Research on Intelligent Decision Platform and Key Technologies Based on Logistics Big Data

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Abstract: With the development of computer technology, Internet of Things, smart mobile terminal devices and social networking sites, the era of big data has already arrived. The management and use of massive data is a key issue that many companies are facing today. This article first explained the basic concepts of big data, analyzed and summarized the data sources of big data, and conducted research and analysis on the intelligent decision-making platform and key technologies based on logistics big data.

1. Introduction
Internet technology has driven the development of all walks of life, and logistics data has also gradually exploded. Big data technology is widely used today, the support of big data technology has gradually changed the past extensive operating mode of the logistics industry, and gradually began to move towards a more intelligent, informatized, systematic and intelligent logistics development model, making decision and logistics planning more intelligent. Logistics operations and management are also gradually moving toward the direction of automation. The logistics industry big data can not only provide more accurate judgments for the development of the logistics industry, make better decision support, but also can maximize the government's service and guidance capabilities. In addition, logistics companies in-depth analyse of logistics big data, improve the company's operating efficiency, reduce the cost of operating logistics companies, and promote the intelligent development of logistics.

2. Overview of Big Data
2.1 Definition
Although big data does not have a unified definition, Wikipedia defines it as follows: Big data refers to the huge amount of data involved so that it can't pass through current mainstream software tools, and it can manage things within a reasonable time, deal with the problems and arrange to become a consultant to help companies manage their business strategies. In addition, Gartner, a research institute, also has the following definition of big data: Big data refers to the need for new processing modes which have strong decision-making power, strong insight and process optimization capabilities, high growth rates and diverse information assets. From the above definition, it can be seen that the data volume of big data is huge, the data structure is also diversified, and the relationship between data is also more complicated. Traditional technologies and information platforms cannot handle big data effectively, and they need to use advanced technologies to achieve big data processing.
2.2 Feature
First, there is a huge amount of data. Compared with traditional databases, the amount of information in big data is even greater, which can be described as excessive data. Quantitative changes will lead to qualitative changes, and more advanced technologies must be used to manage and store data.

Second, the data types are diversified. In big data, data is diverse, not only with unstructured data, but also with semi-structured data and structured data. The form of data is also varied, including video, pictures, voice, mobile terminal data, text, forms, dynamic data, sensor data, etc. The relationship between various types of data is also very complicated.

Third, data has a high value and low density. The data volume of big data is huge, which inevitably has some meaningless data. After dealing with oversized data, valuable data can be found.

At last, the dynamics of the data. Nowadays, the application of sensor devices, computers, and mobile terminal devices has gradually increased the efficiency of data uploading and collecting. At the same time, data has also been continuously increased and updated. Therefore, big data is real-time and dynamic.

2.3 Data Source
At first, the amount of data that the database can store is small, but with the rapid development of Internet technology, after entering Web2.0, it gradually shows its characteristics, that is, users share. Platforms such as Weibo, Taobao, and Amazon are all important components of big data. After combining mobile terminal devices, sensors, and network technologies, various types of data can be generated throughout the day, and data can be uploaded to the network in real time. Data is also one of the data sources for big data. At the same time, big data also includes some existing data warehouses.

3. Logistics Intelligent Decision Platform
The core of the logistics intelligent decision platform is logistics big data, which includes various aspects, namely, the intelligent decision-making layer of logistics, the data acquisition layer of logistics, and the establishment layer of logistics data model, as shown in Figure 2.
3.1 Logistics data acquisition layer
The logistics data collection layers refer to the extraction and clearing of massive and scattered data onto the logistics activity center, and integrates it into useful information such as financial information, user information, delivery vehicle information, enterprise information, and waybill information. In the process of integrating data, different databases need to extract the same amount of data, such as word length and unit name, which is beneficial to the next step to establish a logistics data model.

3.2 Logistics data model establishment layer
The logistics data model establishment layer refers to the transformation of the extracted effective information about a computable data model by establishing a logical mapping relationship between logistics data and business. There are three common modeling methods: the third paradigm of the relational database, the snowflake model, and the star model. The core of an intelligent decision system is the establishment of a data model, which is conducive to the analysis of logistics optimization.

3.3 Logistics intelligent decision layer
The intelligent decision-making layer of logistics is worthy of analyzing and calculating the data model of the multi-dimensional dimension of the West, so as to formulate different optimization schemes of logistics design, so as to provide more reliable data support for intelligent decision-making. At the same time, you can also add visualization technology, which is conducive to companies and users easier to understand the digital optimization results, logistics data can be presented to users and businesses in a more intuitive and visual form.

