



Core Key Points Framework of Logistics Network Optimization Research of Internet Second-Hand Trading Platform Under C2B2C Mode

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Abstract. With the rapid development of mobile Internet, the second-hand Internet trading platform is becoming more and more mature and perfect. In C2B2C mode, the Internet second-hand trading platform faces different markets, and different categories of used car e-commerce are constantly appearing. From C2C transaction to C2B2C mode, the development of second-hand e-commerce is becoming more and more prosperous. Under the influence of C2B2C mode, Internet second-hand trading platform can standardize second-hand goods by intervening in the transaction process, which can improve the transaction efficiency to a certain extent. After the commodities are recycled on the trading platform, they need to be uniformly processed and then resold to consumers. This operation process relies heavily on the circulation of commodities, and it is necessary to build a suitable logistics network to ensure the smooth circulation of commodities and reduce logistics costs. Therefore, in this research process, we mainly start from the logistics network structure of Internet second-hand trading platform in C2B2C mode, study the specific characteristics of radial network, and explore the optimization core of logistics network of Internet second-hand trading platform in C2B2C mode.

Keywords: C2B2C Mode · Second-hand Trading Platform · Logistics Network · Optimization Core

1 Introduction

Under the background of the rapid development of mobile Internet, the Internet second-hand trading platform is also becoming more and more mature and perfect. In the C2B2C mode, the Internet second-hand trading platform is facing different markets, and different categories of second-hand car e-commerce are also constantly emerging. From C2C transaction to C2B2C model, the development of second-hand e-commerce is becoming more and more prosperous. In order to promote the orderly development of the Internet second-hand trading platform, it is necessary to conduct an in-depth analysis of the current network operation mechanism, and provide reference for the long-term development of the second-hand trading platform through effective optimization design.

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D. Qiu et al. (Eds.): ICBEM 2022, AHIS 5, pp. 967–976, 2023.

https://doi.org/10.2991/978-94-6463-030-5_95

2 Logistics Network Structure and Operation Mechanism

At present, some researchers think that the structure of logistics network is that after nodes and lines are interconnected and configured with each other, different logistics networks can be generated because of different structure configurations and contact ways. Usually, the logistics network has a functional cargo handling function, that is, the logistics node [5]. The logistics node is an important link in the logistics network system, such as goods handover, warehousing and processing, information exchange and overall management, which all need to rely on the logistics node to complete the logistics route planning. In the logistics network system, it is mainly the route of goods flowing between different nodes, including water, land, air, pipelines and so on. Logistics lines and logistics nodes are interdependent and an important part of the logistics network system.

Under the background of increasing demand of modern logistics, it is very important to promote the development of logistics industry. At present, the research on logistics network theory is the research focus in the development of logistics industry. Logistics network theory takes different units in the logistics network as the research object, and coordinates the cooperation among different units, so as to improve the operation efficiency of the logistics network. In the process of logistics network operation, it is necessary to scientifically grasp the structure and operation mechanism of logistics network. According to the topological structure, the logistics network structure mainly includes dot network, circuit network, ring network, radial network, mesh network and all-through network [3]. With the development of social economy and science and technology, the development of logistics networks is getting faster and faster, and its main development direction is to complete the cooperation of different logistics networks based on the establishment of existing networks. Usually, the business scope of different enterprises' own networks is limited to some extent, but the expansion of logistics network itself is based on the core business of enterprises. In this case, the logistics network of each enterprise can form a typical rule structure model, and each logistics enterprise operates within its own core business scope. The cooperative network expansion is mainly carried out from the logistics alliance, which can be the alliance between different enterprises or the alliance between different logistics network nodes. This cooperative mode can break through the rule structure of the original logistics network, fully share the logistics resources, and actively help to improve the overall operational efficiency of the logistics system.

The operation mechanism of the logistics network is a process in which different nodes realize the purpose of resource integration in the network lines, and different levels and regions of nodes will lead to certain differences in service skills. In the face of different logistics tasks, the nodes in the whole logistics network can be flexibly and coordinately utilized, so as to solve the problem of insufficient contribution of a single node and ensure that the whole logistics network can complete the tasks in a coordinated and orderly manner. Logistics network needs to be applied to every node, and through the interaction of nodes, it changes from relative disorder to relatively orderly and stable network structure. At present, a logistics network operation model can be constructed according to the operation process of the logistics network, as shown in Fig. 1.

