

Research on Existing Problems and Solutions on Last Mile Logistics Under the Context of Rural Revitalization in China

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Abstract: Under the guidance of the “Internet Plus” policy, China’s logistics industry has experienced high-speed growth in recent years. However, due to the exposure of existing problems, consumers and operators are faced with new challenges, focusing on high distribution costs, slow logistics, high complaint rates, fewer rural distribution points, and so on. In particular, solving the last-mile problem in the new era for various objectives such as implementing the rural revitalization strategy, enhancing people’s satisfaction and happiness, and achieving common prosperity are urgent challenges that we must address now. Based on the analysis of the current situation in China’s logistics industry and by referencing express distribution modes in foreign countries, this paper analyzes the bottleneck problems that challenge last-mile delivery. It proposes targeted solutions from five perspectives: effective planning and tracking software, development of the delivery system, agile logistics status updating, promotion of technological innovation, and enhancement of the overall ability and efficiency of local logistics services.

Key words: traffic engineering; rural revitalization; last-mile logistics; problems and bottlenecks; solutions

1 Introduction

The connotation of last mile delivery refers to the direct delivery of goods purchased by users via the e-commerce platform to users in the e-commerce environment, enabling the door-to-door logistics distribution service in the whole process. The last mile is not the so-called one mile from the view of geographical location, but the last link of the distribution center, that is, delivering goods from distribution center to consumers^[1]. As a matter of fact, it represents the very end of logistics. This is the key link that dominates service quality and effect of the whole logistics distribution^[2], which will also be regarded as a key indicator to measure users’ satisfaction with their service.

At present, logistics industry has become a mainstream industry in the economic development of China. With the rapid rise and expansion of e-commerce, a greater space is created for the development of logistics industry. A number of logistics operating companies have formed their own logistics distribution system with complete distribution service, so it is the common practice of overnight delivery or same-day delivery. However, for

enterprises, logistics management is a key issue of great concern. Currently, both suppliers and buyers are desired to deliver goods purchased from e-commerce platform to their consumers promptly. In this regard, huge demands and challenges are posed for the logistics enterprises in the last mile delivery^[3].

For the logistics enterprise with the intention of standing long in the market and industry, they must try everything possible to meet the needs of suppliers and consumers. According to statistics, 55% of consumers and suppliers will put the logistics companies with strong distribution service ability as priority. However, high cost brings in great difficulties in the management of the whole supply, resulting in tough process in achieving fast delivery^[4]. Besides, the last-mile delivery directly matters the customer’s satisfaction with the entire product consumption. Therefore, though some costs may be generated, enterprise’s investment in this aspect will bound to have a positive effect on its further development.

2 Significance of last mile delivery

In 2021, under the leadership of the State Council,

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competent authorities in the industry jointly launched a series of suggestions and regulations on the construction of delivery logistics system in rural areas^[5], and stated that the delivery efficiency of the rural delivery logistics system can not only offer channels for the development strategy of delivering products into rural areas, but also enable the rural residents to feel the progress of The Times. Most important of all, it matches with the development slogan of rural revitalization. The people-centered principle should be followed at all times to implement the planning and construction level by level in counties and villages, effectively remove the shortcomings of rural logistics delivery, further improve the level of rural logistics, offer new employment opportunities for more farmers, and help to increase the people's living income and enhance their happiness index. From the people-oriented view, great efforts are made to continuously strengthen the delivery capacity of rural logistics, develop products with the rural characteristics, and effectively promote the development by taking high-quality goods into urban area, actively deal with problems on the lastmile and promote further expansion and upgrading of rural consumption^[6–7].

In 2022, the government departments also conducted analysis on the current situation of rural logistics delivery and proposed relevant requirements on improving and strengthening the commercial economic system of each county, for the purpose of popularizing the e-commerce development in rural areas. In terms of rural logistics, “the lastmile”, “express into villages”, “cost reduction by express sharing”, etc. have become the hot topics of people's concern^[8].

