

Research on the "Last Kilometer" Logistics Distribution in Campus

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Abstract: The "last kilometer" problem of logistics industry has always been the pain point. Campus, as the last kilometer of College Students' consumption group, has gradually attracted the attention of major express companies. However, with the rapid development of campus express, it also faces many problems. From the perspective of College Students' consumption characteristics and university logistics distribution environment, this paper comprehensively analyses the existing problems of campus express delivery and puts forward corresponding solutions.

1. Introduction

With the continuous innovation and sustainable development of Internet and mobile communication technology, e-commerce has begun to popularize to the public. Because online shopping has the advantages of saving shopping time, variety of goods and low price, online shopping has gradually become a trend.

Online shopping is more common among college students. According to the latest data released by the National Bureau of Statistics and the Ministry of Education, the number of college students in China is 26.958 million. According to the statistics of Ali Research Institute, in 2015, the number of e-commerce parcels generated by colleges and universities in China accounted for 6% of the total number of e-commerce parcels, about 700 million.

The problem of logistics in Colleges and universities has attracted the attention of public opinion. In fact, it is not because of its rapid development, but because of its "dirty and messy". But essentially, campus express delivery is the epitome of the inadaptability caused by China's transition to an information society. Among many logistics problems, "the last kilometer" distribution problem is attracting more and more people's attention.

2. Current Situation of Logistics Distribution "Last Kilometer" in Colleges and Universities

2.1 Analysis of College Students' Online Shopping Behavior

(1) Gender Characteristics of College Students' Online Shopping

The survey found that there were slightly more boys than girls doing online shopping. The frequency of boys using the Internet was significantly higher than that of girls, and the knowledge of some network knowledge was better than that of girls. This may be one of the reasons why more boys than girls do online shopping.

(2) The Age Characteristics of College Students' Online Shopping

The survey shows that the number of juniors and seniors doing online shopping is more than that of freshmen and sophomores, and the number of online shopping is also higher than that of juniors. Therefore, we can see that the age of the Internet also has a certain impact on online shopping, and the elderly people are also the people who make frequent online shopping.

(3) The Payment Power Characteristics of College Students' Online Shopping

The basic living expenses of college students are mostly derived from the supply of the family. Therefore, college students' consumption level must be consistent with their family situation.

Everyone's living expenses are basically concentrated between 800 and 1500 yuan. Everyone will consider some additional consumption in addition to some necessary expenses.

2.2 Logistics Distribution Model in Colleges and Universities

(1) The Leading Mode of the School's Direct Management: Centralized Self-selection

It is mainly initiated by the school logistics department and led by the school. Its principle is that the university, as the host, provides a venue for the logistics express company and centralizes the management of the enterprise. Under the mode of socialized management, the school does not participate in the operation at all. It is only responsible for leasing the site to the logistics express enterprise, which centralizes the management and operation, and is responsible for its own profits and losses.