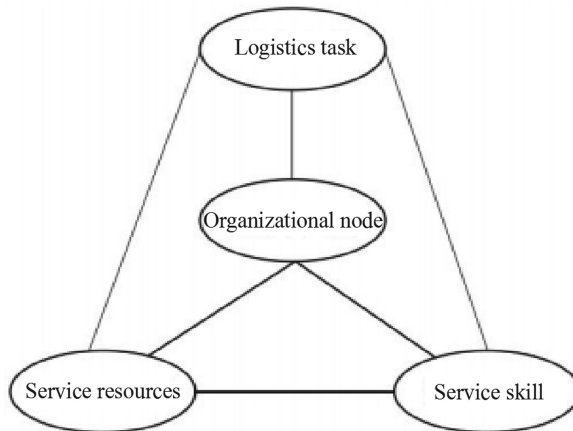


Fig. 1. Logistics network operation model (Original)

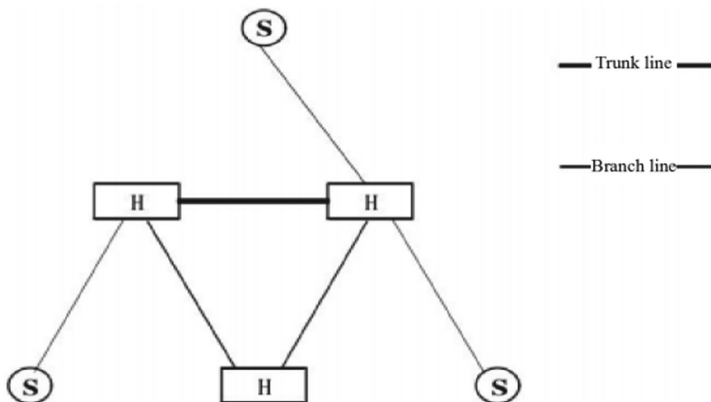


Fig. 2. Radiant network composition (Original)

3 Overview of Radial Network

Radial logistics network, also known as centralized new structure, is a collection of spatial networks including hub nodes and lines. The radial logistics network mainly includes radial nodes and hub nodes, and the operation route mainly includes trunk lines and branch lines, as shown in Fig. 2.

The most important feature of the network operation process is to use nodes to complete logistics transportation, which is a centralized transportation mode. The hub nodes of the radial network are connected by trunk lines, which can effectively convert the flow of all interacting nodes in the logistics network. This method can not only reduce the number of network links, but also effectively improve the accessibility and coverage of the network, which plays a positive role in ensuring the full load rate and transportation frequency of transportation tools [10]. In addition, the scale effect of the

radial logistics network can also be brought into full play, which can reduce the total cost of network services and ensure the effectiveness, convenience and economy of network activities. At present, the radial logistics network system has been applied in automatic banking transaction system, express Internet, Internet of Things and regional logistics.

4 Logistics Network Optimization Core of Internet Second-Hand Trading Platform in C2B2C Mode

4.1 Internet Second-Hand Trading Process

In this research process, we mainly use the second-hand Internet trading platform in C2B2C mode as the main research object to understand the second-hand Internet trading process. Second-hand trading platform is a process in which second-hand merchants complete the rapid circulation of idle goods based on Internet services [8]. During the operation of the second-hand trading platform, more emphasis is placed on organizing economic activities into a feedback circular process of product recycling- product processing-product sales-recycling sent by consumers.

During the operation of the second-hand trading platform, all items can be reasonably used in the circulation of many times, and the value of economic activities can be realized to the greatest extent. Compared with the traditional C2C Internet second-hand trading platform, enterprises will be involved in the process of goods trading, mainly including the following types: First, consignment. Second-hand trading platform, as an intermediary, can improve credit endorsement, provide quality inspection, cleaning, consignment and other services, and charge a certain service fee. Second, resale. In this type, the platform mainly recycles commodities and completes various processing links such as quality inspection, cleaning, maintenance and renovation, and then resells them to earn a certain price difference. Whether it is consignment or resale, there is no big difference in the composition of logistics network.

In this study, we mainly focus on resale, but in C2B2C mode, the Internet second-hand trading platform can effectively reduce the problem of information asymmetry in the process of idle goods trading, which is helpful to increase the trading volume. The specific operation flow of C2B2C mode is shown in Fig. 3.

At present, the C2B2C mode Internet second-hand trading platform adopted in China is mainly in the vertical field, such as Aihuishou and City help in 3C field, Zhi'er and Plum in clothing, shoes and bags field, Dejavu in books field, etc.. After acquiring the market, different platforms in these fields are trying to expand to other categories. For example, Aihuishou in 3C field has expanded from mobile phones to 3C, and Dejavu is developing towards daily necessities. However, the overall top-level search is more difficult. In addition, using C2C mode to develop idle fish and turn around also introduced the plates of Xianyu excellent products and Zhuanzhuan excellent products, which are the main trends of the development of Internet second-hand trading platform, and are developing towards more functions and levels [7].

