Hindawi
Discrete Dynamics in Nature and Society
Volume 2022, Article ID 7310757, 8 pages
https://doi.org/10.1155/2022/7310757

Research Article

Application Research of Cross-Border Logistics Based on Cloud Distribution Model

Shengli Zang,[1] **Lihong Wang**,[1] **and Suqin Li**[2]

[1]*Hebei Vocational University of Industry and Technology, Tianjin, China*
[2]*Shijiazhuang Communications and Transport School, Shijiazhuang, Hebei, China*

Correspondence should be addressed to Lihong Wang; 13930112117@126.com

Received 2 March 2022; Accepted 7 April 2022; Published 2 May 2022

Academic Editor: Giulio E. Cantarella

Cross-border logistics is an important support for the rapid development of cross-border e-commerce. This paper expounds cross-border e-commerce and its development status and explores the problems existing in cross-border e-commerce logistics distribution, such as high cost, low level of information, e-commerce credit evaluation system being not perfect, and professional personnel shortage. Advanced cloud distribution mode is introduced into cross-border e-commerce logistics, and cloud logistics distribution network model is built using the precise center-of-gravity method. Based on the cloud distribution, the paper puts forward some suggestions for the development of cross-border logistics, such as optimizing the path to reduce transshipment links, optimizing the level of logistics informatization, improving the market supervision system and credit evaluation mechanism, and improving the talent training mechanism, in order to improve the stability and security of cross-border logistics distribution, reduce logistics costs, and improve service quality.

1. Introduction

In recent years, the increasingly convenient application of network technology in international trade motivates more and more consumer demands for cross-border consumption. At present, cross-border logistics has become an important link in the development of cross-border e-commerce in China, which is directly related to the overall benefit and investment cost of enterprises [1]. The types of cross-border logistics change along with the development of cross-border e-commerce, and currently there are four types of logistics: postal parcels, international business and domestic express, special line logistics, and overseas warehouses [2]. With the continuous improvement of logistics development level in China, cross-border e-commerce can no longer meet the needs of foreign consumers by relying solely on postal and express delivery. Reference [3] puts forward the limitations of logistics service transportation and introduces the fuzzy TOPSIS method to improve cross-border e-commerce logistics service, so as not to affect their shopping experience. Therefore, more and more cross-border e-commerce sellers regard it as the major logistics method in the future and plan and design it in order to obtain the optimal logistics system.

However, it is difficult for most of the current cross-border e-commerce logistics to meet the actual requirements. Although some logistics problems have been well solved and cross-border e-commerce logistics has been greatly improved, there are still many instability and insecurity problems such as holidays, weather, and many other factors because of which consumers often have to wait for a long time. For example, [4] analyzes logistics distribution and analyzes the realization of efficient transportation under the influence of product water management, yield loss, and adverse conditions in allusion to the short-term storage requirements of agricultural products based on the discrete time mathematical model. During logistics transportation, many problems such as parcel loss tend to occur which will directly cause consumer complaints; therefore, most cross-border e-commerce enterprises have gradually recognized the need to improve logistics distribution modes in order to further expand the cross-border e-commerce market. For this purpose, this research proposes the logistics cloud distribution development strategy under

cross-border e-commerce environment in combination with cloud distribution modes.

2. Review

2.1. Overview of Cross-Border e-Commerce. Cross-border e-commerce is an international trade behavior in cross-border transactions where trading entities from multiple countries conduct transactions, payments, and settlements between different countries and complete the transactions in cross-border logistics [5]. Based on existing research results, the basic elements of the e-commerce ecosystem are as shown in Figure 1. The e-commerce ecosystem can be divided into leading population, key population, parasitic population, etc. Due to the dual drive of the development of Internet technology and the diversification of customer needs, the internal and external parts of the system are characterized by competition, cooperation, and symbiosis.

On network transaction service platforms, there are e-commerce enterprises, financial institutions, logistics organizations, and consumers. E-commerce enterprises display their products through the Internet transaction service platform and continuously release and update product information [6] and thus obtain sales orders. The basic process is as shown in Figure 2.

Consumers check the products they need through the service platform, place purchase orders after finding the products, and make payment through the payment platform provided by financial institutions. After receiving the payment, the payment platform will provide payment information and, after verification, inform the cooperative logistics organizations to distribute goods to consumers according to the order information [7]. At the same time, the freight yard information is constantly updated on the network transaction service platform to facilitate e-commerce enterprises and consumers to track the products.

