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The impact of radio on the construction of smart cities

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Abstract. In the process of smart cities, radio technology has played an increasingly important role. With the continuous acceleration of the global urbanization process, cities are facing many challenges. Driven by the government's vigorous support and business promotion, wireless communication technology has developed rapidly, and new wireless communication technology has continued to emerge, providing more choices and possibilities for smart city construction. This article reviews and analyzes the actual case analysis, studies the impact of radio technology on the construction of smart cities, while explaining the importance of radio security management. The results showed that the application of radio technology enabled smart cities to achieve functions such as intelligent traffic management, intelligent communication, and intelligent energy management, but there were also problems such as leakage privacy, signal interference, and imbalance in regional development. In the process of future smart city construction, it is necessary to further optimize the safety and popularity of radio, promote the use of radio, narrow the gap between the use of different regions and cities, and enhance the radio management, so that it can better serve the construction of smart cities.

Keywords: Radio, Smart City, Urban Construction, Smart Transportation.

1. Introduction

Since the concept of smart cities has been proposed in 2008, it has attracted widespread attention internationally and continued to trigger the development of global smart cities. Smart cities are an important part of my country's urbanization process, and the main way to improve the living standards of urban residents [1]. With the evolution of smart cities, radio technology and applications have ushered in a great opportunity for comprehensive development. The demand for radio equipment and resources in all areas of people's production and life, and in all dimensions of urban and social management will increase day by day, especially as a result of the support of the development of the Internet of Things (IoT) technology industry and the rapid emergence of the mobile Internet, and a variety of radio applications will be accelerated to penetrate into the production and life of the city [2]. Radio has become one of the important new methods for building a smart city in recent years. It has played an important role in its construction process, but there are also defects and deficiencies. The further optimization and utilization of radio is conducive to promoting a better integration of new generation information technology such as the Internet, big data, the IoT, cloud computing, artificial intelligence, and blockchain. This article adopts a combination of literature reading, research, and practice. Through the review and summary of the relevant government bulletins and literature and the analysis of specific cases, explain the impact and existing problems in the construction of smart cities.

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2. The specific impact of radio on smart cities

2.1. The use of radio in smart cities

Radio technology and equipment are important means for the construction of smart cities. The construction and operation of smart cities are inseparable from the support of radio spectrum resources, and they are inseparable from a stable and orderly electromagnetic environment [3].

Urban communication and connections are due to the rapid development of radio technology. This technology not only realizes high-efficiency communication inside and outside the city but also closely connects the equipment and systems of smart cities. With the rapid development of the mobile Internet, the application of smartphones has become part of people's lives, and smartphones will become one of the best carriers in the smart era [2]. This radio communication network allows all departments and systems to exchange data and information in real time to achieve collaborative work.

Radio technology is an important support for smart medical care. In the medical field, radio technology can realize long-range medical and mobile medical services, allowing patients to enjoy high-quality medical services anytime, anywhere. For example, through radio technology, doctors can remotely check the patient's medical records, conduct remote diagnosis, and even conduct remote surgery. In addition, radio technology can also be used for medical first aid. Through radio equipment, emergency personnel can understand the patient's condition in real time and provide patients with timely treatment.

The cornerstone of the Internet of Things and sensor networks is radio technology [4]. This technology enables various sensors and equipment to connect, thereby collecting and transmitting a large amount of data. These data are widely used in smart cities, covering the fields of transportation management, environmental monitoring, and energy management, which effectively improve the efficiency of urban operations and the quality of life for residents.

Intelligent transportation system (ITS) is an important tool for improving traffic network management and operations by using new communication and computing technology [5]. Radio technology is the core of smart transportation. With the increasing pressure of urban traffic, how to effectively carry out traffic management and improve the efficiency of road traffic has become a major problem for urban managers. Through radio communication, the traffic management center monitors traffic conditions in real time, flexibly dispatches traffic signal lights and facilities, and provides real-time traffic information to drivers and passengers, thereby effectively reducing traffic congestion and improving traffic efficiency.. Taking Suzhou as an example, Suzhou Public Security has established a "Internet+" signal optimization mechanism. Through the smart traffic signal optimization system, when the signal is refined to the city's more than 7,200 intersections, the key intersection has an average of 10 sets of signal matching schemes to ensure that the signal matches the dynamic changes in traffic flow. Suzhou has vigorously promoted the setting of the green wave belt, and the city's green wave coverage rate reached 41.20%. Vigorously promote the management methods of lane organizations such as "joint", "variable", "tidal", optimize the time and space allocation of road resources, and add 86 "variable" and "tidal" lanes to effectively improve the intersection efficiency.