According to the statistics, the logistics coverage rate in China's townships remained at 96.6 percent by the end of December 2019, and in the following year, thanks to the implementation of the “rural outlets” plan launched by China Post; “express delivery to rural areas” became popularized. These changes not only suggest that logistics services have penetrated into rural areas, but also indicate that the rural express delivery is becoming more convenient.

In the process of serving the rural revitalization strategy, promoting rural revitalization by “express into villages” is playing an increasingly important role. For

specific, it not only activates the development potential of rural industry, but also provides rural local products with the access of express logistics, which is conducive to increasing farmers' income. Under the background of implementing the “Express delivery to every village” strategy, if the logistics operators could minimize the logistics cost while strengthening the logistics effect, it will be possible to combine the Post Express and agricultural sector in all rounds, and drive the prosperity of local economy, improve the income and expenditure level of farmers, making the slogan of rural revitalization heard everywhere.

A logistics company will secure better consumption experience for customers and gain customers' high satisfaction with their logistics services as long as it successfully delivers the “lastmile” service in the whole logistics delivery. Therefore, these data are deemed as vital for improving the competition and further development of enterprises. As the last mile service involves a direct contact with consumers, customer's satisfaction can be affected by the image and value culture reflected in the service, so how to manage and design the lastmile delivery is very crucial, which not only matters the success of an enterprise, but also refreshes the shopping experience of customers^[9].

In conclusion, this paper provides a summary of bottlenecks and existing problems on the last mile of China's rural logistics, and puts forwards targeted solutions based on China's national conditions while learning from the successful practices and experience of typical countries. In the process of rural revitalization, it has important theoretical and practical significance to solve the lastmile difficulties in rural logistics, improve the people's happiness and satisfaction, and ultimately achieve prosperity for all.

3 Bottlenecks restricting last mile delivery

3.1 High cost of logistics companies

According to statistics, the cost of the lastmile service accounts for 53% of the total in the whole logistics and distribution service to consumers, so this is deemed as a strict challenge for logistics companies. In addition, more and more customers are seeking for faster delivery of products, thus great challenges are posed for the logis-

tics companies in terms of financial expenditure. To respond, enterprises must optimize and upgrade their cost and distribution mechanism to better meet the user's needs and solve some personalized problems. By doing so, they can get considerable profits and improve the user satisfaction^[10].

3.2 Concerns caused by delivery delay

Various factors are involved in the delivery of goods, such as traffic or goods supply, but regardless of the reason, it will definitely lead to increased complaint rate and dissatisfaction rate of consumers for the service. At present, more and more customers are seeking for faster delivery of products, but due to late delivery of goods, many customers have filed complaint about it, even resulting in loss of large-scale customers. With the rising of these problems, the corporate image is seriously impaired, and the enterprise's business is adversely affected to some extent. From the customer's point of view, whatever the reason for late delivery of goods, the blame should be laid on the express companies for its management ability, so these are what the enterprises have to face.

3.3 Lack of verification of logistics information

Frequent problems on the last mile may also be resulted from improper operations by the customers. For instance, the goods are delivered to another place as the users provide wrong and invalid address information to the express company. In this case, return or rejection of goods will be resulted.

The customer has resumed the delivery of 30% of all offline orders. The above problems may bring significant setback to logistics distribution, because the company cannot predict these factors in advance, and also has inability to make them under control. Further, false information submitted by a large number of customers may also give rise to rejection of goods. All these problems will weaken the service efficiency on the last mile, and bring more dissatisfaction and complaints from consumers at the same time^[11].

3.4 Challenges for same-day delivery

High costs and inadequate distribution plans are the biggest obstacle in solving the problem on the last mile, which make it difficult for logistics companies to secure timely delivery of goods. In this regard, logistics enter-

prises may select to develop different delivery schemes and plan different delivery routes to greatly strengthen their efficiency in the last mile delivery, thus achieving accurate delivery of products as possible.