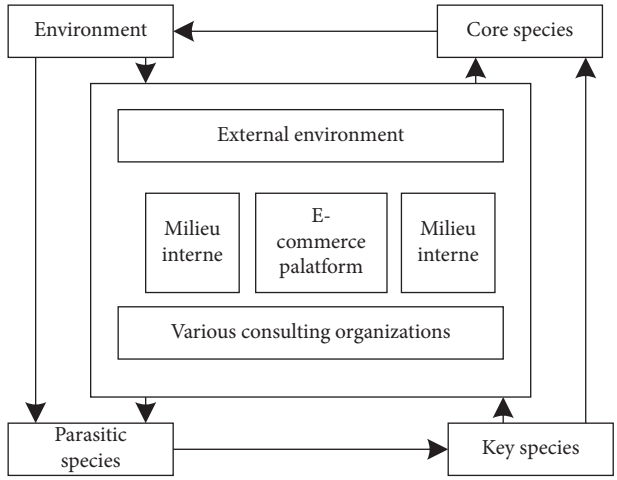

Figure 1: The e-commerce ecosystem structure diagram.

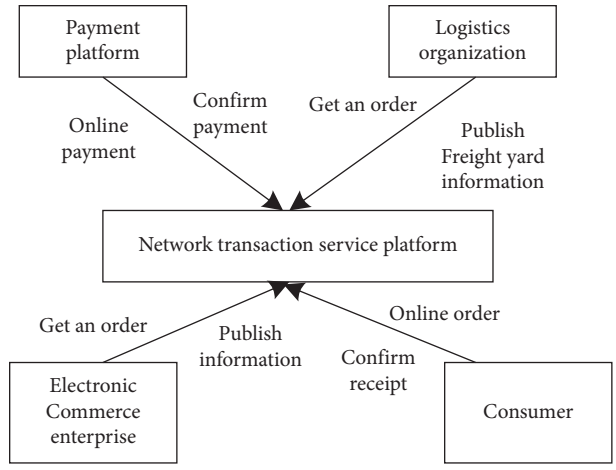

Figure 2: Cross-border e-commerce business flowchart.

2.2. Status Quo of Cross-Border e-Commerce Development. Cross-border e-commerce has emerged in developed economies such as North America and Western Europe and develops rapidly in emerging markets such as the Asia-Pacific region, Latin America, and Africa, which is consistent with the development level and development trend of e-commerce in China. In recent years, cross-border e-commerce has developed rapidly. More and more countries and companies begin to attach importance to cross-border e-commerce and rapidly expand all around the world. Globalization and the increasing frequency of international trade have promoted exchanges among countries and regions [8].

All around the world, traditional Internet enterprises, e-commerce enterprises, traditional international transportation enterprises, logistics enterprises, and financial institutions as well as traditional manufacturing industry, the retail industry, the food industry, and other traditional industries all actively dive in the wave of cross-border e-commerce. Although cross-border e-commerce has only a short history of development, it has become inevitable in terms of market prospect, market potential, market vitality, scale and number of participating enterprises, and market environment. At present, China has more than 5,000 platform enterprises and more than 250,000 foreign trade enterprises to carry out cross-border e-commerce business.

2.3. Problems Faced by Logistics Distribution under the Cross-Border e-Commerce Environment. At present, China's cross-border e-commerce enterprises are faced with problems such as insufficient capital, small scale, and inadequate warehousing and supply chain, details of which are as follows.

Logistics cost: at present, the well-known cross-border e-commerce platforms in China include DHgate.com, AliExpress, Globalsources, etc., all of which are engaged in e-commerce business. EMS, the largest express enterprise in China, has established a close relationship with them, thus forming a unified logistics network. DHL, FEDEX, UPS, and other frequently used international express companies [9] offer faster delivery but at a higher cost, so fewer consumers in foreign countries choose them. At present, the development of cross-border e-commerce logistics in China is greatly restricted. Taking DHL as an example, it takes 5 days

and corresponding money to ship 600 grams of goods from China to the US, while there is a corresponding extra charge for goods of more than 600 grams. If the seller reckons the freight in the cost of goods, the goods will lose their price advantage in the fierce market competition, thus adversely affecting the sales and development of the company. In addition, if the goods received by customers have quality defects, they must be returned or resent, which will lead to repeated logistics and thus increase transportation cost and reduce company profit [10].

