

Current Situation and Countermeasures for the Development of E-commerce Logistics in China

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Abstract: With the rapid development of the Internet, e-commerce has risen rapidly around the world, promoting the prosperous development of e-commerce logistics in China. This paper mainly analyses the current development status of e-commerce logistics in China, including market size, major players and development trend. At the same time, this paper also discusses the main challenges and issues facing China's e-commerce logistics, such as logistics and distribution efficiency and cost, warehousing and inventory management, logistics information and data security, and green logistics. In response to these problems, this paper proposes a series of development countermeasures, such as improving logistics and distribution efficiency and reducing costs, optimising warehousing and inventory management, strengthening logistics information and data security protection, and promoting green logistics and sustainable development.

Keywords: E-commerce in China; Logistics development; Market size; Challenges and countermeasures.

1. Introduction

With the rapid development of Internet technology and the continuous upgrading of consumer demand, China's e-commerce industry has made world-renowned achievements. However, the development of e-commerce cannot be separated from the support of efficient and convenient logistics. As an emerging industry, China's e-commerce logistics has attracted the world's attention in terms of its development speed and scale, but at the same time, it is also facing a series of challenges and problems. The purpose of this paper is to analyse the current situation of the development of China's e-commerce logistics, discuss the challenges and problems it faces, and put forward corresponding countermeasures, with a view to providing reference for promoting the high-quality development of China's e-commerce logistics.

2. Overview of E-commerce Logistics in China

2.1. Definition and characteristics of e-commerce logistics

E-commerce logistics refers to a series of logistics activities and processes involved in e-commerce transactions to achieve the effective delivery of goods from suppliers to consumers. It has the following characteristics:

Informatisation: E-commerce logistics is highly dependent on information technology, and all links, including e-commerce platforms, logistics enterprises and third-party logistics service providers, need to achieve information sharing and collaborative operations through information systems. This helps to improve logistics efficiency, reduce operating costs and improve customer service.

Quickness: E-commerce logistics pursues faster distribution speed to meet consumers' demand for shopping convenience. With the continuous innovation of logistics technology and distribution mode, such as the application of drones, unmanned vehicles, intelligent warehousing and other technologies, the speed of e-commerce logistics distribution has been significantly improved.

Flexibility: e-commerce logistics services have strong customisation characteristics, and can provide personalised logistics services according to consumer demand and commodity characteristics. For example, cold chain logistics, large logistics, cross-border e-commerce logistics, etc., can meet the e-commerce logistics needs in specific scenarios.

Cost-effectiveness: While pursuing high efficiency and speed, e-commerce logistics also needs to focus on cost control. By means of optimising the allocation of logistics resources, innovating the logistics model, and improving the transport efficiency, the reduction of logistics costs can be achieved, thus enhancing the competitiveness of e-commerce enterprises.

Synergy: E-commerce logistics involves a number of links and participating subjects, such as e-commerce platforms, logistics companies, suppliers, consumers and so on. To achieve efficient operation, all parties need to strengthen the synergy and co-operation, share resources and improve the efficiency of the overall supply chain.

Green environmental protection: With the improvement of social awareness of environmental protection, e-commerce logistics is also gradually promoting green packaging, green storage, green transport and other environmental protection measures, in order to reduce the impact of logistics activities on the environment and achieve sustainable development.

2.2. The development history of China's e-commerce logistics

The development history of China's e-commerce logistics can be divided into three stages: the starting stage, the rapid development stage and the optimisation and upgrading stage.

In the starting stage, from about 1999 to 2003, China's e-commerce logistics is still in the primary stage, the co-operation between e-commerce enterprises and logistics enterprises is not close, and the logistics and distribution efficiency and experience are relatively poor. At this stage, the main characteristics of China's e-commerce logistics were slow logistics and distribution speed, low service quality, and high logistics costs [1]. From 2004 to 2012, China's e-commerce logistics entered a rapid development stage. With the explosive growth of the e-commerce market, logistics

enterprises began to operate on a large scale, and e-commerce platforms began to build their own logistics systems. At this stage, the main features of China's e-commerce logistics were that logistics enterprises operated on a large scale, e-commerce platforms built their own logistics, and the efficiency of logistics and distribution and the quality of service were significantly improved. From 2013 to the present, China's e-commerce logistics has entered the optimisation and upgrading stage. With the maturity of the e-commerce market and the advancement of logistics technology, China's e-commerce logistics has begun to focus on improving logistics efficiency, reducing logistics costs and improving customer experience. At this stage, the main feature of China's e-commerce logistics is that logistics enterprises improve logistics efficiency through technological innovation, e-commerce platforms optimise logistics and distribution through big data and artificial intelligence, and the speed of logistics and distribution and the quality of service are further improved [2].

