

# Design about Cost Management of Logistics Enterprises under the Background of the Big Data and Informatization

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**Abstract.** Under the background of the information era, the cost management of the logistics and distribution enterprises have undergone many opportunities and challenges. The information level of the logistics enterprises is improved well by making use of the big data better, and the information technology will be applied to the logistics cost management of logistics enterprises, which will greatly contribute to the development of the logistics enterprises and then improve the core competitiveness of the enterprises. This paper will elaborate on the challenges faced by the cost management of the logistics enterprise under the background of the big data and informatization and its specific design scheme of the cost management.

**Keywords:** cost management; logistics; informatization; big data.

## 1. Introduction

Big data, a new generation of information technology, is regarded as an essential driving force of the radical innovation for promoting the information and related industries. With the combination of the information technology and production activities as well as the rapid popularization of the related technologies, the big data has created a huge impact on the economic and social development and people's lives at the macro level. At the same time, it has also played a vital role in the logistics, medical treatment, entertainment and other industries at the micro level. In 2016, the Outline of the National Informatization Development Strategy pointed out, "the potential of informatization in promoting the economic and social development and serving the country's overall strategic layout has not been fully released", which also requires all walks of life to advance the process of informatization and makes use of the big data to further deepen the level of the informatization. At the same time, according to the present situation, the application of the existing informatization technology of big data of the enterprise is mostly based on the perspective of business operation, and then serves the specific business design and process management, but it lacks of the awareness of systematically controlling the cost by using the big data and informatization and the solutions to innovate the cost management of enterprises.

The application of big data and informatization in the logistics industry has a prominent fitness and development prospects. Under the development trend of "smart logistics", the data information generated by the logistics enterprises has gradually increased, and it has been a big tendency for the logistics enterprises to use the big data and information technology. From the perspective of the business, the big data could be used to deal with the logistics and distribution information to provide decision makers with a more reliable decision-making basis, in this way could the informatization and logistics enterprise be matched to improve the competitiveness of the logistics business; From the perspective of the cost management, the business activities of enterprises are inseparable from the external environment, and the internal management work also needs to be coordinated with the external information of enterprises. The accounting work, especially the cost management, is also inseparable from the external data. Therefore, the cost management also needs to apply for the big data and informatization technology to achieve the synchronous optimization of its functions and methods, which is of great significance for the development of the cost management theory and the upgrading of the cost management practices.

## 2. Literature Review

At this stage, some domestic scholars have made some researches on the application of the big data and informatization to cost management of the logistics enterprise. Zhang Jing (2013) analyzed the trend of necessity of upgrading the informatization and information management, and then she put forward some relevant suggestions for developing the logistics public information platform. Hu Xiuhua (2013) took the Harbin Longyun Logistics Park as an example, and analyzed the present status and requirements of logistics management informatization, and finally she planned the logistics information construction based on this situation, and some corresponding countermeasures and suggestions were proposed from the macro and micro perspectives. From the technical level, Gao Li (2017) designed the information system of the logistics center, and constructed the distributed network structure of the logistics center and the distribution function in the e-commerce warehouse, and finally it would realize the collection, turnover and query of the logistics information by using the equipment. From the above research, it could be found that the current research was mainly focused on the technical application and business improvement of the big data and informatization in the logistics enterprises, and it tended to the function introduction and management of the business processes. How to affect the cost management and improve the level of information in cost management, which was less involved.

Zhang Yongmei (2014) analyzed the cost control effect of big data in the enterprise, and then she discussed the supply chain processes such as the design, procurement, inventory, production, sales as well as the transportation and distribution, and finally the benefits of the big data and informatization to enterprises' cost management were confirmed. The Fan Yanping and Wei Lizhi (2016) conducted some researches on the optimization of cost management about the enterprise operation chain under the background of the big data, and explored the new ideas of applying the big data to the cost management, and the cost of internal and external resources was comprehensively considered, the enterprises' cost management has been further analyzed from the three aspects of the downstream terminals, the upstream, the enterprise.

In summary, the research on the big data and informatization applied to the enterprise management and the combination of related cost management theories was relatively comprehensive. However, these studies often stayed at the macro level or the technical level, which was lack of the practicality, and the specific application of the cost management was relatively obscure. It was especially rare to study how to apply cost management to the specific logistics industry. Based on the industry characteristics of the logistics enterprises, this paper will analyze the challenges faced by logistics enterprises in cost management under the background of the big data and informatization, and then combine the big data and informatization technology with the cost management, and finally propose the solutions of the specific cost management information, which is applicable to the logistics distribution enterprises.

## 3. The Challenges of Cost Management in the Logistics Enterprise's Informatization

### 3.1 Accelerate the Informatization Construction of the Cost Management

Before the implementation of the logistics informatization, for each logistics center, which is a single operation or a self-system logistics enterprise, has the high regional-level operation costs. First, there is a lack of coordinated scheduling of the orders and distribution resources in the single work area, and it is impossible to reduce costs through the collaborative work. Second, the replenishment supervision code and the outbound barcode in the area are not fully utilized. Third, the warehousing operation scheduling and delivery operation scheduling are not related to the system information, and thus the higher skill requirements will be required for the scheduling personnel.

