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Research on the Operation of Changzhou Distribution Center of Huitong Express in the Peak Period of Online Shopping

(Full Paper)

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ABSTRACT

With the rapid development of network technology and the improvement of payment tools, the advantages of online shopping have become increasingly prominent, and various online shopping festivals have rapidly emerged. During the peak period of online shopping and the peak season of express delivery business, the market needs don't often be met, and problems such as warehouse explosions, express delivery delays, and false receipts often occur. As an important transfer link of express logistics, Distribution Centers will affect the entire express logistics process once operational problems occur. This topic takes Huitong Express Changzhou Distribution Center as an example. By analyzing the current operating conditions of various departments of Huitong Express Changzhou Distribution Center and the problems that arise during the peak period of online shopping (taking "Double 11" as an example), we will further explore more efficient to achieve the maximum possible profit by reducing costs in order to achieve the maximum possible profit.

Keywords: Online shopping peak; double 11; Huitong Express; Changzhou Distribution Center; efficient operation

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INTRODUCTION

With the rapid development of network technology and the continuous improvement of electronic payment tools (Alipay, Internet banking, etc.), all of these make online shopping more convenient and secure, and the advantages of online shopping are increasingly prominent. Therefore, the competition between e-commerce is becoming increasingly fierce, and the promotion activities are more and more frequent.

Take "Double 11" as an example. Beginning in 2009, Taobao began to launch "Double 11" promotional activities, with sales of nearly 100 million yuan that day. In the next few years of "Double 11", Taobao and Tmall's transaction volume began to grow wildly: in 2010, the transaction volume was 936 million yuan, in 2011 it was 5.2 billion yuan, and in 2012 it was approximately 19.1 billion. The single-day sales reached 35.019 billion yuan, and the day's transaction volume in 2014 was 57.1 billion. In 2018, "Double 11" day transaction volume reached 210 billion yuan, and in 2019, the day's transaction volume was 268.4 billion yuan. According to Cainiao Network's statistics, the logistics orders generated by Tmall in 19 years exceeded 1.292 billion.

According to statistics, "double 11" period, express industry of the processing volume of 230% of daily volume, it can be seen that express logistics plays an important role in the development of e-commerce. However, up to now, the development of domestic express industry is far behind the development of e-commerce. Especially in the peak period of online shopping, express delivery service cannot meet the market demand. The express Distribution Center is a logistics transfer center integrating processing, goods handling, and delivery functions, and has the functions of storage, sorting, distribution, and connection (Wang, & He, 2007). The problems in the operation of the Distribution Center include: damaged parts, false sign in, overstocking of express goods on the conveyor belt during peak period, and large number of returned parcels. These are very important and common in the express delivery enterprises. Therefore, how to make the Distribution Center still operate normally and efficiently in the peak state of online shopping, and directly determine the logistics efficiency of express, we need to summarize our experience in practice. This paper takes Huitong Express Changzhou Distribution Center as an example, analyzes the problems and causes of these problems in the current operation of Changzhou Distribution Center during the peak period of online shopping. The paper puts forward suggestions on improving the service quality and improving the operation efficiency of the Distribution Center by using theory, so as to make the operation more reasonable and efficient.

ANALYSIS OF THE OPERATIONS

Brief introduction of Changzhou Distribution Center of Huitong Express

Established in 2003, Huitong Express is a large private express company that took the lead in using information technology in China. Changzhou Distribution Center is a three-level branch company subordinate to Huitong Express Company. The higher-level departments include Shanghai Huitong Express Headquarters and Huitong Jiangsu Branch Management Center. At present, Huitong Express Changzhou Distribution Center is in the second phase of GLP Logistics Park, Huanghe West Road, Xinbei District, Changzhou City. It is geographically located at the northern urban-rural border of Changzhou City, near Changzhou

Luoxi Hub, and away from S39 Jiangsu Jiangyi Expressway and G42 Shanghai It is about 3 minutes' drive from the intersection of Chengdu Expressway; about 25 minutes' drive from Changzhou Benniu Airport. It is about a 20-minute drive from downtown Changzhou, and it can directly lead from the outer ring to Wujin District in the south of the city. Overall, the location is very advantageous.

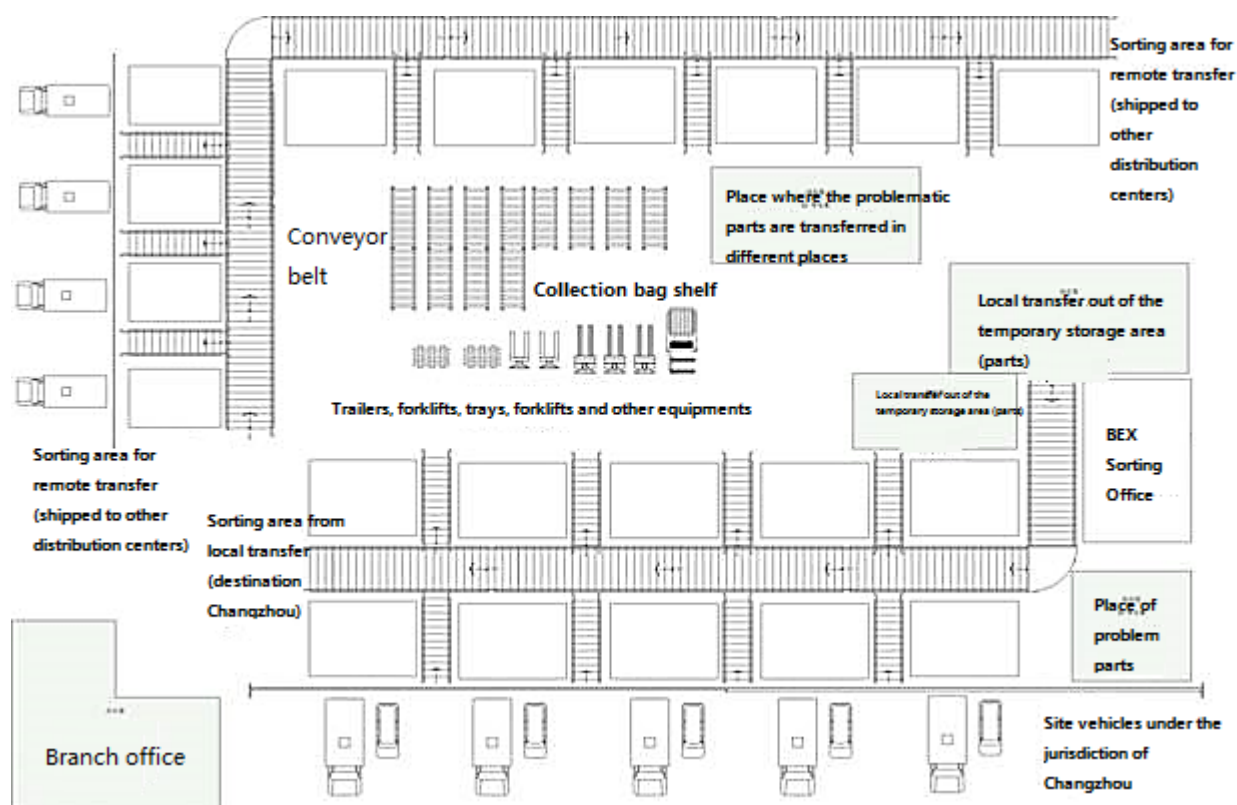
Current status of Huitong Express Changzhou Distribution Center

