Research on Logistics Management Information Interaction

Junan Xie

Shanghai Business School, Shanghai, 200235, China

2537801169@qq.com

Keywords: Logistics management; Internet; Information interaction

Abstract: Economic and technological development has promoted the rapid reform of the logistics industry, especially its informatization. In general, the more information interaction points the logistics enterprise has in its operation chain process, the more accurate the work, the more efficient the service, and the more competitive it is. If logistics companies want to grow and have strong competitiveness in the market, they need to follow the pace of the times and strengthen the informatization of their logistics processes; otherwise, they will be eliminated by the market.

1. Introduction

With the rise of the Internet, logistics, one of the most important tertiary industries, is gradually interacting with information to create a more convenient and efficient logistics industry. An analysis of traditional logistics is provided in this article, along with an explanation of how information is exchanged between various parts. At the same time, each process is expanded and explained, and the information interaction is further described. Based on the number of information interactions in the process activities of logistics enterprises, the enterprises are divided into levels of logistics services: service level 1, 1-10 information interaction points. And analyze its general service characteristics, which further reflects the necessity of informatization.

2. Explanation of Logistics Processes and Information Interaction Points

2.1 Product Warehousing Logistics Process and Information Interaction Point
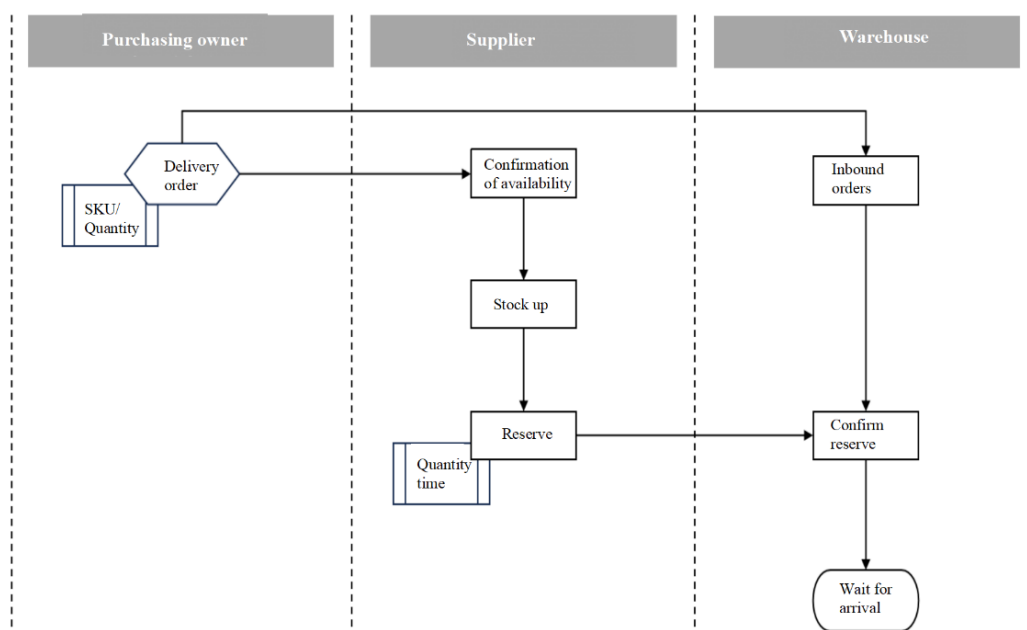
2.1.1 Reservation Warehousing

Figure 1 Flowchart of reservation warehousing

Orders are placed with suppliers by an enterprise's purchasing department or by the goods' owner. In order to prepare the goods, the supplier must confirm that the inventory is adequate. Once the inventory is sufficient, the supplier can confirm the order and prepare the goods. g for the supplier. (See Figure 1)

IIPD(Information interaction point description):

(1) The company's purchasing department or cargo owner can place an order in the supplier's APP or web system.

(2) The supplier can directly compare the inventory with the order from the APP or web system and determine whether it is in stock. The order will be canceled if there is no stock. If there is stock, the order can be reported online to the purchaser and owner of the goods that the order has been received [1].

