Optimized Analysis based on the Characteristics of Cross-Border E-Commerce Logistics Business

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Abstract

Due to the long span of cross-border e-commerce logistics, strict customs supervision, decentralized business links, and high frequency of shipments, its business hours are long and unevenly distributed. The direct consequence is a series of problems such as excessively long delivery time, unstable cycle, damaged or even lost packages, difficult returns, and exchanges, and high logistics costs, which seriously affect customers' online shopping experience. Aiming at the current problems of the cross-border e-commerce logistics business, the composition and influencing factors of the three indicators of timeliness, cost, and quality are analyzed. Proposed solutions to provide punctual, fast, low-cost, and high-quality logistics services for cross-border e-commerce customers. At the same time, it is proposed that optimization analysis based on customer business characteristics can achieve the best results and further promote the development of cross-border e-commerce.

Keywords: Cross-border e-commerce, Logistics business, Optimization analysis

1. Introduction

Due to the long span of cross-border e-commerce logistics, strict customs supervision, decentralized business links, and high frequency of shipments, its business hours are long and unevenly distributed. The direct consequence is a series of problems such as excessively long delivery time, unstable cycle, damaged or even lost packages, difficult returns, and exchanges, and high logistics costs, which seriously affect customers' online shopping experience. How to take effective business optimization measures to shorten and stabilize the delivery cycle, reduce logistics costs, and improve service quality has become an urgent and vital issue to promote the development of cross-border e-commerce.

To provide cross-border e-commerce customers with punctual, fast, low-cost, and high-quality logistics services, and to promote the development of cross-border e-commerce is the main goal of cross-border e-commerce logistics optimization.

The timeliness of cross-border e-commerce logistics has two meanings: one is the speed of goods delivery, and the other is the stability of the goods delivery cycle. Excessive delivery time or excessive fluctuation of goods will seriously affect the online shopping experience of customers. When the time fluctuation is too large, cross-border e-commerce sellers can only increase safety stock for urgent needs to meet market demand and avoid shortages. Increased inventory costs, and even caused serious consequences of slow sales and obsolescence.

The main cost of cross-border e-commerce logistics business comes from the cost of cross-border e-commerce logistics, and lower logistics costs are the core competitiveness of sellers.

One of the main goals of cross-border e-commerce logistics optimization is to reduce goods damage and goods difference, solve the difficulty of return and exchange, and improve service quality.

2. Analysis of cross-border e-commerce logistics system

System principle is one of the most basic principles of modern management science. It means that when people are engaged in management work, they use systematic viewpoints, theories, and methods to conduct an adequate systematic analysis of management activities to achieve management optimization goals. That is to understand and deal with the problems that arise in business management from the perspective of system theory. This article takes the cross-border e-commerce logistics export business as an example to analyze the cross-border e-commerce logistics system. The cross-border e-commerce system consists of two parts, the cross-border e-commerce business process, and the cross-border e-commerce infrastructure.

Cross-border e-commerce infrastructure refers to organizations related to cross-border e-commerce logistics, including cross-border e-commerce buyers, sellers, and their related supply chain members. Such as eBay, Amazon, Ali-express, DH gate, and other platform e-commerce companies, ports, airports, stations, transportation, warehousing, logistics business agents and other logistics companies, customs, national inspection, taxation, foreign exchange administration, and other departments to form supervision and Functional departments, integrated service park enterprises and other public integrated service platform departments. Cross-border e-commerce logistics business includes a series of logistics operations from the place of supply of goods to the place of consumption. This article takes export as an example to study the optimization of cross-border e-commerce logistics. The basic process is shown in [Figure 1].
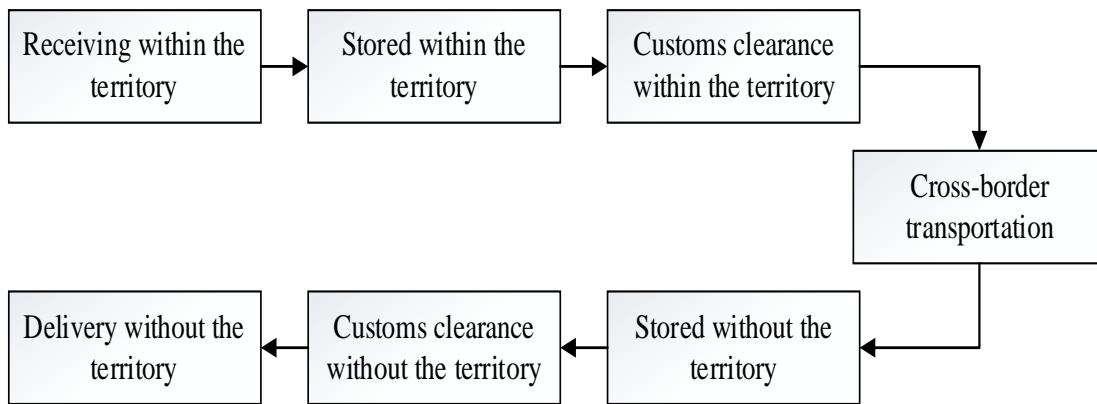
Figure 1. Cross-border logistics process

