Analysis of Intelligent Transportation System Based on Internet of Things

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Abstract: The Internet of Things is a technology that has strategic significance in the information age. The research on the Internet of Things will bring great benefits to the economy and even the entire country. In recent years, as the country's economy has grown, people are getting richer and more and more people have motor vehicles. But this has brought great pressure on the country's transportation. How to ease this pressure is a problem awaiting a solution. However, through in-depth research on the IoT technology of intelligent transportation, current problems will be effectively mitigated.

1. Introduction

In today's human life, the Internet of things occupies an unparalleled place. Its function is to connect the articles and articles to the Internet through the sensor equipment to achieve the purpose of intelligent management and control. It is of great practical significance. That is to say, the Internet of things can also be described as a network of objects and objects.

At present, China's auto market is showing an explosive growth trend, and vehicles have entered every corner of ordinary people's lives. However, problems such as traffic congestion and traffic accidents that have plagued many drivers and traffic control departments have emerged while facilitating people's travel. Transportation has gradually become the top priority for the country to consider in its development and growth. Therefore, promoting the modernization, information, and intelligence of transportation is one of the important goals of the country's development strategy. Through the effective use of technologies such as sensors, communications, data processing, networks, and information distribution, the traffic management system can achieve accurate and efficient control of the traffic system.

Aiming at the traffic data of current traffic system can only be obtained by road monitor, the driver can not get the road information timely and accurately, and traffic managers are unable to control the overall situation and other defects, and form a traffic illness. However, through the installation of sensing equipment in the car, to perceive the current road information, identify the identity of the vehicle through the chip and sending and receiving messages, summary in the system of traffic management information center using the return data, will be able to have a more effective traffic control, and to solve problems one by one.

2. Technical Feasibility

During the past few decades, the development of highway has made significant progress. However, with the rapid development of highway, the traffic problems like traffic accident, environment pollution, energy consumption are still serious, and the highway management lags far behind the road construction. How to achieve highway efficient, fast, safe is a great serious problem that not only our country but also the world faces. As the development of information technology, data communication technology, electronic control technology and computer science, intelligent transportation system has become the most effective way to solve these problems, which uses advanced technologies to build communication between vehicles and roads, so that it could improve transportation efficiency, guarantee traffic safety, improve energy utilization and environment qualities. The emergence of Internet of things provides new impetus for the development of ITS. Internet of things ITS uses some

kinds of sensor devices such as RFID, infrared sensors, GPS, sensor network technology to collect Internet, so as to make a combination of vehicles, people and roads and archive real-time, accurate traffic information collections which are basic data for rational management control and scientific decision.

3. Internet of Things Architecture

The Internet of things has three characteristics: comprehensive perception, reliable transmission, and intelligent processing. We use RFID, sensor and so on to get object information anytime and anywhere, and transmit information entities accurately through the network. Then we use various intelligent computing technologies to analyze and process data, and achieve intelligent control of objects.