Changzhou Distribution Center is currently divided into the following departments:

(1) Network department: including network director, network assistant and BEX direct point department. Network department is also known as "quality control department", as its name implies, is the Department controlling quality. The network department is not only subordinate to Changzhou Distribution Center, but also under the management of Jiangsu provincial network department, the superior department of the network department. The main function is to control the dispatch speed and quality of each site (currently the stations supervised by Changzhou Distribution Center include 35 stations in Changzhou, Danyang stations, Changshu stations, and a total of 80), and timely feedback to the superior departments on the situation of the Distribution Center and subordinate management sites at the same level. Huitong Express is the distribution mode of the combination of the management of the outlets (stations) and "BEX direct business point Department". "BEX direct business model" is a new distribution mode adopted since Huitong Express was acquired by Baishi Group. It refers to the dispatch site of express company is directly managed by the Distribution Center, and the dispatcher is directly recruited by the company. This can have certain constraint effect on the distribution site and small members, which is convenient for data statistics and management, and makes the company more standardized.

(2) Customer service department: also known as LCS (logistics customer service) department in Huitong Express Company. It is mainly responsible for receiving the customer consulting telephone, complaint telephone, etc., and handling the complaint and problem parts of the CRM system of Huitong Express delivery system, helping the customer solve the problems, the handling of the problem parts and the headless parts. Customer service department is one of the few departments in Huitong Express Company that directly faces customers. Therefore, it plays an important role in the cooperation between the Distribution Center and customers and improving the operation efficiency.

(3) Allocation office: the most important operation Department of the Distribution Center. The allocation site covers the largest area and the most operations to be processed. Mainly responsible for the scanning, sorting, city transfer and distribution, remote transfer, problem handling and other work. Huitong Express Changzhou Distribution Center has the largest number of staff, and sorting is usually started at night.



Source: This study.

Figure 1: distribution of Distribution Office of Changzhou Distribution Center of Huitong Express

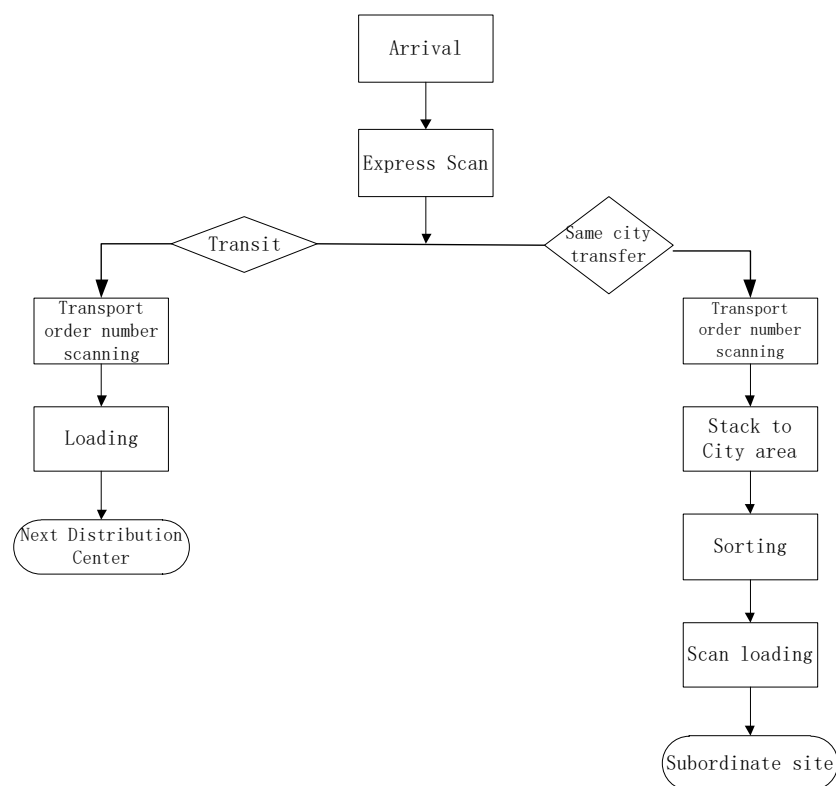
(4) Administrative department: mainly responsible for staff management and logistics of the company, including city manager, personnel supervisor, financial department, and other personnel.

At present, the transfer belt, forklift, hand-held frame trailer, pallet and other infrastructure equipment are used in the Distribution Center of Changzhou. In sorting operation, manual labor is still used. The distribution office layout is shown in Figure 1.

Daily work of Changzhou Distribution Center

The Distribution Center completes daily work based on existing departments and hardware facilities and equipment. The main process is as follows:

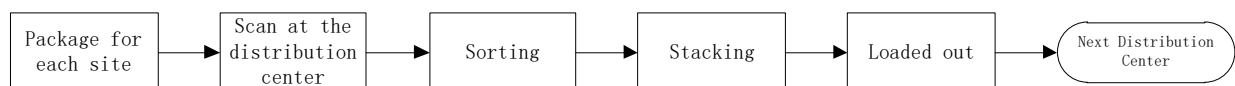
(1) Arrival flow (as shown in Figure 2): the dispatch center of Changzhou receives the goods, and the express arrives at the allocation site for unloading, scans the barcode of the number on the express, and automatically uploads the express to the system; sorting is carried out according to the destination of the express (the corresponding number of the online store will be available on the express): the express sent to the other place, scans, loads, and transfers to the next Distribution Center; it is sent to the same city. The express mail of the company shall be stacked in the transfer out area of the same city, and transported by the operator to the stations under the jurisdiction of each Changzhou Distribution Center through the transmission conveyor belt. The site personnel and site personnel shall scan and load them to their respective stations.



Source: This study.

Figure 2: express to piece flow

(2) Delivery flow (as shown in Figure 3): The parcels are collected from each station and shipped to the Changzhou Distribution Center. The operator sorts them to the corresponding venues according to the numbers on the waybill, scans them, and loads them at night and transfers them out.



Source: This study.

Figure 3: express delivery process

Whether it is arrival or delivery transfer, the network department shall summarize and feedback daily data of each site during the process, mainly including dispatch quantity, arrival quantity, quantity of goods received, sign in rate and small piece package quantity. If the site is abnormal, it is necessary to deal with the exception. Customer service department handles customer phone,

network complaints and inspection issues in Changzhou District throughout the process, and includes the handling of problem parts.