The measurement method of the cost management needs to be more precise in the era of big data, which would put much higher requirements on the application ability to the big data and information tools.

### **3.2 Strengthen the Integration and Utilization of Internal and External Information Resources of the Cost Management**

Logistics companies with lower levels of big data and informatization and the inefficient using of the informatization software have the higher operating costs. The human control is more susceptible to the subjective factors, and the distribution process is more complicated, which will lead to problems such as the difficulty in distribution supervision, the high labor cost, the low control as well as the low timeliness in processing problems.

The data will play an important role in the function of big data. In the current cost management, it is necessary to obtain the external data such as the environment and competitors in time in addition to analyzing the internal data, and these data need to be cleaned up and accumulate and analyzed when needed in order to provide support for the enterprise's decision-making. If the logistics enterprise is in the state of the information island, and the financial information is also isolated, which will be difficult to trace it effectively. The database of each link will be independent, and the data sharing cannot be realized. The informatization function will not be effective to improve the effect of cost management.

### **3.3 Upgrade the Cost Management to Strategic Management Level**

The practice of cost control has made people realize that the final decision-making is made not the accounting level but the management level. It is necessary to fully innovate and apply various potential and possible cost control models. The logistics companies must establish the cost management systems to solve the cost problems from the perspective of the management and decision-making. In the era of big data and informatization, some relevant technologies are needed to provide the management accounting support, decision-making and control data required for the cost strategy management.

## **4. Solutions Applied to the Cost Management in Logistics Enterprise of the Big Data and Informatization**

### **4.1 Building a Comprehensive Information Platform for enterprises to Realize the Data-based Cost Management**

#### **4.1.1 Construction in Enterprise IT System and Layout of the Comprehensive Information Flow**

The enterprise's information platform mainly focuses on the data standardization, resource flexibility, capability service-oriented, service networking, management automation as well as centralized management. The IT system construction aims at the centralized deployment, and reduces the system deployment and the complexity in operation and maintenance, then improves the efficiency of interaction and collaboration between the business and management units, and finally reduces the total costs. The IT platform will focus on the ERP and the logistics integrated management platform. The reason is that the main business of the logistics enterprises is the distribution and wholesale and retail. Therefore, the matching of wholesale, retail and logistics of enterprises becomes the core competitiveness of enterprises; secondly, the decision support system will realize the comprehensive support for business operations from the information system.

The ERP system mainly implements the following functions: the centralized business management module, the centralized and decentralized management of the price, sales restriction, and credit; the centralized system management; the reduced operational training cost after the user transfer; the centralized business data; the centralized and summarized data, which will provide better support for the data-based centralized applications. The integrated management platform in the enterprise logistics mainly implements three parts of system functions: purchase order management (OMS), logistics and transportation management system (TMS), and warehouse management system (WMS).

#### **4.1.2 Constructing a Data Integration Architecture and Data “Resource Pool”**

The enterprise’s cost management informatization is indispensable to the support of the database, a data integration architecture is built, and it further will form a data warehouse, finally a data “resource pool” will be completed. The data integration mainly refers to the process of recollection and unified management based on the business data of the enterprise’s decentralized information systems. After unifying the data information of each department, the enterprise will establish various business management and control systems and the data buses. Each department could personalize development and self-service analysis according to the different requirements. The processed data could be uniformly displayed through the reporting platform, and a unified data interface service will be developed.

To achieve a data integration platform for the management and applications of the master data in the enterprise, it must have the pretty data connectivity, data quality exploration and analysis, and data conversion capabilities. For example, after adding a customer information data in the customer relationship management (CRM) system, it will be directly sent to the enterprise data center, and the enterprise data center could be distributed to the risk management system, the data warehouse system, and the main data management system.

#### **4.1.3 Constructing an Integrated Data Warehouse and Fully Integrating this Data**

A three-tier integrated data warehouse will be built, which will include the storage layer, the warehouse layer, and the client application layer. The real-time data will be input and cleaned, and then stored in a data warehouse, and finally the visualized methods will be used for the front-end data presentation. The construction of the integrated data warehouse mainly emphasizes three objectives: concentration, separation, and openness.

Concentration: ERP, finance, labor, chain, and data in production system could be centralized in the data warehouse. Separation: The role of data warehousing could be used for both data storage and development and business analysis. Openness: The obtained business data could be accessed, applied and developed based on the data warehouse. Based on the business system-data warehouse-front-end analysis, the enterprise will realize the unified data management and analysis.

### **4.2 Constructing a Centralized Logistics Information System to Promote the Cost Management Informatization**

#### **4.2.1 Using the OMS to Track the Cost Information**

By connecting the OMS to the present ERP platform of the logistics company, it is possible to enhance the single order management and the entire tracking management of the order. The main function of the order management system (OMS) is to achieve the all-round management of orders and trace of the entire information, which will dynamically focus on the progress and completion of orders, and improve the efficiency of operations in the logistics process, thereby the operating time and costs will be saved and then the market competitiveness of logistics distribution companies will be enhanced.

