

# Application and Research of Internet Technology in Intelligent Logistics System

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**Abstract:** With the continuous development of network technology, the Internet of things, big data, cloud computing and other related technologies have been applied more and more deeply in the logistics industry. Under the background of "Internet +", the logistics industry is also developing towards the direction of intelligent logistics. Intelligent logistics can effectively improve the quality of logistics services. The rise and development of the Internet of Things is a great significance to the logistics industry. It is also a double-edged sword. It is both an opportunity and a challenge. Intelligent logistics is a complete system with complexity and systematic. Under the background of "Internet +", to improve the development of intelligent logistics technology system, promote the development of logistics finance, accelerate the transformation of logistics intensification and intellectualization, and improve the quality of employees and so on can better promote its development.

## 1. Introduction

The core of contemporary logistics is information technology, focusing on the optimal allocation of resources and the optimal design of processes. Therefore, in the Internet of Things, the three core technologies are perception technology, network technology and intelligent information processing technology. With the development of information technology and network technology, the Internet of Things is coming quietly. How to make enterprises make full use of the advantages of the Internet of Things to realize their own development and improve the quality of products and services, and how to use logistics information to carry out scientific pricing has become key issues for current enterprises to consider. As the main direction of modern logistics development, intelligent logistics is influencing the development of logistics industry from the technology and management aspects.

## 2. Overview of Internet of Things and Intelligent Logistics

### 2.1 Overview of the Internet of Things

At present, there is no unified concept explanation for the Internet of Things. Considering the conceptual interpretation of the Internet of Things by scholars, this paper holds that the Internet of Things is to connect people and things according to certain communication protocols through various information sensing devices, such as sensors, barcodes and two-dimensional codes, etc. In this network, it can effectively realize the connection between people, people and things, things and things, while the access network and the Internet are used to transmit and process information to realize the intellectualization of identification, location, tracking and supervision.

### 2.2 Overview of Intelligent Logistics

The so-called intelligent logistics is essentially the whole process of goods moving from supplier to buyer, including the intellectualization of warehousing, goods distribution, transportation, packaging, loading and unloading, and the goods collection and processing. Realizing intelligent logistics is to strive for better economic benefits for suppliers, to strive for higher quality of service for purchasers, and to effectively reduce energy consumption and logistics costs, and ultimately to achieve complete logistics system intelligentization.

With the development of network technology and information technology, the Internet of Things has also become a key issue in the development of logistics industry. Intelligent logistics is one of the important applications of the Internet of Things, and it is also the intelligent development of logistics. With the help of advanced science and technology, comprehensive using of various advanced information systems, logistics operations can be completed independently. Realizing intelligent logistics is not only conducive to the construction of an environmentally friendly society, but also can effectively promote economic construction.

### **3. Basic Compositions of Intelligent Logistics System**

Unlike other logistics operations, the construction of intelligent logistics system cannot be separated from the support of the Internet of Things. The Internet of Things is a data-centric logistics operation, including information collection and analysis, data collation, data processing, data transmission and decision support. From the composition of intelligent logistics system, it can be divided into sensor network, core bearing network and information service system. From the specific structure of these parts, the sensor network mainly includes sensing nodes, including data collection and control nodes, related hardware facilities, various sensors, barcode and two-dimensional code identifier, reader and writer, etc. It is mainly responsible for data reception and equipment control of the system. It also includes peripheral networks such as sink nodes and access gateways, which are mainly responsible for transmitting data to perceptual nodes. And then, in the core bearer network, it mainly includes communication networks based on Internet of Things business. According to their different types, it can be used for many different purposes, including information services and data communications. In the service system, the main hardware facilities are application server, client and so on, mainly serving for information processing and decision support.

If the hardware platform of intelligent logistics system is the skeleton framework of the Internet of Things, then its software platform is the neural network of the Internet of Things. Different Internet of Things has different software platforms. Usually, the software platforms of the Internet of Things contain communication protocols, and the communication protocol system is layered, including data sensing, middleware, network operation, Internet of Things management, information center management and other parts. Among them, the data perception system software is mainly responsible for the processing and identification of EPC codes, the Internet of Things middleware system software is mainly responsible for data perception and background management, the network operating system is mainly responsible for the Internet of Things network communication and information sharing, and the Internet of Things information management system is mainly for logistics information management.