Low logistics informatization level: in this information era, all walks of life should grasp the dynamic of the time. Therefore, only by improving the informatization degree of cross-border e-commerce can China's logistics service quality be effectively improved. However, the informatization construction of China's cross-border logistics system still faces many problems including imperfect communication channels, poor comprehensive sorting ability, and low informatization level.

Lack of the e-commerce enterprise credit evaluation system: because cross-border e-commerce involves many countries in the transaction process, it is difficult to accurately assess the credit of each other. Such asymmetry facilitates the selling of shoddy or fake commodities by some sellers in order to gain profits, thus damaging consumer benefits [11], while consumers with poor credit will deliberately damage products, return commodities, and make misleading evaluations, resulting in huge economic and credit losses of enterprises. Therefore, it is particularly urgent to establish a reputable international credit management system.

Lack of related professional talents: many multinational enterprises are relatively small and weak, and it is difficult for them to attract specialized multinational e-commerce talents. Meanwhile, many multinational enterprises lay insufficient stress on staff training and lack compound talents, and cross-border e-commerce transactions are also restricted.

3. The Theory of Cloud Logistics Distribution

The cloud logistics distribution mode is an information sharing platform established by applying cloud computing and other core technologies and it integrates a variety of technologies such as the Internet of Things and GPS technology. The combined application of various technologies can realize resource perception and location tracking [12]. Also, when relevant information is shred, the concept of cloud computing can be used for reference to realize joint service. Therefore, the cloud logistics platform can effectively coordinate and optimize distribution resources. The logistics distribution network under the cloud service mode is as shown in Figure 3.

The characteristics of the cloud logistics distribution mode are as follows.

First, it can meet personalized demands. The traditional distribution mode is one associated with production or commodities [13] and is restricted by factors such as resources, equipment, and user location. However, considering current distribution situation, there are cases of multiple

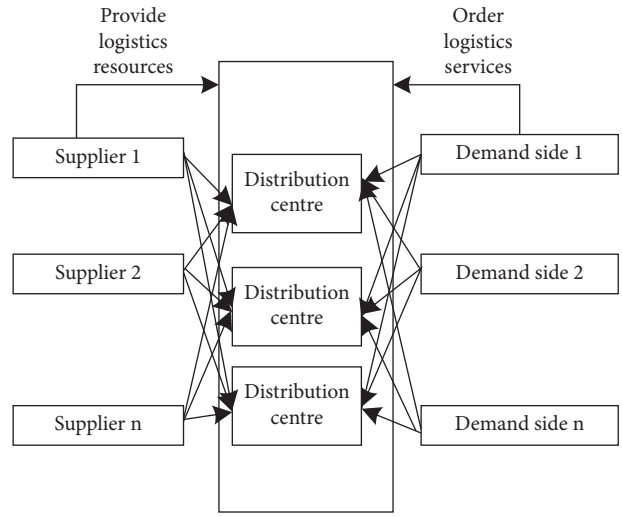

Figure 3: Distribution network under the cloud service mode.

batches and multiple varieties of cross-border commodities, which makes the personalized demands for logistics and distribution increasingly prominent. The cloud distribution mode can combine customer demands, integrate scattered resources in a virtual way, and uniformly process items so as to improve service quality and reduce distribution cost. Second, the distribution mode is dynamic, which is mainly shown in the following: It can dynamically reflect information and customer demand change can be learnt about in a timely manner; it can dynamically supply corresponding logistics resources [14], and cloud logistics distribution can set up resource values belonging to its own platform and dynamically allocate resources through coupling mapping; there is a dynamic relationship between distribution demanders and providers, and when there is a distribution demand, the platform can automatically search and match distribution service providers according to multiple constraints. Based on the abovementioned dynamic characteristics, it can better meet the personalized demands of customers. Third, it is a distribution mode with service collaboration and resource sharing. Compared with the traditional distribution mode, the distribution mode based on cloud computing technology can integrate resources and realize the real resource sharing because of the support of its database, model library, and so on. It is not a single service organization mainly because it requires the cooperation of multiple service principals to achieve the purpose of centralized resources and decentralized services. Fourth, it embodies intellectualization. The large amount of information contained in the logistics distribution mode enables it to fully consider the customer aggregation degree [15] and coordinate the logistics of all links so as to improve service quality and cut cost.