2.3. Market size and trend of e-commerce logistics in China

China's e-commerce logistics market size is huge and continues to grow. With the popularity of the Internet and the development of e-commerce, China's e-commerce logistics market has achieved significant growth in the past decade. According to my training data, the size of China's e-commerce logistics market has exceeded one trillion yuan and is expected to maintain high growth in the coming years [3].

The growth of the e-commerce logistics market is due to a number of factors. First, the rapid development of e-commerce has driven the demand for logistics services. With the increasing acceptance of online shopping by consumers, the competition between e-commerce platforms has become increasingly fierce, which has prompted the improvement of logistics service level and the reduction of logistics costs. Secondly, technological progress and the advancement of information technology have also provided better technical support and management tools for e-commerce logistics, improving logistics efficiency and accuracy. In addition, government support and policy promotion for the e-commerce logistics industry has also played a positive role in the expansion of the market scale. In the future, China's e-commerce logistics market will continue to maintain the growth trend. With the continuous development and innovation of e-commerce platforms, logistics services will also continue to be upgraded and improved. For example, the application of advanced technologies such as unmanned delivery, intelligent warehouses and big data analysis will further improve logistics efficiency and user experience. In addition, green logistics and sustainable development will also become an important direction for the future development of e-commerce logistics in order to cope with environmental issues and meet consumer demand for environmental protection [4].

3. Major Players of E-commerce Logistics in China

3.1. E-commerce platform

E-commerce platforms play a crucial role in China's e-commerce logistics. E-commerce platforms facilitate a large number of transactions by providing online shopping platforms that connect consumers and sellers. These

platforms have a large user base and can attract more sellers and buyers to participate in the e-commerce market [5].

The development of e-commerce platforms in logistics is mainly reflected in the following aspects. Firstly, e-commerce platforms have improved the efficiency and speed of logistics and distribution by establishing self-built logistics systems. For example, Alibaba's Cainiao network and Jingdong's self-owned logistics have achieved rapid distribution of goods by establishing storage centres and distribution networks. Secondly, e-commerce platforms have expanded the scope and coverage of logistics services by cooperating with third-party logistics service providers. E-commerce platforms can integrate socialised logistics resources to improve the efficiency and reliability of logistics distribution. In addition, e-commerce platforms can realise the intelligence and automation of logistics through big data and artificial intelligence technology. Through the analysis of user behavior and purchase data, the e-commerce platform can predict the sales trend of goods, optimize inventory management, and improve the efficiency of logistics and distribution.

The role of e-commerce platforms in e-commerce logistics cannot be ignored. They have improved the efficiency and speed of logistics and distribution by establishing self-built logistics systems, cooperating with third-party logistics service providers, and utilising big data and artificial intelligence technologies. The development of e-commerce platforms in logistics helps to improve user experience, increase user stickiness, and further promote the development of the e-commerce market. However, e-commerce platforms also face some challenges in logistics, such as high logistics costs and untimely logistics and distribution. In the future, e-commerce platforms need to continuously innovate and optimise their logistics services to cope with market competition and the constant changes in user demand.

3.2. Logistics enterprises

Logistics enterprises play a crucial role in China's e-commerce logistics. They are the bridge between e-commerce platforms and consumers, and are responsible for warehousing, sorting, packing and distribution of goods. With the rapid development of the e-commerce industry, logistics enterprises are facing many challenges and problems.

Logistics companies need to cope with the growing volume of orders and distribution pressure. During the promotional activities of e-commerce platforms, there is a surge in the volume of orders, and logistics companies need to handle a large number of orders quickly and efficiently to ensure that the goods can be delivered to consumers on time. In addition, logistics companies also need to deal with distribution challenges in remote areas and improve distribution efficiency. Secondly, logistics companies need to improve warehousing and inventory management capabilities. With the increase in the variety and quantity of goods, logistics companies need to optimise storage space, improve inventory management efficiency and reduce inventory costs. At the same time, logistics enterprises also need to achieve real-time updating and tracking of inventory to meet the rapid response of the e-commerce platform to the demand for goods. In addition, logistics enterprises need to strengthen logistics information and data security protection. In the process of e-commerce logistics, a large amount of personal information and transaction data need to be transmitted and processed. Logistics enterprises need to ensure the security of these

information and data, prevent data leakage and theft, and protect the privacy and property security of consumers [6].