(3) Suppliers can enter cargo information and confirm appointment times through the warehouse's APP or web system.

2.1.2 Arrival and Unloading

The supplier must sign in, deliver the order to the warehouse operator, and wait for the warehouse to arrange the unloading port after delivering the goods to the warehouse [2]. Suppliers should inform the warehouse in advance of the nature of the goods, unloading requirements, and other precautions to avoid damage to items during Unloading.

IIPD:

(1) Using the warehouse's APP or the positioning system on the website, the supplier can locate, confirm, and sign in the goods when they arrive at the warehouse.

(2) During the order placement process, suppliers can enter order information, such as the order number, through the warehouse's APP or website system to confirm that the order has been delivered to the warehouse.

(3) As soon as the supplier completes the order placement, the warehouse system analyzes the working conditions and queuing conditions of multiple unloading ports in real-time and automatically assigns the supplier to the unloading port with the shortest waiting time.

2.1.3 Quality Inspection and Acceptance

Quality inspection is required before entering the warehouse. If there are no errors, the order can be signed and placed in the warehouse. If there are problems, they need to be dealt with on a case-by-case basis [3]. Depending on the circumstances, it can be approved for storage after confirmation. Otherwise, it should be rejected, and the supplier should communicate with them to determine whether it needs to be exchanged or is out of stock. If it needs to be exchanged, the goods will be unloaded. After the goods are qualified, the order can be signed.

IIPD:

(1) During the quality inspection process, large quantities of goods such as beans and rice can be screened through mechanized equipment with computer-controlled screening modes to retain qualified products and remove defective products.

(2) After the quality inspection, the warehouse can use the APP or web system to put the quantity of qualified products into the warehouse for processing, reject the unqualified products, give feedback to the supplier, and ask the supplier whether the goods are exchanged. If there is a shortage, they can communicate and deal with it in time.

(3) Suppliers can directly conduct special approval through the warehouse's APP or web system and attach relevant item information and certificates when special commodities fail to pass quality inspection.

2.1.4 Signing Orders and Warehousing

Once the goods have passed the quality inspection, the quantity will be counted and matched to the order.

IIPD:

(1) When the supplier's actual goods do not match the order information, the supplier can directly

check whether the goods are sufficient to supplement the order through the company's APP or web system. When the goods are sufficient, the supplier can also quickly place an order for the goods[4].

(2) The order information can be entered directly into the warehouse APP or web system when recording an order. If the quantity does not match the order information during the order-matching process, you can directly modify it online and enter it into the system.

(3) Both parties can keep and store the electronic documents in their systems to facilitate quick searches.

2.1.5 Inventory on Shelves

The goods that have been received are stored in the receiving temporary storage area. After the shelving task is dispatched, the warehouse operators will put the goods on the shelves according to the recommendations [5]. Under special circumstances, some goods do not match the recommended storage locations and cannot be put on the shelves. In this case, operators need to manually find the location and complete the put on the shelves. The goods put on the shelves need to be entered and confirmed by operators in the system.

IIPD:

(1) The system can analyze the status of the goods in temporary storage and the vacancies of cargo spaces, match the size of the goods with the cargo spaces, and provide the warehouse operators with the recommended shelf space, thus reducing the problem of goods not being put on shelves after the shelving task is assigned.

(2) The warehouse can input the supplier information and goods details into the inventory through the APP or web system and display the merchant's item information in the cargo owner's inventory.

2.2 Logistics Process and Information Interaction Point of Product Processing Process

Logistics process of product processing, raw material picking, finished product packaging, finished product shelves, and supplier collaborative processing.

IIPD :

(1) When the customer places an order on the APP or web system, this system automatically integrates the order time period with the raw material area to form an order set.

(2) Based on customer order requirements, the system can analyze the processing process for the lowest loss, lowest cost, highest efficiency, and highest yield.

