Application and Innovation Exploration of Supply Chain Management in Modern Logistics under the New Development Concept

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Abstract: Under the background of new development concept leading economic transformation, this article focuses on the application and innovation of SCM (supply chain management) in modern logistics. This article deeply analyzes the relevant theoretical basis, and discusses the specific application of SCM in modern logistics under various dimensions of new development concept. It is found that innovation concept promotes technology and model innovation, coordination concept promotes the coordination of all links and industries in the supply chain, green concept guides the implementation of environmental protection measures, open concept helps international cooperation and market expansion, and sharing concept realizes resource and information sharing. Based on this, it is clear that the future should be driven by technological innovation, collaborative model innovation, green sustainable innovation, open cooperation innovation and sharing mechanism innovation. It is hoped that this research can further promote the development of SCM in modern logistics and provide useful reference for the high-quality development of the industry.

1. Introduction

Under the background of the rapid development of economic globalization and digitalization, modern logistics, as the key support of economic operation, has a far-reaching impact on all industries and even the whole economic system [1]. At the same time, the new development concept, as an important guiding ideology to lead the economic and social development of China, has pointed out the direction for the transformation and upgrading of various industries [2]. In this environment, the application and innovation exploration of SCM in modern logistics is of great significance [3].

The new development concept covers five dimensions: innovation, coordination, green, openness and sharing [4]. This not only provides a theoretical basis for the transformation of China's economic development mode, but also brings brand-new opportunities and challenges for the development of modern logistics industry [5]. As an effective means to integrate logistics resources and improve logistics efficiency, how to realize innovation and optimization under the guidance of new development concepts has become the focus of current academic and business circles.

With the increasingly fierce market competition, enterprises put forward higher requirements for the control of logistics costs, the improvement of service quality and the acceleration of response speed [6]. The traditional logistics operation mode has been difficult to meet these needs, and it is urgent to use the concept and method of SCM to realize efficient cooperation of logistics operation by integrating upstream and downstream resources and optimizing processes [7]. Sustainable development has become a global consensus, and green and low-carbon logistics development mode has become an inevitable choice. This requires that in the process of SCM, the concept of green development should be fully implemented to promote the sustainable development of modern logistics. Based on this, this article aims to deeply explore the application status of SCM in modern logistics under the new development concept, and further explore its innovative development direction.

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2. SCM and modern logistics theory

The new development concept is composed of innovation, coordination, green, openness and sharing, which is an important guide for China's economic and social development. Innovation and development focus on solving the problem of development motivation, emphasizing the development of various fields through innovation such as technology and system, and providing core motivation for industrial upgrading [8]. In the field of logistics and supply chain, innovation can give birth to new operation modes and technology applications. Coordinated development aims at solving the problem of unbalanced development and promoting regional, urban and rural areas, as well as economic and social aspects to make concerted progress. As far as SCM is concerned, it is necessary to ensure the coordinated operation of all links, avoid the short board effect and realize the balanced development of logistics and other industries.

Green development focuses on the harmonious coexistence between man and nature, emphasizing the protection of ecological environment in economic activities. In modern logistics, green development promotes the implementation of green packaging, energy-saving and emission-reduction transportation and other measures, and promotes the transformation of SCM to environmental friendliness. Open development focuses on solving internal and external linkage problems and encourages active participation in international economic cooperation and competition. In the field of logistics, open development helps to expand the international logistics market and strengthen international logistics cooperation. Shared development emphasizes that the development results are shared by the people, which is reflected in the sharing of logistics resources and information in SCM, and improves the overall efficiency and service level.

SCM is to plan, coordinate, control and optimize the whole chain from raw material procurement, manufacturing, product distribution to final consumption. Its development has gone through the stages of traditional logistics management and integrated SCM, and now it emphasizes collaboration and intelligence [9]. The main contents of SCM include supplier management, inventory management and logistics distribution management. By integrating resources, we can achieve the goal of reducing costs and improving service quality and response speed. Modern logistics organically combines the basic functions of transportation, warehousing, loading and unloading, handling, packaging, distribution processing, distribution and information processing. It has the characteristics of informationization, automation and intelligence, and can effectively improve the logistics operation efficiency and service level. Modern logistics and SCM are closely linked. Logistics is an important part of SCM, which provides substantive support for efficient operation of supply chain, while the concept of SCM guides the development of modern logistics in the direction of integration and synergy.

