Hindawi
Security and Communication Networks
Volume 2023, Article ID 9891340, 1 page
https://doi.org/10.1155/2023/9891340

Retraction

Retracted: Optimization of Regional Logistics Distribution Information Network Platform

Security and Communication Networks

Received 5 December 2023; Accepted 5 December 2023; Published 6 December 2023

This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] H. Yan, "Optimization of Regional Logistics Distribution Information Network Platform," *Security and Communication Networks*, vol. 2022, Article ID 6729247, 7 pages, 2022.

Hindawi
Security and Communication Networks
Volume 2022, Article ID 6729247, 7 pages
https://doi.org/10.1155/2022/6729247

Research Article

Optimization of Regional Logistics Distribution Information Network Platform

Honglin Yan

School of Logistics, Henan Communications Polytechnics, Zhengzhou, Henan 450015, China

Correspondence should be addressed to Honglin Yan; 2013042426@stu.zjhu.edu.cn

Received 5 March 2022; Revised 27 March 2022; Accepted 2 April 2022; Published 23 April 2022

Academic Editor: C. Venkatesan

In order to solve the problem of regional logistics distribution, a study on the optimization of regional logistics distribution information network platform is proposed. Firstly, in order to meet the development requirements of regional logistics and improve customer satisfaction, the regional logistics path is optimized to solve the problem of long time consumption for the optimization algorithm of regional logistics distribution path to find the optimal path. The clustering algorithm is used to divide the logistics distribution area, and the multiobjective function of logistics distribution path optimization is established, mainly including weight index, timeliness index, customer importance index, time window index, and total path index. The distribution target weight is set to find the best target path, so as to realize the optimization of regional logistics distribution path. The experimental results show that the time for the designed optimization algorithm to find the optimal path is less than 2 minutes, while the time for the traditional algorithm to find the optimal path is more than 3 minutes, up to 4.6 minutes. The comparison shows that the traditional algorithm takes more time to find the optimal path in five times than the algorithm designed this time. Therefore, the optimization method of this design takes less time to find the optimal path than the traditional method, which proves the effectiveness of the regional logistics distribution path optimization algorithm.

1. Introduction

Regional logistics refers to the effective physical flow of various goods inside and outside the region from the supply place to the receiving place in a certain economic region, centered on large and medium-sized cities, based on the scale and scope of regional economy and combined with the effective scope of logistics radiation. Regional logistics has an important impact on promoting regional resource integration and industrial structure adjustment. Therefore, it is of great significance to improve regional logistics from the aspects of logistics environment, logistics information communication, and logistics technology. Logistics distribution is not only the key step of regional logistics operation but also the implementation link of regional logistics to finally achieve the logistics goal. Logistics distribution involves many problems, such as vehicle scheduling, logistics deadline, goods assembly, and route selection. Logistics distribution information sharing and communication are the premise and foundation for the smooth implementation of regional logistics between urban and rural areas. Logistics distribution information platform is the carrier for regional logistics to realize information sharing and exchange. The information of relevant elements of logistics distribution can be released, queried, and exchanged on the platform, which is conducive to the seamless connection and smooth development of regional logistics distribution. Therefore, optimizing the regional logistics distribution information network platform is the inevitable choice for the optimal development of regional logistics under the policy of overall urban and rural development, as shown in Figure 1.

2. Literature Review

From the existing logistics distribution information network platform, its construction subjects are different, including enterprises, industry associations, and governments. Logistics distribution information includes material operations within enterprises. Circulation, control, and management information, as well as the logistics distribution supply and