## **4. The Foundation of Intelligent Logistics Development under the Background of "Internet +"**

### **4.1 The Foundation of Internet of Things**

In the Internet of Things, there are many systems to provide technical support for the operation of the Internet of Things, the most important is the intelligent transportation system. Following is a detailed analysis of the various parts of the intelligent transportation system. In the intelligent transportation system, it mainly includes data collection system, information transmission system, traffic information processing system and information control system. Firstly, in the data collection system, the ability of real-time collection and collection of traffic information is effectively improved by making full use of radar technology and navigation technology, thus providing timely and accurate data is the basis for intelligent traffic information processing. Secondly, in the information transmission system, through the application of various networks, including Internet, computer network, communication network and so on, to realize the rapid transmission of information, so that the information obtained by the data collection system can be quickly and timely transmitted to the intelligent transportation integrated management platform. Thirdly, in the traffic

information processing system, real-time traffic information obtained from the information transmission system is screened and processed through special information processing storage and processing devices, so as to provide useful information support for decision makers. Finally, in the information control system, many traffic management subsystems such as information dissemination, traffic guidance, parking information, traffic safety control and emergency treatment are mainly used. they provide more comprehensive guarantee for intelligent traffic and improve the service quality of intelligent traffic. Through the above analysis of intelligent logistics, it can be found that advanced Internet of Things technology can provide better services for urban traffic and help to optimize the structure of urban traffic network. At present, more and more countries and regions have made full use of Intelligent Transportation System (ITS). With the help of ITS, they can provide more comprehensive and timely traffic information and decision support for traffic management departments, and help to manage the whole traffic system more scientifically, and ultimately improve the whole traffic management level as well as the quality of urban traffic services.

#### **4.2 Foundation of Vehicle Networking**

Traffic Internet of Things (IOT) is a technological transformation and conceptual innovation based on the traditional intelligent transportation system. Through the realization of IOT, it opens up a better prospect for the development of intelligent transportation. Besides, it is also conducive to building a more harmonious, stable and orderly transportation network through IOT. IOT is a downward perception, collection and processing of data and information. Compared with the traditional intelligent transportation system, IOT has more advantages in the width and breadth of information collection, the accuracy of information and the efficiency of information utilization. In the automotive industry, it realizes the informationization and intellectualization of the automotive industry. With the improvement of scientific level, the progress of Internet of Things and Internet technology has provided favorable conditions for the development of information technology in automobile industry. The "Internet +" strategy, which was launched in 2015, has now risen to the strategic goal of the whole country. It is believed that in the future development process, the effective integration of the Internet and the transportation industry in the automotive industry can better promote the realization of the Internet of vehicles.

#### **4.3 Human Resource Base**

Intelligent logistics is a complete system with complexity and systematic. As a direct contact person and control subject of intelligent logistics, the quality of logistics professionals will have a significant impact on the development of intelligent logistics. From this point of view, logistics talents will directly determine whether intelligent logistics can achieve sound development in the future. At present, there are as many as 500,000 enterprises carrying out logistics business, and the growth rate of logistics market has reached 30%. The demand for talents in the whole logistics market is expanding rapidly. Under such a tight situation of logistics talent market, the government needs to take active measures to expand the human resource base of intelligent logistics. Firstly, clear plan of training and recruiting logistics talents should be made in the strategic plan, such as strengthening the theoretical knowledge education and practical experience training of logistics talents; Secondly, it is necessary to strengthen the employment guidance of logistics industry and optimize the post allocation of logistics industry; Thirdly, it is important to strengthen the construction of logistics specialty in colleges and universities, absorb the advanced experience of other countries, carry out special training for intelligent logistics talents, strengthen the construction of teachers of logistics specialty, improve the education level of logistics specialty, build a more perfect and multi-level logistics vocational education system, and further meet the needs of logistics talent market; Fourthly, it is also a way to vigorously support the training of logistics talents through policy guidance, actively introduce senior logistics management talents and professional and technical talents, and strengthen the management of talent training market.

## **5. Research on Intelligent Logistics Development Strategy under the Background of "Internet +"**

### **5.1 Perfecting the Construction of Intelligent Logistics Technology System**

The functional modules of intelligent logistics can be roughly divided into three parts: information module responsible for data collection and collation, decision module responsible for extracting flow knowledge, while resource allocation and terminal application module responsible for intelligent logistics technology and decision execution. In the information module, it mainly includes information perception, collection, transmission, storage and processing and other functional modules. Its main function is to receive and transmit logistics data. At the same time, after simple processing of data, relevant logistics information is shared in the logistics management platform in time. In addition, in the decision-making module, the logistics information obtained from the information module is optimized by intelligent technology, which provides decision-making support through analysis and prediction, effectively integrates enterprise resources by means of modeling and simulation technology, realizes macro-control of activities and coordination among tasks, thus can help enterprises complete logistics operations quickly and effectively. Finally, in the terminal application module of intelligent logistics system, it is mainly based on the received data and information processed to make plans and make decisions, to help enterprises complete logistics operations in an efficient state, and to provide better services for buyers. The terminal application module is based on information module and decision module to optimize the scheme and support the decision. It intelligently infuses the whole process of logistics, including intelligent application of monitoring, storage, distribution, transportation and so on.