Analysis of the operation status of Changzhou Distribution Center of Huitong Express in the peak period of online shopping ("Double 11" situation of Changzhou Distribution Center of Huitong Express in 2019)

Table 1: Forecast and actual difference analysis of import and export volume of Huitong Express Changzhou during the period of the double eleven in 2019

date	Predicted quantity	Actual output	Deviation (plus or minus 100%)	Forecast dispatch quantity	Actual dispatch quantity	Deviation (plus or minus 100%)
11-11	80000	89555	11.94%	60000	38188	-36.35%
11-12	130000	153337	17.95%	60000	41534	-30.78%
11-13	100000	100757	0.76%	70000	48214	-31.12%
11-14	70000	66352	-5.21%	80000	52976	-33.78%
11-15	60000	54365	-9.39%	70000	60743	-13.22%
11-16	50000	48909	-2.18%	70000	65299	-6.72%
11-17	40000	43039	7.6%	60000	55920	-6.8%
11-18	40000	52196	30.49%	60000	59513	-0.81%
11-19	40000	44338	10.85%	50000	64699	29.40%
11-20	40000	36933	-7.67%	50000	64904	29.81%

Note: the quantity of outgoing goods refers to the express delivered to other regions by express delivery center of Changzhou by Huitong Express; the dispatch quantity refers to the number of express sent by Changzhou and sent by Changzhou stations.

From Table 1, the accuracy of the network Department of Changzhou Distribution Center is higher than that of the dispatch volume. Meanwhile, the dispatch volume forecast in the first few days is not accurate and the forecast is too much. Moreover, the peak time of online shopping has been delayed more and more in recent years, which makes it difficult to predict.

Table 2: analysis of the rate of goods collected by Huitong Express in Changzhou during the period of the double eleven in 2019

date	11-11	11-12	11-13	11-14	11-15	11-16	11-17	11-18	11-19	11-20
Rate of goods taken	97.56%	98.1%	98.23%	98.21%	96.12%	95.86%	93.9%	96.52%	97.83%	96.64%

Source: data from network Department of Changzhou Distribution Center of Huitong Express

Table 3: collection of packages in Changzhou of Huitong Express during the period of the double eleven in 2019

date	11-11	11-12	11-13	11-14	11-15	11-16	11-17	11-18	11-19	11-20
Packet rate	64.79%	67.96%	71.38%	71.86%	65.57%	71.67%	56.68%	56.59%	63.59%	84.69%
Error set rate	6.41%	4.85%	7.20%	6.59%	14.76%	6.69%	5.32%	5.82%	7.36%	12.21%

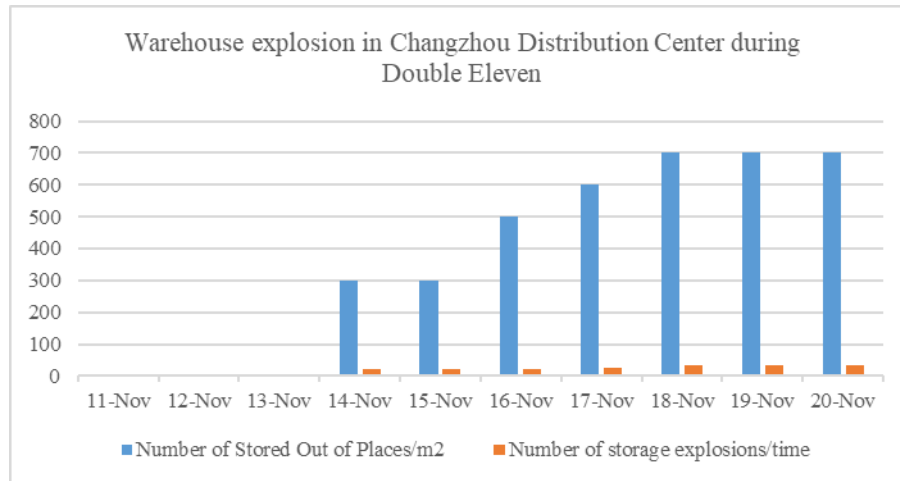
Source: data from network Department of Changzhou Distribution Center of Huitong Express

Note: package collection: refers to the small piece express delivery sent to the same place. When sorting in the Distribution Center, it is packed in a large bag, and the large bag has a label indicating that the small pieces in the big bag have the same code. During transportation, the label code on the large bag is used as the information code of the small piece in the whole bag. After arriving at the destination, the bag is unpacked and sorted.

Table 4: the situation of Huitong Express Changzhou warehouse breaking during the period of the double eleven in 2019

date	11-11	11-12	11-13	11-14	11-15	11-16	11-17	11-18	11-19	11-20
Number of block explosive cases /m ²	0	0	0	300	300	500	600	700	700	700
Number of positions in the block /time	0	0	0	20	20	23	25	34	34	34

Source: data from network Department of Changzhou Distribution Center of Huitong Express



Source: This study.

Figure 4: the situation of Huitong Express Changzhou warehouse breaking during the period of the double eleven in 2019

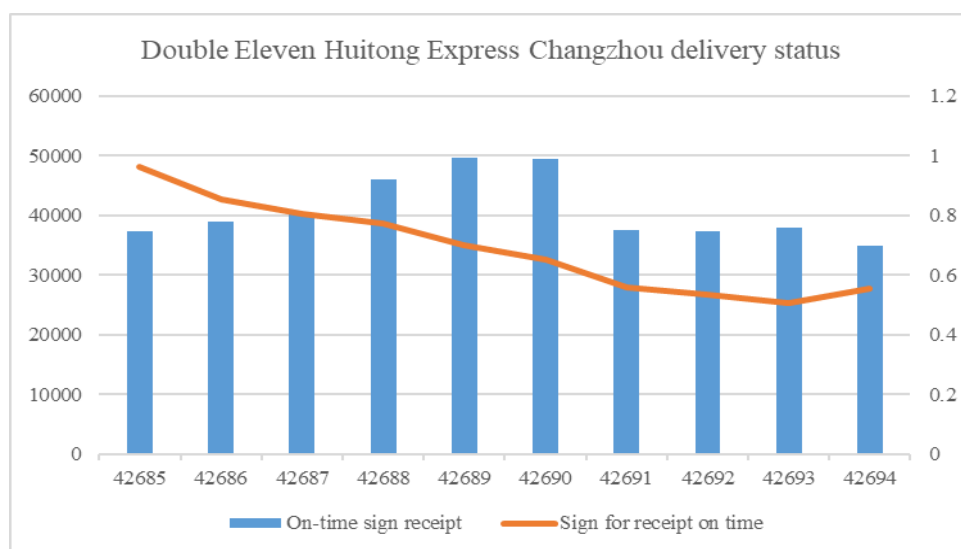
Note: the card position explosion refers to the statistics of all stations within the jurisdiction of Changzhou Distribution Center.

From Table 2-4 and Figure 4 above, the explosion usually occurs after 14, and it is concentrated after the 18th, that is, the second half of the peak period of online shopping, mainly because of the excessive quantity of dispatched items.