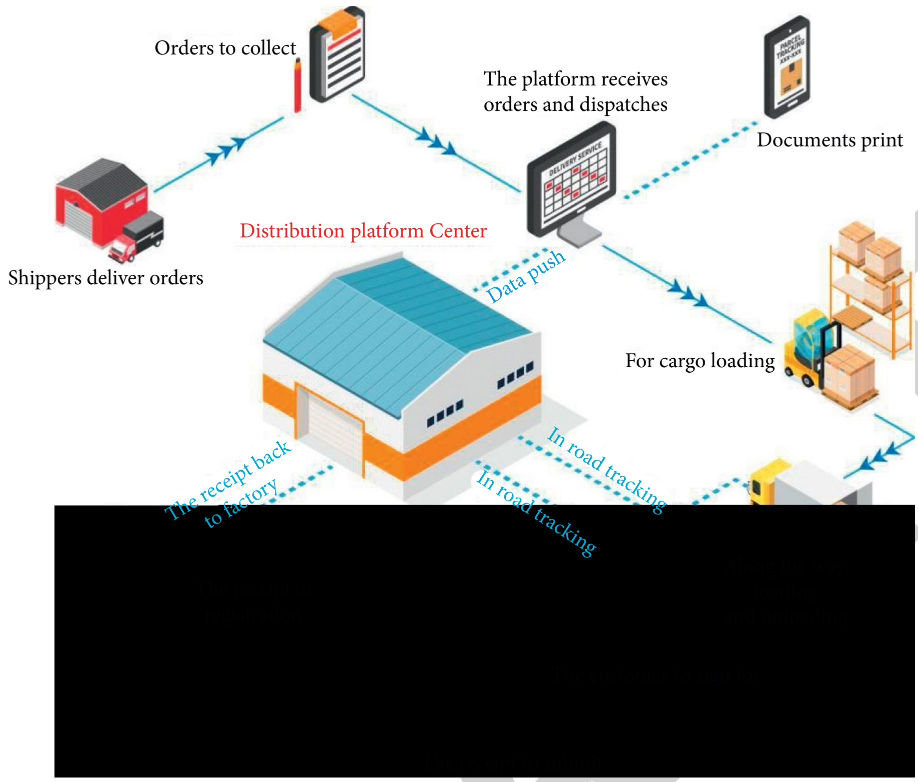

Figure 1: Optimization of the regional logistics network platform.

demand information, are released by the enterprise. Therefore, enterprises mainly start from these two aspects in the construction of logistics distribution information platform. Some enterprises build their own websites, which are mainly used for the service of their own resources. The effect of promoting information communication of distribution business through a website is limited, while some enterprises manage relevant information by establishing internal distribution information management and control system. In addition, there are information platforms related to logistics distribution information established by other organizations or associations, such as the subwebsites set up under the logistics procurement network. These websites mainly disseminate various logistics information and publish relevant logistics information. Logistics distribution information is only a part of the construction of these websites. The website does not focus on the management and promotion of relevant content, so its function in the communication of logistics distribution information of regional logistics is limited [1]. Both enterprises and other organizations are only building their own platform when building the logistics distribution information network platform.

Jie Ming et al. and others earlier used the simplex method to solve the vehicle scheduling problem and obtained the preliminary planning scheme suitable for logistics scheduling [2]. During this period, Yang et al. proposed a model to predict the distance traveled by the fleet in the logistics distribution involving the depot and its affected areas and studied the structure of the many to many optimal logistics distribution networks from a macro perspective [3]. Li and Li applied a mathematical programming method to discuss the complex and multilevel optimization of production and distribution networks faced by petrochemical enterprises [4]. As a numerical iterative algorithm based on mathematical theory, the exact algorithm has been preliminarily applied to the logistics distribution schedule. Berry et al. and others applied the dynamic programming method to study the shortest path problem of logistics distribution [5]. Bosona et al. established a distribution optimization model involving a single distribution center with the goal of minimizing the total mileage of distribution and obtained a decision-making scheme for the logistics distribution network through the branch and bound method [6]. Liu, McMahon, and others used the dynamic programming method or analytic hierarchy process to solve the location and distribution shortest path problem of logistics distribution centers [7]. Zhen combined "grey" and "robust" dual uncertainty factors to obtain a dynamic programming algorithm suitable for emergency logistics distribution with simple design, fast convergence speed, and wide application range. However, in the case of large-scale distribution points, the scheduling scheme obtained by this algorithm is often a local optimal scheme [8]. Jie Ming used the prim algorithm in graph theory to study the optimal transportation scheduling for logistics enterprises and verified it with an example to obtain the optimal logistics path [2]. Xie and others obtained the optimization algorithm that can optimize the logistics distribution route with the help of the DIJKSTRA algorithm for the logistics distribution route planning problem [9].

