

Research on Smart Logistics Construction Under the Background of Coordinated Development of Beijing, Tianjin and Hebei

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Abstract: The coordinated development of Beijing Tianjin Hebei is a national strategy, which implements the coordinated development of Beijing Tianjin Hebei, promotes the coordination ability of regional economy, improves regional competitiveness, and thus promotes the development of the national economy. The goal of Hebei Province is to build a national modern commercial logistics important base, which is also an important part of the coordinated development of Beijing Tianjin Hebei and an important task for Hebei Province. Innovating logistics models to promote the industrial development of Beijing Tianjin Hebei is an inevitable trend in the context of regional coordinated development. Smart logistics integrates multiple service functions, and can realize the rapid, efficient and smooth operation of information flow and material flow, thus reducing social cost, improving production efficiency, integrating social resources and promoting local economic development. This article first elaborates on the problems in the development of logistics in the three regions under the background of coordinated development in Beijing Tianjin Hebei. Then, it analyzes the current situation and problems of smart logistics construction, and finally provides actionable suggestions for the coordinated development of smart logistics in the three regions.

Keywords Beijing Tianjin Hebei Cooperation; Smart logistics; build

INTRODUCTION

In the context of the coordinated development of Beijing Tianjin Hebei, the logistics industry plays a very important role in promoting regional economic integration among the three regions. Firstly, the logistics industry is an important link connecting the Beijing Tianjin Hebei region, and the construction and improvement of the logistics network can promote the coordinated development of the three regions' economies. The logistics industry can effectively connect the production, circulation, and consumption links of the three regions, achieving optimized resource allocation and coordinated economic development; Secondly, the development of the logistics industry can promote the upgrading of the industrial structure in the Beijing Tianjin Hebei region. As an important component of modern service industry, logistics industry can provide better support and services for manufacturing, agriculture, and other industries in the three regions, promoting the optimization and upgrading of industrial structure; Thirdly, the development of the logistics industry can improve the quality of life of residents in the Beijing Tianjin Hebei region. The logistics network can cover rural and remote areas in the three regions, providing residents with more convenient and efficient logistics services, while also driving the development of local characteristic industries and increasing residents' income sources; Fourthly, the development of the

logistics industry can promote regional coordinated development in the Beijing Tianjin Hebei region. The construction and improvement of logistics networks can promote resource sharing and complementarity among the three regions, achieving complementary advantages and collaborative development.

Smart logistics plays a crucial role in the development of logistics. First of all, intelligent logistics can realize the intellectualization and automation of logistics process through the use of Internet, Internet of Things, Big data and other technical means, so as to improve the efficiency of logistics operation. Smart logistics can optimize logistics processes, reduce logistics costs, improve the quality and efficiency of logistics services, and provide enterprises with more efficient and accurate logistics solutions; Secondly, smart logistics can reduce costs in the logistics process through intelligent and automated methods. For example, through intelligent warehouse management and distribution planning, inventory and distribution costs can be reduced, logistics efficiency can be improved, and enterprise costs can be saved. Once again, smart logistics can improve the safety of the logistics process through advanced technological means. For example, real-time monitoring and tracking through IoT technology can ensure the safety and integrity of goods; Through Big data analysis, risks and accidents during transportation can be predicted and avoided to ensure transportation safety; Finally, smart logistics

can improve customer experience through customized services and intelligent delivery methods. For example, through intelligent delivery path planning, fast and accurate delivery services can be achieved; Through an intelligent customer service system, personalized services and customer feedback can be provided to improve customer satisfaction and loyalty. Moreover, as an emerging field in the logistics industry, smart logistics can promote innovation and development in the industry. The development of smart logistics can drive the development of Internet, Internet of Things, Big data and other related industries, and promote innovation and technological progress in the industry.

CURRENT RESEARCH STATUS AT HOME AND ABROAD

As a hot topic, "smart logistics" has retrieved a total of 4865 relevant studies on CNKI, including 4036 academic journals, 304 Thesis, 52 conferences, 308 newspapers, and 5 books, covering smart logistics deployment mode, cloud computing based smart logistics model reconstruction, smart logistics technology application, and a total of 14 studies when searching for "Beijing Tianjin Hebei Collaborative Development of Smart Logistics", The proportion of research related to "smart logistics" is only 0.29%, while there are a total of 10 journals, accounting for only 0.25%. From this, it can be seen that there is a serious lack of research on "smart logistics in the context of coordinated development between Beijing, Tianjin, and Hebei".