3.3. Third-party logistics service providers

Third-party logistics service providers play a crucial role in China's e-commerce logistics sector. They provide professional logistics services for e-commerce platforms and merchants, including but not limited to warehouse management, order processing, delivery and transport. With the rapid development of the e-commerce industry, the demand for third-party logistics services is also growing, which prompts third-party logistics service providers to continuously innovate and improve service quality [7].

On the one hand, third-party logistics service providers achieve real-time monitoring and optimisation of the logistics process by adopting advanced information technologies, such as the Internet of Things, big data and artificial intelligence. The application of these technologies can improve logistics efficiency, reduce errors, and enhance customer satisfaction. For example, through intelligent algorithms, third-party logistics service providers can predict the volume of orders and adjust warehousing and distribution resources in advance, so as to effectively cope with the logistics pressure during peak periods. On the other hand, 3PL service providers are also actively exploring green logistics solutions to reduce the environmental impact of logistics activities. This includes the use of environmentally friendly materials for packaging, optimising transport routes to reduce carbon emissions, and promoting the use of new energy means of transport. As society becomes more aware of environmental protection, green logistics has become one of the key factors in the competitiveness of 3PL service providers. However, 3PL service providers are also facing some challenges. The first one is the cost control problem. The rise of logistics costs may compress the profit margins of service providers. Second is the guarantee of service quality, how to provide competitive prices while ensuring service speed and accuracy is a problem that needs to be solved by 3PL service providers. In addition, with the consolidation of the e-commerce industry, large e-commerce platforms may build their own logistics systems, which brings greater competitive pressure on third-party logistics service providers.

4. Challenges and Problems Facing China's E-commerce Logistics

4.1. Logistics distribution efficiency and cost issues

China's e-commerce logistics faces many challenges in terms of distribution efficiency and cost. Firstly, due to China's vast territory, the distribution distance is far, which leads to low efficiency of logistics and distribution. In addition, logistics companies have to face problems such as traffic congestion and unreasonable urban planning in the distribution process, which further affects the distribution efficiency [8]. At the same time, the cost problem of China's e-commerce logistics is also more prominent. On the one hand, in order to ensure the quality of service, logistics enterprises need to invest a lot of money for the purchase of equipment and technology upgrading, which leads to higher operating costs. On the other hand, with the intensification of market competition, logistics enterprises often adopt the price war strategy in order to compete for customers, resulting in the compression of profit margins, further increasing the cost

pressure [9].

4.2. Warehousing and inventory management challenges

China's e-commerce logistics in the rapid development also faces the difficulties of warehousing and inventory management. Due to the diversity of the sales model of e-commerce platforms, the variety of goods and the fluctuation of inventory levels have brought great challenges to warehouse management [10].

The diversity of sales modes of e-commerce platforms, including pre-sales, flash sales, and promotions, leads to a wide variety of commodities and fluctuating inventory levels, which puts higher requirements on warehouse management. Secondly, due to consumers' rising expectations of delivery speed, warehouse management needs to be more refined and efficient to ensure that goods can be delivered to consumers in a timely manner. In addition, during holidays and promotional activities, warehousing and inventory management are under more pressure, how to reasonably predict and control the inventory level, to avoid the occurrence of excess or out-of-stock situation is a problem that e-commerce logistics enterprises need to solve [11].

4.3. Logistics information and data security issues

With the rapid development of the e-commerce industry, the problem of logistics information and data security has become increasingly prominent. In the logistics process, a large amount of personal information and transaction data are involved, and how to guarantee the safety of this information has become a problem that needs to be solved at present. Logistics information and data security issues have a serious impact on the development of the e-commerce industry. Once logistics information is leaked, it may lead to a decline in consumer trust, thus affecting the reputation and market share of e-commerce platforms. In addition, logistics data security problems may also lead to legal risks for e-commerce enterprises and even affect the healthy development of the entire e-commerce industry. Secondly, the logistics information and data security problem involves a variety of factors. On the one hand, e-commerce platforms need to strengthen the supervision of logistics information to ensure the security of information in the process of transmission, storage and processing. On the other hand, logistics enterprises need to raise awareness of data security and adopt effective technical means and management measures to protect logistics data. At the same time, the government and relevant departments also need to strengthen the supervision of logistics information and data security issues, establish and improve relevant laws and regulations, and regulate the behaviour of logistics enterprises and e-commerce platforms.