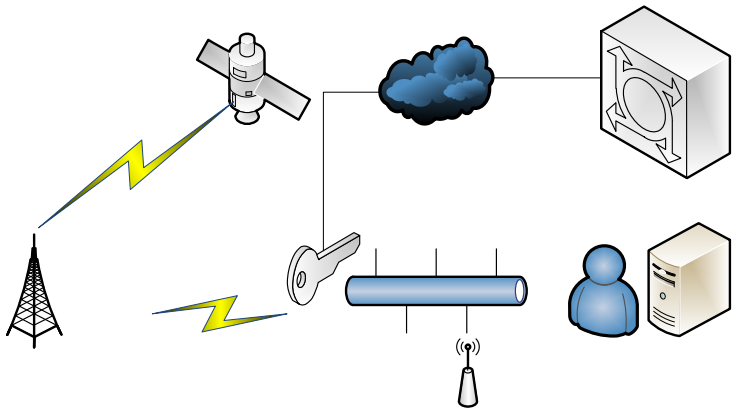

Fig. 1 Work principle of Internet of things

According to the system function, this system needs to be stable, safe and reliable; the interface design is simple and easy to operate; the information query is fast and accurate, so the overall system structure of the vehicle-mounted IoT intelligent transportation system should be divided into five modules: positioning module (Determine the geographic information of the current location of the vehicle), control module (media for positioning module and communication module operation), communication module (realize communication and exchange of information between the vehicle, monitoring and dispatching center, and user terminal), and display module (user terminal) And monitor the dispatch center), power supply module (for each function module to provide power).

In order to achieve this technology, there are three conditions to be met.

One is the technical feasibility in the intelligent traffic system, the main is to obtain the position information of the vehicle using GPS module and network module, data package according to the Short Message protocol standard, by the end of the network module settings, the packaged information to send out Short Message form. Install the designed equipment on the car, it can be intelligent traffic navigation.

The two is economic feasibility. The adoption of intelligent transportation navigation system will greatly improve the efficiency of traffic resources. As a national economic lifeline, the traffic flow is undoubtedly of great significance. At the same time, the use of intelligent traffic navigation system will greatly alleviate the shortage of human resources, and make a good number of trips.

The three is the feasibility of operation. The system must be simple and easy to understand. We can know road information and feasible route through simple operation on vehicle terminals.

After analyzing the functional requirements, we can find that the intelligent transportation system mainly consists of six modules: the main control module, the system module, the alarm module, the suggestion module, the GSM module and the GPs module. Through the interaction of these six modules, the vehicle traffic system is summarized and analyzed, so as to solve the problem of road traffic jam and improve the transportation efficiency.

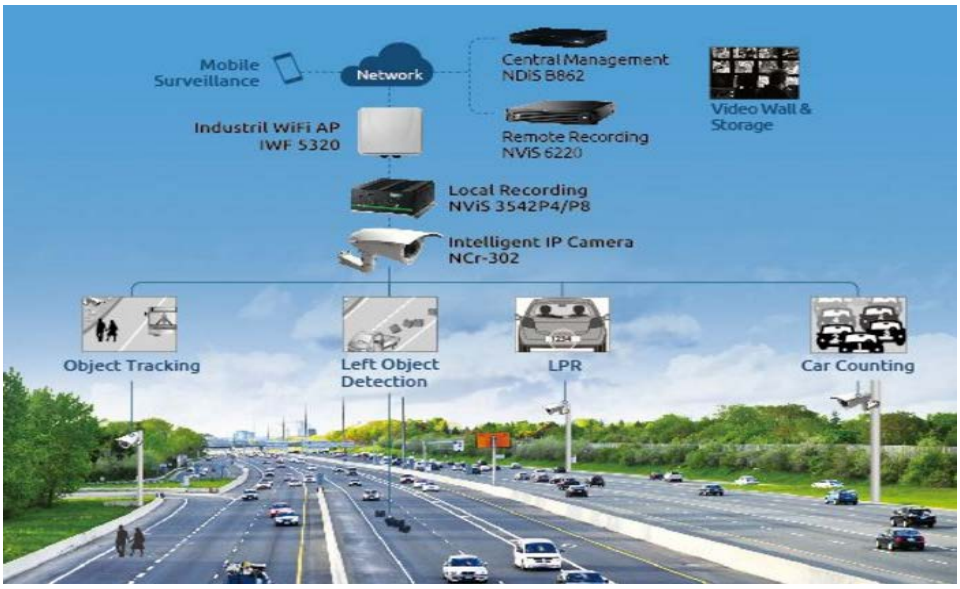

Fig. 2 Intelligent transportation system

The working principle of intelligent traffic management system based on RF1D: the course of the work in the system, the reader ((Reader) first through the information transmitting antenna to transmit encrypted data carrier signals, and these signals are transmitted to the vehicle electronic tag (TAG), which is also called the transponder (Transponder) response. Is after the corresponding identification processing circuit is activated, encrypt the carrier signal and will contain the vehicle information through the transmitting antenna, the reader will according to the corresponding sequence of receiving and interpreting data for Taiwan after application to do the corresponding processing, the system function and automatic recognition of presupposition, to realize the automation of vehicle management. As shown in Figure 3.