4. Design of the Cloud Logistics Distribution Network Model

According to geographical scope, logistics networks can be divided into four levels: international logistics networks, regional logistics networks, urban logistics networks, and

urban and rural logistics networks. The networks at different levels are interconnected and they organically constitute the modern cloud logistics network system. The transportation logistics network refers to the aggregation of logistics, business flow, information flow, capital flow, and the flow of related organizations and facilities between different countries or regions. The goal is to better serve cross-border e-commerce and international trade. Cross-border e-commerce is an international trade mode based on the development of international logistics networks. The unique advantages and value standards of cyberspace have a profound impact on cross-border e-commerce. Therefore, it has characteristics obviously different from traditional transactions. In a sense, cross-border e-commerce benefits from the rapid development of modern international logistics and can greatly cut logistics cost. Therefore, the characteristics of international logistics must be studied in depth. There are two types of methods, namely, qualitative analysis methods and quantitative analysis methods to study the characteristics of international logistics network. The qualitative analysis methods include the Delphi method, the analytic hierarchy process, the fuzzy comprehensive evaluation method, and the grey correlation method. The quantitative analysis methods consider the main factors affecting the location of logistics distribution centers such as transportation cost, storage cost, fixed cost, and maintenance cost, quantize these factors, and determine the optimal network layout.

The precise center-of-gravity method is a single-distribution-center network model which does not need to consider competition, hub flow distribution, and other factors and simply aims at the lowest freight. The net of the center-of-gravity method is in the same plane. All customer demand points are distributed in a plane with the center of gravity in its center. The requirement and location of each point represent the weight distribution of the object. The cloud logistics distribution center is the center of gravity of the object and is placed in the best position of logistics. The node position of the logistics network is determined through mathematical methods by imitating the center of gravity of objects, and the assumptions are as follows:

(i) The transportation cost is only related to the straight-line distance between the logistics distribution center and the distribution point, while urban traffic conditions are not considered. In contrast, urban traffic conditions have little impact on freight costs, so ignoring them will not have a great impact on the practicability of the model.

(ii) The location of the logistics distribution center is greatly related to the freight, which this model does not take into account nevertheless.

(iii) Assume that each demand point and its demand quantity are known and constant.

Assume that there are n customer demand points within a network and their coordinates are $(x_i, y_i)\,(i = 1, 2, \ldots, n)$, respectively, and that the coordinate of the logistics distribution center is (x, y). The network graph is as shown in Figure 4.

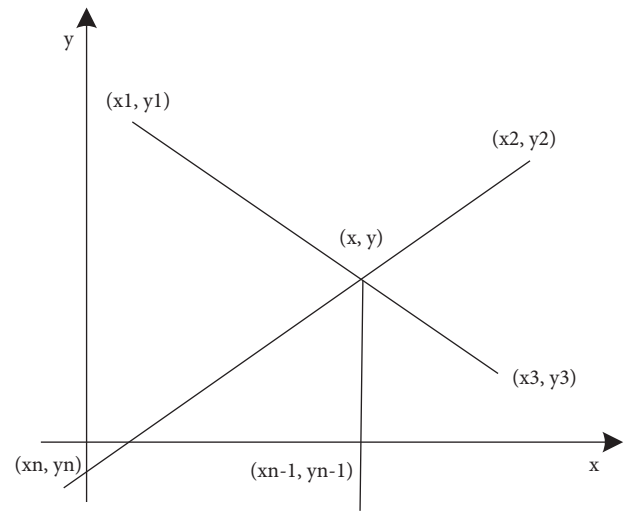

Figure 4: Graph of the precise center-of-gravity method.

Parameter setting is as follows:

(i) a_i: the freight of per unit volume within per unit distance of transportation from the logistics distribution center to demand point i

(ii) b_i: the transportation volume from the logistics distribution center to demand point i

(iii) d_i: the transportation distance from the logistics distribution center to demand point i

Objective function is as follows:

$$F = \sum_{i=1}^{n} a_i b_i d_i = \sum_{i=1}^{n} a_i b_i \sqrt{(x - x_i)^2 + (y - y_i)^2}. \tag{1}$$

Let

$$\frac{\partial F}{\partial x} = \sum_{i=1}^{n} \frac{a_i b_i (x - x_i)}{d_i} = 0, \tag{2}$$

$$\frac{\partial F}{\partial y} = \sum_{i=1}^{n} \frac{a_i b_i (y - y_i)}{d_i} = 0. \tag{3}$$