### **5.2 Promoting the Development of Logistics Finance**

Logistics finance is the related financial activities carried out around logistics business. The most important one is logistics financing. Logistics financing is the joint development of financial institutions and logistics enterprises. It takes part of the materials owned by enterprises as collateral, and enterprises are responsible for the supervision of collateral. At the same time, it provides information about collateral to financial institutions. On the basis of the analysis of the relevant information given by enterprises, financial institutions provide credit loans to logistics enterprises according to the actual situation. According to the different life cycle stages of different products, there are three different forms of logistics finance business: firstly, the prepayment financing business model based on transaction relationship; secondly, the logistics finance business model based on inventory; thirdly, the logistics finance business model based on accounts receivable. From the view of the development requirement of intelligent logistics for logistics finance, it mainly shows in two aspects: (1) With the rapid development of logistics industry and the progress of network technology, the logistics industry has higher requirements for the quality of financial services such as payment and settlement. Through the development of logistics financial services activities, it is conducive to expanding the service of logistics industry. In addition, the value of logistics finance to the development of intelligent logistics is mainly embodied in the innovation model. Through the innovation of logistics finance, effectively linking the financial industry, logistics industry and industry to promote the all-round development of multiple industries, thus, it is beneficial to promoting the optimization and upgrading of industrial structure, providing more powerful security for national finance, and improving the market competitiveness of many industries.

### **5.3 Accelerating Logistics Intensification and Intelligent Transition**

Accelerating the transformation of logistics intensification and intellectualization can effectively expand the development prospects of automobile parts supply logistics. Similar to pharmaceutical logistics, automotive parts supply and sales are self-owned. According to the demand of automobile manufacturers for automotive parts, companies should organize logistics transportation business to transport parts to automobile manufacturers by their own. However, due to the scattered distribution of automobile parts suppliers, the efficiency of self-organizing logistics is not ideal, which is not

good to the reduction of energy consumption and the development of logistics intensive, thus ultimately will only bring more logistics costs to automobile parts. Therefore, the construction of third-party logistics is a way to effectively improve the current transport mode of automotive parts logistics, and improve logistics efficiency and quality. Establishing logistics warehouse management center near automobile manufacturers and integrating small-scale self-operated logistics systems can not only effectively improve the overall level of logistics, but also build a platform for good interaction between purchasers and suppliers to improve the timeliness and accuracy of logistics by strengthening communication.

#### **5.4 Improving the Quality of Employees**

Enterprises should pay more attention on the quality level of employees and take positive measures to provide the quality of logistics professionals. Firstly, enterprises should carry out strategic planning of human resources according to their actual situation, and strengthen theoretical and technical training for intelligent logistics professionals. Secondly, they should improve the personnel training mechanism, organize technical training activities for on-the-job personnel through relevant non-governmental organizations or associations, hold regular academic exchanges for scholars, or conduct special training for senior logistics management personnel and professionals. Thirdly, strengthen the training of talents in Colleges and universities, construct teaching experimental bases and laboratories, strengthen the training of technology-applied talents are necessary. Different from the traditional logistics, the application of intelligent logistics to information technology and network technology is more in-depth, so the requirements for logistics talents are also adjusted. In the process of training logistics talents, enterprises should strengthen the training of talent management ability, theoretical knowledge and computer technology, optimize the structure of logistics talents, and intensify the training of high-level talents. Fourthly, enterprises should also attach importance to innovation in human resources management, strengthen dynamic management of personnel, improve staff performance appraisal, promote employees to consciously enhance their professional ability and comprehensive quality, so that can ensure that enterprises provide a continuous stream of high-quality talents. Finally, the efficiency of employees and organizations should be regarded as the goal of talent management training, and the comprehensive ability and quality of talents should be continuously improved, so that employees can work together for the development of enterprises, to effectively realize the healthy and sustainable development of enterprises.

#### **6. Conclusion**

From the historical development of logistics, the Internet of Things is not only the best stage of current development, but also a huge technological revolution in the current era. The rise and development of the Internet of Things has epoch-making significance for the development of logistics industry. It is also a double-edged sword. It is both an opportunity and a challenge. The operation of the Internet of Things will completely subvert the past logistics mode. However, it should be noted that the Internet of Things is still in its early stage of development and the Internet of Things system is not yet fully mature. There is still a long way to go to realize intelligent logistics. Therefore, it needs the continuous efforts of researchers and professionals.

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