3. Application of SCM in modern logistics under the new development concept

(1) Application under the concept of innovation and development

Innovative development concept promotes SCM to introduce new technologies and create new models in modern logistics. Taking intelligent warehouse management as an example, with the help of automatic three-dimensional warehouse and intelligent sorting equipment, the utilization rate of warehouse space and the efficiency of goods sorting are improved. Big data analysis plays a key role in logistics demand forecasting. By collecting historical orders, market dynamics and other data, enterprises use forecasting models to plan inventory and distribution in advance to reduce shortage and inventory backlog. Blockchain technology is applied to the traceability of logistics information, ensuring the transparency of goods source and transportation process and enhancing consumer trust.

(2) Application under the concept of coordinated development

Coordinated development focuses on all aspects of the supply chain and the synergy between logistics and other industries. Within the supply chain, suppliers, manufacturers, logistics providers and sellers need to cooperate closely. By establishing an information sharing platform, information such as demand, inventory and production progress can be transmitted in real time, and collaborative planning, collaborative procurement, collaborative production and collaborative

distribution can be realized. Table 1 takes the supply chain of automobile manufacturing industry as an example. Before coordination, the delay rate of spare parts supply reached 15%, and the inventory cost accounted for 20% of the total cost. After coordination, the supply delay rate decreased to 5%, and the inventory cost ratio decreased to 15%. Between industries, logistics is deeply integrated with manufacturing and commerce. Manufacturing enterprises outsource logistics business to professional logistics enterprises, realize the separation of main and auxiliary, focus on core business, and promote the professional development of logistics enterprises.

Table 1: Comparison of Supply Chain Collaboration Indicators in the Automotive Manufacturing Industry

Comparison Item	Before Collaboration	After Collaboration
Parts Supply Delay Rate	15%	5%
Inventory Cost as a Proportion of Total Cost	20%	15%
Number of Production Plan Adjustments (per Month)	8-10 times	3-5 times
Logistics and Distribution Cost (per Vehicle)	¥800-1,000	¥600-700
Product Delivery Lead Time (from Order to Delivery)	20-25 days	12-15 days
Supplier Response Time (after Receiving Demand)	Average 48 hours	Average 24 hours
Final Vehicle Defect Rate	3%-5%	1%-2%
Overall Supply Chain Inventory Turnover (per Year)	3-4 times	5-6 times
Supplier Collaboration Satisfaction (on a 1-5 Scale)	Around 3 points	Above 4 points

(3) Application under the concept of green development

The concept of green development urges SCM to practice environmental protection measures in modern logistics. In the packaging process, the use of degradable and recyclable packaging materials should be promoted, and the use of disposable packaging should be reduced. In transportation, transportation routes should be optimized and multimodal transport should be adopted to increase vehicle loading rates, reduce energy consumption, and lower exhaust emissions. Some logistics enterprises introduce new energy vehicles to replace traditional fuel vehicles and realize energy saving and emission reduction in transportation links. In the construction of storage facilities, energy-saving lamps and intelligent temperature control equipment are adopted to reduce storage energy consumption.

(4) Application under the concept of open development

The concept of open development promotes SCM to strengthen international cooperation and expand the global market in modern logistics. China logistics enterprises actively carry out strategic cooperation with international logistics giants, learn advanced management experience and technology, and enhance their competitiveness. With the promotion of the "Belt and Road Initiative", many logistics enterprises have participated in the construction of international logistics channels, expanded international transportation routes such as China-Europe trains, and strengthened logistics cooperation with countries along the route. Overseas logistics nodes should be strategically laid out, overseas warehouses should be established, global logistics distribution capabilities should be enhanced, and business development needs such as those of cross-border e-commerce should be met.

(5) Application under the concept of shared development

The concept of shared development is embodied in the sharing of resources and information in SCM and modern logistics. Logistics enterprises improve resource utilization by sharing resources such as warehousing and transportation equipment. In terms of information sharing, we should build a public logistics information platform to gather information such as logistics supply and demand, vehicle capacity and storage resources, realize real-time information interaction, improve the transparency and efficiency of logistics operation, and reduce the waste of resources such as empty driving rate.

