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The Design of A New Operation Mode for Urban Freight Logistics

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Abstract: Due to inefficient management, there is a serious waste of logistics resources in urban freight logistics, so it is essential to improve the operation efficiency and profit of urban freight logistics by using innovative management. At the same time, the extensive application of e-commerce provides conditions for the realization of this demand. And the rapid development of e-commerce also requires intimate docking between e-commerce and modern logistics. Accordingly, this paper integrates the needs of urban freight through e-commerce platform, and achieves real-time information exchange between the e-commerce platform and vehicles, as well as visualization supervision of the vehicles by using mobile e-commerce. Besides, it simplifies the payment procedure of urban freight logistics through
the design of the Logistics Alipay. Therefore, this paper designs a new operation mode for urban freight logistics and enables the urban freight logistics to be more efficient.

Keywords: urban freight logistics, e-commerce, Logistics Alipay

1. INTRODUCTION

At present, there are many problems in urban freight logistics, such as too much no-load stroke of the vehicles, parking chaos of the vehicles, etc. But in the new century, the development and wide application of e-commerce make it possible for re-shipping transaction process and the payment procedures, which will provide conditions for a completely new operation mode of urban freight.

2. URBAN FREIGHT LOGISTICS IS IN GREAT NEED FOR SCIENTIFIC AND EFFECTIVE ORGANIZATION AND MANAGEMENT

The driving process of vehicles can be divided into load stroke and no-load stroke according to their load conditions. The ratio of load stroke and no-load stroke is utilization of the vehicles, which is one of the most important factors that influence the efficiency of vehicles. Obviously, the more no-load stroke of the vehicles there is, the lower the utilization will be. In urban freight logistics, because the delivery place of the previous task may be far from the carriage place of the next task, the vehicle has to carry on long no-load stroke. Therefore, much time and lots of resources are wasted in the no-load stroke which can’t make profits.

As a matter of fact, the utilization of logistics resources in China is low for a long time.
And one of the most typical performances is just high rate of no-load stroke. A survey shows that, the no-load stroke rate of Chinese logistics vehicles is 37%; for some specialized vehicles that transport special cargo, such as vehicles which carry cars, their no-load stroke rate is as high as 39%. The table below shows the result of a survey about no-load stroke rate.

Table 1. The survey about no-load stroke rate

<table>
<thead>
<tr>
<th>No-load stroke rate of vehicles</th>
<th>Below 30%</th>
<th>30%—50%</th>
<th>Above 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production enterprises</td>
<td>34.2%</td>
<td>57.9%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Business enterprises</td>
<td>14.3%</td>
<td>78.6%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Logistics enterprises</td>
<td>31%</td>
<td>51.7%</td>
<td>17.2%</td>
</tr>
</tbody>
</table>

Data source: China communications and Transportation Association

The no-load stroke of vehicles is entirely expendable process, so it increases the average logistics cost. As a result, the transportation companies have to carry on overload transportation to make profits and this brings about great hidden danger of accidents. At the same time, some vehicles are parked in chaos, because when they finish their transportation tasks, they can’t make sure where to take the next tasks. This causes that many roads in the city are occupied by the parking vehicles and the road congestion problems are more serious.

Therefore, in the process of transportation, it’s essential to use modern information technology to achieve scientific organizations, dynamic scheduling and orderly management. Only by this way, can we reduce the no-load stroke of vehicles and release the traffic burden caused by unordered parking of vehicles. What’s more, when the oil prices are going up, it is of more great importance for us to manage the urban freight logistics scientifically and effectively.
3. THE FURTHER DEVELOPMENT OF E-COMMERCE REQUIRES SEAMLESS DOCKING WITH MODERN LOGISTICS

Modern logistics is an important part of e-commerce operation process and the fundamental guarantee for realizing the value of information flow, business flow and capital flow. In e-commerce, with the help of the Internet, the seller can find demand, that is, the customers’ purchase desire. But the business trade on Internet is after all virtue economic process, and the final allocation of resources must be realized through the transfer of goods. Only by distribution, can the goods and services be transferred to the consumers and can the business process be ended.