3. Analysis of factors affecting cross-border e-commerce logistics optimization indicators

Cross-border e-commerce logistics optimization indicators include time, cost, and quality. The following will analyze these indicators and their influencing factors. It also proposes targeted optimization measures to improve the efficiency of cross-border e-commerce logistics systems.

3.1. Timeliness control

Starting from the analysis of the composition of time, the strategies for controlling time consumption and time fluctuations are studied from each business link, to improve the timeliness of cross-border e-commerce logistics.

From the perspective of the entire system, the time of cross-border e-commerce logistics business activities consists of two parts: network transportation time, node storage, or transit time.

(1) The time of receiving (delivering) goods within (overseas). This part of the time is roughly divided into waiting time for vehicles, receiving time, and vehicle transportation time. The length of time depends on factors such as whether the vehicle can be dispatched in time, transportation distance, road conditions, and the skill level of the driver.

(2) Domestic (foreign) storage turnover time. After the goods arrive at the warehouse, they need to wait for customs clearance for international transportation or distribution. This period consists of the unloading and warehousing of the goods, sorting out of the warehouse, and loading and transportation. The length of its time depends on the warehouse equipment, the operating efficiency of the personnel, and the level of operation management organization.

(3) Customs clearance time at home and abroad. Because cross-border e-commerce has the business characteristics of small batches, multiple varieties, and high frequency. This fragmentation of massive orders makes the declaration procedures for cross-border e-commerce products cumbersome, long declaration time, and has a very high expense during customs clearance, which brings greater challenges to the traditional supervision model based on customs declarations.

(4) Cross-border transportation time. Cross-border transportation time is divided into cargo transportation preparation time, cargo loading and unloading time, and the transportation time between endpoint ports.

Control time consumption. To control time consumption, it is necessary to control the time consumed by each business link following the cross-border e-commerce logistics business process.

Control the time of receiving (delivering) goods at home (outside). To achieve this goal, we can share social resources, build a social capacity pool, use cross-border e-commerce logistics information platforms, build transfer centers, dispatch centers, and settlement centers based on big data technology, and integrate social transportation resources to obtain receipt information on time. Dispatch nearby vehicles to simplify receiving procedures and optimize transportation routes. For example, according to the performance of the past logistics express company, the quotation of each segment, the real-time transportation capacity resource situation, the real-time shipment volume of the flow, and other information, relevant "big data" analysis can be performed to obtain optimized route options. And optimize the combination configuration of the third-party logistics company, and the system will send the order data to each link, which will be completed by the corresponding logistics company. The big data platform enables the logistics resources in a certain area to be included in the scope of dispatch and use, "all for my use", to achieve "timely delivery of receipt information, the timely arrival of vehicles, and optimization of transportation routes". Of course, preparing the goods in advance is a prerequisite for shortening the delivery time. Otherwise, after the vehicle arrives, not only can it not be transported by the fashion car, but it will also delay the capacity and cause economic losses.

