

Application Research of Intelligent Express Cabinet in Express Delivery of University Campus

Yalin Jiang ^{a,*}, Jing Zhao ^b

School of Business, Henan University, China

^ajiangyalin09@126.com, ^bzhaozhaoziki@outlook.com

Abstract

With the growing prosperity of e-commerce in China, online shopping has become an important shopping method for most consumers. This consumer group of university students has become the main force of online shopping, which has brought a severe test to the “last mile” distribution of university campus express delivery. Campus express delivery came into being, and it also put forward higher requirements for the efficiency and service quality of campus express delivery. Based on the analysis of the current situation of university express delivery development, this paper further analyzes the advantages and application prospects of intelligent express delivery cabinets in university express delivery, and puts forward relevant suggestions for improvement, and is committed to solving the problem of campus distribution efficiency and quality for the campus. Teachers and students provide better living services.

Keywords

Campus express, Delivery, Intelligent express cabinet.

1. Introduction

With the acceleration of the informatization process, the continuous optimization of the network environment, the rapid development of Internet technologies, and the continuous popularization of electronic products, e-commerce emerged as the times require. In recent years, the government has introduced a number of policies and regulations, which have promoted the development of e-commerce to some extent. With the rapid development of the global economy, especially e-commerce, express delivery service has become more and more popular as an advanced and fast transportation service method, and has been booming. The express delivery industry is an important part of modern logistics and has become one of the fastest growing industries in China in recent years. China's express logistics industry is still in the stage of development and improvement, with broad development prospects, and the future is bright and full of challenges. College students are the main users of express delivery. Therefore, studying the development of campus express delivery is conducive to improving the service ability and quality of express delivery industry, optimizing the delivery network and distribution mode.

2. The current situation of university campus express delivery

According to the statistics of the logistics center, among the online shopping people in China, the number of college students aged 18-23 is 42.7%, and the consumer group of college students has become the main force of online shopping. However, due to the online shopping, the “last mile” delivery of university campus express delivery is facing a severe test. The distribution cost of the “last mile” of express delivery accounted for more than 37.4% of the overall cost, and this proportion continues to increase. For colleges and universities, the “last mile” distribution is even more difficult. First of all, the campus area of colleges and universities is generally large, and the “last mile” distribution link is difficult to operate. Secondly, most colleges and universities have closed management to control the entry and exit of vehicles or personnel into and out of the campus, making the delivery of couriers more difficult.

The volume of campus express business continues to grow and has shown an explosive trend. In the process of "the last kilometer" delivery, the following characteristics have appeared in campus express delivery in China: First, there are differences. The development level of campus express is also different because of the great disparity of economic development level in different regions of China and the slightly different demand of teachers and students in different regions of the country for express delivery. Under the influence of local management concept, ideology, consumption habits and humanistic environment, campus express in China has formed a diversified development model; the second is non-equilibrium: in terms of time, dispatch package, etc., campus Express has a very obvious non-equilibrium. In the beginning and graduation seasons, college teachers and students will buy a large number of daily necessities and other items; during the winter and summer vacations, most students leave school, and the number of express delivery declines significantly. The fluctuation of express delivery volume is closely related to the population agglomeration effect of teachers and students in Colleges and universities. Generally, the main reason for students and courier delivery is online shopping. Therefore, the campus courier service tends to have more dispatches and fewer receipts, and the imbalance is particularly prominent. The third is decentralization: as a campus express operator, we must ensure the optimal service process to meet the different needs of different groups of people. In fact, the campus express business seems to be relatively centralized, in fact, the needs of the crowd are different, coupled with the campus express business can not basically form a unified scale, so specific to different groups of teachers and students, will lead to different situations. The decentralization of campus express delivery results in different characteristics of centralized collection and sorting and delivery mechanism.

3. Problems in the campus express delivery

3.1 The service quality of campus express delivery is on the low side

The low quality of campus express service is mainly reflected in the following three aspects: First, campus express delivery fails to meet the "door-to-door" demand of consumers, which does not reflect the excellent service of express delivery, and reduces the recognition of teachers and students in the industry of express delivery. On the other hand, some courier couriers did not wear uniform uniforms when they delivered, and their service awareness was relatively weak. Sometimes, the phenomenon of courier parcels being randomly placed or even thrown was reduced, which lowered the quality and consumption of courier services. In the end, the service attitude of the service personnel at the collection point is poor, especially during the peak period of the "Double Eleven" and "Double Twelve" carnival express delivery, the courier will be returned if it is not taken away for a long time.