In recent years, particularly since the financial crisis, with the in-depth development of e-commerce, e-commerce put forward lots of innovation demand to logistics companies. The demand is prominently manifested in requiring seamless docking between e-commerce and logistics. For example, as China's largest C2C trading platform, the current daily turnover of Taobao has got 500 million yuan and the turnover in 2009 is expected to reach more than 200 billion yuan. This not only provides tremendous opportunities for modern logistics, but also puts forward practical requirements of developing seamless docking between e-commerce and logistics. Because online trading must be combined effectively with the actual delivery of goods, payment and logistics services, then the online trade intention can be transformed into real trade activities. Otherwise, without the support of logistics, it’s probable that the e-commerce will become foam of economics.
The figure above shows the sales of Taobao in 2007-2009, from the figure, it’s easy to find that the sales growth rate of Taobao is more than 100% every year. The rapid development of e-commerce, not only requires close docking between e-commerce and logistics, but also puts forwards innovative service requirements such as the "Next Morning-tat" and "Time-limited logistics". These have become a major driving force for promoting the integration of e-commerce and logistics extension services.

Under such circumstances, the seamless connection of e-commerce website and logistics platform will be able to promote the development of e-commerce and logistics, and effectively coordinate and allocate the logistics resources in a certain time and space, which will alleviates the urban traffic congestion.

4. THE DESIGN OF A NEW OPERATION MODE

4.1 The Integration and distribution of the transportation demand

In urban freight logistics, because the information of vehicle resources is separated from the information of goods, the consignor can’t communicate effectively with the drivers,
which leads to too much no-load stroke and a serious waste of social resources. At the same
time, since the transportation demand and the vehicle resources are instable and decentralized,
we can’t integrate and rationally allocates them. In this case, if we can integrate
transportation demand and the vehicle resources through e-commerce, it’s sure that we will
create enormous economic and social benefits.

To achieve the above idea, we need an e-commerce platform for the integration and
distribution of the demand and the platform should be set up and managed by a Network
Company, which has powerful information systems and communication network.
Transportation vehicles can become partners with the Network Company by registering on
the company’s web. If the customers are in demand of transportation, they can register
through the Internet and make orders. Then the Network Company integrate the demand
instantly through their information systems and distribute the tasks to the vehicles
immediately (see Figure 2).

![Diagram](image.png)

**Figure 2.** The integration and distribution of the transportation demand

### 4.2 The application of mobile e-commerce technology

Because the position of a vehicle is constantly changing, as an platform for information
collection, processing and transmission, the Network Company have to carry on real-time
information exchange with the vehicles in order to achieve effective scheduling of the vehicles. The rapid development of mobile Internet, mobile positioning technology, mobile middleware, mobile positioning and mobile terminal bundling technology, provided possibilities for the mobile positioning of logistics vehicles, effective transmission of instructions, and dynamic scheduling of the vehicles. Therefore, the GPS、GIS systems on vehicles, and mobile phones can be bundled together, so that real-time position information and status information of vehicles can be transmitted via the wireless communication network to the e-commerce platform.

The Network Company can send messages about task distribution to the truck drivers through the network, then truck drivers can use GPS navigation to reach the palaces for collecting goods as soon as possible. By this way, the key technology foundation of a new operation mode for urban freight logistics was laid.

Since the new e-commerce platform has integrated network technology and mobile technology, it can reduce the waiting time of the vehicles as well as the consignees to a minimum and the no-load stroke of vehicles to the least, with dynamic scheduling ability of vehicles.

4.3 The supervision of vehicles

Due to the variability of the logistics operating environment, the logistics cost is always changing, which makes it necessary to carry on timely communication with customers when
the cost of logistics changes. In the new operation mode, the driver's transportation tasks come from the Network Company, so its entire transportation process should be supervised by the Network Company through GPS, GIS systems. In this case, the Network Company may pay them reasonably based on the actual logistics cost.

