis capabilities of third-party logistics companies and their hardware facilities. However, often these logistics companies are unable to provide services in these areas. Currently, many logistics companies, especially small and medium-sized ones, have outdated data collection equipment and incomplete information collection and processing platforms. This leads to the provision of only simple product transportation information during the transportation process, such as the location of transfer stations. For example, during the transportation of electronic components, customers need to obtain real-time information about the temperature, humidity, static electricity, and dust index inside the cargo hold. However, many enterprises often fail to provide complete transportation product information in a timely manner. Under this transportation model with various drawbacks, enterprises cannot effectively analyze, collect data, and coordinate logistics information, leading to difficulties in connecting with suppliers and customers, resulting in slow updates of real-time product transportation information, delayed feedback on cargo transportation, and indirectly reducing enterprise competitiveness and customer loyalty [3].

3. Optimization strategies for enterprise logistics transportation management

3.1. Enhancing Logistics Management Efficiency

Enterprises should increase their attention to logistics management and clarify its key role in improving customer satisfaction, optimizing operational efficiency and enhancing corporate competitiveness. Logistics management should not only be regarded as a tool for cost control but also as a core component to promote the strategic development of enterprises. Therefore, enterprises should establish a dedicated logistics management team to enhance its status in the company and strengthen the training of senior management to ensure that the strategic value of logistics management can be fully understood and supported.

In addition, optimizing the third-party logistics cooperation model is another key measure to improve logistics management efficiency. When cooperating with third-party logistics companies, enterprises should avoid over-reliance on outsourcing and ensure control over the logistics process. By sharing real-time transportation data with third-party logistics companies and establishing a joint feedback mechanism, enterprises can effectively improve the transparency and collaborative efficiency of the supply chain. Such a cooperative approach can not only ensure the efficiency, accuracy and traceability of the logistics process but also find the best balance between cost and service quality.

Enterprises need to strengthen their interaction with customers and suppliers, especially the feedback mechanism in the transportation link. Regularly conduct customer satisfaction surveys and establish a dedicated customer support team to respond to problems in the transportation process in a timely manner. This will not only enhance customer stickiness but also improve logistics services by promptly handling customer feedback and reduce the risk of customer loss due to information lag or

asymmetry. At the same time, communication between enterprises and suppliers can also optimize overall logistics management, thereby enhancing the flexibility and responsiveness of the supply chain.

Finally, improving data quality and timeliness is an important guarantee for improving logistics management efficiency. Enterprises should require logistics partners to provide real-time and accurate transportation data reports, and avoid relying on post-aggregated data, so as to ensure that customers obtain accurate information in a timely manner during transportation. Through the application of automated systems, enterprises can further improve the accuracy and timeliness of data, thereby ensuring that the logistics process is more efficient and improving the overall service quality.

3.2. Development of Information Collection and Processing System

Information collection equipment and the enterprise's own information processing capabilities are crucial in the transportation model. Enterprises can collaborate with third-party logistics companies to install sensors, data collection equipment, cameras, etc. on vehicles, warehouses, and other links to obtain real-time logistics transportation information such as cargo status, location, and movement trends. In the current logistics transportation market, customers have an urgent demand for such information and have high requirements for the detail level and timeliness of the data. After collecting these transportation data, the company's logistics management department conducts centralized information data analysis and processing to achieve cargo tracking, transportation strategy optimization, and inventory management [5], thereby completing logistics transportation work more efficiently and at a high level. This approach can effectively improve the enterprise's transportation management capabilities and optimize the transportation model. With the foundation of logistics transportation information, it can help enterprises respond to customers' data information needs and provide data support for the transportation management department's risk assessment, scheme formulation, and other work. Optimizing logistics transportation management can ensure that product transportation can respond to market customer needs more quickly and accurately, providing high-quality supply chain services for customer groups and ensuring timely product delivery. This in turn improves customer satisfaction and loyalty, promoting the company's high-quality development [6]. For example, during the transportation process of J Food Company's product (chilled black chicken), through cooperation with its logistics contracting company, temperature and humidity monitoring devices were installed in the cargo hold and connected to the company's transportation management department's cloud data terminal for data collection and analysis, thus monitoring product transportation and completing customer feedback work in real time, improving the enterprise's own transportation model management capabilities, thereby enhancing customer satisfaction and reducing transportation costs.

3.3. Information-based and intelligent logistics management system

The methods of integrating digital systems into logistics management have become an urgent issue for enterprises. The core of supply chain management lies in enhancing the synergy among various links in the supply chain [7]. Therefore, it is crucial to establish an information sharing platform among suppliers, enterprises, customers, and logistics contractors. This platform facilitates real-time feedback of product data and information during transportation, enabling the construction of an integrated logistics supply chain to better meet information sharing and specific logistics needs of customers. Additionally, it provides an online channel for customers to provide feedback and suggestions on product transportation. In supply chain information management, this platform can integrate functions such as order management, inventory management, logistics distribution, and payment settlement, thereby enhancing the transparency of the entire supply chain information

management and improving the operational efficiency of the supply chain [7]. Through this form of digital logistics integrated supply chain, enterprises can strengthen their monitoring and management of the entire transportation chain and achieve a higher level of information circulation with customers. By strengthening the control of transportation quality through a logistics management system, enhancing process management, and reducing quality risks, enterprises can establish both internal quality feedback mechanisms and external customer feedback mechanisms, adopting continuous quality improvement mechanisms to continuously improve product quality [8]. Integrating satellite real-time positioning systems, meteorological prediction systems, and transportation route condition data into logistics transportation management can also help enterprises better plan and manage transportation modes and routes. By introducing artificial intelligence systems for the prediction of transportation resources and demand, optimizing the allocation of transportation vehicles and human resources, and selecting appropriate transportation tools based on different goods and logistics transportation needs [7], as well as planning the optimal transportation route according to different demands, real-time road conditions, and meteorological factors, optimizing the layout of warehouses and transportation transfer stations can reduce or even avoid transportation risks, reduce unnecessary transportation costs, and improve transportation efficiency [9]. For example, Company P has constructed a transportation route analysis model, integrating real-time road condition data and climate data into an artificial intelligence system for unified analysis and processing. It also collects and compiles complete transportation data and customer resource demands for the re-layout and planning of warehouses and transportation stations, achieving maximum utilization of resources and costs. Based on the implementation of meteorological factors and emergencies such as traffic accidents, it plans the optimal transportation route in real time, greatly improving transportation efficiency and reducing transportation risks, achieving the management goals of shortening product transportation cycles, reducing inventory, lowering costs, and improving inventory turnover rate [10].

4. Conclusion

Optimizing transportation modes and implementing effective management are crucial ways to enhance corporate competitiveness, improve product supply chain resilience, and increase customer loyalty. Efficient logistics and transportation management can establish a positive corporate image, provide comprehensive information to enhance the company's real-time decision-making and risk resistance capabilities, and serve as a significant method for enterprises to pursue high-quality development. Strengthening logistics and transportation management is the primary task for enterprises to reduce costs and improve service quality. Through digital transportation management, all aspects of the transportation and logistics supply chain can be fully coordinated, ensuring rapid data circulation. From a supply chain perspective, transportation management models can be continuously improved through real-time data from information platforms, thereby providing enterprises with efficient transportation and logistics services to meet the personalized service needs of consumers in the market. In the future, enterprises can establish a new product logistics and transportation information sharing platform with peers in the industry to achieve higher levels and better quality information sharing.

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