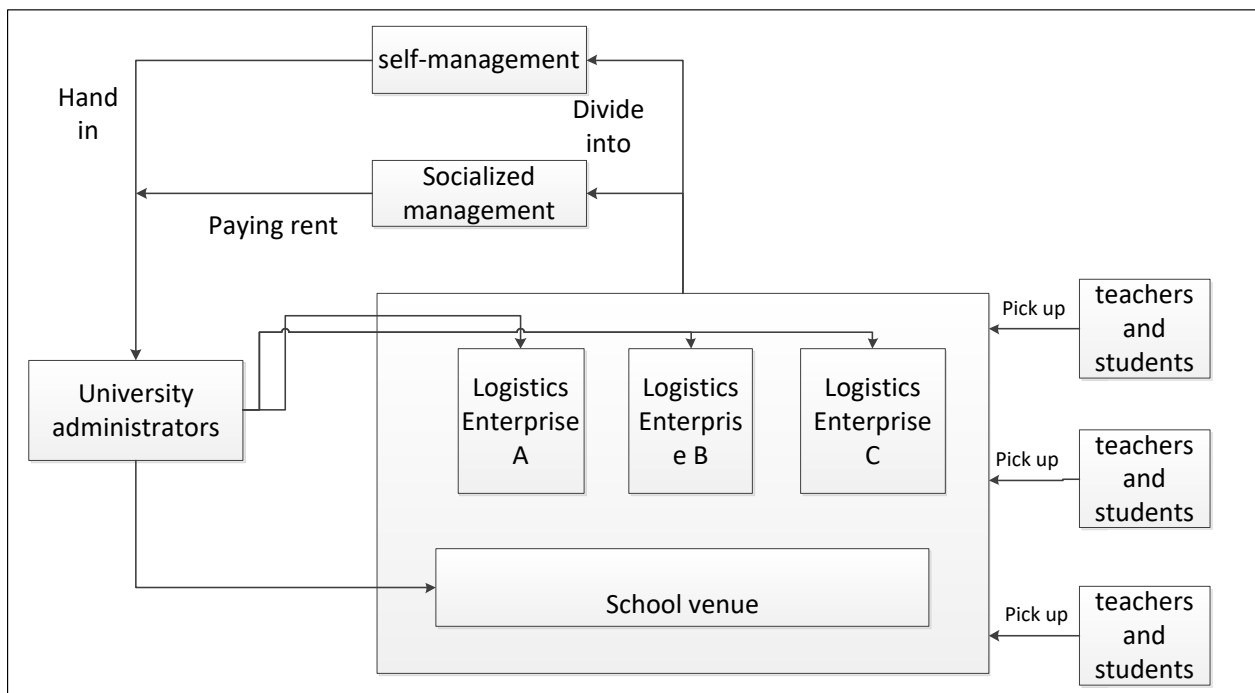


Figure 1. The Leading Mode of the School's Direct Management: Centralized Self-selection

(2) Enterprise-led Franchise Agent Model: Decentralized Self-access

The dominant principle of this model is to allow express delivery enterprises to set up agent networks in the campus, and express delivery enterprises to set up agent networks in various areas of the school. In this mode, the whole express delivery process and the collaborative operation of each link are theoretically completed by the express company alone, which has high express delivery efficiency. However, due to the strong decentralization and fragmentation of University Express consumption, it is difficult for large express companies and teachers and students to completely independently complete the direct exchange of express demand and service, and for the school to manage the fragmented express network.

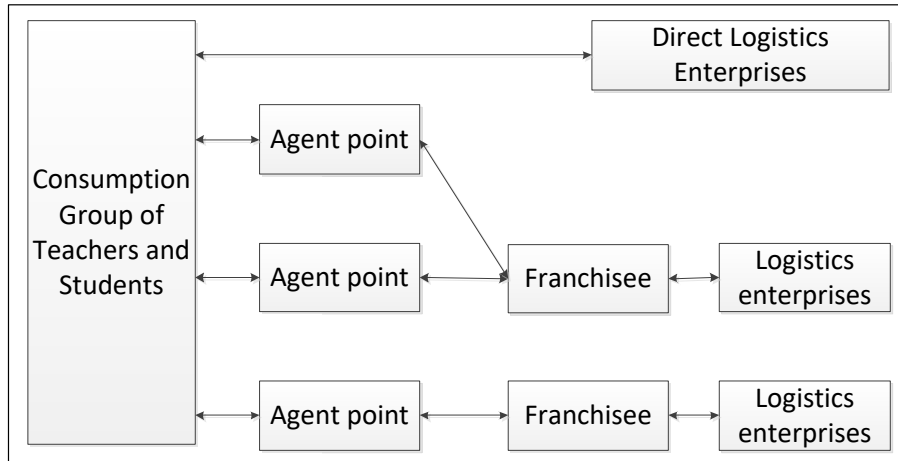


Figure 2. Enterprise-led Franchise Agent Model: Decentralized Self-access

(3) Intelligent Express Box Mode in Colleges and Universities: Automation and Self-lifting

In the past two years, the major express and e-commerce enterprises have invested a lot of money and personnel in the field of intelligent express box, and carried out extensive business practice. Intelligent express box into colleges and universities, to serve the vast number of teachers and students, is still a recent thing and mainly depends on the promotion of colleges and universities.

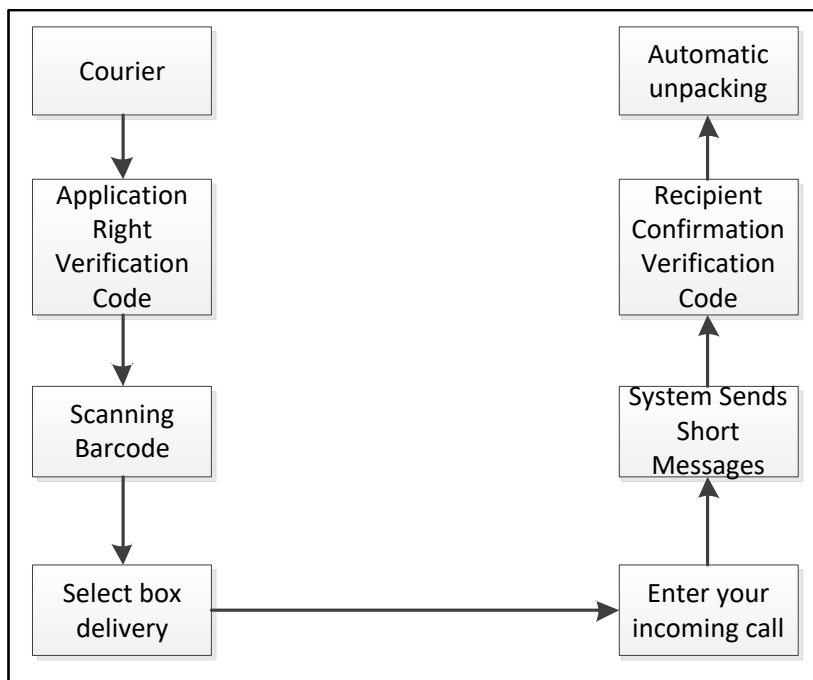


Figure 3. Intelligent Express Box Mode in Colleges and Universities: Automation and Self-lifting