3.2 Technical issues of services

In order to cater to the development of the information age, it is more convenient for consumers. Many modern express delivery companies have begun to use the Internet to establish a more modern management information system. At each stage, the express tracking is also carried out in a timely manner. Customers can query the Internet according to the express delivery number. The location of the shipment. However, this also exposes the defects of the information management of the terminal express delivery point, and the information management cannot be standardized and timely. University teachers and students have often been on the Internet to find out that the shipment has arrived at the school, but they can't wait for the notification of the pickup to make it impossible to pick up the item. At present, the management of campus express delivery mostly uses traditional hardware facilities, adopting manual management, and the level of intelligence is low, which affects the efficiency of express delivery.

3.3 Higher cost of campus express delivery

The "ground distribution" mode will reduce the success rate of one-time delivery, and the courier will have to perform secondary distribution, which inevitably increases the cost of delivery. In addition, the pick-up party is limited by time in the process of picking up the pieces, and can only pick up the

pieces at a specific time, which brings certain inconvenience to the pick-up side and increases the time cost of pick-up. The normal operation of rookie stations and collection points requires a certain number of staff, and this business model will increase labor costs. Most of the work on the campus "Rookie Station" is completed by students in the school. The students are almost all part-time workers. The mobility is large and the professionalism is not strong. To a certain extent, the management cost of the rookie station is increased.

4. Application of intelligent express cabinet in university campus

4.1 Intelligent courier operating mode

The intelligent express cabinet is a new thing that constantly develops with the express delivery industry. The intelligent express cabinet is a device based on the Internet of Things, which can identify, temporarily store, monitor and manage the express mail. It can form a smart express delivery box system together with the PC server. The intelligent express cabinet temporarily saves the express mail in the delivery box, and sends the delivery information to the user via SMS, etc., to provide the user with a 24-hour self-service pickup service.

The intelligent express cabinet company and the school have established a good cooperative relationship. At the same time, for the convenience of students, the construction site selection, cooperation with major express companies, the courier into the express cabinet, and the school's teachers and students' express delivery service. The courier of the courier company that cooperates with the courier will deliver the courier to the school every day and put it into the courier. When the courier is placed in the cabinet, the system will automatically send a message to inform the user to pick up the item. The teachers and students can choose the courier company to carry out the express delivery.

The intelligent express cabinet is composed of cabinets (the cabinets are divided into three types: large, medium and small, which can meet the delivery requirements of most express delivery), 24-hour self-service pickup operation screen, no dead angle HD surveillance camera and internal CPU control system. Fig. 1 is the specific operation flow chart of the campus intelligent express cabinet. The recipient enters the pickup password through the intelligent voice prompt on the display, and can go to collect the express delivery by himself. The delivery express will no longer be subject to the delivery time limit. The last mile problem provides an effective solution; it also properly diverts the people who receive the courier, so the number of people who pick up too many people and the congestion at the express delivery point can be effectively reduced.

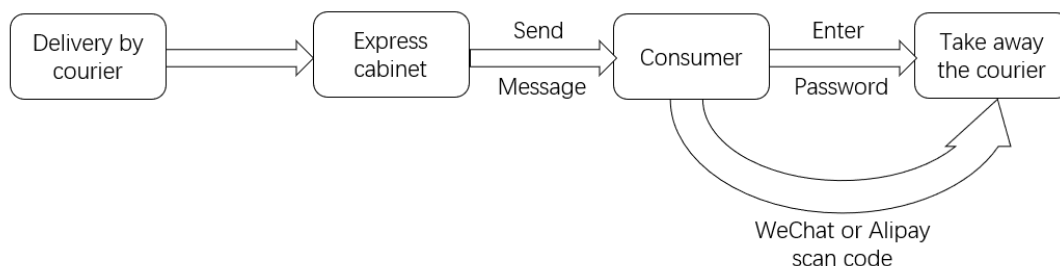


Fig. 1 Campus Express Cabinet Operation Flow Chart

4.2 Advantages of intelligent express cabinets

In the development trend of China's express parcels continues to grow and the scale is huge, the intelligent express cabinets are more and more favored by the market. At present, there are dozens of intelligent express cabinet companies in the country, China Post Express, Fengchao, Yungui and other mainstream express. The cabinet enterprises have developed rapidly, and compared with the traditional distribution mode, the intelligent express cabinets have shown more and more obvious advantages.