Then,

$$x* = \frac{\sum_{i=1}^{n} a_i b_i x_i / d_i}{\sum_{i=1}^{n} a_i b_i / d_i}, \tag{4}$$

$$y* = \frac{\sum_{i=1}^{n} a_i b_i y_i / d_i}{\sum_{i=1}^{n} a_i b_i / d_i}. \tag{5}$$

Because formulas (4) and (5) contain the distance item d_i, $x*$, $y*$, the coordinate of the shortest distance cannot be obtained directly. Generally, the geometric center point of all users is calculated first and then the center point is taken as the postulated point of the initial logistics distribution center before the iterative method is employed repeatedly to get the corresponding x, y of the minimum freight. The cloud

logistics distribution network model features that it is suitable for solving static problems and applies to the logistics situation of choosing-one-from-many. Its advantage is its great flexibility as the alternative points can be arbitrarily set. Subsequently, some heuristic methods and intelligent algorithms can be introduced to quickly solve the problem of dynamic logistics distribution. The model should be verified by example to prove the rationality and operability of the model.

5. Evaluation

5.1. Path Optimization to Shorten Transportation Process and Lower the Cost in the Meantime. Considering the actual situation, customs clearance will take a long time and the goods will not be delivered in time while the cloud logistics platform can provide efficient custom clearance services for current cross-border e-commerce, thus improving the efficiency of logistics. In order to realize the mode reform and innovation of cross-border e-commerce, it is necessary to strengthen the construction of cloud computing platforms [16], which can optimize the path to the maximum, reduce the flow of logistics to the maximum, and effectively share resources. Through optimization, distribution cost can be effectively lowered. At the same time, cloud service platforms can facilitate the provision of services such as logistics consulting and logistics path planning to further lower transportation cost.

5.2. Optimization of Logistics Informatization Level Based on Cloud Distribution

5.2.1. Logistics Order Management under the Cloud Distribution Mode. As the initial stage of cloud logistics based logistics management, order management includes a series of operations such as order reception, order status tracking, and delivery based on the order [17]. There are many contents involved in order making, so a cloud distribution based order management system is established [18]. The system structure is as shown in Figure 5.

(1) The order management system can determine the time of order processing and the start time of corresponding distribution resources and discover and eliminate risk states in advance

(2) An effective order management system can facilitate the rapid reorganization of existing logistics resources and improve the dynamic responsiveness

(3) In the ever-changing market environment, the use of convenient networks can facilitate faster and more flexible order processing

In the process of implementation, enterprises should deeply integrate logistics resources and link up logistics networks to improve their dynamic response ability and flexibility.

5.2.2. Logistics Transportation Management under the Cloud Distribution Mode. Efficient and reasonable logistics

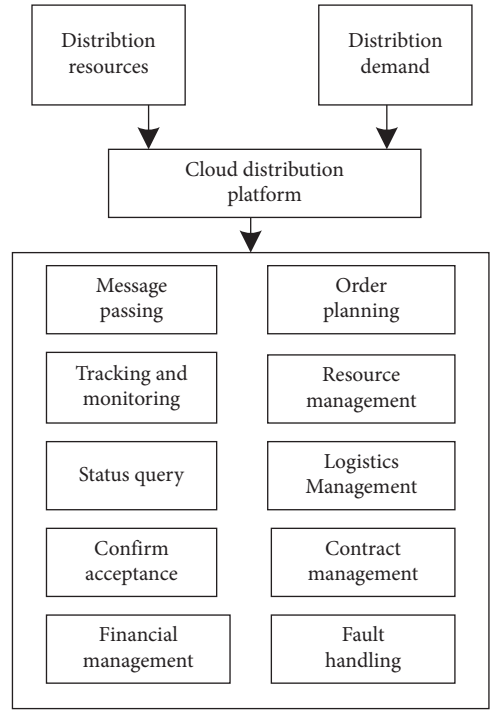

Figure 5: Order management system.

management is the basis of logistics activities and also the premise for logistics enterprises to integrate and share existing resources, expand logistics scale, improve logistics service, and reduce logistics cost:

(1) Transportation decision management is to select from various schemes before carrying out transportation activities including means of transportation, vehicles, transportation path, time of transportation, estimation of transportation cost, transportation personnel, and insurance. It also includes the management of customer resources [19], service items, and transportation resources, all of which are necessary for decision-making.