Based on the current research, this paper puts forward a research on the optimization of logistics distribution information network platforms. Logistics distribution is an important link directly connected with consumers in the logistics system. It is the process of logistics nodes delivering to the consignee. Logistics distribution system is generally divided into single-level and multilevel distribution system. Enterprises can determine what form and scale of distribution system to establish according to their own business scale, scope, and type [10].

3. Optimization of the Regional Logistics Distribution Information Network Platform

3.1. Development Status of the Regional Logistics Distribution Information Network Platform. The construction of logistics distribution information network platforms in most rural areas is insufficient. Rural logistics is an important part of regional logistics. From the construction of logistics distribution information network platforms in most rural areas, there are still various deficiencies in the platform construction due to various conditions. First of all, most products in rural areas are still sold and distributed in small rural fairs. Even various professional wholesale markets often adopt traditional trading methods. Farmers mainly rely on traditional ways to obtain the logistics and distribution information of agricultural products, and there are few communication media and networks from the local market. The lack of information construction and traditional cognition of logistics and distribution make the construction of information network platforms in most rural areas lack of basic construction environment [11]. Secondly, although some agricultural-related information networks have built the logistics distribution section, in practical application, most websites lack effective planning, reasonable standardization, and guidance for the relevant logistics distribution information section. For example, in the distribution information section, there is no targeted interface for the source and management of information, resulting in problems such as information distortion or information expiration. Therefore, the construction of the existing logistics distribution information platform in most rural areas is not perfect.

3.1.1. Regional Logistics Distribution Process. The business process of regional logistics distribution mainly includes order receiving, registration, call arrangement, fleet handover, picking up, and shipping, in-transit tracking, arrival signing, receipt, transportation settlement, and other links. The flow chart is shown in Figure 2.

In Figure 2, order receiving is the primary link of regional logistics distribution. It involves the procedure that the logistics and transportation department receives the transportation delivery plan of the customer, then the logistics and transportation scheduling department obtains the delivery document of the supplier, and finally checks and obtains the delivery document of the supplier. The registration link is closely linked to the order receiving the link. Its main purpose is to register the destination of distributed goods and the pick-up code of distributed customers and the

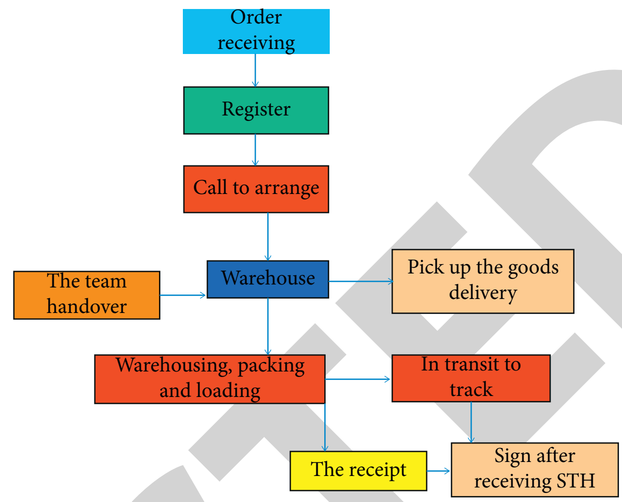

Figure 2: Flow chart of logistics distribution in local areas.

pick-up note received by your distribution personnel in the logistics transportation dispatching center and confirm and sign on the transportation registration book. The call arrangement is the main link of logistics distribution. The quality of the two links directly relates to the benefit of logistics enterprises. The steps involved in call arrangement include making transportation plan, filling in transportation route information form, sending service form, and tracking feedback form [12]. The purpose of the logistics center is to make overall arrangements for the delivery of goods and the delivery time of vehicles to the customer according to the logistics center's demand for goods and the maximum delivery volume of vehicles.