2.3 Finished Product Delivery Process and Information Interaction Points
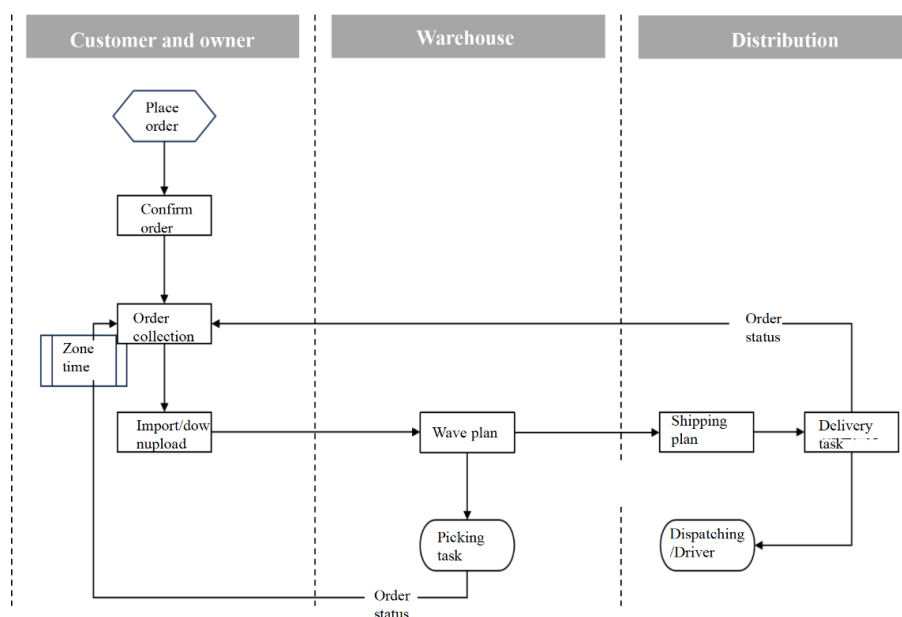
2.3.1 Order Delivery

Figure 2 The flow chart of order delivery

When customers and cargo owners place orders, the warehouse will integrate the orders within the specified time period and issue a set of outgoing orders. Orders are processed in waves, picking tasks and shipping plans are formulated, and delivery tasks are arranged for the drivers after the picking is complete. (See Figure 2)

IIPD:

(1) The operator's picking process can be adjusted in real-time through real-time feedback on the picking situation in the APP or web system during picking.

(2) During picking and distribution, the order status can be monitored in real-time through the system, which makes it easier for suppliers, warehouses, and customers to follow order progress and adjust schedules as needed.

2.3.2 Outbound Process-Inventory Picking

After each wave of orders is released, documents are made according to the order information. The warehouse workers then pick according to the documents [6]. Picked goods are checked according to the documents after picking and placed on shelves to sort and ship.

IIPD:

(1) During the process of allocating picking tasks, the system can use calculations to plan a more convenient and efficient route for each worker.