Table 5: distribution of Huitong Express in Changzhou during the period of the double eleven in 2019

date	Quantity of parts to be dispatched	Quantity of signed in time	Signature of on time	Delayed receipt	Backlog	Signed in rate (punctuality and delay)
11-11	38662	37374	96.24%	1245	43	99.89%
11-12	44949	38894	85.4%	5958	97	99.78%
11-13	49258	40338	80.73%	8760	160	99.68%
11-14	57480	46036	77.4%	11248	196	99.66%
11-15	68365	49727	70.01%	18237	401	99.41%
11-16	71027	49413	65.1%	21206	408	99.43%
11-17	62309	37631	55.74%	24256	422	66.71%
11-18	66147	37407	53.49%	28284	456	66.71%
11-19	69687	37937	50.76%	31450	380	66.71%
11-20	60399	34971	55.37%	25232	196	66.71%

Source: data from network Department of Changzhou Distribution Center of Huitong Express



Source: This study

Figure 5: the distribution of Huitong Express in Changzhou during the period of the double eleven in 2019

From Table 5 and Figure 5, the signing in problem mainly started in mid-November, mainly because the foreign parts in the later period entered Changzhou, which led to the explosion. The punctuality-signing rate of last year began to decline since the 17th, and all of them were lower than 60%, which was not good. At the same time, there are also a lot of backlog. Although backlog decreased after 20th, the duration was longer.

Table 6: preparation and use of emergency resources for Changzhou emergency dispatch of Huitong Express during the period of the double eleven in 2019

date	Resource reserve (number people)	Resource reserve of (site)	Resource reserve (vehicle)	Actual use (number people)	Actual use of (vehicle)	Actual use (site)
11-11	317	4290	184	317	184	99.89%
11-12	317	4290	184	317	184	99.78%
11-13	317	4290	184	317	184	99.68%
11-14	317	4290	184	317	184	100.66%
11-15	317	4290	184	327	184	100.41%
11-16	317	4290	184	327	184	100.43%
11-17	317	4290	184	327	184	86.71%
11-18	317	4290	184	327	184	76.71%
11-19	317	4290	184	327	184	66.71%
11-20	317	4290	184	327	184	66.71%

Source: data from network Department of Changzhou Distribution Center of Huitong Express

From Table 6, the estimated and actual use of vehicles is relatively accurate and specific in transportation (in Changzhou Distribution Center, it is mainly trunk vehicles and branch vehicles to each station, excluding specific distribution vehicles). There is also no massive congestion and delay. This is a better aspect of doing.

In short, it can be seen from the above tables that before "Double 11", Huitong Express Changzhou Distribution Center made certain forecast preparations, but because the number of online shopping during the peak period of "Double 11" in 2019 exceeded expectations, Therefore, there is a certain difference between actual and estimated, which is mainly reflected in the amount of delivery; on the other hand, the error collection rate on the collection package is higher. At the same time, it can be found from the above table that the logistics cycle this time is relatively long, almost extended by half a month (the above is only 10 days of data, and it lasts until the end of November).

ANALYSIS OF THE PROBLEMS AND CAUSES

Problems and causes of Network Department

In the overall operation of the distribution center, the network department belongs to the department that directly manages the lower-level primary and secondary sites. During the peak period of online shopping, the main tasks include: prediction and

preparation for the pre-peak period of online shopping, including temporary adjustment of personnel, venues, vehicles, equipment, etc. and employment prediction; during the peak period of online shopping, Changzhou is in charge of various data statistics for each site, including: pickup rate, delivery rate, problem rate, etc.; site abnormal situation handling, such as: warehouse explosion, lack of staff; late online shopping peak period, various data statistical feedback, etc.

At present, during the peak period of online shopping, the problems and causes in the operation of network department are as follows:

(1) Poor communication with primary and secondary sites. Since the Changzhou Distribution Center has a large number of sites under its jurisdiction and a wide range, in addition to the nearby Changzhou city and suburb sites, it also directly manages more than 80 first-level sites in Liyang, Jintan, Danyang and Changshu. There are several second-level sites at the lower level; on the other hand, most site managers are not highly educated, generally technical secondary school or college, and do not have professional logistics knowledge. Therefore, if you want to maintain unblocked contact with each site, it is a relatively large amount of work but also a certain degree of difficulty.

(2) Communication with superior is not timely. Besides being managed by the city manager and supervisor of the Distribution Center, the network department is also under the jurisdiction of Jiangsu provincial network department. Therefore, there are many management situations sometimes. At the same time, it also leads to a lot of data that the network department needs to statistics and feedback, and the workload is large. Especially in the peak of online shopping, we often pay attention to the data late into the night. In addition, the superior department sometimes only pays attention to the final results, and does not understand the actual situation on Changzhou side, it will put forward an unreasonable request. Therefore, it will cause some obstacles to management communication.

(3) The speed of statistics, sorting and feedback of information data is slow. During the peak period of online shopping, the data of major e-commerce companies will increase sharply within a day, and it will even exceed 10,000 per second during "Double 11". During the peak period of delivery and distribution, statistics of various sites is also changing all the time. At the same time, the network department needs to count many types of data. (Li, Liu, & Tang, 2009) Therefore, during the peak period of online shopping, the network will inevitably have statistical errors or inaccurate data. Inaccurate data will affect the Changzhou Distribution Center's estimate of the next peak online shopping period, which will have a knock-on effect.

Problems and causes of distribution

Because of the particularity of the peak period of online shopping, the number of express goods transferred from the Distribution Center, whether it is transferred out or transferred in, is several times that of normal times. Therefore, the Distribution Office (i.e. the allocation site) has the following problems in the operation during the peak period of online shopping:

(1) The site was out of stock. Express delivery is a sudden increase in express delivery received by express companies, which leads to the delay of sorting, and many express pieces are stuck in the departure station or transfer station, so that the express will arrive at the customer for a long time. (Hu, & Du, 2004) To some extent, the most fundamental causes of the warehouse explosion caused by the Distribution Office of Changzhou are: the lack of site and low sorting efficiency. The reasons for the explosion are as follows:

⊖ The logistics direction of express is relatively centralized, but the express network is polarized. B2B and C2C online stores are mainly concentrated in the southeast of China, such as the Yangtze River Delta and the Pearl River Delta, but consumers are distributed all over the country. One is that logistics is divergent, (Zhou, Xu, & Lyu, 2008) so the transfer station, such as Changzhou Distribution Center, has too many express destinations, which increases the workload of sorting personnel invisibly.

⊗ The Transfer Center Express is overstocked, and the primary and secondary stations are not deployed enough. Although the site capacity of Changzhou Distribution office is enough, however, due to the limited storage and distribution level of the sub stations in the community or supermarket, the warehouse and distribution level of the outlets is inevitable. (Ma, & Chen, 2007).