Turnover time of domestic and overseas warehousing. The length of time for unloading and entering the warehouse, sorting out of the warehouse, loading, and transportation, etc. depends on the warehouse equipment, the operation efficiency of the personnel, and the level of operation management organization. To this end, it is necessary to vigorously introduce modern logistics technology and management and organization systems, improve the efficiency of warehousing operations, and speed up the turnover time of domestic and foreign warehousing. Take "Suning Yun Cang" as an example. The warehouse uses intelligent logistics robots for collaboration and cooperation. Through many advanced technologies such as artificial intelligence, deep learning, intelligent image recognition, and big data applications, industrial robots can make independent judgments and behaviors. Adapt to different application scenarios, commodity types, and forms, complete various complex tasks and realize automation in the links of commodity sorting, transportation, and warehouse delivery. The picking speed of parallel robots can reach 3,600 times per hour, which is equivalent to 5 to 6 times that of traditional manual labor. Currently, "Suning Yun Cang" can handle 1.81 million parcels per day, which is more than 4.5 times the processing capacity of similar warehouses in the industry. The picking efficiency can reach 1,200 pieces per person per hour, which is more than 10 times that of the most advanced warehouse of its kind. A single order can be shipped out within 30 minutes, which is more than 5 times the fastest processing speed of similar warehouses in the industry.

Innovate the customs supervision model. Because of the small-batch, multi-variety, and high-frequency business characteristics of cross-border e-commerce, the following measures can be explored and implemented in the customs clearance process: first out, then report, cooperate with the temporary storage account book of goods, allow products that generate orders to be declared out of the country in advance, and record the list Depart from the country, and then declare the customs declaration. Set up temporary storage in and out of the zone to facilitate the movement between goods and outside the zone, and avoid problems such as deletion and modification of the export declaration form in advance. Implement centralized declaration, allowing the centralized declaration of export declarations within a certain period. Implement paperless customs clearance, and realize paperless declaration of export declaration forms, exit filing forms, outbound orders, and other documents. Take measures to merge similar items to allow the first eight goods with the same commodity code to be merged into the same item for declaration, effectively reducing the number of documents. Build a credit system, follow up the credit records of customs declaration entities, and take random checks and inspections for those with high credit to speed up the release. It can also strengthen information sharing with other relevant units or institutions in the cross-border e-commerce system, confirm each other, and improve the efficiency of supervision.

Cross-border transportation time. The transportation between the two endpoints is restricted by the technical conditions of the vehicle (for example operating speed), so the room for improvement is limited. However, the cargo preparation time and cargo loading and unloading time consumed in the terminal port still have a certain room for improvement according to the current operating level. For example, an international express giant set up an Asia-Pacific transshipment center at Shenzhen Baoan International Airport. According to the timeliness requirements of aviation logistics, the international transshipment center must complete all transshipment operations in just 2 hours, including customs declaration of entry and exit, and inbound and unloading. Aircraft operation, cooperation with customs inspections, apron tally and transportation scheduling, various document production, and system entry, outbound flight stowage arrangement and installation, plus a series of operations, plus the model and capacity of each arrival flight The difference, the unbalanced cargo volume of each route, the difference

in container size, and the fact that in addition to the transit cargo on the inbound flight, there are also a large number of Shenzhen local cargoes that also have to depart from the port. Therefore, it is necessary to make the most reasonable rebuild plan for the timeliness of the flight and the airworthiness of the container's volume and weight, as well as re-declaration, re-recording, and re-packing.

The company's rebuild process before the optimization is shown in [Figure 2]. Due to insufficient information acquisition capabilities, the inability to obtain accurate information such as the weight and volume of goods and containers in advance leads to the following problems: First, all containers that can be combined and cannot be combined are transferred from the apron to the cargo station and unpacked without discrimination. Check, and then do the Rebuild Planner, it will lead to a waste of capacity and time resources, and even cause a Cargo delay. Second, the volume and weight of the container are airworthy constraints. That is to say, after multiple boxes are merged, they are found to be overweight or exceed the loading capacity of the container, which will lead to re-merging, delaying valuable installation time. By marking the AAZ\AAY container with a low loading rate and small size and the container with a small weight and a large quantity of cargo, after the aircraft arrives at the transshipment center, these collections are targeted (but not all). The loader is transferred to the transshipment center for re-loading, reducing the link of cargo inspection at the cargo station, thereby saving about 30% of the operating time.
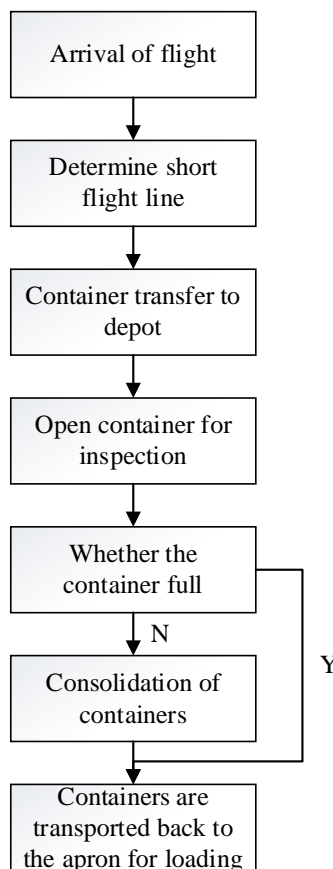