The most important thing about the OMS system is the order management function. The order management process will be implemented through the OMS, the historical information of the order could be queried and analyzed, and the accurate historical data will effectively help the enterprise to improve the scientific nature of the order. After the orders are successfully shipped out, the OMS will take advantage of its logistics management, and track and update the latest status of the orders’ delivery in real time. The order information will be directly shared to the inventory management and order demand side based on the database of the company.

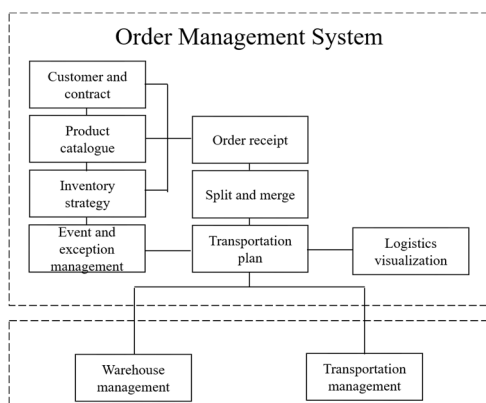


Fig.1 OMS Order Management System

#### 4.2.2 WMS Warehouse Management System is Applied to Real-time Cost Detection

The WMS warehouse management system will effectively control and track the whole process of logistics and cost management of warehouse business through the functions of warehousing business, outbound business, warehouse allocation, inventory allocation and virtual warehouse management, and then realize or improve the standardization of enterprise warehousing information management and promote the warehouse management software with intelligent process-oriented management. It will contain the basic functions of the Internet of Things, so it could be combined with the present IoT technology in this study to provide the high-efficient and accurate services according to the order during the delivery phase.

Through the WMS system, the inventory management mode will be improved to the process-oriented. It will convert to the “data acquisition” from the original “data input” in a compatible way. At the same time, the efficiency of warehousing management will be improved by monitoring and the labor cost will be reduced. Under the whole management mechanism, the order cost management will be refined. The overall accuracy of the orders will be improved to enhance the control of cost management.

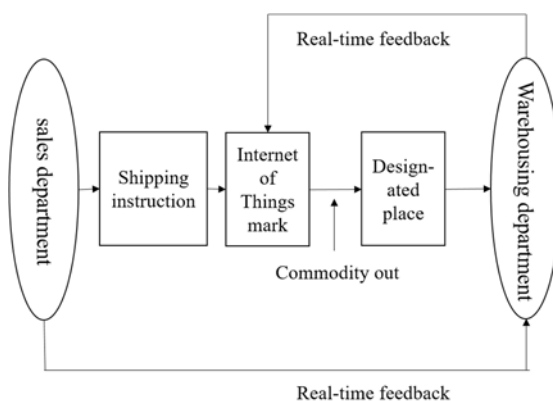


Fig.2 WMS Warehouse Management System

#### 4.2.3 TMS Transportation Management System will Realize the Distribution Cost Control

##### Intelligent Distribution Supervision System Based on Data-mining

The Vehicle Transportation Management System (TMS) integrates various functions such as the GPS traffic management, order allocation and scheduling. By automatically planning the distribution routes, it will improve the operational efficiency and reduce the transportation costs. The combination of the geographic information system of the logistics enterprise could clearly check the real-time location and status of the commodity, thus reducing the cargoes damage rate. When facing the terminal, a variety of sensors will detect the status of the cargoes in real time and deliver the recorded information to the customer throughout the process. It is conducive to ensure quality of the cargoes during the transportation and then it will enhance the trust of users.

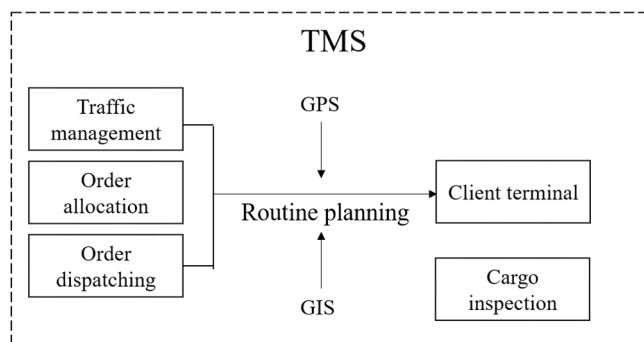


Fig.3 TMS Transportation Management System

## 5. Summary

The background of big data and informatization has put forward some new requirements for the cost management of logistics enterprises. It is necessary for the logistics enterprises to change the concept of cost management with the times and use relevant information technology to carry out the strict and elaborate cost management. The logistics enterprises make use of the big data to upgrade the informatization level, which could collect data in time and process efficiently. It is beneficial to enterprises to make quick decisions, and the logistics activities will be timely effective control to control costs. The enterprises will construct the logistics information platform in the context of the big data, so that information could be stored completely, the more valuable information will be extracted from massive data to improve the decision efficiency and accuracy, thereby the logistics efficiency will be enhanced and reduce the cost in the business links, finally the ability of the cost management in enterprises will be enhanced.

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