(2) People are difficult to control. During the peak period of online shopping, the quantity of express goods increased rapidly and the workload increased, which put forward higher requirements for the number of personnel and work efficiency; in addition, whether sorting or distribution, due to the increase of workload, these employees who do physical work will inevitably have emotions and affect the work efficiency. Therefore, for the distribution of personnel in the peak time of online shopping management is more difficult.

Problems and causes of customer service department

In the peak period of online shopping, the quantity of express goods increases rapidly and the delivery commitment of e-commerce to consumers makes the whole express logistics industry under great pressure. However, the emergence of various abnormal phenomena such as warehouse explosion, delayed delivery, problem parts and false sign in will bring dissatisfaction to customers. Therefore, in the peak of online shopping, customer service department will also have various problems in operation. The problems and causes are as follows:

(1) There are too many reminders and complaints, too late to deal with. Due to the occurrence of warehouse explosion, the delivery time of express shipments is prolonged, or the occurrence of problematic items, such as loss, damage, etc., customers

will complain and complain, so the complaints and inquiries received by the customer service department will be several times the usual. If the customer service staff is too late to deal with it, it will cause a vicious circle.

(2) Too many problems make it difficult to query. The express during the peak period of online shopping is mainly online shopping goods, which are very similar in size, packaging, shape, etc. if there are damaged or headless parts; it is difficult to distinguish the time customers come to check. For example, in 2019, "double 11", there are a lot of headless pieces in Changzhou Distribution Center of Huitong Express. Many customers come to ask the whereabouts of express, and there are many similar items when looking for them. Headless is a express that the waybill has been damaged during transportation, or the contact information and address of the addressee are unknown.

(3) The number of personnel is insufficient and the required professional skills are insufficient. Huitong Express has a system dedicated to the customer service department: CRM system. However, if the customer service personnel temporarily hired or transferred during the peak period of online shopping are not familiar with the CRM system, the processing efficiency will be affected during the use process.

Problems and causes of secondary site

Although the site is not the division center department, but directly by the Distribution Center management and monitoring. At the same time, Huitong Express currently uses the model of BEX direct business point Department of the network department, which has direct management of the distribution of small members. Therefore, the problems of each site are also the problems to be dealt with by Changzhou Distribution Center. During the peak period of online shopping, the problems and causes of the first and second-level sites are as follows:

(1) It is difficult to manage personnel. The main causes are: insufficient distribution personnel; the temporary employed express personnel are not familiar with the geographical distribution area, extending the distribution time; the express personnel are too tired and inefficient.

(2) The lack of site caused the explosion. The main causes are: insufficient site; unreasonable stacking, resulting in damaged or missing express.

(3) False signature. During the peak period of online shopping, Changzhou Distribution Center will take a certain performance appraisal method for each site, such as the daily delivery or sign in quantity. A bit of site in order to achieve the goal, may upload "signed in" information in the system, then send. In fact, it has caused false signing. False sign in is a serious behavior in express industry. May directly affect the site, the integrity of the company.

The difference between forecast and actual import and export

Before the peak period of online shopping, Changzhou Distribution Center will forecast the number of packages in the peak period of online shopping according to the previous data, and then adjust and supplement all the current personnel, venues, vehicles, etc. in order to meet the arrival of the peak period. However, there will still be differences between the forecast and the actual data, which lead to the following reasons:

(1) The handling and sorting efficiency of operators cannot be determined. The ability and level of staff are different, and the difference of work efficiency may cause the link between links not timely, which will delay the express logistics time.

(2) It is expected to be too conservative. If the data analysis of previous years is inaccurate or the existing resources of the Distribution Center are not well understood and deployed unreasonable, it will cause the prediction to be too conservative, which will cause the shortage of personnel, site and equipment when the peak time of online shopping really comes, which will cause the explosion.

The speed of the goods and transfer is slow and the efficiency is not high

As an organization specialized in the allocation activities, the most important function of the Distribution Center is transfer, which has both transfer out and transfer in at the same time, the distribution volume is generally large in the peak period of online shopping, which will restrict the quantity of goods received. In the process of transfer out, there are often problems of slow transfer out of site parts and arrival Distribution Center. The main causes of inefficiency are as follows:

(1) The personnel did not respond in time and could not reach the sender for the goods within the specified time after receiving the information of the contract.

(2) Too much delivery to upload information to the logistics system immediately. During the peak period of online shopping, the quantity of the delivery will be several times higher than usual. In case of a lot of daily quantity, it will be too late to input each waybill number into the system one by one. The actual parts have been hired or transferred, but there is no information display in the system because the information update is not timely.

(3) Lack of handheld terminals and improper use. The staff at the venue and the site will have their own handheld terminals, that is, the express scanner, which is divided into several modules such as sending, arriving, delivering, signing, and collecting. Before using the scanning gun, each operator must enter his or her job ID and password in the system. After entering the system, select the operation module he wants to perform, click the scan button, and align the scanner with the barcode on the waybill. After the beep sounds, it means that the information of the waybill has been entered into the upload system, and the customer or

the company's internal operators can check the status of the ticket in the system. The lack of handheld terminals and improper use will cause information to be updated in time.

The accuracy of small package is low

For online shopping, ordinary customers buy small goods (lighter, smaller volume and low value). Therefore, for online shopping small pieces sent to the same destination (divided into provincial and municipal level), small-sized package is adopted for convenient transportation and storage. In this way, the most important problem for the dial center is accuracy. The possible cause is the human problem, because the package needs manual operation so far.

COUNTERMEASURES TO IMPROVE THE OPERATION LEVEL

Forecast of online shopping in the early peak

Although the peak period of online shopping is sudden and the duration and the quantity of express messages are different every year, according to the statistics of Changzhou Distribution Center in the peak period of online shopping in previous years, some data and problems can be found to follow the general rules, which can be predicted in advance.

According to the data of 2019, the data that can be predicted are mainly:

- (1) The storage area that is needed is generally 100% - 100.5% of the usual. However, in case it could increase to 101%.
- (2) The duration of the peak. From 2019 data, the period of rapid increase in online shopping express is generally in the middle term, because the express from all over the country will be transported to Changzhou, usually lasting 5-7 days. Therefore, the sorting, distribution and site management of these days should be focused on.
- (3) The quantity of the delivery and the quantity of the dispatch. The quantity of outgoing goods refers to the express quantity transferred from Changzhou to the city, and the dispatch quantity refers to the express that the destination is the one transferred out from Changzhou. If the speed of dispatch is higher than the speed of the outgoing parts, it can reduce the pressure and relieve the phenomenon of warehouse explosion for the allocation site of Changzhou Distribution Center.