4.4. Green Logistics and Sustainable Development Issues

With the rapid development of China's e-commerce industry, logistics, as its important support, faces many challenges. Among them, green logistics and sustainable development issues are particularly prominent. In the traditional e-commerce logistics model, there are serious problems such as over-packaging, emission pollution from transport means, and waste of resources. This not only affects the quality of the environment, but also restricts the long-term development of e-commerce logistics.

The problem of over-packaging is serious. In order to ensure the safety of commodities in the transport process, e-commerce platforms and logistics enterprises often use a large number of packaging materials, such as plastic bags, cardboard boxes and so on. While these materials increase the loss rate of goods, they also bring a large amount of waste, which puts pressure on the environment. Secondly, the problem of pollution from transport vehicle emissions should not be ignored. E-commerce logistics involves a large number of transport and distribution links, and the emission pollution of transport tools is one of the important factors. Especially in the urban distribution links, minivans, electric bicycles and other means of transport emission pollution problem is more prominent. In addition, the problem of resource waste is also very serious. In the process of e-commerce logistics, there is a waste of resources in warehousing, packaging, transport, distribution and other links. For example, the waste of resources caused by a large amount of inventory backlog, and the excessive use of packaging materials, transport tools and so on [12].

5. Countermeasures for the Development of E-commerce Logistics in China

5.1. Improve logistics and distribution efficiency and reduce costs

China's e-commerce logistics has achieved remarkable development in recent years, but still faces the problems of low logistics and distribution efficiency and high cost. In order to enhance logistics and distribution efficiency and reduce costs, the following aspects can be taken into account.

Strengthening the construction of logistics infrastructure is the key to improving distribution efficiency. E-commerce platforms and logistics companies should increase investment in logistics and warehousing facilities, and build more distribution centres and distribution sites to shorten the distance of commodity distribution and improve distribution speed. At the same time, optimise warehousing layout and inventory management to reduce warehousing costs and improve inventory turnover. Secondly, the introduction of advanced information technology and automation equipment is also an important means to improve the efficiency of logistics and distribution. Through the logistics information system and logistics automation equipment, real-time tracking of logistics information and automated sorting of goods can be realised, reducing manpower costs and improving distribution efficiency. In addition, the use of big data analysis and artificial intelligence technology to predict commodity sales and optimise distribution routes reduces distribution costs and improves distribution accuracy. In addition, strengthening logistics co-operation and sharing resources is also an effective way to reduce logistics costs. E-commerce platforms, logistics enterprises and third-party logistics service providers should strengthen cooperation and share logistics resources and information to achieve scale effects and reduce operating costs. At the same time, promote competition and cooperation among logistics enterprises, promote the diversification of logistics services, and provide personalised logistics services to meet the needs of different consumers. Finally, strengthening the promotion and practice of green logistics concept is also an important direction to reduce logistics costs. By optimising packaging and reducing

packaging waste, we can improve the recycling rate of packaging and reduce energy consumption and carbon emissions in the logistics process. At the same time, the promotion of the use of new energy and low-carbon emission logistics and distribution tools to reduce the impact on the environment and achieve sustainable development.

In summary, the distribution efficiency and cost reduction of e-commerce logistics can be effectively enhanced by strengthening the construction of logistics infrastructure, introducing advanced information technology and automation equipment, strengthening logistics collaboration and sharing resources, and promoting the concept of green logistics. This will help promote the sustainable development of China's e-commerce logistics industry and enhance the competitiveness and market share of e-commerce enterprises [13].

5.2. Optimising warehousing and inventory management

China's e-commerce logistics is facing the challenges of warehousing and inventory management while experiencing rapid development. Optimising warehousing and inventory management is important for improving logistics efficiency and reducing operating costs [14].

Warehousing and inventory management in e-commerce logistics faces problems such as large inventory fluctuations and difficult demand forecasting. In order to solve these problems, e-commerce enterprises can take the following measures.

Adopt advanced inventory management system to achieve accurate control of inventory through data analysis and technical means. For example, use IoT technology and intelligent equipment to achieve real-time monitoring and automated management of goods in the warehouse. Secondly, adopt a diversified warehousing strategy and choose the appropriate warehousing method according to the characteristics and needs of the commodities. For example, for perishable commodities, cold chain warehousing can be used; for high-value commodities, insurance storage and other methods can be used. Again, strengthen supply chain collaboration, establish close cooperation with suppliers and distributors to achieve inventory information sharing and collaborative management. For example, through the supply chain management system, order forecasting and inventory management for suppliers can be realised, so as to reduce inventory backlogs and out-of-stock situations. Finally, promote the concept of green warehousing and sustainable development to improve the energy utilisation efficiency of warehousing facilities and reduce the impact of warehousing and inventory management on the environment. For example, energy-efficient lighting systems and green packaging materials are used to reduce energy consumption and waste generation.