Wang Xifan, Zhou Jie, and Gu Yigang (2020) believe that with the development of network technology and the upgrading of consumer structure, the new retail wave has impacted the highly dispersed basic pattern of China's retail market. This study is based on the perspective of "new retail" and takes Alibaba Group's Hema Fresh as an example to explore the innovative application of smart logistics in the fresh retail industry. It analyzes the main implementation path of logistics "intelligence", namely "four intelligences+one automation", and analyzes the current constraints faced by Hema Fresh's development from the perspectives of new retail mode and logistics allocation. It proposes to improve the quality of logistics distribution services, improve warehousing mode Strengthen the supply chain collaboration response strategy, with the aim of providing reference for the further development of Hema Fresh. ^[1] Li Jia (2019) proposed to build a smart logistics model with integrity, efficiency, convenience, and low cost characteristics, with "one center, three auxiliary lines" as the main content, and e-commerce, logistics, and e-government platforms as the basic framework, consisting of supply subsystems, demand subsystems, and regulatory subsystems. By extracting sparse value, aggregating

fragmented value, precise business docking, and responsibility allocation mechanisms, Under the standardized logistics mode, the supply side and the demand side should be matched to the maximum extent, and the information flow, business flow, logistics, capital flow in the operation of the intelligent logistics mode based on Big data cloud computing should be transmitted efficiently and at low cost. The smart logistics model based on Big data cloud computing has good applicability in information sharing, resource utilization collaboration, and supply chain integration. It plays an obvious role in promoting the development of smart logistics. In the future, it will be further upgraded with the development of high-end technologies such as artificial intelligence and blockchain. ^[2] Wang Shuai and Lin Tan (2019) believe that under the core Logical framework of smart logistics, logistics activities are mainly composed of the foundation layer, the operation layer, the perception layer, the transmission layer, the analysis layer, and the decision-making layer, which are characterized by automatic perception, self judgment, intelligent decision-making, automatic execution, deep collaboration, and intelligent learning. In order to better promote the development of China's smart logistics and the reform of modern logistics operation mode, enterprise operation management mode and government supervision mode, we must correctly understand the many obstacles facing the development of China's smart logistics, further accelerate the construction of smart logistics standard system, accelerate the digital transformation of logistics enterprises, make full use of the smart logistics collaboration Shared space, and strengthen the sharing, cooperation and application of logistics data between government and enterprises, Extend to the upstream and downstream industrial chain of multimodal transportation. ^[3]

Jun G, Chunxiu L, Guoqiang L, etc. (2023) proposed a measurement framework for the flow of technical talents based on patents from the perspective of Complex network. Build a Technical Talent Mobility Network (TTMN) model to measure changes in network topology from three levels: network, node, and edge, in order to deepen our understanding of important nodes and mobility channels for technical talents. Then, using China's smart logistics as an example, the proposed framework was validated, and the results showed that it can reveal the actual situation of technological talent flow reported in government bulletins and related articles. The framework proposed in this article provides a new method and perspective for measuring the flow of technical talents, which is of great significance for promoting regional innovation and economic growth. ^[4] Wang X, Zhang F, Li X (2022), by establishing a complete system, uses differential centrifugation and pneumatic transportation to act on Waste sorting and

Pipeline transport, formulates standardized collection and transportation procedures, and implements block based autonomous management in communities. Based on the above methods, a one-stop service for residents' household waste collection, classification, recycling, compression, packaging, and transportation is completed to solve the problem of urban waste, ultimately forming the result of building an intelligent process for waste collection, transportation, and classification. This article utilizes the innovation of domestic waste rail logistics system to provide smarter treatment ideas for future communities and create a better living environment for residents. It plays a positive role in implementing organic urban construction, promoting industrial upgrading and economic development. ^[5]