3.2. Promoting the Construction of Regional Information Infrastructure and Providing the Basis for the Wide Application of the Information Network Platform. The construction of regional logistics distribution network information platform is inseparable from the construction of regional information facilities. For example, only in areas where the Internet is popular, the logistics distribution network information platform can be effectively constructed, and the network platform can give full play to its effectiveness. Other information facilities are also the basic conditions for the operation of the information platform [13]. Under the overall development of urban and rural areas, compared with the convenient network facilities and other advanced transportation monitoring facilities in urban areas, the construction of information infrastructure in most rural areas lags behind, resulting in the lack of synchronous management of logistics distribution in urban and rural areas. The information content on the information platform cannot be carried out in a unified format, which affects the use effect of the information platform [14]. In addition, many logistics transport vehicles in rural areas are not equipped with positioning systems. Therefore, the transportation and distribution status of rural transport vehicles cannot be updated in time on the distribution information web page, which affects the real-time adjustment of relevant distribution information by the information network platform. In the context of urban-rural overall planning, the optimization of logistics network information platform must start with the construction of information infrastructure and provide a good foundation for the operation of logistics distribution information network platform through the construction and promotion of infrastructure [15].

The regional logistics distribution network information platform can be effectively constructed, and the network platform can give full play to its effectiveness. Other information facilities are also the basic conditions for the operation of the information platform. Under the overall development of urban and rural areas, compared with the convenient network facilities and other advanced transportation monitoring facilities in urban areas, the construction of information infrastructure in most rural areas lags behind, resulting in the lack of synchronous management of logistics distribution in urban and rural areas. The information content on the information platform cannot be carried out in a unified format, which affects the use effect of the information platform [16]. In addition, many logistics transport vehicles in rural areas are not equipped with positioning systems. Therefore, the transportation and distribution status of rural transport vehicles cannot be updated in time on the distribution information web page, which affects the real-time adjustment of relevant distribution information by the information network platform [17]. Under the background of urban-rural overall planning, the optimization of logistics network information platform must start from the construction of information infrastructure and provide a good foundation for the operation of logistics distribution information network platform through the construction and promotion of infrastructure.

4. Experiment and Research

Big data technology is used to accurately predict the future needs of customers and realize personalized services for customers. However, most enterprises have failed to effectively use these data for route planning. The traditional logistics distribution path cannot cope with today's complex urban road traffic conditions and can no longer meet the actual needs of consumers [18]. In order to improve customer satisfaction, the regional logistics distribution path is optimized to solve the traditional regional logistics distribution path optimization algorithm and find the most effective design method. Firstly, the clustering algorithm is used to divide the logistics distribution region. The multi-objective function of logistics distribution path optimization is established, mainly including weight index, timeliness index, customer importance index, time window index, and total path index, and the distribution target weight is set. The optimal target path is found to realize the optimization of the regional logistics distribution path [19].

The experimental results show that the optimization method of this design takes less time to find the optimal path than the traditional method, which proves the effectiveness of the regional logistics distribution path optimization algorithm.

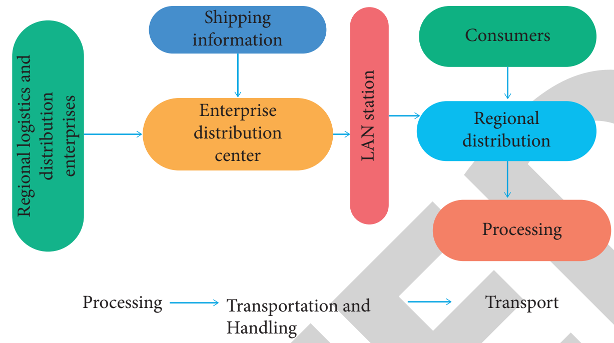

Figure 3: Route distribution diagram.

4.1. Division of the Logistics Distribution Area. Before optimizing the regional logistics distribution path, the regional distribution process is analyzed, as shown in Figure 3.

Based on the above analysis, the logistics distribution area is divided by a clustering algorithm. The division process is as follows.