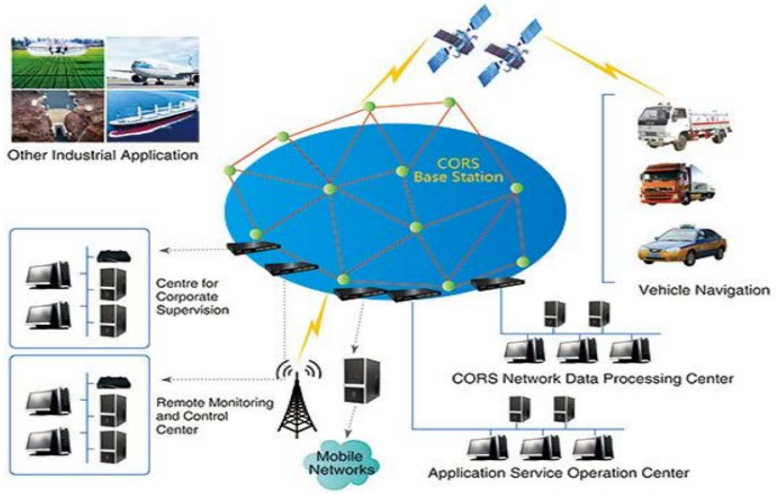

Fig. 3 Intelligent transportation system based on Internet of things

For the RFID intelligent traffic management system, each motor vehicle should be equipped with an RFID tag in the dashboard or vehicle number plate inside the car. The reader can choose to set a group of antennas every few kilometers of the main road. The reader is set on the road side, or the reader is installed directly in the highway toll lanes and traffic intersections. When the vehicle passes, The reader reads through the vehicle's license plate number and elapsed time value via the transmitting antenna, and transmits these data communications read through the wireless network, mobile network, etc., to the information center. Afterwards, the relevant vehicle and traffic flow dynamic information is calculated, analyzed and statistically back-grounded, and traffic grooming decisions can be made based on the results of data analysis and processing. A traffic light or variable sign of the road section can be adjusted in real time, and related traffic information can be released

externally.

The intelligent traffic inducing function also needs to be able to receive the inquiry function from the vehicle terminal, locate the vehicle according to RFID, GPS, etc., and combine the location of the vehicle in the network and the destination entered by the traveler, combined with the road network transmitted by the traffic data acquisition subsystem. Traffic information provides travelers with driving routes that can avoid traffic congestion, reduce delays and efficiently reach their destination. On the display screen of the in-vehicle information system, a map of the state of the road network in front of the vehicle is given, and the recommended best route is indicated by an arrow.

4. Summary

As the economy is getting better and better, the masses of the masses are the basic consumption groups of the intelligent transportation system. For the vast number of manufacturers and operators, the masses are the resources they are trying to find. The research and development of high-tech products need time. We need to adapt scientific research to the masses, so that we can generate a continuous source of power and promote technological development. With the rapid development of network technology, the transmission of information through the network will certainly become a trend. Before the trip, first through the network to plan their own trip route; after the vehicle was stolen, the location of the vehicle was inquired through the positioning device. The new era of transmission of vehicle information through the network is taking the place of the old age of manpower scheduling step by step.

The benefits brought by the network are slowly penetrating into every corner of our life. The rise of the Internet of things has provided a convenient soil for the development of intelligent transportation. Although there are many problems, such as traffic congestion and unbalance of urban development, the advent of the age of intelligence will bring a glimmer of light on it.

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