Figure 2. The company's rebuild process before optimization

Control the fluctuation of logistics time. Cross-border e-commerce goods are shipped from the country, and the logistics distribution cycle is very unstable, and the fluctuations are quite large, usually between 5d and 30d. Through the analysis of the main reasons for the instability of the transportation cycle, we can find the places that can be improved. The fluctuation of the transportation cycle tends to be minimized.

(1) Analysis of reasons for fluctuations in logistics time. The main reasons for the unstable transportation from the receiving (delivering) point to the domestic (foreign) warehouse include: the goods are not ready, and the truck is loaded after waiting for a certain volume at the receiving point. The loading and unloading time are unstable; the transportation time on the way is unstable; it needs to pass through the transfer station to regroup or reload.

(2) Good transportation method. For example, the time stability of railway transportation is better than that of road and water transportation. With the implementation of my country's One Belt One Road strategy, railway transportation has reached more and more countries or regions, covering cross-border e-commerce consumption areas, and railway transportation has increasingly become one of the main cross-border transportation methods of cross-border e-commerce logistics. The larger the transportation volume, the easier it is for the transportation company to give priority transportation arrangements and the more stable the delivery time. Therefore, expanding the transportation batch is also the main measure to stabilize the fluctuation of logistics time. Making a plan in advance, or storing the goods in domestic or overseas warehouses in advance, helps to prioritize the operation of goods, thereby reducing fluctuations in operation time. Simplify the logistics business links to prevent the time fluctuations of multiple business links from being superimposed. The fewer business links, the smaller the time fluctuations.

3.2. Logistics cost analysis and control optimization

The logistics costs of cross-border e-commerce mainly include transportation costs, warehousing costs, ordering costs, and losses caused by shortages. Take the first shipping and overseas warehouse models as examples. The transportation costs include the transportation cost from the purchase receiving a place to the domestic transshipment warehouse, the transportation cost from the domestic transshipment warehouse to the port, the sea transportation cost from the domestic port to the foreign port, and the foreign port to the foreign port. Shipping costs from overseas warehouses, shipping costs from overseas warehouses to overseas customers.

Warehousing costs include storage costs for domestic transshipment warehouses, warehouse storage costs for overseas warehouses, warehouse storage costs, and other value-added service costs.

Because the cross-border e-commerce logistics business affects the seller's inventory control strategy, ordering strategy, and loss of stock, the ordering fee and the loss of stock loss are also included in the logistics cost.

Ordering cost: refers to the cost of negotiator travel, business negotiation, contract signing, order processing, etc., for purchasing from a supplier. Out-of-stock loss fee: refers to the opportunity cost of missing sales due to the out-of-stock and the cost brought to the customer, which has a negative impact on the brand and causes the loss of sales of the brand's products in the future.

Transportation cost control and optimization. Common methods of cost control include expanding business volume to exert economies of scale, reducing unit logistics costs, increasing the input/output ratio through technical means, reducing no-load and eliminating waste, etc.

