The Concept, Supporting Technology and Application of Smart City

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Abstract: In the process of future modern city development, building smart city has become the direction of current development, it needs to effectively apply the Internet of things, cloud computing and other support technologies, to make our urbanization development towards the direction of information technology. This paper expounds the relevant concepts of smart city, explores several common supporting technologies at present, and systematically explores the application of smart city in the current urban modernization development, hoping that people can better understand smart city, promote the application of various technologies and equipment, and provide people with more convenient services to the greatest extent. Meet People's Daily production and living needs.

Keywords: Smart city; Digital city; Internet of Things; Cloud computing

Nowadays, urbanization is developing faster and faster, but it also faces various problems, such as; Scarce land resources, ecological environment problems and so on. It is because of the shortage of current technology that the development of energy, transportation and other aspects cannot effectively meet the needs of urban development. With the appearance of smart city, our country can effectively improve the existing problems in the current urbanization construction, serve the people better, apply the relevant support technology better, and build smart city.

1. The concept of smart city

Smart city refers to the effective combination of Internet technology and cloud computing technology in the current urban construction process to help people effectively obtain all aspects of urban resources and information and constantly meet the daily needs of urban areas. It mainly arranges and distributes resources well, helps people to further improve the overall urban management level, builds a harmonious and beautiful city for people, and effectively improves the overall living development level. In fact, before the construction of a smart city, it is necessary to ensure that the city has reached a certain level of development, has the corresponding information technology and green concept, so as to truly build a beautiful and harmonious "smart city".

2. Supporting technologies for smart cities

After investigation, we find that the supporting technologies of smart city mainly include big data technology, cloud computing technology, digital city related technology and so on. Big data technology is mainly to integrate and analyze the acquired data, while cloud computing technology is mainly to carry the application system well. In order to effectively carry out the construction of smart cities, these technologies are needed to support, so as to effectively meet People's Daily needs.

2.1 Digital city related technologies

As early as 1998, former U.S. Vice President Al Gore proposed "digital city", which actually refers to the integration of the data of the whole city, forming an information model covering the whole city, sorting all kinds of information according to geographical coordinates, so that people can better observe all kinds of information in the city, such as: Natural, human, social and so on, people can also use geographical coordinates to better search[1].

2.2 Internet of Things technology

In fact, the Internet of Things technology is to integrate the Internet and communication network, expand and extend it, and make

its application more extensive. In particular, in the construction of smart city information service system, corresponding intelligent sensing devices can be installed to perceive the physical world more deeply, effectively exert its transmission and interactive performance, and realize information interconnection and docking. As far as the current situation is concerned, the current network architecture of the Internet of Things mainly includes three layers, namely the perception layer, the application layer and the network layer.

2.3 Cloud computing technology

Cloud computing technology is actually a relatively new method of calculation, it can mainly provide corresponding services according to the actual needs of users, for example, through the mobile terminal cell phone, computer, etc., to complete the configuration of the calculation data for data sharing, and then according to the number and number of compensation users to calculate the data, do a good job of the corresponding fee operation. It mainly uses the virtualization technology, realizes the flexible management, makes the storage utilization of the cluster to a certain extent to improve. In order to effectively improve its super computing power and fast response ability, it can also use distributed storage technology and parallel computing technology to do a good job of information data calculation, storage and processing to the greatest extent. Thus, cloud computing technology can be said to provide a powerful "brain" for the construction of smart cities.

2.4 Big data technology

Big data technology mainly integrates and analyzes the collected data to form a powerful comprehensive database, including traffic information, Internet of things data, etc., which often needs to be classified and sorted by this technology to facilitate the search of the data in the subsequent use.

2.5 Broadband Internet Technology

This technology mainly constructs and transmits high-speed information, carries and transmits urban social operation and life data, such as environmental data, running status, etc., and transmits these data together to the data center for monitoring.

3. Applications that can be carried out in smart cities at present

In order to make urban development and operation more efficient and intelligent, it is necessary to attach importance to the construction of smart cities and realize the interaction between the virtual world and the real world as much as possible. At the same time, the government should also play an effective role in guiding the communication between enterprises and individuals, improve productivity and efficiency to a great extent, strive to realize intelligent development, and inject a ray of vitality into urban construction.

3.1 Security services in cities

In the construction of smart cities, the traditional passive response to accidents can be changed to automatic alarm or early warning before or during the incident, which can avoid risks to a great extent. Its security service is mainly to protect the city's public security resources, effective use of spatial information, sensor network, etc., establish the corresponding security protection system, starting from the emergency command, daily management and other aspects, to provide security guarantee for its urban development to the greatest extent. For example, the application of intelligent video analysis system can make effective use of the video collection function to analyze the video content and discover the violations in the corresponding scene in advance. At this time, the system will take corresponding measures according to the actual situation and category, and relevant personnel can take action on the alarm information in time. At the same time, the automatic alarm and first aid mechanism can also effectively provide the location of asking for help. The nearby public security, traffic police, fire department and other rescue resources can also be allocated nearby, providing people with better services and optimal solutions to the greatest extent. Commanders can also effectively give orders based on such information, remotely command and operate all departments for first aid, and minimize the damage caused by emergencies or natural disasters to people and the living environment[2].

3.2 Services for sustainable operation of urban economy

In the long run, the construction of smart cities can bring a steady flow of power to the development of urban economy and make the overall urban construction prosperous. As far as the current situation is concerned, the construction of smart cities makes the Internet of Things and various aspects of technology more and more widely applied. On the one hand, the investment in various infrastructure has been greatly increased, and the construction of smart power grid, smart transportation and other infrastructure facilities has greatly improved the economic development of other industries, and also provided more job opportunities for people. On the other hand, it can also provide convenience for urban residents to travel, greatly improve social

benefits, so that people can have more effective time to create greater value. In addition, the optimization and establishment of infrastructure to some extent will also provide development opportunities for the development and transformation of various industries in the future.

3.3 Life mass services in smart cities
3.3.1 Intelligent transportation service

At present, urban traffic management process is spontaneous, drivers need to choose routes according to their own judgment, signal signs only play the role of guidance and command. Thus, the utilization rate of Chinese urban traffic resources is not high, it is easy to appear traffic congestion and so on. With the emergence of smart city construction, the corresponding traffic facility sensors can be effectively used to collect the whole urban road conditions, such as traffic flow, weather, traffic accidents, etc., which is conducive to better understanding of road traffic information for drivers, providing the best travel route for drivers through cloud computing system, and guaranteeing travel safety to the greatest extent. At the same time, intelligent transportation can also greatly improve the efficiency of transportation, the incidence of traffic accidents will also be reduced, and energy consumption will also be reduced.

3.3.2 Personal intelligent application

After the smart city construction with good infrastructure, the Internet of Things can provide users with a variety of services, whether indoors or outdoors, to provide data support and help for users, such as: to provide people with travel information, remote communication with family video and so on. In this way, users' daily services can be greatly satisfied, providing convenient services for urban residents.

3.3.3 Urban management and service

In fact, the current city cannot live without thousands of living facilities. In order to ensure the smooth operation of urban construction, it is necessary to effectively use the collected information and data to do a good job in planning and provide better management and services for people. Once problems occur in the process of urban management, effective preventive measures should be taken according to the actual situation to ensure the quality and level of management[3].

4. Closing Remarks

In general, in order to better carry out the construction of smart city, it is necessary to take this as the goal to explore the application of technology, effectively play the advantages and roles of cloud computing technology and Internet of things technology, fully combine the actual situation of urban development, and constantly do a good job in optimization management. Only in this way can we provide people with better management and services, and make the construction effect of smart city become better and better.

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