(2) Each time a piece of goods is picked up, the code on the system can be scanned, saving time and effort in the subsequent "picking confirmation" process.
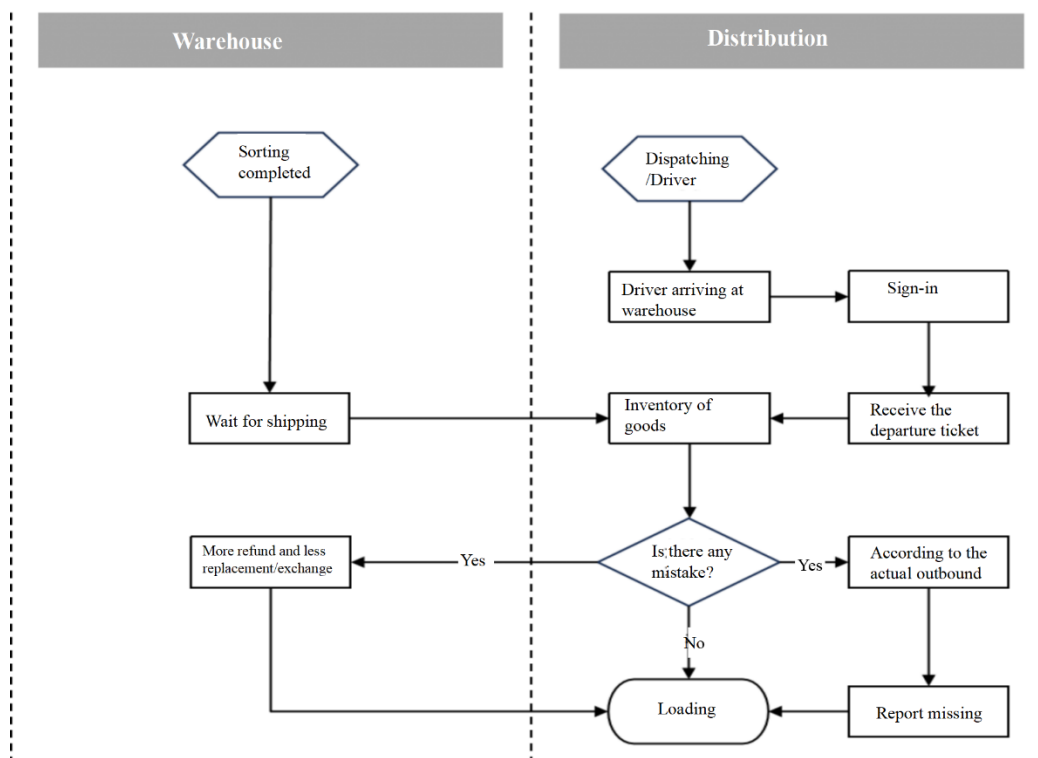
2.3.3 Outbound Process - Handover and Shipping

Figure 3 The flow chart of the outbound process - handover and shipping

After the goods are sorted, they enter the shipping area and wait for shipping. Upon signing in at the warehouse, the delivery driver receives the delivery order, which includes information such as the quantity and category of the goods. As soon as the dispatch order is received, the goods should be counted according to it. (See Figure 3)

IIPD :

(1) Drivers can sign in online using the real-time positioning of the APP or web system to ensure they arrive at the warehouse on time and are ready to pick up the goods.

(2) The system can directly inform the driver about loading instructions when the platform is idle when the driver arrives at the warehouse and completes the sign-in process.

(3) Upon receiving the dispatch order, the driver and staff can use the APP or web system to create an electronic dispatch order. The driver can check the quantity and type of goods according to the electronic dispatch order.

2.3.4 Delivery Process - Signing and Delivery

When the goods are counted out of the warehouse, the warehouse operators need to count the goods, sign the confirmation, and check the departure order. After confirming that it is correct, it can be loaded and departed.

IIPD :

(1) When inventorying goods, it can be compared according to the amount of goods in the APP or web system during the time period. Verify the number and type of goods again.

(2) When the warehouse is confirmed, the operator can directly process the warehouse through the APP or web page system and generate electronic documents for storage.

(3) In signing the order, the driver and the warehouse responsible personnel can use the APP or web page system to sign the online electronic order. The departure ticket can also be signed online, and the paper version can be reserved.
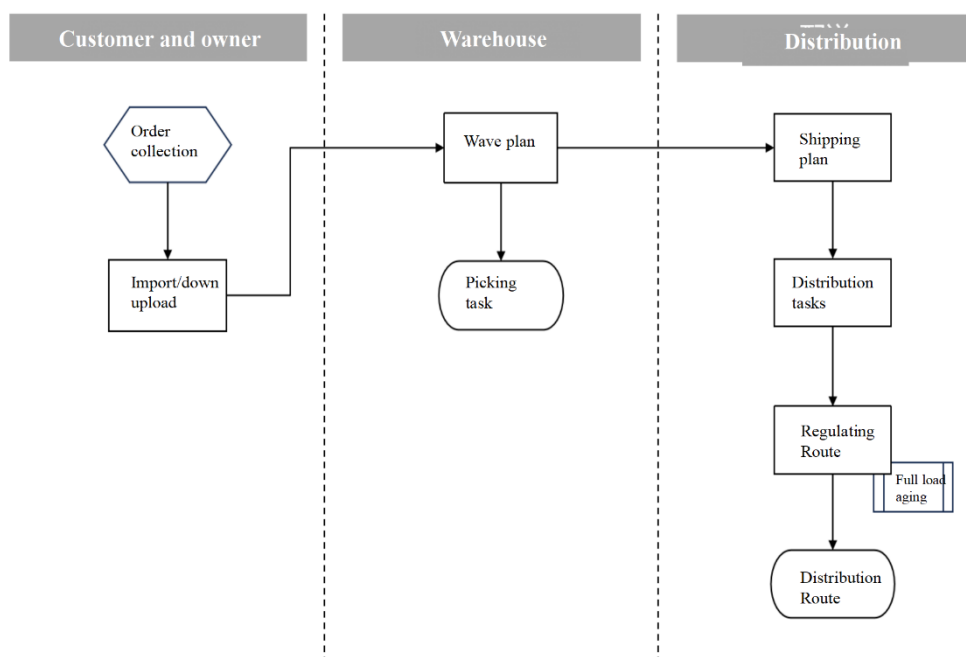
2.3.5 Distribution Tasks