4. The innovative direction of SCM in modern logistics under the new development concept

(1) Driven by technological innovation

Technological innovation is the core power to promote the development of SCM in modern logistics. With the continuous maturity of Internet of Things technology, logistics equipment and goods will be fully interconnected. In the warehousing process, by installing sensors on shelves, pallets and goods, real-time monitoring of goods location, inventory quantity, temperature and humidity and other information, intelligent warehousing management is realized. The integration of big data and artificial intelligence will further optimize logistics decision-making. Using machine learning algorithm to analyze massive logistics data, predict transportation demand, optimize distribution path and improve logistics efficiency. As shown in Table 2, it is estimated that in the next 3-5 years, through these technological innovations, the transportation cost is expected to be reduced by 15%-20%, and the delivery punctuality rate will be increased by 20%-25%.

Table 2: Estimated Impact of Technological Innovation on Logistics Costs and Efficiency

Indicator	Current Situation	Projected Changes in the Next 3-5 Years
Transportation Cost	40%-50% of Total Logistics Cost	Decrease by 15%-20%
Inventory Cost	20%-30% of Total Logistics Cost	Decrease by 10%-15%
Warehouse Space Utilization Rate	50%-60%	Increase by 15%-20%
Order Processing Time	Average 2-3 Days	Shorten to 1-2 Days
On-Time Delivery Rate	70%-80%	Increase by 20%-25%
Cargo Damage Rate	3%-5%	Decrease to 1%-3%

(2) Collaborative model innovation

The coordination of all links in the supply chain needs to change from traditional linear cooperation to deep integration. An ecological alliance led by core enterprises in the supply chain establishes strategic plans jointly and shares resources and interests among its member enterprises, while strengthening cooperation with external institutions such as research institutes and financial institutions. Scientific research institutions provide technical support and innovative ideas, and financial institutions provide financial guarantee and financial service innovation for supply chain operation.

(3) Green and sustainable innovation

To further promote green supply chain logistics, stricter environmental protection measures should be taken in the whole process. In packaging, the development of new intelligent packaging materials not only has environmental protection characteristics, but also can realize real-time monitoring and information transmission of goods. Transport links, speed up the popularization of new energy vehicles, and explore the application of clean energy such as hydrogen energy in heavy logistics transportation. In the construction of storage facilities, green building materials and energy-saving technologies are adopted to create zero-carbon storage. Through these measures, a green logistics system running through the supply chain will be formed to meet the challenges of global climate change and resource shortage.

(4) Open cooperation and innovation

In the field of international logistics, we will strengthen the interconnection of logistics infrastructure with countries and regions along the "Belt and Road". Stakeholders collaborate to build a digital logistics corridor and achieve seamless integration of logistics information. They actively engage in the formulation of international logistics standards to enhance China’s influence in the global logistics arena. Domestic logistics enterprises are encouraged to pursue cross-border mergers and acquisitions as well as strategic partnerships with international logistics giants, thereby acquiring advanced management expertise and expanding their global market share.

(5) Innovation of sharing mechanism

Improve the sharing mechanism of logistics resources and information, and develop a more powerful shared logistics platform. In addition to sharing storage and transportation equipment, we

should also share logistics talents, technology and other resources. In terms of information sharing, blockchain technology is used to ensure the authenticity and security of information, promote the comprehensive sharing of logistics supply and demand information and price information, break down information barriers, and build a fair and efficient logistics market environment.

5. Conclusions

This article focuses on the application and innovation of SCM in modern logistics under the new development concept. Based on the theoretical basis, this article expounds the new development concept, SCM and modern logistics theory to lay a solid foundation for the follow-up analysis. In the part of application analysis, the specific application under the development concept of innovation, coordination, green, openness and sharing is discussed in detail, showing the powerful guiding role of the new development concept in the integration of SCM and modern logistics.

The research shows that the new development concept has been deeply integrated into the practice of SCM in modern logistics, and the application results of each concept are remarkable, with initial results in improving efficiency, reducing costs, protecting the environment, expanding markets and optimizing resource allocation. However, the development of the industry will never stop, and we still need to continue to exert our strength in the direction of innovation in the future. Technological innovation should keep up with the forefront of the times, the collaborative model should be deepened and integrated, green sustainability should run through the whole process, open cooperation should be expanded in breadth and depth, and the sharing mechanism should be continuously improved. In the future, with the continuous and in-depth implementation of the new development concept, SCM is expected to achieve higher quality development in modern logistics, promote China's logistics industry to occupy a more favorable position in global competition, and provide solid support for economic and social development.

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