

# Analysis of Logistics Information Real-time Monitoring Model Based on Mobile Terminals

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**Abstract.** This paper analyzes the status quo of the logistics process and mobile terminal equipment, taking the university laboratory environment as the background, mainly introduces how to use a popular wireless communication technology and intelligent operating system in the laboratory environment, to monitor the real-time information in logistics process through mobile terminal. This paper puts forward the real-time monitoring technology and scheme through mobile terminal, and forecasts the application foreground of this model.

**Keywords:** Logistics, Mobile terminal, Real-time monitoring.

## Introduction

### Development status of logistics industry

In recent years, the logistics industry has been developing rapidly in the world. According to statistics, the global logistics market in 2010 was \$7.7 trillion, reaching \$9.2 trillion in 2015. In China, the total cost of social logistics in 2010 was 7.1 trillion yuan, which exceeded 11 trillion yuan in 2015. The rapid development and popularization of Internet of things technology, wireless communication technology and intelligent terminal devices have greatly enhanced the overall level of logistics management and business management.

Especially the appearance and development of intelligent logistics, It emphasizes the quick, efficient and smooth operation of information flow and material flow, so as to reduce the social costs, integrate social resources, improve efficiency, and promote local economic development.

Intelligent logistics integrate a wide range of technical services, although a variety of logistics information technology can be competent for logistics information collection, processing, but not very good at supporting real-time transmission, monitoring and managing logistics information, so as to the logistics company unable to timely and accurately grasp the transport vehicles, goods, information delivery in logistics transmission chain, thus reducing the overall efficiency of logistics. The problems of high cost, untimely and inaccurate logistics information acquisition have become the bottleneck of logistics informatization construction.

### Intelligent mobile terminal

The development of intelligent mobile terminals based on Android and IOS has brought a new and unique experience to the public. People can't have a computer that can access the Internet anytime and anywhere, but they can use the intelligent terminal device to browse, obtain and share information anytime and anywhere. With the development of powerful intelligent terminal, the application of APP (the application software of intelligent terminal system) is becoming more and more popular. People can use the App application instead of the personal computer to process daily

affairs, such as online learning, entertainment, shopping, information query, booking tickets, etc. The application of the App begins to penetrate into the work and life of the public.

### **The content of real-time monitoring logistics information model**

This paper mainly discusses the use of Internet of things technology, combined with wireless communication network and intelligent terminal equipment to build an information logistics system platform. Through the platform based on the Internet of things simulates the logistics transmission process in reality. Through intelligent terminal equipment, the logistics information can be checked, monitored and tracked.

This model mainly implements the following monitoring information:

#### **Data collection, storage and statistics**

In the process of logistics operation, vehicle information and commodity information need to be collected by hardware device. The collected data are analyzed and stored in the database for extraction when needed. According to the business needs, the data collected can be taken out of the database, and the data can be analyzed to generate such as pie charts, bar charts, graphs and so on. The intelligent receiving terminal can collect the data, analyze the statistics, and send the instructions to the central console for post-processing, facilitate logistics company business analysis.

#### **Data query display**

The data collected during the logistics process can be queried and displayed at anytime and anywhere, such as displaying the data information of the designated vehicle and the goods; displaying the current batch of vehicle goods information; displaying the vehicle cargo information, the history of the goods and the whole information, etc.

#### **Tracking and monitoring of vehicles and cargo**

Logistics distribution is complicated, and the collection, assembly and delivery of logistics and distribution vehicles require scientific management.

Scheduling system of Intelligent logistics through GPS positioning, mobile phone positioning, electronic map and so on, can track and monitor the logistics vehicle, and goods and personnel positioning, and can query the current vehicle trajectory and historical trajectory, the goods information such as temperature, humidity, weight, at the same time, the information can be sent to the central console to realize the whole process of logistics monitoring.

#### **Alarm prompt**

During the delivery of the goods, the vehicle speed, the route of the vehicle, the temperature of the goods and the weight of the cargo can be monitored and alerted. If the information is changed, the alarm data can be sent through SMS, notification and other forms, so as to provide timely management and control.

### **Scheme and adopted technology**

#### **Project design background**

The design of the scheme is considered in the following aspects:

The rapid development of logistics industry in China has become the leading industry of guiding production and promoting consumption, and has formed a huge industrial chain. But at present, the

informatization level of logistics enterprises is low. According to statistics, the logistics enterprises that have implemented or partially implemented information construction account for 21%, and the lack of information among enterprises in the supply chain leads to high logistics costs. With the development of modern logistics business to specialization, diversification and internationalization, it is necessary to support the information technology, so it is imperative and feasible for the informatization construction of logistics industry.