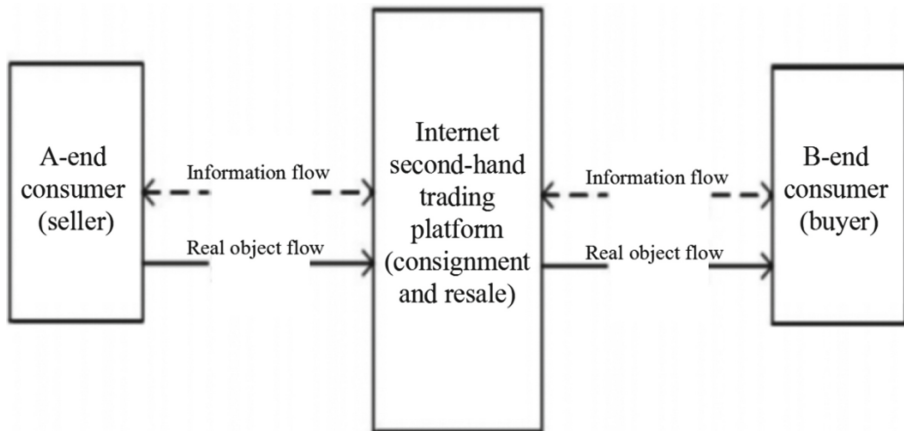


Fig. 3. Operation process of Internet second-hand trading platform in C2B2C mode (Original)

4.2 Logistics Network Structure and Commodity Circulation Process

The logistics network of Internet second-hand trading platform using C2B2C mode is mainly composed of reverse logistics from consumers to enterprises and forward logistics between enterprises and consumers. Usually, A-end consumers, recycling points, recycling centers and B-end consumers are important components of this logistics network system. Some To B businesses will flow to remanufacturing plants, raw material processing plants and waste treatment plants. The logistics network structure system of Internet second-hand trading platform in C2B2C mode is shown in Fig. 4.

In the actual research process, the platform needs to recycle items from consumers, which mainly includes online recycling and offline recycling. Online recycling refers to the delivery of goods directly from consumers to the processing center. In this recycling method, platform enterprises need to strengthen cooperation with express delivery enterprises, and express delivery enterprises directly take out goods from consumers and deliver them to the processing center of platform enterprises. If the articles meet the platform recycling standards, it can be confirmed that the recycling flows into the next processing link. If the items do not meet the recycling standards of the platform, the platform should contact the A-end consumers to determine the whereabouts of the items. If customers give up idle items, enterprises can dispose of them. If the customer requests to return the idle items, they need to be sent by the express delivery company again to the A-end consumers. Offline recycling is mainly used by some second-hand trading platforms to solve the problem of whether items are recycled and the value of recycling according to the specific situation of offline stores. In the process of operation, this recycling method can reduce logistics network links and express delivery costs, but it will lead to the increase of construction cost and operating cost [2]. The commodity circulation process of Internet second-hand trading platform in C2B2C mode is shown in Fig. 5.

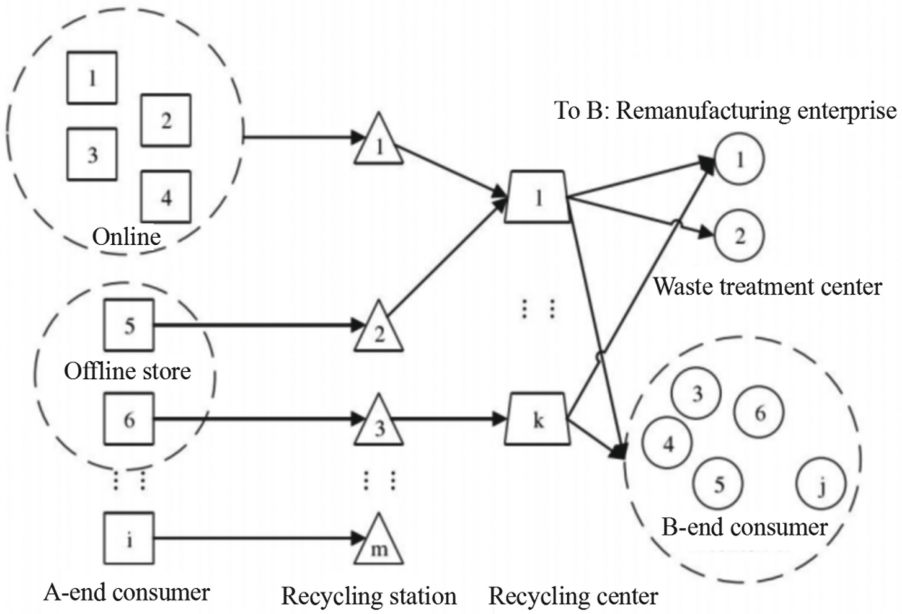


Fig. 4. Logistics network structure system of Internet second-hand trading platform in C2B2C mode (Original)