(2) The process management of transportation is an important part of transportation management, which involves the safety of shipment and transshipment of goods. Transportation management mainly involves the implementation of goods, inspection of packaging labels, arrangement of short-distance transportation, and transportation preparation [20]. Receiving management mainly involves handling of handover, unloading, preparation of freight space, direct allocation, and so on. Transshipment management should attach importance to transshipment connection, strengthen packaging, and remove and replace damaged goods to improve transportation quality. Transportation safety management is mainly to formulate various transportation safety systems, prevent and dispose traffic accidents, and carry out real-time dynamic monitoring of vehicles.

(3) Transportation settlement management includes transportation cost settlement and accounting

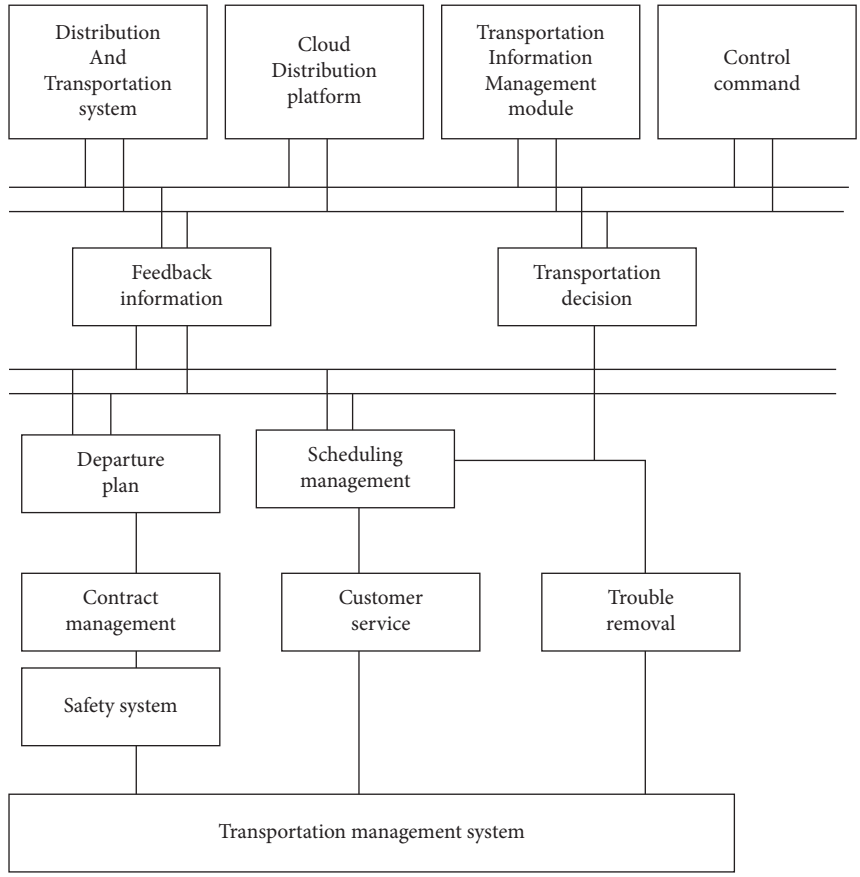

Figure 6: Cloud distribution transportation management system.

treatment. It also includes handling of claims and claims of other people, transportation equipment maintenance, warehousing, and so on.

(4) Transportation information management refers to the management, storage, summary, and analysis of logistics information so as to learn about real-time traffic conditions [21] and provide guarantee for the realization of transport service.

Under the cloud distribution mode, the logistics management system should realize the real-time monitoring of logistics, know the completion of the order all the time, make analysis, compare with historical data, and make the right decision. According to the business requirements of the system, the function modules of the transportation management system are designed as shown in Figure 6.

This system realizes not only static management including product and document management, but also dynamic management including the whole process tracking of products. Among them, the transportation decision management module is divided into planning and customer relationship [22] and the transportation process management includes two parts: enroute management and safety management. Under each subdivided unit, functions such as cost accounting and personnel flow management can be added as demanded. On the one hand, it receives information and issues commands, and on the other hand, it feeds the data of each module back to the cloud distribution platform in real time and summarizes and analyzes the data of each module at the same time. Cloud distribution logistics management enables reasonable path configuration and personnel scheduling, and third-party service helps save the technology development by logistics enterprises on their own, which can cut the cost by at least 20%. The introduction of barcode technology, database technology, electronic ordering system, etc. shortens the overall delivery time by 35%, which helps realize efficient logistics goods management.