The development of mobile intelligent terminal brings a new round of impact experience to users. People can use intelligent phones and other terminals to carry out various business processing conveniently, timely and accurately. Various App applications are in full swing, and the ultimate goal of this scheme is to develop App applications based on intelligent mobile terminals

Based on Internet of things for the construction of the laboratory, the laboratory simulates "The Belt and Road" on the site of the logistics operation process. Combined with the new technology, the development of logistics operation process related App applications, not only satisfy the teaching but also meet the application in the future.

This paper mainly introduces how to simulate the business process of logistics information monitoring using intelligent phones and other terminals in the Internet of things laboratory environment.

### **Scheme design**

In the scheme design, we use the Internet of things technology, combining with wireless communication network and intelligent terminal equipment to build logistics system platform to simulate the process of logistics transmission in reality. The logistics platform system consists of the central console, intelligent terminal devices, and the local network of logistics sites. Logistics sites mainly provide vehicle logistics information, goods and delivery staff; the central console is mainly composed of the database server, GIS server, GPS server, temperature and humidity monitoring system, scheduling system and other control center to monitor and manage the logistics information. At the same time, the logistics platform system cooperates with intelligent terminal equipment to realize logistics data storage, detection tracking, real-time data receiving, statistics and analyze the vehicle information and cargo information in the whole process of logistics operation. The intelligent terminal equipment can be used to query, monitor and track the logistics information. In the later stage, according to the collected logistics information, the corresponding information can be sent by the intelligent terminal and the control and management of the logistics process should be carried out by the central console, such as temperature regulation, weight detection, dangerous goods monitoring and so on. It can also be customized to simulate the logistics operation flow in reality.

Through this mode of the monitoring task, we can design the following scheme. The organizational structure of the scheme is divided into four parts: intelligent hardware, central control platform, terminal component and wireless network.

#### **Intelligent hardware.**

The model vehicle is designed with a multi-function motor controller that can be integrated with a variety of sensors, laying magnetic stripe tracks. The model vehicle can travel on the magnetic stripe track. Installing detection equipments on site, when the model vehicle through the site, the site data, vehicle data, goods data can be collected and can be sent to the central control platform of the receiving device.

On the hardware platform, we require a hardware operating platform, model vehicle (integrated electric drive, receivers and other control device), magnetic stripe orbit, site receiving processor,

information transmitter , the data receiver of the central control platform, integrated development board, the voltage processor, etc.

### **The central control platform.**

The main function of the central control platform is to receive information, display the simulation vehicle track, display the information of vehicles and goods, vehicle management, information statistics, terminal equipment management, participation personnel management, control information transmission, etc. The central control platform is developed into the B/S structure of the web system, with multiple login, permission management and various function module management.

### **Terminal control.**

The terminal is developed in the mode of the APP. It can receive vehicles and cargo information through the central control platform and view data statistics information. The terminal equipment sends commands to the vehicle through the central control platform.

### **Wireless communication systems.**

Wireless communication network technologies such as 3G and 4G are used for networking.

## **Key technique**

### **Android mobile platform system.**

Through analysis and comparison, the intelligent terminal devices in the logistics system adopt the Android system. The platform system adopts the Internet of things technology. The logistics sites use the wireless mobile communication network, designing wireless sensor network based on the ZIGBEE. The model vehicle with a variety of sensors can acquire information using RFID radio frequency technology, using GPS and GIS technology to position the model vehicle. The central control platform coordinates with the intelligent terminal to carry on the real-time inquiry of the logistics information, sends the instruction and realizes the multipoint monitoring.

### **Architectural approach.**

The central control system adopts B/S architecture, which can realize internal LAN communication. The logistics company is easy to use, fast flexible deployment, stable upgrading, good scalability at the later stage. Multi-client can access at the same time, can realize multi-user management, multi-user login, synchronous update of information data accurately in real time. Through the scheme design, the traditional logistics and modern intelligent logistics can be fused. With the support of wireless communication network technology, using the intelligent terminal equipment to realize the real-time data collection, analysis, statistics, positioning and tracking of the vehicle and cargo information in the process of logistics operation, and send instructions to the central control console by the intelligent terminal equipment. The central console controls and manages all kinds of information .

## **Conclusion**

The model discussed in this paper aims to solve the problems of the traditional logistics information collection management lag, data omission, insecurity and so on. The model combined with the current popular App technology is widely applicable, strong commonality. It is not only greatly improve the efficiency of logistics system, but also analyze the statistical

processing based on this information. This model can be applied in other directions such as mobile commerce, automatic processing, commodity tracking and monitoring, real-time information monitoring, etc., which embodies the social informatization requirements of logistics industry.

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