4.3 Problem Analysis

At present, the development speed of offline stores of C2B2C Internet second-hand trading platform adopted in China is relatively slow. There are many offline experience centers or testing equipment points in the development process of 3C field, such as Aihuishou and Kielet, while the number of offline stores in books and luxury goods fields is relatively small [1]. In addition, the second-hand trading platform can also use the third-party express delivery to recover the corresponding items from the A-side consumers, which will lead to the following problems: First, the cost of express delivery. Compared with traditional e-commerce, the Internet second-hand trading platform in C2B2C mode needs to consider not only the issue of commodity sales, but also the stability of supply. In order to reduce the disposal cost of idle items by consumers at the A end and promote the effective circulation of items, enterprises will bear the express delivery cost when items are recycled, but some items do not meet the recycling standards of enterprises. Although some platform enterprises will also bear the cost of refund, in this case, it will lead to an increase in the operating cost of the platform, and C2B2C platform enterprises will bear the logistics cost with low return rate or even zero single return [4]. Second, user experience and service issues. If the items recovered from the consumers at the A end do not meet the enterprise recycling standards of C2B2C platform, some platform enterprises will bear the express fee for returning the items by the consumers. Some enterprises even detain items without refund. In this case, it is easy to conflict with the A-end consumers, which will affect the service experience of the platform, not conducive to the circulation of idle goods and the profit of enterprises, and will have a negative

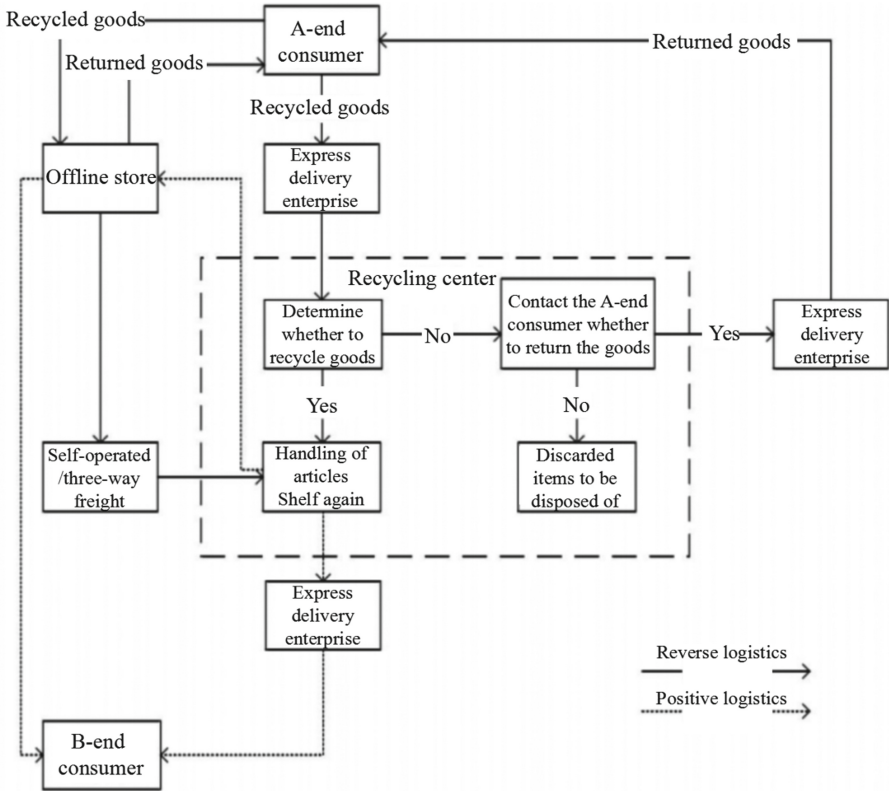


Fig. 5. Commodity circulation process of Internet second-hand trading platform in C2B2C mode (Original)

impact on the long-term development of enterprises. In addition, because of the rise of new retail, the Internet second-hand trading platform using C2B2C mode will develop towards offline stores after stable operation, and expand the service scope of enterprises by using online+offline operation mode. In this case, there are more data of second-hand transactions, such as freight company, express company, express company at the time of sale and platform data, which are all data types that must be considered in the operation process. However, these data cannot be managed in a unified way, and there may be disclosure. In addition, there are some differences in the performance appraisal standards of different companies, and there are timeliness problems in the operation of logistics network. In order to reduce the cost of commodity circulation and ensure that the recycling process and the sales process can form a well-circulated logistics network system, it is necessary to design a more appropriate logistics network structure according to C2B2C mode and idle goods recycling. In the specific design process, we need to pay attention to the intermediate logistics links of platform enterprises and optimize the existing logistics network, so as to effectively reduce the cost of enterprises.