Domestic (foreign) collection (delivery) freight transportation cost control. In the actual operation of the cross-border e-commerce logistics business, it is difficult to exert economies of scale due to scattered orders. This type of "fragmented demand" has led to "fragmented supply", that is, a large number of companies providing products or services, small scale, and fierce competition. The result of "fragment supply" is usually a fierce price war in the industry as a whole. When the cost is difficult to compress, the price drop must come at the cost of the drop-in service quality. Facing the "fragment" status in the field of warehousing and logistics, the delivery information of a large number of customers on the cross-border e-commerce platform can be aggregated on the demand side, and preliminary processing can be carried out. On the supply side, the decentralized transportation capabilities of small warehousing and logistics companies are integrated through an information system, so those small express companies can obtain customers through access to the "cloud warehousing and logistics" platform, and pick up and deliver goods through this platform. The "cloud warehousing logistics" platform needs to rely on big data processing to increase the concentration of supply and demand to play a scale effect. The integration of social logistics resources through the big data platform can optimize the allocation of logistics resources and reduce social logistics costs. The big data platform uses information technology, is driven by logistics demand, and takes logistics service orders as contracts, coordinating the global available social logistics resources, realizing instant use and instant settlement.

Control of trunk transportation costs. In cross-border e-commerce trunk transportation, due to its long transportation distance and high consumption cost, the logistics cost control potential at this stage is huge, which is of great significance for controlling the entire cross-border e-commerce logistics cost. In cross-border e-commerce trunk transportation, especially in the air transportation mode, in a certain effective cargo volume of the vehicle (cargo plane), if the load can be increased, it will have a significant effect on reducing logistics costs. Because international air trunk transportation needs to span multiple regions or countries, some cargo needs to be collected and transshipped at multiple airport nodes, and the timeliness requirements are high, resulting in a low loading rate of container equipment, resulting in a wasted cabin, and brought to air cargo operations. Huge economic losses are the biggest cost problem in international aviation logistics.

Measures such as formulating integration plans in advance, improving information systems, and reengineering operating procedures can significantly reduce the number of operations and workloads of cargo planes in airport transfer centers, improve operational efficiency, save aviation time, increase cabin loading rates, and reduce air transportation costs.

Improve the efficiency of warehousing and exiting operations. Adopting advanced logistics technology to improve the efficiency of inbound and outbound operations. At present, the storage efficiency of "unmanned warehouses" is more than 10 times that of traditional beam racks, and the work efficiency of warehouse operators have been greatly improved. The brand new Suning Yun Cang only needs one or two managers to control the automatic storage and replenishment operations of large and small items. Among them, the automated storage system (ASRS) can realize automatic storage and retrieval of 30 pallets per hour (50 pallets in a single cycle), and the Miniload high-density storage system can realize automatic storage and storage of small boxes and cardboard boxes per hour. 1400 boxes.

Control inventory. The moving space and time of cross-border e-commerce products are long, and the cost of urgent purchases or out-of-stock is relatively high. How to control

inventory is of great significance to reducing logistics costs. Use big data technology to analyze the law of customer demand, predict the future demand of customers, and achieve timely delivery, to achieve the purpose of inventory control. You can also establish an order inventory model and analyze and calculate the order point, safety stock, best order batch, and lowest logistics for important parameters such as costs, sellers can refer to the above parameters to achieve the purpose of inventory control.

3.3 Quality management and control optimization

The frequent occurrence of goods damage, poor goods, and difficulty in returning and replacing goods have become one of the focuses of cross-border e-commerce customers, and it is also the main goal of improving the quality and optimization of cross-border e-commerce logistics services. Through information technology, especially big data technology, the relevant cross-border e-commerce logistics service data is counted, analyzed, and processed, and various quality indicators are obtained, and monitoring and selection are implemented to achieve the goal of controlling service quality and optimization.

Evaluate carrier performance. Calculate key performance indicators such as the damage rate of each carrier through big data, and provide the best supplier for cross-border e-commerce logistics to provide decision-making.

Reduce cargo damage claims. Analyze the correlation between the rate of cargo damage and cargo difference in various modes of transportation through data, improve the mode of transportation, and reduce the rate of cargo damage claims.

Tracking of the person responsible for the damage. Through bar code scanning and identification, "monitor" the entire process of sorting or mobile operations by warehouse workers, and collect product error data in various business links of cross-border e-commerce logistics. And you can locate which worker is processing which order, trace the source, find out the person responsible for the damage and the difference, and manage it to reduce the loss caused by the damage and difference.