Costs and improve distribution efficiency

The end delivery method of express delivery is the on-site service mode. The problem of the last mile of the campus is mainly reflected in the contradiction between the time and place of the sender and the picker. The smart courier cabinet not only avoids the phenomenon of people in the process of sending parts, but also saves extra time and space during the campus delivery process because of its reasonable fixed location and its flexible and random pick-up time. Labor costs, the full use of technology, not only greatly reduced the cost of hiring labor, but also effectively break the time and place restrictions on user pickup.

Convenient user life and promote intelligent development

The intelligent express cabinet integrates the resources of the major express delivery companies, which exist in the community, colleges and office buildings, and concentrates the express delivery to one place. It can realize the pickup service of the whole 24 hours a day. Users can make their own time according to their own time. It is more convenient, safe and fast to collect your own items at any time. In view of the increase in the current express delivery volume, the traffic pressure is increased, and the existence of the intelligent express delivery cabinet can facilitate the user's life to a certain extent and alleviate the urban traffic pressure. The intelligent express cabinet itself is a sign of the development of intelligent economy, which reflects the development of "Internet +" and can promote the linkage and integration development with the communication industry and related service industries.

Protect customer privacy and security

Traditionally, the delivery address of the shipment is the customer's home address, which can easily lead to privacy leaks. When using the smart courier cabinet, customers can write the address of the delivery as the address of the smart courier cabinet, thus protecting customer privacy. In terms of safety factor, the express cabinet can effectively protect all aspects of safety, as follows: the security of the pickup, the background of the express cabinet system using the mobile phone QR code, password, mobile phone number, ID card, etc. for identity authentication; data transmission security, through Customized protocol, network security software, data encryption transmission implementation; shipment returned safely, unattended for a long time, the courier needs to re-submit the second verification of the parcel to retrieve the return; the parcel box is safe, design infrared detection items and Door detection, backup power, abnormal alarms, etc. ensure the site is safe; the items are safe, and there is a 24-hour monitoring system to ensure the safety of the parts and equipment.

5. Suggestions for further development of intelligent express cabinets in colleges and universities

5.1 Functional diversity

Both the campus and the students are originally a group place that is good at accepting new things and updating at a very fast speed. In order for smart express cabinets to successfully open this vast market, they must constantly meet their needs. Deriving other value-added functions in the most basic storage express function, such as the interface that can consider and reserve a variety of services, cooperate with the nearby businesses to carry out advertising, mobile phone recharge, purchase train tickets and other value-added functions, thus The intelligent express cabinet creates a multi-service platform, which can reduce the operating cost of the intelligent express cabinet, and can also cooperate with other businesses to promote the development of the smart express cabinet on the campus.

5.2 Innovative operation mode

Innovate the operation mode of intelligent express cabinets according to the differences and characteristics of each region. For example, in some areas, there is plenty of light, so consider using solar energy to operate smart courier cabinets. Install a solar chasing module on the top of the cabinet to realize a simple tracking of solar energy. Considering the short board of solar tracking by the rain day chasing module, the design can use the east-west, north-south 180-degree rotating column

structure to receive the sun's heat in all directions. It is converted into electricity to power the smart express cabinet. At night, the intelligent express cabinet automatically connects to the power supply to ensure its normal operation. The next day, the solar power is automatically turned off after receiving the solar energy, thus achieving the effect of saving electricity and environmental protection.

5.3 Enrichment of the cabinet

Breaking the traditional cabinet specifications, innovative use of multi-faceted cabinets, such as octahedrons, hexahedrons, etc., externally set up multiple operating screens and outlets. Using a storage method similar to the "stereo parking garage", the internal storage space precisely matches the size of each courier. The minimum distance that a single storage unit can be adjusted up and down is 2 cm, and the storage position matches the height of the courier. The cabinet will automatically recognize the current idle storage status and organize it in time to ensure efficient operation and save time after entering the cabinet. The new multi-faceted cabinet that extends the space upwards solves the problem that the current courier cabinet is not enough, and the core problem of small reserves can accommodate more than one hundred packages.

6. Conclusion

Campus express delivery came into being, and it also put forward higher requirements for the efficiency and service quality of campus express delivery. "Internet +" express is the future development direction of the express industry, and establishes an "Internet + efficient logistics" operation system that is networked, intelligent, service-oriented and collaborative. This is also an important means for the express industry to achieve industrial optimization and upgrade. The function of sharing intelligent express cabinets to access express delivery makes the contradiction between people and space and time in the logistics system optimized, and it solves the last mile problem of campus logistics terminals. Therefore, it is necessary to further apply and promote the intelligent express cabinet in colleges and universities, and better integrate and optimize the end resources of college campus express delivery.

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