Do a good job in the preliminary planning

The plan is a macro plan for the whole by the top management. According to the forecast, the corresponding planning work is needed to alleviate the problems. Mainly have the following aspects:

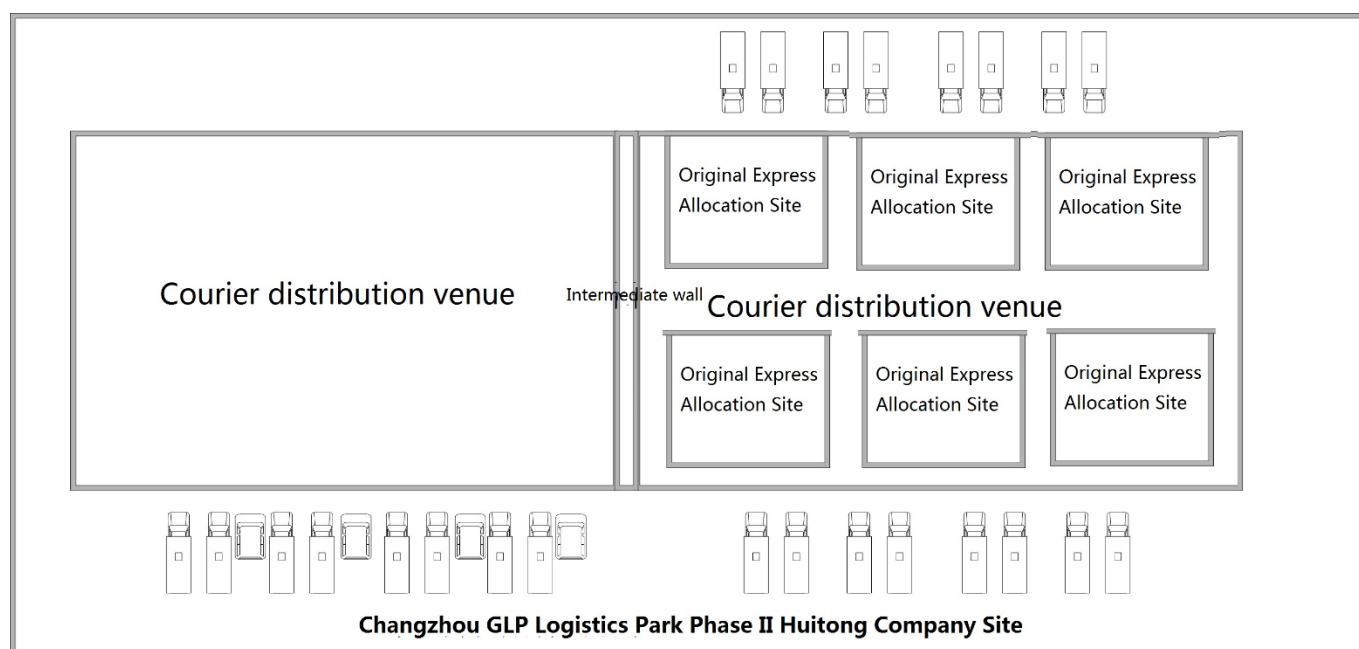
- (1) Storage space, that is, the plan of the approximate area of the required site. To ensure that there is enough space to accommodate many express deliveries during the peak period, the site needs to be reasonably arranged on the basis of the predicted number, whether it is a re-planning of the existing site or Temporarily add new storage locations on the existing basis (Kim, 2020).
- (2) The personnel plan mainly includes the temporary addition and dispatch of each department in this special period, as well as the precautions for personnel operation in specific posts.
- (3) The plan of facilities and equipment includes the arrangement of facilities and equipment in different sites and different work, and preparation for the preliminary inspection of specific equipment. (Jiang, & Wang, 2005)
- (4) The plan of vehicles is sufficient for Changzhou Distribution Center, but due to the particularity of peak period, the vehicles can be readjusted to meet the needs of transportation and improve efficiency and alleviate the problem of explosion.

Reasonable planning of site to alleviate the insufficient storage location

The express delivery volume during the peak period of online shopping has the characteristics of suddenness and large quantity. If the express delivery and delivery are arranged after the peak period of online shopping, it will definitely be too late to cause the problem of warehouse explosion. To a certain extent, the main problem is the "explosion" of the distribution site. It can be seen from Figure 1 that for the Changzhou Distribution Center, the daily application utilization rate of the distribution site has reached more than 70%, especially the space occupied by local express mail, which reaches 87% in normal operations. the above. If enough space is allocated, no matter what the rapid increase rate of express shipments is, the degree of liquidation problem can be relatively reduced. Therefore, one of the most important tasks before the peak period of online shopping is to prepare the venue. There are several ways to alleviate the shortage of storage space.

Temporary borrowing of other sites

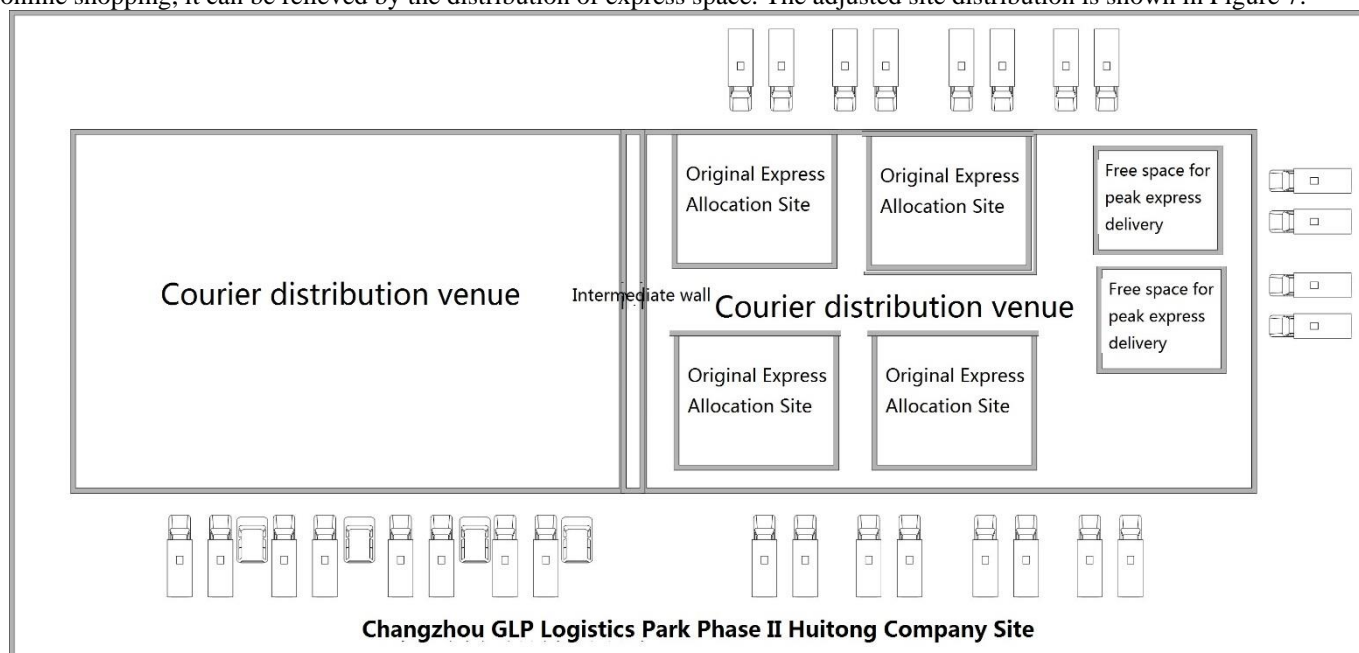
Huitong Express has a fast Distribution Center in Changzhou besides the express Distribution Center (responsible for the transfer of large-scale goods of large-scale companies with cooperation with Huitong), and the two distribution sites are adjacent. The distribution of the distribution site of express delivery and express transportation in daily situations is shown in Figure 6:



Source: This study

Figure 6: general distribution of remit express and express distribution in daily situations

Compared with express delivery, express transportation is a long-term cooperation, the sales of goods are relatively stable, and there is little sudden peak. Therefore, for the period of rapid increase of express delivery generated during the peak period of online shopping, it can be relieved by the distribution of express space. The adjusted site distribution is shown in Figure 7:



Source: This study

Figure 7: overall distribution of remit express and express distribution after adjustment

As shown in Figure 7, the transfer out of express goods is relatively stable, so the temporary free space in the express delivery site can temporarily alleviate the tension of the express distribution area. The details are shown in the two upper right corner of Figure 5. At the same time, because there is still a certain space on the other side of the express site, it can be used for the transportation vehicles in and out, which is very convenient and safe. The daily express transportation can still be handled through the front door and back door of the Distribution Center, and the transportation vehicles are also convenient to enter and exit (Demirta, Nurgül, & Tuzkaya, 2012).

Compared to temporarily renting other warehouses to transfer centers during peak periods, the use of existing express distribution sites saves a lot of cost, mainly reflected in: (1) site rental fees; (2) redesign of transportation routes Expenses, energy and time; (3) Arrangement and distribution of facilities and equipment in the leased site; (4) Staff arrangements for temporary sites. In addition, the time for online shopping peaks to appear and maintain each year is relatively short. For

temporary lease of venues, firstly, it is difficult to find a suitable address; secondly, general warehouses are unwilling to assume the lease period within one month.

Of course, the occupation of the express distribution site also needs to be prepared for relevant communication in advance, mainly as follows:

- (1) The paper analyzes the allocation of Daily Express Department, reasonably estimates that the express transportation is in the peak period of online shopping to reduce the allocation site and does not affect the feasibility of the operation in production.
- (2) The area of the site that may need to be occupied more during the peak period of analysis. According to Table 6, it can be concluded that the more sites needed for Changzhou Distribution are about 0.4% - 0.8%, namely 17.16m²-34.32m².
- (3) Express administration department and express department shall communicate with Express Department to borrow the site in advance to get understanding.
- (4) Reasonably plan the express location for the reserve space in the peak period at the Express office at least 2 days in advance.
- (5) Make the deployment of personnel, equipment and vehicles in the standby site in advance.
- (6) After the peak period, reply to the normal operation of the express in time and express our thanks.

Direct delivery

As for Changzhou Distribution Center of Huitong Express, there are no major problems in vehicle during the peak period of online shopping. Because of the lack of storage in daily operation, all express delivery through Changzhou, whether it is transferred out of the same city or transferred in other places, needs to be concentrated in Changzhou Distribution Center first, and the rapid volume increases greatly in the peak period of online shopping, which brings great pressure to the site of the Distribution Center. Therefore, if we can send some of the vehicles directly around the over dial center to the distribution network during peak period, the pressure of the storage in the Distribution Center can be relieved. Of course, direct delivery needs to do a series of other supporting work as follows:

- (1) Determine the distribution outlets for direct delivery. For the outlets that can be directly distributed, to allow the large-scale transportation vehicles that originally go to the main line directly into the branch line, the most important thing is that this or these outlets must have a large distribution volume. (Yu, & Xu, 2012). As for Changzhou, the outlets with large distribution volume mainly include Wujin, Jintan, Liyang, and Danyang stations managed by Changzhou Distribution Center.

Wujin is the largest area in Changzhou, and it is separated from the north and south ends of the city with the new North District where the Distribution Center is located. The G42 and S39 high-speed can be directly connected to the Wujin and exit, so the goods to be transported to Wujin can be sent directly. Jintan, Liyang and Danyang are all county-level cities, but because the cost of building large Distribution Centers is very high, they are usually managed by Changzhou Distribution Center. However, during the peak period of online shopping, one of the largest sites in the three county-level cities can be used as temporary small distribution centers, or temporary warehouses can be used to transport the three original distribution centers to Changzhou distribution centers. The express mails of county-level cities are diverted to free up storage space for express mails destined for downtown Changzhou, and it can also reduce the pressure of sorting in Changzhou distribution center.

- (2) Arrange sorting in advance. The direct delivery will inevitably change the sorting work of some parts. For the express to Jintan, the express of this part should be sorted and shipped for Changzhou according to the destination in the previous sorting work. However, after the direct delivery, the destination of the express is changed to Jintan. Therefore, the express sent to Changzhou city should be piled separately during sorting.

- (3) Coordinate cooperation with other Distribution Centers. In the direct delivery mode, some vehicles that were originally through Changzhou Distribution Center no longer pass through here, but directly to the distribution network, which is equivalent to the change of transportation route of some vehicles. In addition, the early sorting is in the previous level of the allocation center, which is equivalent to increasing the workload of other Distribution Centers. Therefore, it is necessary to communicate with the previous level of the Distribution Center in advance. Under the condition, the personnel can be added to the sorting center at the upper level and help can be provided to promote the normal operation of the whole express network.

Rationalization of personnel management

Adequate personnel

In the peak of online shopping, the problem of insufficient personnel mainly appears in sorting office, subordinate stations and customer service department.

- (1) Sorting office: according to the statistics of Huitong Express Changzhou Distribution Center during the period of "double 11" in 2019, the general explosion occurred after November 14, and reached the peak on 19 and 20, and the most direct reason for the explosion of the Distribution Center was the delay of express due to the low sorting efficiency. Therefore, the Distribution Center should focus on the dispatch of additional personnel to the sorting office in these days. If it is difficult to hire temporary workers, other departments can be mobilized to participate in sorting when necessary, such as colleagues from relevant express departments.

(2) Subordinate site: compared with the transfer site, the "explosion" is more often found in the lower level site. The main reason is that the site is insufficient, and the site personnel are generally not many, generally in 3-5, some small stations may only have two people, in the case of rapid increase in the peak online shopping, it is difficult to deal with it efficiently.