5.3. Improvement of the Market Supervision System and the Credit Evaluation Mechanism. The establishment and improvement of the market supervision mechanism is the requirement to ensure the benign development of cross-border e-commerce in China. The cloud distribution technology is used to monitor international trade, improve China's international trade laws and regulations system and the corresponding patent protection system, and severely punish all kinds of crimes according to law. Establish an enterprise credit evaluation system, improve national supervision, and make analysis with big data technology so as to better identify and provide specific services, which can both reduce information exchange barriers between the two parties and improve consumer satisfaction at the same time [23]. The credit rating of enterprises shall be jointly assessed by international market regulatory authorities, e-commerce platforms, and consumers.

5.4. Improvement of the Talent Cultivating Mechanism. Due to the large scale of China's logistics industry, investment in fixed assets of logistics industry speeds up, and the requirements for engineering personnel are getting higher and higher. As technologies such as information technology, automatic storage technology, packaging technology, loading and unloading technology, and related equipment technologies spring up continuously, the development of the logistics industry requires more and more high-quality personnel and high-quality logistics personnel have become an important part of China's logistics industry [24].

At present, to meet the actual demand for cross-border e-commerce talents, responsible departments of the state are formulating relevant policies, improving the talent training and incentive system, and ensuring the implementation of talent training supporting facility construction, expenditure support, and tax relief and exemption. Many universities in China are constantly training talents to meet the practical needs of cross-border e-commerce in China. For example, they set up cross-border e-commerce practice bases with companies where companies can provide practical training for college students [25], thus creating a sound employment environment for graduates. In addition, governments, colleges, and enterprise associations should have meaningful discussions in talent cultivating. Industry associations function as a bridge in the cooperation among governments, colleges, and enterprises and can reflect market demand for talents as well as talent cultivating results in real time. Governments, colleges, enterprises, and industry associations will integrate resources and expertise to establish a superior talent cultivating mode in the cultivation of cross-border e-commerce talents through division of labor and cooperation. The mode of joint training of government, schools, enterprises, and industry associations is helpful to improve the talent training mechanism.

6. Conclusion

Based on the above process, the research on logistics cloud distribution development strategy under cross-border e-commerce environment is completed. This research probes deep into the development status quo and characteristics of e-commerce as well as problems in the existing e-commerce logistics distribution mode. It applies the cloud distribution method in e-commerce logistics distribution to optimize the distribution strategy, which can meet the requirements of cross-border e-commerce logistics distribution. The innovation of the strategy in this research lies in that the strategy makes full use of the cloud distribution mode and combines modern intelligent technology to make logistics distribution more intelligent, which can provide some help for related fields.

However, since cloud distribution involves many problems, and the current network business environment is constantly changing with other new elements being continuously integrated, further optimization is needed in the follow-up study so as to obtain superior development strategies.

Data Availability

All the data contained in this study can be obtained upon request to the corresponding author. Readers can also inquire part of the original data and the results of data processing in this paper.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

Acknowledgments

This research was supported by Doctoral Foundation Project of Hebei College of Industry and Technology (bz2020003) and also supported by Hebei Provincial Department of Human Resources and Social Security(JRSHZ-2022-02107).

References

[1] S. Fu, W. Chen, and D. Wang, "Study on the collaborative development of cross-border E-commerce logistics supply chain," *Journal of Northeastern University*, vol. 23, no. 1, pp. 52–60, 2021.

[2] C. Ding and Z. Dai, "Cross-border e-commerce logistics development strategy analysis —— take mousse bedding as an example," *Tea in Fujian*, vol. 42, no. 2, pp. 63-64, 2020.

[3] C. Chen and S. Yang, "Research on logistics service provider selection of cross-border E-commerce using intuitionistic fuzzy TOPSIS method," *Science and Technology Management Research*, vol. 40, no. 5, pp. 186–192, 2020.

[4] E. Mardaneh, R. Loxton, S. Meka, and L. Gamble, "A decision support system for grain harvesting, storage, and distribution logistics," *Knowledge-Based Systems*, vol. 223, no. 1, Article ID 107037, 2021.

[5] D. Xue, Y. Lu, and R. Yang, "Demand analysis and training strategy research of cross-border e-commerce talents for enterprise demand," *Market Modernization*, no. 13, pp. 27–29, 2020.