By setting up overseas warehouses and other methods, the return and exchange business can be processed in time, to solve the problem of difficult returns and exchanges in cross-border e-commerce.

4. Optimization analysis based on customer business characteristics

The above analyses the timeliness, cost, and service quality indicators of the cross-border e-commerce logistics business, and proposes countermeasures, but there is a contradiction between timeliness, cost, and service quality, that is, to improve timeliness or service Quality may increase logistics costs. For example, when cross-border e-commerce customers choose logistics channels, they will often face the dilemma of choosing international express delivery with better timeliness or international parcel with a price advantage. Taking the selection and optimization of logistics channels as an example, Table 1 makes a comparative analysis of the timeliness and costs of these types of logistics channels.

Table 1. Analysis of common cross-border e-commerce logistics channels

Channel way	The delivery time	Price(dollar)
The international parcel	More than 30 days	12-14/KG
International express	7 to 15 days	18-20/KG
International special line logistics	15 to 30 days	15/KG
Overseas warehouse	Within 7 days	15/KG

The advantages of international parcels include: First, low cost. Compared with other modes of transportation, international parcel service has an absolute price advantage. Using this delivery method can minimize costs and enhance price competitiveness. The second is simplicity, easy delivery of international parcels, and global uniform billing methods, regardless of the first weight and renewal weight, which greatly simplifies freight accounting and cost control. The third is globalization. International parcels can deliver products to customers in almost any country or region in the world, as long as there is a post office, which greatly expands the market space for foreign trade sellers.

The professionalism and timeliness of the international express channel have obvious advantages, but its wide range and complexity of the system, coupled with the particularity of the international express itself, make it more difficult to operate and face more risks. In addition, international express has higher requirements for the provision, collection, and management of information, and must be supported by an international information system. Moreover, the demand for products is also very high, and imitation brands, electricity-containing, and special products are unable to be delivered. These factors have caused international express channels to occupy only a small part of the market share. However, if its price can be lowered, it will have a very big impact on the postal channels in the future.

The characteristic of dedicated line logistics is that the delivery time of goods is fixed, the transportation cost is cheaper than express logistics, and double clearance is guaranteed. Dedicated Logistics is a better logistics solution for cross-border e-commerce in a certain country or region. However, although the domestic routes of dedicated line logistics can be controlled in the hands of logistics companies, if the goods go abroad, they are still postal parcels. At the same time, delivery delays will also occur if the first arrival of the goods in the city is far from the customer's address. And the service of dedicated line logistics is not as good as express logistics, for example, customers return goods, ordinary dedicated line logistics does not have such services.

Overseas warehouses are warehouses established overseas by logistics service providers. Sellers store goods in overseas warehouses. When buyers have demand, sellers can respond quickly and notify overseas warehouses in time for sorting and packaging of goods. , And transport from the country's warehouse to other regions or countries, which improves the logistics response speed. At the same time, combined with the characteristics of the local logistics of overseas warehouses, it can ensure that the goods reach the end buyers safely, accurately, timely, and at a low cost. It is not only conducive to the expansion of overseas markets but also reduces logistics costs. However, the overseas warehouse model must have a certain amount of inventory, otherwise, the customer's order cannot be completed on time due to lack of stock, and the platform will be punished.

In short, international parcels and international express delivery are the simplest and most direct logistics methods. International parcels are characterized by low tariffs but long delivery times. International express delivery has a shorter delivery time than international parcels, but the cost is high. Although the postal express method is convenient and flexible, it is riskier. Even so, for many smaller foreign trade companies, international parcels and express delivery are still the most commonly chosen logistics methods. Therefore, according to the different needs of customers, comprehensive decisions such as timeliness, price, and service quality required by customers should be considered, and an optimization plan should be given to achieve the goal of the best overall effect.

5. Conclusion

In recent years, cross-border e-commerce has developed rapidly, but it also faces many problems. The biggest problem still comes from the logistics business. This paper takes timeliness, cost, and quality as the goals, and proposes corresponding optimization measures. With the development and changes of the global economic and trade situation, the cross-border e-commerce industry will also face more and different problems, which require practitioners and scholars to continuously research, improve, and implement, so that the industry can always maintain efficient operations, thereby further promoting Development of my country's foreign trade import and export business.

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