Step 1. Select the starting cluster center, find n data in all the data information of the cluster center, and put $n = 1, 2, \ldots, n$. N data are found in the data information of N data information, and $N = 1, 2, \ldots$, n. N data information is taken as a clustering center [20]. According to the requirements of the e-commerce logistics distribution center, it will be used as the clustering center. According to the requirements of the e-commerce logistics distribution center, the coordinates of N cluster centers are divided into (x_1, y_1), (x_2, y_2), ..., (x_n, x_n), so as to ensure that the initial divided areas do not overlap.

Step 2. Use the distance formula to solve the distance between each cluster center and each data. The calculation formula is shown in the following formula:

$$D(k+1) = \sqrt{g_a} - f_{a+1}, \tag{1}$$

where $D\ (k+1)$ represents the distribution area division factor; g_a stands for cluster center; and $f_{a\,+\,1}$ represents the data of the cluster center. According to the formula, calculate which cluster center the data is closest to, and classify it to that cluster center. The purpose is to save the time for vehicles to transport goods on the road.

Step 3. Modify the cluster center. Because the centers of n clusters containing some data often change, the cluster center data are remodified based on the calculation results of Step 2 [21]. The calculation method is to divide the longitude coordinates of all points in a cluster by the number of points. On this basis, the dimensional coordinates of all points are added and divided by the number of points, so as to obtain the longitude and latitude coordinates of the new cluster center and the position of the new cluster center [22]. The purpose is to keep the distribution workload as uniform as possible and avoid imbalance. Therefore, the distribution volume of each small area should be roughly equal.

Step 4. Verify the cluster center, use the cluster center calculated in Step 3 for the next iteration cycle, and compare the cluster center position calculated in the above three steps with the cluster center obtained last time. The calculation formula is shown as follows:

$$K_g = \sum_a q \bullet \frac{a}{f^n \bullet h}, \tag{2}$$

where K_g represents the clustering object of logistics distribution area; $\sum a\ q$ represents the cluster size; f^n represents the distance of cluster center; h represents the cluster center comparison parameter; and a represents the density of distribution points.

If the position of the center calculated according to the formula is quite different, the position of the center is calculated again to keep the distribution volume of each distribution vehicle roughly equal.

4.1.1. Regional Logistics Distribution Path Optimization Algorithm. Based on the above division of logistics distribution areas, the logistics distribution path is optimized. Before optimization, the path design process is analyzed. The path design process is shown in Figure 4.

On this basis, the logistics distribution path is established, and the multiobjective function is optimized, mainly including weight index, timeliness index, customer importance index, time window index, and total path index. The specific calculation process is as follows. Weight index: in the process of regional logistics distribution, the weight of goods must be considered. In general, priority should be given to the delivery of heavy goods to reduce fuel consumption in the distribution process. The weight index is shown as follows:

$$S_g = \sum_i f(g-i)^{tu}, \tag{3}$$

where S_g represents the number of locations to be delivered; $\sum_i f$ represents the weight of goods delivered; g is the location sequence of logistics distribution; i is the weight of goods to be delivered at the i-th place; and tu is the weight index calculation factor.

On the basis of the above weight index calculation, the aging index is calculated. Since there will be more and more cold and fresh products in e-commerce distribution and the requirements for logistics distribution time are higher and higher, the aging index is established to reflect the timeliness requirements of goods. The calculation formula is shown as follows:

$$S_t = \frac{1}{N}\left(\frac{t_a - t_i}{T_{fx}}\right), \tag{4}$$

where t_i represents the preservation time of goods at the i-th distribution point; T_{fx} represents the time required to deliver the goods; t_a is the departure time of distribution; $1/N$ represents the influencing factors in the distribution process; and S_t is the expected arrival time of the goods.

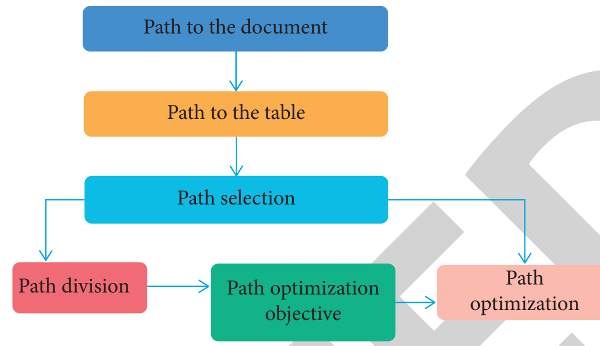

Figure 4: Path design process.