Huitong Express is different from other express companies, such as Yuantong, Zhongtong, etc. the most important point is that Huitong has a direct business BEX station and small members, which are directly managed by Changzhou Distribution Center. In peak hours, we should use BEX direct sales personnel as alternate members flexibly, and we can consider external temporary employees to relieve pressure. (Yu, Wang, & Liu, 2018)

(3) Customer service department: the number of complaints and inquiry items increased sharply during the peak period of online shopping, which often makes the telephone of customer service department burst. Although Huitong Express has its own customer service system, it can relieve the pressure on the telephone to a certain extent, but the daily problems handled by the customer service department in peak period will be 5-8 times that of the normal. The handling capacity of a customer service personnel in a day may reach 400 for the problems to be dealt with in the optical CRM system. Therefore, the customer service department should find temporary workers or interns as early as possible when preparing for the online shopping peak. On the other hand, because the customer service performance evaluation of Jiangsu Province is tied together, if there are not enough customer service personnel on Changzhou side, other cities, such as Nanjing, Zhenjiang and Suzhou, can be asked to assist in handling.

Training personnel skills

The skills training mainly involves the division, customer service and administration.

(1) Division: the most important part of the Distribution Center is sorting. At present, in Changzhou Distribution Center, besides the automation of conveyor belt and vehicle, sorting and packet collection work is mainly based on labor. Therefore, the operator should be trained properly (Gao, Li, & Li, 2017), such as the use mode and specification of the handheld terminal, mainly the hand-held express scanning gun. It also needs training on the use of conveyor belt and the standard operation of small package in the distribution site.

(2) Customer service department: train the service specification of customer service personnel. The main purpose is to standardize the terms of receiving the phone. Before the customer service personnel take the post, the director of customer service department should teach the basic politeness language model to the new customer service. Adopt different telephone terms in the face of different types of customer requirements; on the other hand, the operation training of customer service system, mainly the use of CRM system and Q9 system in the work.

Increase and make reasonable use of the guidance of professional personnel

For the improvement of working efficiency in the peak period of online shopping, in addition to the previous data analysis, we need to have professional knowledge as the basis. (Zhang, Jin, Song, & Dan, 2010) Therefore, we should strengthen the cultivation of talents in the industry and attach importance to the cultivation of high-end talents in the field of e-commerce. Encourage universities, scientific research institutions and enterprises to achieve collaborative innovation. On the other hand, for the first-line express delivery staff, we should strengthen the recruitment and training management, improve the quality of the employees, and ensure the end-user experience.

In the peak of online shopping, we should make full use of the skills of express logistics professionals, and mobilize the enthusiasm and self-confidence of employees in the face of the peak period of online shopping, so as to be fully prepared. Meanwhile, the overall situation shall be mastered during the period, and the fact monitoring and reasonable adjustment of personnel and equipment shall be conducted.

Reasonable division of labor and full use of reward and punishment system

During the peak period of online shopping, you should not be busy with the large amount of express mail. At this time, you should divide your work reasonably and perform your own duties. As the direction indicator of an enterprise, senior leaders should grasp the overall situation and formulate corresponding reward and punishment systems while boosting morale to maintain the achievement of various indicators. For example, you can give staff, especially manual sorters and dispatchers, sufficient rest time before the peak of online shopping; during the peak of online shopping, provide extra meals for personnel in various departments, especially when the problem of warehouse explosion is serious. A few days; do a good job of emotional comfort.

Accelerate automation

For Changzhou Distribution Center, automation means that more machines are used in the configuration of equipment and facilities instead of labor. On the one hand, it can avoid the shortage of labor; at the same time, it is also a way to reduce the cost in the end. (Han, 2006).

The most important thing for the distribution center is the application of fully automated sorters. The data shows that the working capacity of a fully automatic sorter can reach 6000-7700 express items per hour, while the error rate will remain below

1%; and the current manual operation workload is about 150 express items per hour. The error rate is usually above 3% (Chen, Langevin, & Riopel, 2011). At the same time, the automatic sorter can sort many goods steadily for a long time regardless of time, weather, energy, mood, and other factors. Therefore, compared with manual sorting, the fully automatic sorter has the advantages of stability, low energy consumption and low cost in the end.

In addition, the equipment implementation of Huitong Express Changzhou Distribution Center mainly includes vehicles, hand-held terminals, sites, shelves, water conveyor belts, forklifts, pallets, lifts, etc. In the peak of online shopping, the following points should be achieved:

- (1) According to the experience of previous peak online shopping, the quantity and model of required facilities and equipment shall be predicted in advance, and the quantity of preparation shall be greater than required, and the existing equipment shall be checked in advance for good use.
- (2) In the ordinary management, this equipment should be checked regularly. If there is a sudden equipment failure during the peak period of online shopping, both the maintenance cost and the operating profit are double consumption.
- (3) Conduct standardized operation guidance, such as training and guidance for operators before equipment use; posting operation specification instruction at obvious places of equipment.

The process of rapid increase information

In order to reduce the occurrence rate of "explosion" and "problem parts" in the peak period of online shopping, the importance of information flow to logistics is self-evident. It is necessary to apply various system software to the operation of Huitong Express Distribution Center more flexibly to speed up its informatization process (Lee, & Kwon, 2010).

- (1) Q9 system, with many modules and powerful functions, belongs to a comprehensive system, and the Distribution Center is mainly used for checking the parts
- (2) OA platform, which belongs to the internal system of the company, is used for the update of internal information at any time, the release of notices, etc. Network department and customer service department need to pay attention to the information on the platform frequently, so as to timely understand the latest decision-making and operation status of the head office and superior departments, and adjust the operation in combination with the actual situation on Changzhou side.
- (3) CRM system is a special customer service system, which is used for the input and processing of LCs problem parts. But the application rate of CRM system in practice is still lower than that of customer service telephone. On the one hand, the number of customers using network complaints and queries is a small number; on the other hand, the situation that CRM system can handle is still limited, and needs to be improved and maintained constantly.

CONCLUSION

The rapid development of network technology and electronic payment has made online shopping a very important part of modern life. In order to attract consumers, major domestic e-commerce platforms are racing to launch online shopping promotion festivals. Among them, Taobao's "Double 11" is the main hit. The explosive increase in transaction volume during the peak period of online shopping places high demands on express logistics, which has led to various problems. Among them, the problem of "explosion" in distribution centers and subordinate sites is particularly prominent. As an important transfer link in express logistics, the distribution center is a logistics base that integrates processing, tally, and delivery functions, and has functions such as storage, sorting, collection and distribution, and connection. Therefore, once the distribution center has operational problems, it will affect the entire express logistics process. This article takes Huitong Express Changzhou Distribution Center as an example, based on the actual situation, uses theory to put forward suggestions to improve the express service quality and improve the operation efficiency of the distribution center, so that the operation is more reasonable and efficient. Hope it has a certain meaning to the operation of Huitong Express Changzhou Distribution Center.

In short, the efficient operation of the distribution center is a process of continuous optimization, which is of great significance to the efficiency of express delivery during the peak period of online shopping. At present, the development of the express industry is still lagging behind the development speed of e-commerce. Therefore, it is necessary to continuously learn advanced technology and experience. Continuous optimization can make the operation efficiency of the express distribution center be further improved.

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