THE CURRENT SITUATION AND PROBLEMS OF SMART LOGISTICS DEVELOPMENT IN BEIJING, TIANJIN, AND HEBEI

In order to promote the development of smart logistics in the Beijing Tianjin Hebei region, the Beijing Tianjin regional government has provided strong support for the development of smart logistics. For example, the Beijing Municipal Government has released the "Beijing Logistics Industry Improvement and Development Plan (2018-2020)", proposing development goals such as promoting logistics informatization and intelligence. The Tianjin Municipal Government has also formulated the "Tianjin Smart Logistics Industry Development Plan (2019-2025)", proposing specific measures for building a smart logistics system. Although the progress in Hebei Province has been slightly slower, the "Action Plan for Accelerating the Construction of a Logistics Strong Province in Hebei Province (2023-2027)" was also proposed in 2023. Although specific measures for "smart logistics" were not explicitly proposed in this plan, a clear goal was proposed, which is to accelerate the transformation and upgrading of logistics infrastructure, deepen the promotion and application of new generation information technology and intelligent transportation, sorting, and loading and unloading equipment, and build a batch of standardization Integrated intelligent cloud warehouse, build logistics Big data service system, realize logistics data interconnection, sharing and exchange, and by 2027, 100% of intelligent logistics facilities and equipment will be covered.

The smart logistics industry in the Beijing Tianjin Hebei region is developing rapidly. All three regions have increased investment in logistics parks, logistics enterprises, and other areas to promote the development of smart logistics. For example, Beijing has built a smart logistics industrial park in Haidian District, Tianjin has built a smart logistics center in Binhai, and Hebei Province has built a smart logistics demonstration zone in Shijiazhuang.

The Beijing Tianjin Hebei region actively applies advanced technical means in the field of smart logistics, such as the Internet of Things, Big data, artificial intelligence, etc. For example, some logistics enterprises use the Internet of Things technology to monitor and track goods in real time, use Big data analysis to optimize logistics operations, and use artificial intelligence technology for intelligent distribution.

The uneven level of economic development in the Beijing Tianjin Hebei region has led to a gap in the development of smart logistics among the three regions. For example, as a central city, Beijing has a relatively complete logistics infrastructure and strong technological innovation capabilities, while some rural and remote areas in Hebei Province have insufficient logistics services, such as outdated roads, transportation, warehousing and other facilities, which affect the development of smart logistics.

The development of smart logistics requires the sharing and interconnection of information. However, in practical operation, due to the inconsistency of information standards and norms, the problem of information silos still exists, leading to difficulties in information sharing and interconnection. Firstly, different logistics enterprises and logistics parks adopt different standards and norms in information collection, processing, and sharing, which makes it difficult for information to synchronize and integrate with each other, affecting the development of smart logistics; Secondly, the construction of logistics information platforms in the Beijing Tianjin Hebei region is relatively lagging, lacking a unified information platform to support information sharing and transmission. At the same time, due to the inconsistent progress of information platform construction in various regions, it has also led to difficulties in information sharing. Finally, the sharing and transmission of information involve business secrets and customer privacy of enterprises, and some enterprises are unwilling to share information due to security considerations. At the same time, information sharing may also lead to data leakage and abuse, which is also an important reason for the difficulty of information sharing.

Due to factors such as terrain and population distribution, the carrying capacity of the environment in the Beijing Tianjin Hebei region is limited. Although the environment has been improved to some extent through governance in recent years, the development of smart logistics still faces environmental issues. For example, intelligent delivery may lead to increased vehicle mileage and energy consumption, which may have a certain impact on the environment. Therefore, in the development of smart logistics, it is necessary to pay attention to environmental issues and take

corresponding measures to reduce the impact on the environment.

OPTIMIZATION MEASURES FOR THE DEVELOPMENT OF SMART LOGISTICS IN BEIJING TIANJIN HEBEI

The coordinated development of regional logistics in the three regions of Beijing, Tianjin, and Hebei needs to focus on supplementing the shortcomings of Hebei Province. Firstly, educational institutions and industry associations in Beijing and Tianjin can assist in talent cultivation and training in Hebei Province, improving the professional quality and innovation ability of talents. At the same time, enterprises in Hebei Province can cooperate with universities and research institutions, especially those in Beijing and Tianjin, to jointly promote technology research and development and talent cultivation, and increase the talent reserve in the field of smart logistics in the Hebei Province region; Secondly, the Beijing Tianjin Hebei region should strengthen cooperation and exchange, and logistics enterprises and parks in the three regions can strengthen cooperation and exchange to jointly promote the development of smart logistics. For example, cooperation mechanisms can be established to achieve resource sharing and complementary advantages, promote information interconnection and technological exchange and cooperation. At the same time, cooperation between cities can be strengthened to achieve complementary advantages and coordinated development; Finally, we can actively promote intelligent technologies in Hebei Province, such as the Internet of Things, Big data, artificial intelligence, etc., to improve the intelligent level of logistics process. At the same time, the application and innovation of technology can be strengthened to improve the development speed and quality of smart logistics.