Finally, the total route index of regional logistics distribution is calculated. Because different logistics distribution routes are different, in order to improve the distribution efficiency, the total route index is calculated. The calculation formula is shown as follows:

$$S_k = \frac{1}{F}\left(\frac{n+1}{h_y \bullet j}\right), \tag{5}$$

where S_k represents the distance between the k-th distribution point; $1/F$ represents the return distance after delivery; $h_y \cdot j$ is the adjustment coefficient of the total path; and n is the total path index value.

Based on the above weight index, timeliness index, customer importance index, time window index, and total path index, the objective function of logistics distribution path optimization is established [23]. As the regional logistics distribution center pays different attention to the goods distribution target, the weight is set for the distribution target. Before setting, the objective function obtained above is dimensionless. The calculation formula is shown as follows:

$$X^e = \frac{x-n}{M-m}, \tag{6}$$

where x^6 represents the value of an evaluation index in any scheme; M represents the minimum value in m; and x represents the maximum value in n.

Based on the above dimensionless treatment, the weight is determined, and the relative importance is evaluated by comparing two factors. The evaluation method is shown in Table 1.

Based on the above logistics distribution index function and weight, the distribution path is optimized, as shown as follows:

$$G = \eta * (W_1, W_2, W_3, W_4, W_5), \tag{7}$$

where W_1, W_2, W_3, W_4, and W_5 represent the total weight of weight index, timeliness index, customer importance index, time window index, and total path index, respectively, and η is the positive proportional gain coefficient.

4.2. Simulation Test. In order to verify the effectiveness of the regional logistics distribution path optimization algorithm designed above, the traditional algorithm is compared

Table 1: Relative column scale value.

Different levels of importance	Weight assignment
Elements i and j are equally important	2
Element i is slightly more important than element j	4
Element i is more important than element j	6
Element i is much more important than element j	8

Table 2: Regional logistics cargo information.

Serial number	Weight (kg)	Importance (%)	Unloading time (h)
1	0.6	4	0.4
2	0.4	5	0.7
3	0.1	6	0.6
4	0.5	4	0.6
5	0.67	2	0.64
6	0.29	1	0.36
7	0.66	2	0.2

with the algorithm designed this time, and the time for the two methods to find the optimal path is compared.

4.2.1. Test Data. The experimental data are provided by a regional logistics distribution center. In a logistics distribution task of the logistics center, a total of 7 goods need to be distributed. The basic information of these 7 goods is shown in Table 2.

According to the analysis of Table 2, the weight, importance, and unloading time of the seven distribution tasks are different. Two methods are used to find the optimal path of the seven goods distribution, and the time of finding the optimal path is compared between the two methods.

4.3. Analysis of Experimental Results. The time results of the regional logistics distribution path optimization algorithm and the traditional algorithm to find the optimal path are shown in Figure 5.

It can be seen from the analysis of Figure 5 that the time for the optimization algorithm to find the optimal path in this design is less than 2 min, while the time for the traditional algorithm to find the optimal path is more than 3 min, up to 4.6 min. The comparison shows that the traditional algorithm takes more time to find the optimal path five times than the algorithm designed this time. Through the above experiments, it can be proved that the regional logistics distribution path optimization algorithm designed in this paper under the background of big data has a shorter time to find the optimal path than the traditional algorithm and can meet the needs of the regional logistics distribution path optimization. In order to more clearly describe the optimization results of different algorithms, the path optimization results of different algorithms are compared with the actual optimal path, and the resulting errors are described in table form. The results are shown in Table 3.