Figure 4 Logistics flow chart of delivery task

When the customer or cargo owner places an order, the document will download a wave outbound plan according to batches and periods. The final delivery route should be referred to and confirmed based on cargo volume, availability, and estimated full load. (See Figure 4)

IIPD:

(1) Delivery tasks can be issued to idle drivers via the APP or web.

(2) During the route adjustment process, the system calculates the driver's full load, cargo volume and availability to plan an efficient delivery route.

2.3.6 Task Dispatch Car

After the delivery route is confirmed, the model of the delivery vehicle also needs to be confirmed.

And make a dispatch plan based on the next day's delivery route, the vehicle model, and the number of vehicles on each route.

IIPD:

(1) Dispatching cars and drivers online is possible in the APP or web system, eliminating offline phone calls.

(2) Driver assessment information like attendance days and absence days can also be viewed directly in the APP or web system.

2.3.7 Handover Loading Vehicle

When the driver arrives at the warehouse, he can sign in and receive the dispatch order.

IIPD:

(1)The driver can confirm the driver's route through the APP or web system and identify the shipping platform for the driver based on the route. At the same time, the system will notify the shipping personnel to go to the designated platform to inventory the goods.

(2)When the inventory is completed, and there is an inventory shortage, the warehouse can use the APP and web system to check the warehouse inventory. It can directly send outbound tasks to fulfill the order if sufficient.

2.3.8 Outbound Distribution

After loading, the driver must check again with the dispatch order. After the verification is completed, both parties sign the dispatch order. The driver needs to make warehouse management and record the time of departure from the warehouse so that it is convenient to calculate the journey time when the goods are delivered.

IIPD:

(1) The driver can use the dispatch order sent in the APP or web app once the goods have been loaded.

(2) During the sealing process, the electronic lock can be used to monitor the carriage's opening and closing status in real-time.

(3) Outbound management can be done through an APP or web system.

2.3.9 Proper Delivery

After the goods arrive at the customer's location and the customer confirms the customer information is correct, the goods can be unloaded and inventoried.

IIPD:

(1) Delivery time can be confirmed on the APP or web system based on departure time as driver assessment information.

(2) The driver can send a replenishment request to the warehouse through the APP or web system or modify the order information directly [7].

(3) Sign online with the APP or Web system during the customer signing process.

3. Logistics Information Interaction Points and Enterprise Service Level Classification

According to the above, the logistics industry has 100 information interaction points. Different logistics enterprises have different logistics capabilities and logistics efficiency due to the different number of information interactions. Therefore, we will classify them according to the number of information interactions in the enterprise logistics link:

Service level 1 enterprises (0-10 information interaction points) , service level 3 enterprises (41-80 information interaction points) , service level 4 enterprises (81-100 information interaction points) :

According to the four levels of division, the following Table 1 are made :