(4) Logistics Data Platform Model: Infrastructure and Rules

Logistics data platform model, represented by rookie posts, positioning is the infrastructure. The rookie network is a large data logistics collaboration platform in Alibaba ecosystem. It can be called the middle layer of infrastructure for business logistics. The bottom layer is based on Alibaba cloud technology. The upper layer is all kinds of logistics partners. The rookie network provides platforms, rules, standards, technical services and infrastructure.

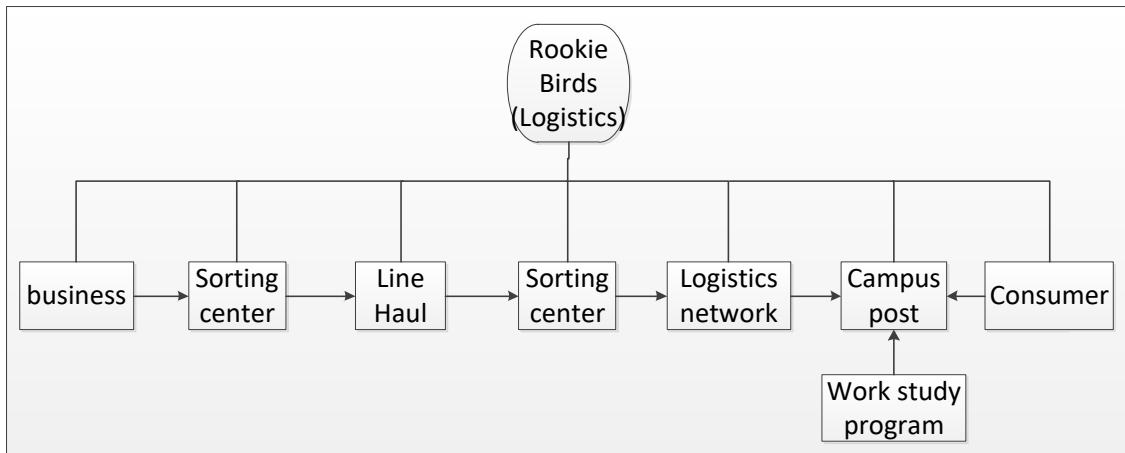


Figure 4. Logistics Data Platform Model: Infrastructure and Rules

3. Analysis on the Problems of University Logistics Distribution Mode

From the customer's point of view, the "last kilometer" distribution problem in Colleges and universities is essentially to solve the problems of convenience, timeliness, security, time flexibility and privacy faced by traditional direct distribution. In recent years, the indirect distribution model has solved the problems of convenience and time flexibility, but it cannot take into account the other issues that affect service quality and customer satisfaction [1].

(1) There are hidden dangers in package security. Most express delivery sites use open shelves, which are neither closed intelligent containers nor manned shelves. There are hidden dangers in the security of parcels;

(2) The receipt of goods is not standardized. Many courier stations or agents on campus fail to verify customer information manually, and some of them are built in universities without acceptance, signature or refusal mechanism after picking up goods from self-service containers, which makes it difficult to deal with later transaction disputes;

(3) It is difficult to provide diversified services. The advantages of indirect distribution mode are no longer mentioned, but users still hope to obtain relatively high-end campus "door-to-door" distribution services. At present, the terminal distribution operators in Colleges and universities are limited by human costs and other issues, and it is difficult to provide diversified services;

(4) Poor profitability. As most of the express delivery business in colleges and universities is still based on direct distribution, compared with the "wheat commune" to increase the service fee of the package business, customers are more inclined to send direct delivery to the courier staff at the school gate. At the same time, the college customer group does not buy much for its O2O product optimization business;

(5) Delivery time is less flexible. Because the working time of express delivery personnel is strictly limited, teachers and students can only pick up the parts within the prescribed time, so there are often one or more delivery failures, which lead to the circuitous return of parcels in the logistics process and increase the cost of express delivery enterprises [2];

4. Solutions to the "Last Kilometer" Distribution Problem on Campus

4.1 Characteristics of Distribution Environment of "Last Kilometer" of Logistics in Colleges and Universities

Because there are many kinds of problems in the development of domestic e-commerce and the situation is very different, there is no perfect solution or model to solve all the "last kilometer" distribution problems of e-commerce. When encountering specific problems, we should also make specific analysis in the light of objective environment. This paper focuses on the "last kilometer" distribution problem of e-commerce logistics under the university environment [1].

