Construction of Smart Logistics Model Based on Big Data

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Abstract. The rapid iteration of e-commerce has put forward higher requirements for the reform of data-based information in the logistics and transportation industry. The iteration of intelligent logistics can be based on big data and other related high-tech to effectively improve the efficiency of logistics and transportation, and improve customer satisfaction. This paper first analyses the intelligent logistics business system, and then studies the construction of key links of intelligent logistics model management based on big data. Finally, it analyses the reconstruction of intelligent logistics model based on big data.

Keywords: Intelligent Logistics Model, Big Data, Construction

1. Introduction
With the rapid iteration of new high-tech, intelligent logistics integrates the Internet of Things (IOT), big data, cloud computing[1], artificial intelligence and other emerging high-tech, so as to support a relatively perfect smart logistics system, which not only improves the level of smart logistics links, but also helps to integrate into the public smart logistics system, so as to truly realize the integration of smart logistics[2]. With the rapid iteration of e-commerce, the logistics and transportation industry is also facing the urgent need of data-based information reform[3]. The iteration of smart logistics can be based on big data and other related high-tech to effectively improve the efficiency of logistics and transportation, and improve customer satisfaction[4]. Smart logistics based on big data can help realize the scientific iteration of logistics at several levels as shown in Figure 1.

Figure 1. Levels of smart logistics based on big data
In a word, the deep cooperation and integration of big data and smart logistics will help to build an optimized management mode with smart management as the core, and achieve the goal of low cost and high quality logistics services[5]. Therefore, it is of great value to study the smart logistics integrating big data technology.

2. Smart logistics business system

Smart logistics business system is based on logistics business as the core, integrating information technology, big data technology and other related elements, so as to achieve efficient and low consumption logistics activities[6]. With the rapid iteration of social economy, the logistics system has also experienced a series of iteration stages, as shown in Figure 2 below.

![Figure 2. Iteration stages of logistics system](image)

The current logistics business system has been extended to the integrated logistics business based on supply chain management, information integration business and smart value-added business. It can be said that big data technology promotes the transformation of logistics business system from traditional logistics business system to smart logistics business system.

2.1. Smart supply chain logistics management

Smart supply chain business is based on the integrated management of supply chain logistics based on smart technology. In the whole process of logistics business management, smart supply chain integrates logistics data and customer data, so as to realize the integrated management of supply chain. The core of smart supply chain business is to provide smart purchasing logistics management and customer service for the supply chain. Through the analysis of customer demand based on information technology, using big data and cloud computing technology to carry out network planning, transportation and other activities of goods distribution, and can provide personalized services for customers. In addition, the key to the auxiliary content of smart supply chain business is to focus on the core business, which is to provide auxiliary support for its core business and further provide value-added services through collaborative management, resource integration, information integration and other tools and activities.

2.2. Smart logistics business management

Similar to the management of smart supply chain logistics, smart logistics business management involves different parts such as core business, auxiliary business and value-added business. Smart logistics business also integrates smart information technology such as artificial intelligence to realize the scientific management of logistics business, so as to realize the automatic management of the whole transportation process by smart information technology, realize the visualization and smart control of transportation process, so as to realize the upgrading of logistics information flow activities, as well as the response speed and efficiency of logistics services. In addition, the auxiliary business of smart logistics is the process of realizing the integration of logistics operation. It uses smart
information technology to carry out smart operation of goods in the circulation link. Smart logistics value-added business is to deeply mine and analyze the information obtained by integrating smart information technology, expand the value-added service field, and further promote the improvement of value-added service level.

3. Construction of key links of smart logistics mode management based on big data
Big data technology can give full play to the advantages of big data through data value mining, and realize efficient and scientific analysis and processing of logistics information. The architecture of the smart logistics system includes four layers, namely, the sensing layer, the network transmission layer, the data storage layer and the application service layer, as shown in Figure 3 below.

![Figure 3. The architecture of the smart logistics system](image)

3.1. The construction of the influenza end of intelligence
The foundation of smart logistics construction lies in comprehensive logistics information perception. At present, the public perception technology of logistics includes tracking tech, sensor tech and communication tech. These high-techs can obtain the information of consumers and goods. With the technical support of the IOT, building a database can fully perceive the information of goods, thus building an efficient database. In addition, the smart collection of logistics related information, to achieve the collection and monitoring of logistics information classification, fusion processing, so as to control the real-time flow of goods information.

3.2. Construction of smart logistics transmission terminal
The transmission end is based on the IOT and the internet, and the transmission system transmits, merges and analyses information. The data transmission at both ends of the information can ensure that each information contact can obtain accurate status in effective and timely manners. In addition, based on various transmission networks and communication high-tech, information collected by sensing devices can be transmitted in a timely and safe manner. The data path used for transmission is composed of various access networks and communication high-tech. Based on the internet, mobile communication technology and cluster communication technology, it realizes the timely control of logistics information.

3.3. Construction of smart logistics storage layer and application layer
The function of the smart logistics storage layer is to process and store the data acquired by the perception layer, to concentrate all kinds of logistics information data in the cloud storage, and to provide users with various information integration applications and technical support for personalized services through information integration and a large number of computing processing. The processing and storage of cloud computing is the core technical support of logistics information processing. The application of big data computing can simplify the delivery process and improve the work efficiency, thus providing a relatively simple means for information storage, consumers and enterprises to process logistics information. The application layer of smart logistics includes data exchange platform, service
platform, etc. the information processing and human-computer interaction are solved by issuing instructions and receiving information on the terminal to obtain various services, obtain valuable information, and improve management quality and efficiency.

4. Smart logistics model reconstruction based on big data

First of all, it needs to reconstruct the idea of smart logistics mode based on big data, build the supply subsystem, demand subsystem and supervision subsystem, and create an open and personalized logistics operation platform. Secondly, reconstruct the elements of smart logistics model based on big data, mainly including building cloud computing processing center of big data, integrating the supply side and demand side, embedding the government review mechanism, transmitting policy information and adjustment scheme to logistics enterprises through smart logistics platform, and ensuring the timeliness and efficiency of regulation and control.

In addition, it is necessary to reconstruct the path of smart logistics mode based on big data, and summarize and input the logistics related policy information, inter regional logistics regulations information, logistics system planning, regulation and design instructions and other information into the platform. Build logistics e-commerce platform, mine data sources, select and extract key information, through in-depth learning, build e-logistics platform and logistics e-government platform to ensure the compliance of logistics system and the safe and stable operation of smart logistics mode.

5. Conclusions

With the rapid iteration of e-commerce, the logistics and transportation industry is also facing the urgent need of data-based information reform. The iteration of smart logistics can be based on big data and other related high-tech to effectively improve the efficiency of logistics and transportation, and improve customer satisfaction. Based on the analysis of the key links in the management of smart logistics mode based on big data, this paper points out that the reconstruction of smart logistics mode based on big data needs to start from different aspects such as ideas, elements and paths, and make full use of system integration technology to build logistics e-commerce platform and government affairs platform, so as to realize the reasonable, safe and stable operation of smart logistics mode.

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