For example, when one truck transports goods from A to B, it finds the road ahead is being repaired. Then the Network Company will get the information instantly by the supervising equipment on the truck, and will promptly communicate with the consignor to determine whether taking a devious route or not. If the consignor agrees, the Network Company will calculate the increased logistics costs for taking the detour to charge the consignor and pay the driver. But if it is a deliberate affair of the driver, the Network Company will detect the cheating behaviors through supervising devices and refuse to pay the increased cost.

4.4 The inquiry of transporting status

After delivery, the consignor can inquire the target vehicle and the real-time transporting status of goods through the Network Company's web site instead of asking the truck drivers. In this way, the Network Company not only avoids that the truck drivers may conceive the consignors by providing false information, but also makes the transporting process more transparent. Besides, it eliminates the consignor's suspicions to the drivers, so the drivers don’t have to pay foregift in advance.

Because the new operation mode achieves seamless docking between modern logistics and e-commerce platform, and bring the information of the vehicles into the control of visual web services platform, it finally realized improving the efficiency of the regional logistics
and reducing the cost of logistics services.

5. **THE DESIGN OF THE LOGISTICS ALIPAY IN THE NEW OPERATION MODE**

The traditional payment mode for logistics services is that the driver goes to get the haulage form the consignor after transporting the goods to the destination and get the receipt of the consignee. In this mode, on the one hand, due to the delaying of getting the haulage, it’ll increase the pressure of the drivers in cash flow; on the other hand, some consignors may deliberately refuse to pay the haulage which will add to the operation risk of the trucks. It especially brings a great deal of operational risk and stress for small and medium sized logistics enterprises.

In the new mode, as the fourth party logistics, the Network Company can charge the consignors and pay the drivers through the Logistics Alipay. The concrete steps are as follows. First, the consignor and the consignee reach an agreement about their trade. Second, after the consignor registers to be one of the Network Company’s members, he can make orders through the Internet, and complete payment through the Logistics Alipay. The money will be put into Network Company’s special account in the bank, and temporarily frozen. Third, The Network Company will match the freight with the trucks through its information systems, and notify the most suitable truck to collect goods. At the same time, it will notify the consignee to make preparations for receiving the goods. Forth, the truck accepting the transport task will reach the delivery location as soon as possible, and complete the handling, transportation and delivery operations. Fifth, after inspection and giving receipt, the consignee will inform the Network Company through the Internet, fax or telephone, etc. Sixth,
when the Network Company confirms that the goods have been delivered to the consignee in time, it’ll notify the bank to pay the haulage to the account of the driver. At last, the bank pays the money into the driver’s account and the whole process is ended.

In the above process, the Network Company is a platform with functions of guarantees, payments, information processing and management. It’s a public e-commerce trading platform connecting the urban logistics consumers and the logistics suppliers. As an open e-commerce platform, the Network Company not only greatly reduces the transaction costs between carriers and the consignors, but also provides these parties with functions of long-range business, financial and other management.

In practice, the above mode of payment can only be used in large e-commerce platform for logistics, which makes barrier to the application of this mode. Therefore, the easier
method is to leave interfaces on existing logistics web sites and graft Alipay to the existing logistics web, which will be implemented with lower cost and more efficiency. In addition, the capital integration of the existing logistics platform and Alipay is also a feasible way that can avoid a lot of tedious negotiations.

6. CONCLUSION

In the new operation mode for urban freight logistics, the consignor, the consignee, the truck drivers and the bank are integrated into a system which has a smooth information flow and a perfect trust mechanism. The new mode simplifies the transaction process, improves the efficient of goods flow, information flow, capital flows in urban freight logistics, and achieves the strengthening of the transporting capacity, which will greatly enhance the economic benefits of logistics companies.

In particular, with forward-looking consideration, this paper put e-commerce and mobile payment technologies into the logistics industry to construct the overall framework of the new operation mode, which provides a completely new idea and a feasible approach for the enhancement of economic benefits in urban freight logistics.

REFERENCES