The services such as in-store pickup, same-day delivery are developed to respond to the differentiated needs of consumers. Actually, there are some consumers who have enough time to wait for the delivery of goods, so it is unlikely for them to spend higher cost for fast delivery of goods, but comparatively speaking, most consumers think it acceptable to gain quick delivery of their goods at higher cost.

3.5 Relative lagging of logistics system construction

Thanks to smooth road network and low logistics, the work to establish and improve the logistics system becomes easier than before. However, in some remote areas of China, there are still many places with long distance, featuring long delivery journey and relatively weak infrastructures, especially the lack of terminal cold chain logistics delivery, so it is not an easy thing to make breakthrough in delivery logistics. In recent years, though the local governments have attached great importance to the construction of the basic delivery and logistics system, for example, developing three-dimensional transportation networks, the end service efficiency is still far to meet the expectations. Therefore, planning and construction of the basic supporting system needs to be strengthened.

4 Foreign references for solving the problems on last mile delivery

It is a common sense that the "lastmile" delivery is tough. Referring to the practices of typical countries, every country adopts the express delivery mode that is related to its traffic characteristics. Among the things, the new delivery modes such as UAV, crowdsourcing or bicycle delivery are more favored by users.

4.1 UAV delivery

Amazon launched its Prime Air drones, which are able to deliver the package to the place designated by the Amazon customers in half an hour. Google's Project Wing is the same case.

Making delivery in 30 minutes requires a drone able to fly 15 miles. Actually, the designated places of cus-

tomers are not always within this distance, though this is not the key problem. Once the commercial permit of using drones from the Federal Aviation Administration (FAA) is obtained, things will work out fine.

4.2 Crowdsourcing

Nowadays, crowdsourcing logistics has become a mainstream mode in international logistics. Amazon, for example, solves the local employment problem while standing firm against its cost control objective when using this mode to develop its delivery^[12].

Uber's new delivery service, UberRUSH, is an on-demand ride service where deliveryman picks up and delivers package for users by bicycle, which is an ideal choice for local residents to deliver small items. Besides, Uber also rolled out UberEats, its stand-alone food delivery app, which is available in 10 US cities.

4.3 DHL—bicycle for delivery

In foreign countries, the express delivery enterprises also place emphasis on the environmental impact and service quality, rather than pursuing for "fast" only. German shipping company, DHL has developed a new type of vehicle to deliver goods, that is, a bicycle without an engine, which can effectively reduce emissions of carbon pollutants and save energy. The vehicle is now available in the Netherlands. For such kind of cargo bike, the superior advantage is configured with no engine, which contributes to effective reduction of emissions of carbon pollutants and also saves energy.

Solutions

5.1 Effective planning and tracking software

In order to live up the service goal of fast delivery at low cost, relevant software may be used to track the delivery process. Assisted by the tracking software, the logistics operators are enabled to choose the optimal plan and route, and cancel some routes of insignificance or low efficiency. By doing so, they will save operation cost and also improve the effectiveness of the entire delivery service^[13].

Consumers are encouraged to inquire the delivery progress of goods, including the expected delivery time of goods, the current location or status of goods, so that they can collect more information about delivery and make more rational arrangement for waiting. Thus, con-

sumers' satisfaction with logistics services will be enhanced.

In delivery logistics, the core indicators are mainly used for cost control and efficiency enhancement, while they also work well in improving the conventional working efficiency and increasing the turnover of goods. The logistics tracking system provides strong data support for technical personnel in terms of information collection and program development, which is the key to strengthen the value of information management system.

5.2 Delivery system development

To develop and apply the delivery system is crucial for solving the problem on the last mile. The engagement of this system not only makes seamless connection of distribution links possible, but also enables enterprises to realize accurate processing of orders. Apart from that, enterprises also need to improve and adjust their communication system constantly to secure timely sharing and information circulation of all links, so that the problems on goods distribution can be timely fed back and handled.

Benefited from effective cooperation and communication in all links, unnecessary delivery problems can be avoided to the largest extent. Therefore, enterprises are required to center on these two points to make improvements. What's more, the system allows consumers to track the delivery status of their orders and presents them with facts, keeping them in a more rational state.

