

# Research Status and Development Trend of Modern Logistics System Technology

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**Abstract:** Modern logistics is not only a traditional organizational management technology related to transportation and warehousing in a general sense, but also an economic management activity that can create higher economic value. It plays an irreplaceable role in improving urban service function, improving investment environment and promoting regional economic development. As a product of the new economic era, logistics industry has become a new "economic growth point" of China's tertiary industry. The paper introduces the general connotation and research status of modern logistics technology, and analyzes some new concepts and logistics system solutions that have emerged and applied in recent years from the aspects of logistics and information flow, and the development of future logistics system technology. The outlook was made.

## 1. Introduction

At present, the world economy is undergoing a major turning point of profound change. The economic restructuring, the rapid development of science and technology and the increasing influence of transnational corporations worldwide are the main trends in the current world economic tide. With the rapid development of the world economy and the progress of modern science and technology, logistics industry, as a new service sector in the national economy, is developing rapidly all over the world [1]. Modern logistics distribution system needs to use a variety of logistics distribution technology and methods to improve the efficiency of logistics distribution, reduce distribution costs, minimize vehicle empty driving rate, and improve the flexibility and flexibility of distribution operations. Statistics show that China's logistics industry as a whole is still underdeveloped, and the proportion of logistics costs in GDP is relatively high, which is estimated to account for about 35% of China's GDP [2]. The logistics costs of developed countries in Europe and America generally account for between 13% and 15% of the country's GDP. It is necessary for China to establish a modern logistics legal system that is in line with the international logistics legal system, in order to meet the needs of the development of new situations such as "Internet +" and cross-border e-commerce, and to improve the current logistics system that needs to be improved [3]. This objectively provides a solid and reliable basis for us to explore the development strategy of modern logistics in the context of sustainable development. Practice shows that which region has a developed modern logistics industry, and which region has more resources and opportunities for development. Therefore, the development of modern logistics industry in the region has received increasing attention.

## 2. Current Situation of Modern Logistics Industry

Since the reform and opening up 30 years ago, China's logistics industry has also developed as well as other sectors of the national economy. The circulation management system and the form of circulation organization have been constantly reformed, and the operation mechanism mainly based on market regulation has gradually been formed. The concept of logistics has been introduced into China for more than 20 years. Chinese scholars and researchers have done a lot of research on the development history and connotation of logistics, but we should also see that the basic theory of logistics, the relationship between logistics systems, especially micro-logistics and logistics information systems, are still far from enough [4]. In the early 1980s, the article "Logistics Talk"

was published in the professional journal "Material Economics Research Newsletter" of the Ministry of Materials. The article systematically describes the concept of logistics, logistics management, logistics structure and logistics information [5]. In the course of more than 30 years of development, China has introduced a series of laws, regulations and clauses to regulate the order of the logistics market. For example: the "Postal Law", "Contract Law", "Highway Law", "Marine Law" and other laws. The comprehensive transportation network system consisting of various modes of transportation has basically taken shape, and the bottleneck restriction of transportation for the development of the national economy has been greatly eased [6].

From the experience of developed countries, the term logistics originated in the 1920s. In just a few decades, it has become an important pillar of a country's economy. From the perspective of China's current economic development, with the market economy Going deeper, there are fewer and fewer opportunities to rely solely on business flow to make a profit. Chinese scholars and researchers have done a lot of research on the history and connotation of logistics development, but it should also be seen that the research on the basic theory of logistics and the relationship between logistics systems, especially micro-logistics and logistics information systems. Far from enough. The formation process is not coherent and systematic, which is undoubtedly undesirable for an independent industry such as the logistics industry, which is not conducive to the sustainable development of the industry. As a result, modern logistics system is an open system, which not only produces economic benefits, but also social benefits. Of course, its benefits are both positive and negative. The rapid development of modern information technology and commodity logistics technology provides a sufficient technical basis for the rapid development of modern logistics industry in China. Practice has proved that the high-quality service of third-party logistics not only meets the complex and changeable logistics service requirements of customers, but also promotes the vigorous development of third-party logistics, thus promoting the coordinated development of economy and society. The construction of socialized logistics distribution center is a revolution in the field of circulation, and its social benefits are compared to a gold mine by international logistics experts.

Logistics is the important support of network economy and e-commerce, and the development of network economy and e-commerce also promotes the process of the transformation of logistics industry to modernization. They are complementary and inseparable. Up to now, most of them have been difficult to adapt to the development of logistics industry under the market economic system, let alone to adapt to the internationalization trend of logistics industry. According to statistics, at present, the turnover rate of commodities in China is only 35% in developed countries, the quantity of goods in stock per square meter is only 26% in developed countries, and the distribution error rate is three times that in developed countries. In recent years, the scale of communication infrastructure construction in China has been increasing, the development of modern communication technology has been accelerated, and the communication information network and various public information platforms have been formed. E-commerce is also proposed to solve the tedious process of information flow, business flow and capital flow to slow down the modern logistics process, thereby further improving the modern logistics speed. The departments in these fields are relatively independent in the legislative process. Basically, in the development process of the logistics industry, when the business in a certain field is involved, the departments affiliated to the field will issue corresponding laws in accordance with the activities of regulating the logistics industry in this field. Regulations. A nationwide mobile communication network, digital data network and multimedia communication network have been established. The continuous improvement of the information infrastructure and the rapid growth of the information service industry have provided strong technical support for the development of the modern logistics industry.