Table 1 The charts of the four levels of division

Logistics service capability	Service level 1 enterprise	Service level 2 enterprises	Service level 3 enterprises	Service level 4 enterprises
Customer convenience	It is inefficient to rely on WeChat, telephone orders, or query commodity inventory.	It is efficient and convenient to query the inventory situation and order in the APP or web system.	In the APP or web system, adapted products and goods can also be recommended to consumers based on level 2 data analysis.	In level 3, external systems can analyze customer purchase data in more detail.
Logistics information real-time and accuracy	In the logistics process, warehousing and billing information are still manually recorded, which results in low efficiency and inaccurate information.	APPs and web systems can store and process order information and warehouse storage data.	With Level 2, all parties can see the real-time inventory and distribution status on the APP or web system, adjust production plans, and replenish goods accordingly.	All parties can view and adjust real-time logistics information with fully automated equipment and warehouses.
The operational efficiency and operational accuracy of the logistics process	All operations are done manually, which is time-consuming, inefficient, and error-prone.	Some information, such as warehouse storage, can be entered into the system, which is more efficient, and the rest is insufficient.	The system participates in most of the processes with high efficiency and low error rate.	Complete mechanization maximizes process operation efficiency and precision.
Management and control efficiency of the logistics process	It appears that workers report problems verbally, by phone, or via WeChat. This indicates poor management capabilities, easy concealment of reports, and low management and control efficiency.	Informatization has somewhat alleviated concealment, but logistics management and control remain inefficient in other aspects.	Data entry systems allow operators to report problems directly to managers through the system, and managers can issue action instructions.	A high degree of mechanization allows management and control to be extremely efficient. Problems can be discovered and resolved quickly by observing the system.
Information collection, analysis and feedback efficiency	Information is entered manually, information analysis requires manual calculations, and feedback is not evident.	Warehouse storage information has been informatized. The system can analyze this part of the information to generate system bills, but other parts are still inefficient.	A data entry system can analyze various factors based on collected data and generate feedback reports based on the results.	Connecting to external systems enhances the ability to collect and analyze information, making analysis results more relevant and efficient.
Market competitiveness	Very weak market competition	Weak market competition	Strong market competition	Very strong market competition
Comprehensive service level	Very low	Low	High	Very high

4. Conclusion

Today, a company's competitiveness and survivability are heavily influenced by the number of information interaction points. Modern logistics enterprises are undergoing profound transformations as technology advances, especially in IT and data analysis. Traditional logistics companies are unable to effectively adapt to the growing market demand, while logistics companies that can quickly introduce and integrate advanced information systems are gradually showing strong competitive advantages.

In general, for logistics enterprises, rapid adaptation and active implementation of informatization and technological innovation are not only means to enhance competitiveness but also necessary for survival and development in a highly competitive market. Continuous innovation of technology will be the key to the future success of logistics enterprises in actively catering to the wave of informatization and strengthening the informatization construction of enterprises.

References

[1] Liu C, Feng Y, Lin D, et al. Iot based laundry services: an application of big data analytics, intelligent logistics management, and machine learning techniques[J]. International Journal of Production Research, 2020, 58(17): 5113-5131.

[2] Trivellas P, Malindretos G, Reklitis P. Implications of green logistics management on sustainable business and supply chain performance: evidence from a survey in the greek agri-food sector[J]. Sustainability, 2020, 12(24): 10515.

[3] Rushton A, Croucher P, Baker P. The handbook of logistics and distribution management: Understanding the supply chain[M]. Kogan Page Publishers, 2022.

[4] Liu Z, Zheng Q, Shi Y, et al. Flexible and stretchable dual mode nanogenerator for rehabilitation monitoring and information interaction[J]. Journal of materials chemistry B, 2020, 8(16): 3647-3654.

[5] Luo Y, Zhao X, Zhou J, et al. A network integration approach for drug-target interaction prediction and computational drug repositioning from heterogeneous information[J]. Nature communications, 2017, 8(1): 573.

[6] Menon R, Di Caterina G, Lakany H, et al. Study on interaction between temporal and spatial information in classification of EMG signals for myoelectric prostheses[J]. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2017, 25(10): 1832-1842.

[7] Laghari A A, Wu K, Laghari R A, et al. A review and state of art of Internet of Things (IoT)[J]. Archives of Computational Methods in Engineering, 2021: 1-19.