5.3 Prompt logistics status update

As the best way to solve the difficulty in verifying the logistics information, customers are timely informed of the distribution status of goods by prompt alarming and notification during the goods delivery, so that unnecessary complaints and the customer's need of query will be avoided. Further, some goods need to be signed by the consignee. In this case, if timely prompt of logistics information is available, the consignee may have chance to arrange his/her time in a more rational way, thereby improving the efficiency of goods distribution.

Currently, in terms of the logistics process, only about 4% of enterprises have made plan and put it into practice, about 37% are in the process of planning and construction, and there are also 44% under planning.

5.4 Technological innovation

Logistics operators can introduce modern manage-

ment tools to innovateservices such as same-day delivery or daily delivery, making a leapfrog progress in solving the problem on the last mile. However, this requires the enterprise to develop a complete order delivery system and management process, and the performance and stability of the whole process must be guaranteed. Though the problem on the last mile delivery still exists, enterprises are bound to solve it effectively under the track of technological innovation.

When improving the ordering scheme and distribution system, it is necessary to combine the customer demands and make targeted planning based on the specific sales volume, attempting to realize accurate distribution and accurate preservation. The implementation of such system will allow delivery of various products as expected in different time periods. For example, the effective delivery of goods is accessible in the peak sales period or when the goods have freshness requirements. In this regard, it is important for logistics enterprises to develop the corresponding connection mechanism with suppliers to ensure timely delivery of goods^[14].

5.5 Improvement of overall ability and efficiency in the delivery and logistics service at the grassroots level

The logistics enterprises should always tackle the blocking points of the current policies one by one according to the requirements and direction of the government and the industry from the perspective of market demands^[4]. A complete range of entities should be encouraged to reform their operation modes, and make more efforts in construction and planning of grass-roots facilities. They should continue to improve the internal management system, make reasonable allocation of various resources; and allocate the existing resources to remote areas as necessary in order to improve the layout of the last mile delivery network towards wider coverage, for example, constructing the cold chain distribution system. Also, the express delivery enterprises are encouraged to make cooperation in constructing the cold chain warehousing and distribution facilities and in the purchasing the supporting cold chain transport vehicles. Hence, they will be able to provide high-quality, differentiated cold chain delivery services, and gradually build a cold chain delivery logistics system. Finally, engagement in market development should always follow the principle of resource sharing.

All express delivery enterprises are encouraged to work together for win-win results, further improving the grass-roots delivery logistics level^[15].

6 Conclusions

This study summarizes the key problems on the last mile restricting the rural logistics in China, and by learning from the foreign experience puts forward the solutions from five aspects of effective planning and tracking software, delivery system development, prompt logistics status update, technological innovation and improvement of overall ability and efficiency in delivery service at the grassroots level, providing important theoretical and practical values. However, it may take some time to solve the problems on the last mile delivery of rural logistics as it has been there for long. With the application of new technologies and new tools, such problems will be gradually solved and improved by the logistics enterprises in the future. The enterprises can optimize their internal logistics management process by virtue of the modern logistics information management system and automation tools to enhance the overall management, which is of great importance for solving the problem on last mile^[16].

Establishing the rural express logistics system as an important link between rural and urban areas, will effectively promote the new type of urban-rural relationship of complementary and coordinated development, and accelerate the implementation of “promoting common prosperity” strategy. How to boost the “last mile” of rural logistics and fulfill the ultimate goal of poverty alleviation & prosperity and rural revitalization, not only requires the government departments at all levels to make policies tailored to specific local conditions, scientific layout and overall planning, but also requires logistics enterprises at all levels to give effective cooperation, full coverage and strengthen the coverage of rural logistics network. Securing the “last mile” of rural logistics will allow people to enjoy the convenience brought by Internet shopping, promote the “last mile” of agricultural products sales, increase people’s income and greatly improve their happiness in enjoying a better life.

Declaration of competing interest

The authors have no competing interests to declare

that are relevant to the content of this article.

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