2.2. The problem of radio use in the use of smart cities

Radio played an indispensable role in promoting urban communication, links, and development, but the problems of existing cannot be ignored.

Signal interference, a question worthy of attention, because of the limited nature of radio spectrum, wireless equipment and systems in smart cities are likely to be disturbed by other wireless devices. This interference may cause a series of problems, such as decreased communication quality, errors or interruptions of data transmission. In addition, with the continuous development of wireless communication technology, the lack of wireless spectrum resources has become a factor restricting the development of wireless communication and wireless communication value-added businesses [6].

Security issues are also challenges that need to be concerned. Due to the characteristics of wireless communication, wireless devices and systems in smart cities can easily become the goal of hacking

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and data leakage. The new communication method brings convenience and also brings a series of security issues, including privacy leakage and illegal tampering. In order to protect the confidentiality and integrity of the data, security measures must be taken [7].

Especially in high -density urban areas or underground facilities, the coverage of wireless communication may be limited. This may affect the strength of the communication signal, and even cause some areas to not be covered, thereby affecting the normal operation of the smart city system.

The wireless equipment and systems used in smart cities come from different suppliers, and may adopt different technical standards and protocols. This may lead to compatibility between equipment, which increases the difficulty of system integration and management.

At the same time, it is limited by uneven development levels such as urban economy and geographical location, and the use of radio use in different regions and cities is relatively large. In areas and cities with well -developed economy, superior geographical location, and rapid development of new industries, radio technology is more developed and deeper.

3. The importance of radio safety management

Radio security is an inevitable requirement for the development of modern society and the basis for the development of modern society. Radio safety is an inevitable way for sustainable development. It must be based on the theory of security, and there must be prevention and control of radio safety. This is because security vulnerabilities may cause a large number of casualties and financial losses, and scientific methods must be used to avoid these vulnerabilities efficiently.

Radio safety management is a key means to ensure the lives, property and privacy of enterprises and individuals. The importance of radio safety management is not only to ensure social safety, but also to ensure the safety of enterprises and individuals' production, operations and business. It must be based on high quality and regulation and supervision of radio safety.

The development of radio safety must keep pace with the times to ensure its sustainable development. The management and control of radio safety is a long -term process. It must be aimed at high efficiency. It not only requires equipment intelligence, but also needs to be able to operate efficiently.

4. Suggestion

In order to solve these problems and better play the value of radio, the government should carry out overall system planning to the use of radio, to do a good job of top -level design, further improve the organizational structure, and systematically learn the experience of advanced city radio and urban construction [8].

Adapt to local conditions, adapt to the time system, expand the scope of radio utilization in the construction of smart cities, increase investment in capital, and match radio construction projects, basic platform facilities, etc., reduce the impact of external electromagnetic interference on radio Use efficiency and capacity to ensure the smoothness and quality of radio. At the same time, the development of the information industry and high -tech industries, and the transformation of traditional industries.

The construction of smart cities depends on advanced technical means such as advanced perception technology, the Internet of Things, and cloud computing, and radio is prone to privacy and security issues such as information leakage, interception or cracking of signals. More secure radio technology is required to ensure the application of radio in smart cities. With the increasing scarcity of radio spectrum resources and various radio applications, radio management is facing new problems and challenges [9].

The gap between radio use between different regions and cities. For example, Beijing, Shanghai, Tianjin and other cities that are more advanced in the use of radio use to consolidate their development advantages. At the same time, establish assistance cooperation with the development of weak areas to share experience to promote the use of radio in different regions. As for the use of the utilization of the suburbs and the city center, the functions of the radio management must be further promoted to sink to

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the grassroots, promoting the co -construction sharing and standardization of infrastructure resources, and accelerating the process of informationization and intelligent construction in the suburban area [10].

5. Conclusion

The importance of radio in the construction of smart cities cannot be ignored. With the development of smart terminals, the application of radio technology in smart cities is increasing, and radio security management has also become an important link in the construction of smart cities. During the use of smart cities, radio has signal interference, spectrum limitations, security, and imbalance in development. Strengthen radio network security guarantee to prevent radio network attacks and invasion; improve the performance and functions of radio technology, and promote the innovation and development of radio technology; formulate unified radio application standards and specifications, and ensure the legality and normality of radio applications. Improving the public's understanding and trust in radio, strengthening effective measures such as the propaganda and education of radio applications can improve the advantages of radio in the process of smart cities, bring people a better life experience, and lead the new direction of future urban development. There are some limitations in the research of this article. The research methods are mainly theoretical research, and lack of in -depth analysis of specific cases. At the same time, the professional theory of radio fields is relatively shallow, resulting in lack and imperfections in the paper.

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