Research on Key Technology of Smart Transportation Based on Internet of Things

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ABSTRACT
Since the middle of the last century, computer has quickly occupied the market with an irresistible trend from the date of its birth. With the on-going of time, the science and technology are more and more developed. Advances in technologies of computer, communication and Internet promote human society into the Internet of Things era. In recent years, Internet of Things technology, as a new type of information technology, is rapidly penetrating into all aspects of social development. It is necessary to analyze the application of the Internet of Things in the smart traffic, accurately grasp its technical points, improve and optimize smart traffic according to the actual situation of it combined with the Internet of Things technology, to infuse fresh energy into the development of the transport system, so as to improve the traffic system, promote social benign operation, facilitate people's daily travel, and promote social sustainable development.

Key words: Internet of Things; smart transportation; key technology; research

INTRODUCTION
There is an old saying “Want rich, build a road first.” After the founding of new China, in order to revitalize China and promote economic development, the government has increased the construction of the transport network. With the on-going of time and social progress, smart transportation has become a
major breakthrough in the transportation industry. Furthermore, with the development of Internet of Things technology, smart transportation has also reached a new stage of development. It is necessary to accurately grasp the connotation of Internet of Things technology, analyze the key technology in smart transportation and optimize the transportation industry. Congestion problem is widespread in China’s transport industry, and in recent years, this problem has become more and more serious.

In order to alleviate the traffic pressure and reduce the incidence of accidents, people tend to build smart transportation, increase the analysis efforts of the smart transportation to truly realize transformation of intelligent traffic network to smart transportation, to create a new transport system and promote human society moves forward

SMART TRANSPORTATION

The Concept of Smart Transportation

The concept of smart transportation was put forward in the late 1980s. Simply speaking, smart transportation is the perfect combination of science and technology and people's wisdom. At present, people use Internet technology, Internet of things technology, cloud computing and other emerging technologies to carry out scientific planning of the transport industry, and is committed to creating a comprehensive, multi-level, intelligent transportation system in order to better serve the people and promote the healthy social operation [1].

With time going and social progress, smart transportation has become a hot topic. It is an upgraded version of intelligent transportation. At present, most cities strive to build intelligent transportation, but its own problems restrict its development. It is the proposing of smart transportation that provides a new opportunity for the sustainable development of the transport industry. Japan has study smart transportation earlier and the relevant technology is more advanced. Sweden is also actively creating smart transportation. Statistics shows that after the introduction of building smart transportation, urban traffic congestion reduced by 25%, traffic capacity increased by 50%; in addition, traffic pollution problem was effectively alleviated. China actively learn foreign experience, combined it with the actual situation of domestic urban transport in creating smart transportation. Now China has 17 regions which spend 7.805 billion to build smart transportation. With the improvement of science and technology, China is committed to building low-carbon environmentally friendly, high-tech smart traffic framework, with a view to achieving the best economic, social and ecological benefits, promote sustainable development of human society [2].
The Features of Smart Transportation

Smart transportation is the product of the development of the times and the crystallization of human wisdom. With the rapid development of science and technology, smart transportation has attracted more and more attention. Informatization, synergy, human service, intelligent decision-making are the most important features of smart transportation. It is necessary to transform traffic with high-tech, so that vehicles travel more smoothly, traffic congestion is reduced, and thus the community operate with high-speed in the rapid flow of traffic. The city will be promoted to a new stage of development [3].

INTERNET OF THINGS TECHNOLOGY

Overview of Internet of Things Technology

Nowadays human society is gradually transitioning from the Internet age to the Internet of Things age. Internet of things is evolved from the Internet, is extended from people to things to communicate and exchange information. Internet of things is a network which connects things with Internet mainly through a variety of technology and equipment, to intelligently identify position, manage and monitor according to the predefined procedures. Internet of things mainly uses information sensors, positioning systems and laser scanners to take things into network system and achieve intelligent control. At present, the technology is widely used in urban traffic to solve the problems of traffic congestion and so on.

The Application of Internet of Things in Smart Transportation

Internet of Things technology has been highly praised by people since its birth, now people mostly use this technology in urban traffic, with a view to optimizing and upgrading the intelligent traffic. In recent years, traffic congestion problem is more and more serious. In order to solve this problem, it is necessary to achieve intelligent control with internet of things and accurately predict the urban traffic conditions, to send information via multimedia equipment to facilitate people to adjust travel routes, improve road patency rate.

The Key Technology of Internet of Things

At the moment, the key technologies of internet of things are sensor technology, cloud computing, radio frequency identification technology, intelligent embedded technology and so on. Accurately grasping these technical points is helpful for better contributing to smart transportation. Sensing technology is not strange to people. As the sensory organ of electronic equipment, it is mostly used for sensing information to provide people with original information. The sensor has also been through a number of stages of development, now it is intelligent, miniaturized and informative. Cloud
computing, another widely used new technology, has ability of massive information resource processing. With very powerful computing function, it is the basis for the development of internet of things and its information storage and computing power promote the continuous development of Internet of Things technology. Radio frequency identification technology--RFID technology, often referred to as electronic tags, identify items mainly through radio signals. This technology is simple and convenient, can be operated automatically. It has strong adaptability and is currently applied to smart transportation. Intelligent embedded technology, as the organic integration of hardware system and software system, can quickly exchange information and achieve information exchange to the greatest degree.

SMART TRANSPORTATION BASED ON INTERNET OF THINGS

Now the state encourages people to choose public transport when traveling. They can cooperate with the public transport company to apply the Internet of Things technology to the buses to achieve real-time monitor. The installation of advanced technology equipment is very important. Firstly, it can scientifically detect the performance of buses, so as to remove security risks as far as possible, ensure the normal passage of vehicles and the safety of people. In addition, it can help monitoring the actual operation of the vehicles and traffic flow via sensing technology, so as to facilitate the timely notification of the traffic system. If people could get some notes of traffic congestion, they could choose appropriate ways to reach their destination early.

At present, some urban transport network in China cannot afford the huge population and their daily travel. Smart transportation, as a major breakthrough in urban transport, has attracted more and more attention. It
makes it possible to take intelligent, dynamic, systematic control of urban traffic to create a new traffic structure. Establishing the urban traffic information collection center, including collecting statistics of urban motor vehicles, uniformly controlling all the lights and installing monitoring equipment in each section to systematically monitor the urban traffic conditions, can help achieve the synergistic interaction between people and vehicles and thus promote urban traffic upgrade from intelligent transportation to smart transportation. We should actively learn the experience of western countries, reform the intelligent traffic, improve the transport service system, and build a traffic information system integrating information collection, processing and decision-making together to provide better services for people. The development of Internet of Things technology has injected new impetus into the construction of smart transportation. The traffic management system based on the Internet of Things technology, can command the decision-making organs and the public service system, scientifically control urban traffic, and effectively provide services for the people. Mobile terminals can be designed in setting up the public service system, so people can search information as needed. For example, when they input the destination, the system will automatically provide a variety of routes for people, with traffic conditions, time needed and so on to help the public to choose the best routes, so as to meet people’s travel needs to the greatest degree.

CONCLUSIONS

All in all, smart transportation, as the general direction of future development of urban traffic, is a major breakthrough based on Internet of Things technology. It is of great significance to scientifically analyze internet of things technology, accurately grasp the main points of network of things technology and apply it perfectly to urban traffic, so as to optimize and upgrade intelligent traffic to smart transportation, fully achieve the value of internet of things. The new transport mode can facilitate people’s daily travel, improve road patency rate, so as to promote social benign operation, and thus promote the human society to move forward.

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