### **3. Development Trend of Modern Logistics System Technology**

In recent years, with the intensification of market competition, the further improvement of international division of labor and the continuous development of computer network technology,

new research trends have emerged in the research and development of modern logistics system technology. In China, with the increase in the number of three-dimensional warehouses and the popularity of three-dimensional warehouse technology, many companies have begun to consider how to integrate the automatic storage system with the production system of the entire enterprise to form a complete and rational logistics system. It is precisely because of the unique characteristics of distribution and transportation that the rational planning of distribution routes has a much greater impact on distribution costs than general transportation. Therefore, it is necessary to formulate efficient transportation routes and select reasonable transportation modes and transportation tools on the basis of comprehensive planning. The government should give sufficient policy support, formulate laws and regulations to manage the modern logistics market, standardize the behavior of the modern logistics market, unify the market standards, and establish and improve a unified policy system. At present, it is still necessary to strengthen the research on logistics basic theory, such as the definition of logistics basic concepts, the impact of logistics on economy, the status of logistics infrastructure in China, and the application of computers in logistics (not only the establishment of MIS system), etc. The degree of marketization of China's circulation industry has approached 65%, which is in the middle stage of socialization and modernization. It is predicted that by the middle of the 21st century, China will realize the modernization of commodity circulation in an all-round way and reach the advanced level in the world.

Modern logistics is a circulating logistics system. The circular logistics mentioned here refers not only to the recycling of waste, but also to the logistics system as a bridge between the ecosystem and the economic system. It includes both the forward logistics system and the reverse logistics system. The transformation of traditional transport enterprises into logistics enterprises is an important means to upgrade the level of transport industry and to make transport enterprises bigger and stronger. Traditional transport enterprises must complete their own structural adjustment and transformation as soon as possible, otherwise it will be difficult to participate in the fierce competition in the market. At present, many foreign rigid production lines suitable for mass production are gradually being transformed into flexible production lines with small batches and multiple varieties. Reasonable determination of the delivery route is to use the least capacity, take the shortest mileage, spend the least cost, and transport the goods to the user at the fastest speed through the least links. The state should comprehensively start the standardization of modern logistics systems, especially the standardization of logistics facilities, standardization of assembly and standardization of logistics information networks, and create favorable conditions for the development of modern logistics across regions and industries. It is necessary to strengthen the study of the matter, and the logistics industry in China should strengthen practical research. There is no point in theoretical research from practice. Here, research on internal logistics, circulation enterprise logistics, logistics nodes, consumer logistics, and logistics management technologies should be strengthened.

At present, our country has formulated the Tenth Five-Year Plan of logistics distribution in order to promote the rapid development of logistics industry. "Planning" put forward that the overall development goal of China's logistics and distribution industry is that during the Tenth Five-Year Plan period, logistics and distribution services are mainly undertaken by socialized and specialized logistics and distribution enterprises. With the application of Global Positioning System (GPS), the dynamic scheduling, dynamic storage and dynamic transportation of social logistics system will gradually replace the static fixed warehouse of enterprises. Because the optimization of logistics system is to reduce inventory to zero inventory, this dynamic warehousing and transportation system fully reflects the future development trend of macro logistics system with the help of global positioning system. At the same time, with the concept of "Internet +" put forward, Internet + efficient logistics is also proposed as an important content. With the deepening of environmental resources, the threat of human survival and development is greater, so people pay more and more attention to the utilization of resources and the protection of the environment. The construction of new logistics regulations should focus on the use of information sharing and artificial intelligence to create more convenient and intelligent logistics. In the case of only forward logistics, all the

resources required for economic activities are taken from the white environment system, and all the waste generated is discharged to the environmental system. For the logistics system, such as pallets, crates, shelves and other resources, there are several trends: the packaging materials are made of degradable materials, and the standardization of the pallets makes the reusability improve and the supply chain management continues to improve. Reduce the use of pallets and crates.

#### 4. Conclusion

Modern logistics technology has been a comprehensive multi-disciplinary science including mechanics, computer science, management engineering and automatic control technology. While reducing manufacturing costs, people pay more attention to reducing logistics costs. The development of logistics industry plays a vital role in the promotion of a country's comprehensive strength. The scientific and systematic logistics laws and regulations system is the fundamental guarantee for the sustainable and sound development of modern logistics. The 21st century is a century of sustainable development. As the core content of circular economy, circular logistics can make full use of limited natural resources and help to protect the ecological environment. It is the only way to achieve sustainable development in China. At present, the research and development of logistics technology is in the ascendant stage in China, and modern international logistics technology is more integrated, virtualized, green, flexible and standardized. Make full use of the existing service network to enhance and realize the networking of logistics enterprises, effectively integrate and interact business flow, logistics and information flow, and build a modern logistics network system to provide accurate and timely logistics services and improve logistics modernization in China. Level.

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