In conclusion, optimising warehousing and inventory management is one of the important countermeasures for the development of e-commerce logistics in China. By adopting advanced inventory management systems, diversified warehousing strategies, supply chain collaboration and green warehousing, logistics efficiency can be improved, operating costs can be reduced and sustainable development can be achieved.

5.3. Strengthen logistics information and data security protection

With the rapid development of the e-commerce industry,

the problem of logistics information and data security has become increasingly prominent. In the process of e-commerce logistics, a large amount of personal information and transaction data are involved, and safeguarding the security of such information and data is crucial to safeguarding consumer rights and interests, enhancing corporate reputation and promoting industrial development.

Strengthening logistics information and data security needs to start from the technical level. Logistics enterprises should adopt advanced encryption technology and firewalls to ensure the security of information and data in the transmission process. In addition, they should establish a perfect data security management system and conduct data security training for employees to improve their security awareness and prevent internal leakage. Second, establish a perfect information sharing mechanism and collaborative defence system. E-commerce platforms, logistics companies and third-party service providers should share information resources, strengthen collaboration and jointly address security risks. By sharing security information in real time, it improves risk prevention and control capabilities and reduces the probability of security incidents. Again, strengthen supervision and regulation. Government departments should strengthen the security supervision of the e-commerce logistics industry and formulate relevant laws and regulations to clarify the rights and interests of enterprises and consumers. For violations of data security regulations, penalties should be imposed in accordance with the law to form a strong deterrent effect. In addition, enhancing consumer security awareness is also an important part of strengthening logistics information and data security. Enterprises should step up publicity efforts to popularise information security knowledge among consumers and remind them to pay attention to protecting their privacy when providing personal information. At the same time, enterprises should effectively fulfil their notification obligations so that consumers understand how their information is collected, used and protected. Finally, enterprises should establish a sound emergency response mechanism to enable them to take prompt measures to mitigate losses in the event of a security incident. This includes the formulation of detailed emergency response plans for security incidents to ensure that they can be activated quickly in the event of a security incident and that effective measures can be taken to prevent the situation from expanding.

In conclusion, strengthening logistics information and data security is the key to the sustainable development of the e-commerce logistics industry. By strengthening technical protection, establishing an information sharing mechanism, reinforcing regulatory laws and regulations, enhancing consumer awareness and establishing an emergency response mechanism, we can effectively improve the security level of the e-commerce logistics industry and create a safe and reliable shopping environment for consumers.

5.4. Promoting Green Logistics and Sustainable Development

With the rapid development of China's e-commerce industry, logistics, as its important support, faces problems such as environmental pollution and resource consumption. Promoting green logistics and sustainable development has become an urgent problem for China's e-commerce logistics industry. Firstly, e-commerce logistics enterprises should strengthen the promotion and publicity of green logistics

concepts, and improve the environmental awareness of employees and consumers. Secondly, optimise logistics packaging and adopt environmentally friendly materials to reduce the impact of packaging waste on the environment. At the same time, logistics enterprises should reduce energy consumption and emissions in the logistics transport process by optimising transport routes and improving the loading rate of transport means. In addition, make full use of information technology to achieve rational allocation of logistics resources, improve logistics efficiency and reduce logistics costs. Finally, the government should also increase policy support for green logistics, encourage enterprises to research and develop green logistics technology and equipment, and promote green logistics and sustainable development [15].

6. Conclusion

China's e-commerce logistics is facing many challenges as well as breeding new development opportunities while developing rapidly. By implementing effective countermeasures, such as improving logistics and distribution efficiency and reducing costs, optimising warehousing and inventory management, strengthening logistics information and data security protection, as well as promoting green logistics and sustainable development, China's e-commerce logistics industry is expected to overcome existing problems and achieve more efficient, environmentally friendly and sustainable development. This will not only help enhance the competitiveness of e-commerce enterprises, but will also provide consumers with better logistics services and promote the overall prosperity of China's e-commerce industry. In the future, with the continuous progress of technology and continuous policy support, China's e-commerce logistics industry will usher in a broader development prospect.

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