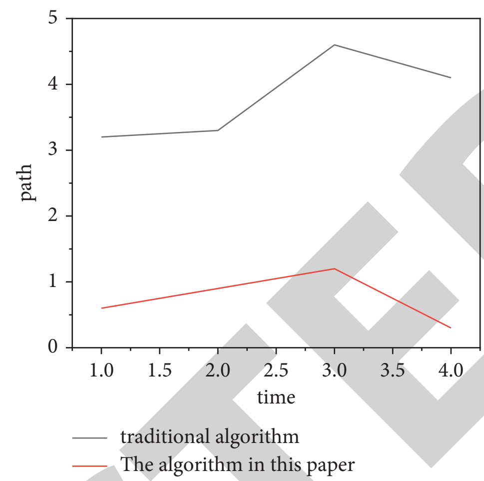

Figure 5: Time to find the optimal path.

Table 3: Measurement error of travel path time.

Error index	Traditional algorithm	Algorithm in this paper
Relative error	95.20	77.03
Average relative error	9.54	7.44
Mean absolute relative error	7.84	5.98
Maximum absolute relative error	0.28	0.07
Square root of mean square sum of relative error	0.07	0.02
Equalization coefficient	0.70	042

By analyzing Table 3, it can be seen that among the two different optimization algorithms, the optimized path of the regional logistics distribution path optimization algorithm designed this time is lower than the actual optimal path, and all error values are lower than the optimization results of the traditional algorithm. The above experimental results show that the optimized path of the designed regional logistics distribution path optimization algorithm is more consistent with the actual optimal path, which verifies the accuracy of the designed regional logistics distribution path optimization algorithm [24].

5. Conclusion

Aiming at the problem that the traditional regional logistics distribution path optimization algorithm takes a long time to find the optimal path, this paper designs a regional logistics distribution path optimization algorithm under the background of big data. Firstly, the logistics distribution area is divided by a clustering algorithm, and then, the multi-objective function of logistics distribution path optimization is established, mainly including weight index, timeliness index, customer importance index, time window index, and total path index. Finally, the distribution target weight is set to find the better distribution path in the objective function, so as to complete the regional logistics distribution path optimization. The experimental comparison results show that the regional logistics distribution path optimization algorithm under the background of big data designed this time takes less time to find the optimal path than the traditional algorithm and can meet the needs of regional logistics distribution. In the practical application of the algorithm, we should constantly update the algorithm in combination with the development of urban roads.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

This study was supported by the fund project Research on Document and Certificate Financing Mode Based on "1+X" Certificate System (No. 2020-YJXM-001).

References

[1] D. A. Grundel, P. Krokhmal, C. Oliveira, and P. M. Pardalos, "On the average case behavior of the multidimensional assignment problem," *Pacific Journal of Optimization*, vol. 21, no. 1, pp. 39–57, 2004.

[2] W. U. Jie-Ming, L. I. Yu-Qi, and L. Wan, "Study of logistics distribution in the complex road network," *Microelectronics & Computer*, vol. 28, no. 7, pp. 183–186, 2011.

[3] Y. Yang, F. Shang, B. Wu et al., "Robust collaborative learning of patch-level and image-level annotations for diabetic retinopathy grading from fundus image," *IEEE Transactions on Cybernetics*, vol. 11, no. 99, pp. 1–11, 2021.

[4] J. Li and L. Li, "Study on optimization of coal logistics network based on hybrid genetic algorithm," *International Journal of Innovative Computing Information and Control*, vol. 15, no. 6, pp. 2321–2339, 2019.

[5] L. M. Berry, B. A. Murtagh, G. B. Mcmahon, S. J. Sugden, and L. D. Welling, "Genetic algorithms in the design of complex distribution networks," *International Journal of Physical Distribution & Logistics Management*, vol. 28, no. 5, pp. 377–381, 1998.

[6] T. Bosona, G. Gebresenbet, I. Nordmark, and D. Ljungberg, "Integrated logistics network for the supply chain of locally produced food, part i: location and route optimization analyses," *Journal of Service Science and Management*, vol. 4, no. 2, pp. 174–183, 2011.

[7] W. Liu, "Route optimization for last-mile distribution of rural e-commerce logistics based on ant colony optimization," *IEEE Access*, vol. 8, no. 99, p. 1, 2020.