4.4 Select the Logistics Network Structure

In the process of selecting and designing the structure of the logistics network, it is necessary to compare the traditional C2C mode Internet second-hand trading platform, because the intermediate goods processing link will cause the buyers and sellers to not simply use express delivery to trade goods, which will directly affect the complexity of the logistics network. Compared with the traditional logistics network for recycling used goods, the second-hand Internet trading platform in C2B2C mode also includes B-end consumers, with a large number of consumers at both ends of A and B and a wide distribution range. In view of this situation, it is necessary to explore the logistics network structure that is more suitable for C2B2C mode, and play the role of recycling center processing and integration to the greatest extent, taking into account the distribution of consumers at both ends of A and B [6].

When choosing the logistics network structure, it is necessary to analyze the characteristics of different logistics network structures. First, the point-to-point direct-through network. In this network structure, all nodes are directly connected by straight lines. In the process of cargo transportation, the transportation distance and time between some nodes are more time-saving than those passing through hub nodes, and the structural reliability of point-to-point direct-through network is also higher. A certain node in the network, especially the hub node, has little influence on the connectivity of the whole logistics network when it can't continue to operate. Second, the radial logistics network. This network structure is a hub node set up by one or more nodes in the network, and the radiating nodes are connected through the hub node. The reliability of the network structure is relatively poor. If the hub node can't operate, it will lead to regional paralysis of some nodes. However, it should be noted that the point-to-point direct-through network structure needs a lot of manpower and material support, and the resources are scattered. Moreover, when the number of nodes N is determined, the radial logistics network structure has outstanding advantages mainly in the following aspects: First, the number of lines in the network is superior. Because the nodes of the point-to-point direct-through network are all connected by lines in pairs during operation, the total number of lines in this network is $N(N-1)/2$. However, in the radial network, the radial nodes are transported to the hub nodes by straight lines, while the hub nodes are transported by trunk lines. When the number of nodes N increases, the number of lines in the point-to-point direct-through network increases in a nonlinear way, and the number of lines in the radial network increases in a linear way. Secondly, the path allocation among nodes in the network also has advantages. In the point-to-point direct-through network logistics network structure, direct transportation is mainly used between different nodes, which can effectively shorten the transportation distance and reduce the time. However, the quantity of goods in the network is relatively large, which can ensure the full load rate and reduce the logistics cost. In the concrete transportation process, there are some problems, such as the small quantity of goods transported on one line and the low full load rate of vehicles. If the demand for goods between two nodes is one-way, the problem of empty return of vehicles may occur, which will affect the logistics cost. In the radial logistics network, different radial nodes all use indirect transportation. Although bypass transportation will occur to a certain extent, which will increase the transportation distance and time, the transportation between hub nodes is centralized transportation, which

can form economies of scale. Usually, a reasonable radial network structure will form a scale and gain more economic benefits. Therefore, the radial network structure can make use of centralized transportation to reduce the unit transportation cost according to the economies of scale. Coupled with the density economy and cluster benefits, the radial network structure can promote the economic development of node areas. Therefore, in the process of optimizing the network logistics structure, the radial logistics network structure is the main one. At the same time, the number, location and radiation range of recycling centers should be determined in consideration of the regional distribution of consumers, so as to optimize the existing logistics network [9].

5 Conclusions

All in all, in the process of optimizing and improving the problems existing in the traditional logistics network, it is necessary to consider the transaction process of the Internet second-hand trading platform in C2B2C mode. At the same time, it is necessary to scientifically choose the structure system of logistics network, and make clear the specific optimization purpose. According to the specific situation of the second-hand trading platform, the optimization and innovation of the logistics network should be completed. In the follow-up research process, it is necessary to conduct in-depth analysis of its economies of scale from the perspective of centralized transportation of the radial network structure, so as to explain in detail every link in the construction process of the logistics network and further strengthen the operating benefits of the second-hand trading platform on the Internet under C2B2C mode.

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