As a group of e-commerce customers in a specific environment, colleges and universities have the following particularities:

(1) Fixed customer groups. College customers are mainly students and faculty;

(2) Customer concentration. Customer groups in Colleges and universities are mainly concentrated in fixed places of study and rest;

(3) The demand for flexibility of distribution time is high. Students and teachers in Colleges and universities have relatively unstable study and class time every day. Besides lunch and dinner time, it is difficult for distribution personnel to master the delivery time of target individuals;

(4) Colleges and universities have high security requirements. Because of the particularity of the University environment, there are usually security departments in the campus, such as security departments, which have strict control over foreign personnel, so it is difficult for distribution personnel to enter the school;

(5) The scale of e-commerce transactions is large. Because of the huge number of customers in Colleges and universities and the huge daily transaction volume of e-commerce, the number of packages handled by the unit distribution personnel is larger.

4.2 The Countermeasure of the "Last Kilometer" Distribution Problem in University Logistics

Based on the present situation of campus express delivery service and the characteristics of distribution environment, this paper puts forward some optimization suggestions to break the bad service state of campus express delivery service in the past. From various perspectives, it puts forward concrete countermeasures and suggestions for exploring the innovation of campus express delivery service and the healthy and harmonious development of Campus logistics, so as to realize the "most" of campus logistics. The quality development of the latter kilometer [3].

(1) Expanding the coverage of rookie posts and intelligent express cabinets

The coverage of the rookie station and the Fengchao cabinet in the colleges and universities of large and medium-sized cities is only 52%, and the space for expansion is still quite large. The following is a Gaussian distribution to solve the problem of the number of rookie stations and Fengchao cabinets that can be built.

Known conditions: the coverage and coverage of the express delivery point (Rookie Station, Fengchao Cabinet), the population composition and distribution within the coverage area, the investment of the rookie station or the price of the express cabinet (x yuan / piece).

Model: Gaussian distribution:

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} \quad (1)$$

Model analysis: In the coverage of a certain express point, students of different grades are divided into different groups. Because different groups have different online shopping habits, they apply Gaussian function modeling respectively, and apply 3σ theorem to ensure that 99.74% or more is guaranteed. The probability makes the rookie station or the courier cabinet sufficient, and finally the amount of the rookie station or the courier cabinet used is superimposed to obtain the minimum value required [4].

(2) Improving the Service Level of Campus Express Managers

Express companies should strengthen the training of inventory management quality and customer service level of campus express managers. They can regularly train managers in professional express management, train them in the methods of express management and service attitude when communicating with students, and formulate a relatively reasonable reward and punishment system to improve customer service satisfaction [5].

(3) Increase campus express delivery collection agency point, optimize the layout of express delivery point

Optimize the distribution of express agent points, so that students living in different areas can be as satisfied as possible, for example, when going to the teaching building to take courier. The

address of students' express delivery can be more detailed, and the express delivery can be delivered to the agent point closer to the students, thus saving the time of distribution. In order to avoid the congestion caused by the peak of student pick-up, the administrator of express delivery agent can stagger pick-up peak in different time periods when sending short messages to inform students to pick up express delivery [5].

(4) Further Improve Distribution Efficiency

In modern society, the requirement for speed is getting higher and higher. In fact, express companies have made great efforts to improve the speed. These years, there have been tremendous changes, but they still cannot meet the growing needs of customers. The survey results show that the respondents have the highest demand for the speed of distribution, especially for college students aged 18-22. Applying new technology and improving distribution efficiency can effectively solve the efficiency problem of "last kilometer". The Internet +, artificial intelligence and intelligent logistics system are truly implemented. After the development and testing of UAV and UAV, they are gradually put into use and participate in the links of logistics. With the help of modern science and technology, the efficiency of logistics distribution can be broken through again, and minute distribution can be realized [4].

5. Conclusion

In recent years, the rapid development of online shopping, however, due to the late start of the logistics industry in China, the logistics distribution of online shopping commodities has been unable to meet the requirements of the development of e-commerce, especially the "last kilometer" distribution, has become a bottleneck for the better and faster development of e-commerce in China. The data show that the "last kilometer" distribution has the lowest efficiency and the highest distribution cost in the whole process of logistics activities. In addition, in the traditional distribution mode, the failure of express delivery and secondary distribution caused by various reasons make the above problems more prominent [6]. In order to solve these difficulties, this paper puts forward the corresponding solutions: expanding the coverage of rookie posts and intelligent express cabinets; improving the service level of campus express management personnel; increasing campus express collection agent points, optimizing the layout of express delivery points; and further improving the distribution efficiency.

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