4. Key technologies for logistics big data
4.1 Data Acquisition Management Technology
Logistics big data includes a variety of content, such as logistics prices, industry information, infrastructure, macroeconomic indicators, logistics parks, logistics companies and other different nature, system, format data. The collection and management technology of logistics big data refers to the collection of a real and stable data collection through a series of cleaning algorithms that remove invalid, wrong, and redundant data. The data collection and management technologies of logistics big data include database technology, data extraction technology, data fusion technology, and fusion
cleaning technology.

4.2 Distributed Storage Technology
Distribute storage technology refers to the storage devices that are scattered in different physical locations to form a virtual storage device. According to the system requirements and storage resources of each location, the data can be stored in a most suitable location, thereby effectively improve the platform. The village was cancel. For example, in a commonly used HDFS system, this system is a distributed storage system in colleges and universities. It can adopt different modes depending on the data. For example, the storage of important files, the optimization of calculation results, etc, are usually NAS and the SAN mode, while the general data storage uses the DAS mode.

4.3 Real-time computing processing technology
Real-time computing and processing technology refers to timely and funny processing of collected real-time information, such as weather, traffic conditions, etc., to quickly obtain calculation results, and apply it to the decision-making and optimization analysis of logistics. The most commonly used real-time computing processing technologies today are Twitter's Storm and Yahoo's S4.

4.4 Safety protection technology
Logistics information involves a lot of private information, such as the user's phone, address, name, etc., as well as more sensitive information such as the company's bank account number, transportation method, storage location, and so on. Therefore, in order to ensure that the logistics big data platform information goes further, we need to adopt a series of security protection technologies, such as data isolation, supply security management, user access control, etc., and use the methods of restricting access rights and setting user passwords. This guarantees the security of the information.

5. Application of Logistics Intelligent Decision Platform
Only the decision platform can have multiple advantages. One of the most important factor is that the entire logistics operation can be optimized. For example, the match between the courier and the goods, the matching of the shipping capacity and the goods, the matching of the warehousing and the goods, and the most frequently used decision system is warehousing and transportation.

5.1 Warehousing intelligent decision system
Warehouse intelligence decision not only has, but also has an impact on the efficient use of warehouse storage. On the one hand, intelligent decision-making for storage can use the data plate to integrate the entire supply chain and analyze the accumulated large amounts of historical inventory data. After comprehensive consideration of various factors, such as transportation costs, inventory costs, and service levels, ensure that in logistics companies the inventory is always kept in the best condition to prevent the situation of explosion and disorder storage. On the other hand, according to the required storage size, weight, and volume of the extracted goods, the quantity, storage time, arrival time, and storage time of the new goods are calculated to ensure that the storage location of the goods is always placed at the highest efficiency position. Not only can the highest utilization of storage space was ensured, but similar goods can also be stratified to avoid the wrong picking of goods.

5.2 Transportation Intelligent Decision System
The intelligent decision-making of transportation not only improves the efficiency of distribution, but also helps to save the distribution costs of logistics companies. The intelligent decision for transportation can analyze and classify the order information and inventory location information. In addition, it can comprehensively consider the distribution personnel's conditions, traffic, weather and other factors, and timely analyze the best delivery route, delivery vehicle, dispatcher, etc. Get the most reasonable delivery book on-demand and route to ensure the best of the proposed distribution plan and
maximize the transportation resources.

6. Conclusion:
Big data gradually covers all walks of life. In the era of big data, people need to make full use of the advantages of big data and give full play to the positive role of big data. The addition of big data technology can accelerate the construction of smart logistics, which plays a crucial role in the construction of the logistics industry. Although big data is still in its infancy, it also requires related personnel to continuously develop, update, and improve various technologies, solve existing problems in a timely manner, improve the accuracy and efficiency of big data processing models, and solve the problem of increasing data explosion. In order to achieve a better and faster development of logistics companies, and then contribute to the development of the country.

References:
[1] Xu Wenjia. Intelligent Decision Platform and Key Technologies Based on Logistics Big Data[J]. Logistics Engineering and Management, 2017, 39(06): 60-61.
[2] Li Cunchen. Research and Application of Distributed Storage Technology for Mass Data [D]. Beijing: Beijing University of Posts and Telecommunications, 2013.
[3] Li Ziliu. Research on real-time streaming clustering framework for big data [D]. Guangzhou: Sun Yat-Sen University, 2013.
[4] Shi Rongli. Information platform construction of smart logistics park based on big data[J]. Business Economics, 2016(427):134-138.
[5] Zhu Lin, Dai Sheng. Research and Design of Logistics Information Management System for Multilingual E-commerce Platform[J]. Agricultural Machinery of South China. 2018(04)