Resolving the difficulties of information sharing must be based on the coordinated development of the Beijing Tianjin Hebei region. Firstly, the governments of the three regions can negotiate and establish a unified information platform to support information sharing and transmission. At the same time, enterprises can be encouraged to actively participate in the construction and application of information platforms through policy guidance and interest mechanisms; Secondly, the governments of Beijing, Tianjin, and Hebei can establish unified information standards and norms to promote the standardization and standardization of logistics information. At the same time, enterprises can strengthen their own information construction, adopt universal information standards and norms, and improve information sharing and interoperability; Once again, the governments of Beijing, Tianjin, and Hebei can formulate relevant laws and regulations to strengthen information security protection and

management. Enterprises can strengthen their own information security construction, enhance their awareness and ability of information security, and ensure the security and reliability of information through employee training and learning; Finally, logistics enterprises, logistics parks, and government agencies in the Beijing Tianjin Hebei region can strengthen cooperation and co construction to jointly promote information sharing and development of smart logistics. Information sharing and interconnection can be achieved through establishing joint information centers, jointly building information platforms, and jointly developing application software.

To solve the relationship between the development of smart logistics and environmental protection in the Beijing Tianjin Hebei region, we can start from the following four aspects. Firstly, promoting green logistics technology is one of the important directions for the development of smart logistics, which can reduce environmental pollution and resource waste in the logistics process. For example, promoting environmentally friendly packaging materials, encouraging the recycling of packaging boxes through policies, using energy-saving and environmentally friendly transportation tools, and adopting advanced logistics technologies can reduce the impact of logistics activities on the environment; Secondly, optimizing the logistics network layout can reduce unnecessary logistics transportation and traffic congestion, reduce energy consumption and environmental pollution. By integrating logistics resources, reasonably planning logistics nodes, and constructing efficient logistics networks, the optimization and efficiency improvement of logistics processes can be achieved; Once again, promote intelligent traffic management: Intelligent traffic management can optimize traffic flow, reduce traffic congestion and exhaust emissions. It can promote intelligent transportation systems, electric vehicles, public transportation and other low-carbon transportation modes, and improve the efficiency and environmental protection level of transportation operation; Finally, by strengthening environmental awareness education, governments and enterprises can strengthen environmental awareness education and enhance the environmental awareness and sense of responsibility of logistics practitioners. Enterprises and individuals can be guided to actively participate in environmental protection actions and promote the sustainable development of smart logistics through publicity, education, training and guidance.

CONCLUSION

The logistics industry can drive the economic development of the Beijing Tianjin Hebei region, forming a more organic regional economic integration pattern. With the continuous acceleration

of globalization, regional competitiveness has become an important component of national competitiveness. Smart logistics, as a key direction for the development of the logistics industry, can significantly enhance the regional competitiveness of the Beijing Tianjin Hebei region. The development of smart logistics in the Beijing Tianjin Hebei region needs to be strengthened and improved in policy support, talent cultivation, cooperation and exchange, and environmental protection issues. By actively promoting intelligent development, we can achieve the intelligence and modernization of logistics processes, improve efficiency, reduce costs, improve service quality and customer satisfaction, and also promote industry innovation and development.

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REFERENCES

- Li Jia. Reconstruction of Smart Logistics Mode Based on Big data Cloud Computing [J]. *China Circulation Economy*, 2019,33 (02): 20-29.
- Jun G, Chunxu L, Guoqiang L, et al. Framework to Measure the Mobility of Technical Talent: Evidence from China's Smart Logistics [J] *Sustainability*, 2023,15 (3).
- Wang Shuai, Lin Tan. Motivation, Structure and Suggestions for Smart Logistics Development [J]. *China Circulation Economy*, 2019,33 (01): 35-42. DOI: 10.14089/j.cnki.cn11-3664/f.2019.01.004.
- Wang X, Zhang F, Li X. Research on Innovative Design of Urban Domestic Garbage Treatment System Based on Intelligent Logistics [J] *The Frontiers of Society, Science and Technology*, 2022,4 (12).
- Wang Xifan, Zhou Jie, Gu Yigang. Research on Smart Logistics Allocation Model in the Context of New Retail: Taking Alibaba Hema Fresh as an Example [J]. *Logistics Engineering and Management*, 2020,42 (01): 22-25.