[8] Y. U. Zhen, "Salt industry logistics distribution network optimization based on service radius," *Computer Simulation*, vol. 28, no. 10, pp. 215–218, 2011.

[9] Q. C. Xie, F. Shi, and J. Qin, "Optimization model and algorithm for bi-level distribution network of ceramic raw materials in ceramic industrial cluster region," *Jiaotong Yunshu Xitong Gongcheng Yu Xinxi/Journal of Transportation Systems Engineering and Information Technology*, vol. 10, no. 2, pp. 160–166, 2010.

[10] R. Rajesh, S. Pugazhendhi, K. Ganesh, C. Muralidharan, and R. Sathiamoorthy, "Influence of 3pl service offerings on client performance in India," *Transportation Research Part E: Logistics and Transportation Review*, vol. 47, no. 2, pp. 149–165, 2011.

[11] R. Li, M. Huang, and X. W. Wang, "Model and algorithm for multi-period resilient integrated forward/reverse network design of fourth-party logistics," *Xitong Gongcheng Lilun yu Shijian/System Engineering Theory and Practice*, vol. 35, no. 4, pp. 892–903, 2015.

[12] J. Kelley, M. Kuby, and R. Sierra, "Transportation network optimization for the movement of indigenous goods in amazonian Ecuador," *Journal of Transport Geography*, vol. 28, no. 3, pp. 89–100, 2013.

[13] D. C. Mattfeld, "The management of transshipment terminals. desicion support for terminal operations in finished vehicle supply chains," *Operations Research/Computer Science Interfaces*, vol. 35, no. 1, pp. 115–132, 2006.

[14] H. E. Xiao-Nian, "Capacitated logistic distribution vehicle routing optimization," *Computer Engineering & Applications*, vol. 45, no. 34, pp. 236–238, 2009.

[15] W. Zhu, K. L. Xu, Y. Sun, and L. Gao, "Logistics distribution route planning with fusion algorithm of petri net and ant colony," *Journal of Zhejiang University*, vol. 45, no. 12, pp. 2229–2234, 2011.

[16] S. Afshin Mansouri, D. Gallear, and M. H. Askariazad, "Decision support for build-to-order supply chain management through multiobjective optimization," *International Journal of Production Economics*, vol. 135, no. 1, pp. 24–36, 2012.

[17] R. Gaonkar and N. Viswanadham, "Collaboration and information sharing in global contract manufacturing networks," *IEEE*, vol. 6, no. 4, pp. 366–376, 2001.

[18] T. S. Raj and S. Lakshminarayanan, "Entropy-based optimization of decentralized supply-chain networks," *IFAC Proceedings Volumes*, vol. 41, no. 7, pp. 10588–10593, 2008.

[19] Y. X. Luo, "Algorithm of logistics distribution path optimization based on intelligent petri net," *Computer Engineering and Design*, vol. 1, no. 7, pp. 104–108, 2011.

[20] D. T. Wilson, G. I. Hawe, G. Coates, and R. S. Crouch, "A multi-objective combinatorial model of casualty processing in major incident response," *European Journal of Operational Research*, vol. 230, no. 3, pp. 643–655, 2013.

[21] H. C. W. Lau, W. T. Tsui, C. K. M. Lee, G. T. S. Ho, and A. Ning, "Development of a profit-based air cargo loading information system," *IEEE Transactions on Industrial Informatics*, vol. 2, no. 4, pp. 303–312, 2006.

[22] C. Ye, J. F. Pekny, and G. V. Reklaitis, "Integrated planning and optimization of clinical trial supply chain system with risk pooling," *Industrial & Engineering Chemistry Research*, vol. 52, no. 1, pp. 152–165, 2013.

[23] Y. U. Hai-Fei and D. W. Wang, "Food-chain algorithm and its application to optimizing distribution network," *Journal of Northeastern University*, vol. 27, no. 2, pp. 146–149, 2006.

[24] K. C. Tan, "A framework of supply chain management literature," *European Journal of Purchasing & Supply Management*, vol. 7, no. 1, pp. 39–48, 2001.