[6] H. Zhou, W. Yan, J. He, and H. Li, "Strategy of cross-border E-commerce dual-channel supply chain under different cooperation scenarios," *Journal of Shanghai University(Natural Science Edition)*, vol. 27, no. 4, pp. 749–765, 2021.

[7] B. Burroughs and W. J. Burroughs, "Digital logistics: enchantment in distribution channels," *Technology in Society*, vol. 62, Article ID 101277, 2020.

[8] X. Zhang and Q. Weng, "Exploration on the safe development environment of urban logistics distribution in the Internet age —— comment on urban logistics distribution under the Internet environment," *China Forest Products Industry*, vol. 336, no. 4, 122 pages, 2020.

[9] H. Andreas, K. Heinrich, and G. Michael, "Product allocation to different types of distribution center in retail logistics networks," *European Journal of Operational Research*, vol. 264, no. 3, pp. 948–966, 2018.

[10] Y. Cao, L. Zheng, and X. Shi, "A study on the cross-border E-commerce logistics alliance in China under the belt and road initiative," *Railway Transport and Economy*, vol. 42, no. 10, pp. 7–13, 2020.

[11] J. Yu, Y. Zhang, W. Liu, and Z. Xiao, "Study on the temporal and spatial heterogeneity of global cross-border e-commerce

logistics resilience under the impact of epidemic," *Geographical Research*, vol. 40, no. 12, pp. 3333–3348, 2021.

[12] Y. Cao and J. Zhu, "Airport aviation logistic development strategy from the perspective of cross-border E-commerce," *Railway Transport and Economy*, vol. 43, no. 4, pp. 61–65, 2021.

[13] D. Jesica, F. Albert, A. Angel, and L. Eduardo, "Corrigendum to "Modeling and solving the non-smooth arc routing problem with realistic soft constraints," *Expert Systems with Applications*, vol. 98, pp. 205–220, 2018.

[14] Z. Wang, L. Yang, and L. Wang, "Research on cross-border e-commerce logistics of tea products under the background of Shijiazhuang 4 + 4 modern industrial development," *Tea in Fujian*, vol. 43, no. 8, pp. 41-42, 2021.

[15] B. Cao, "Problems and countermeasures of tannery enterprises developing cross-border e-commerce," *China Leather*, vol. 50, no. 11, pp. 21–23, 2021.

[16] M. Lv, "Study on the business strategy of tea e-commerce enterprises in cross-border e-commerce environment," *Tea in Fujian*, vol. 42, no. 10, pp. 41-42, 2020.

[17] K. Feng and X. Zhang, "Research on the business model of cross-border E-commerce based on mobile Internet," *International Business Research*, vol. 41, no. 1, pp. 39–49, 2020.

[18] L. Chen and Q. Feng, "Application research of real-time update system of third-party logistics information based on blockchain," *Electronic Design Engineering*, vol. 29, no. 22, pp. 42–46, 2021.

[19] W. Liu, "Research on cross-border e-commerce innovation model of leather products in China under the background of 'One Belt One Road," *China Leather*, vol. 50, no. 3, pp. 46–49, 2021.

[20] T. Fiorita, "Cloud-based precision technology gives last-mile logistics the boost it needs," *Supply chain brain*, vol. 23, no. 2, pp. 46-47, 2019.

[21] Z. Karabulut and M. Kasapbaşı, "Cloud computing integrated multi-factor Authentication framework application in logistics information systems," *Journal of International Trade*, vol. 3, no. 2, pp. 50–57, 2017.

[22] T. Zhang, N. Wei, and A. Li, *Research on the Development Strategy of Intra-city Clothing Distribution Based on O2O Mode*, Sprinker, New York, NY, USA, 2021.

[23] L. Ding, "Research on the invulnerability of cross-border bidirectional logistics network in e-commerce supply chain," *International Journal of Manufacturing Technology and Management*, vol. 1, no. 1, p. 35, 2021.

[24] J. Hao, "Research on the construction of international logistics supply chain based on cross-border E-commerce," in *Proceedings of the 2021 2nd International Conference on E-Commerce and Internet Technology (ECIT)*, Hangzhou, China, March 2021.

[25] Z. Min, X. Mikai, and D. Debao, "Research on game strategy of information sharing in cross-border e-commerce supply chain between manufacturers and retailers," in *Proceedings of the 4th International Conference on Intelligent, Interactive Systems and Applications (IISA2019) Bangkok*, Thailand, June 2019.