Research Progress of Digital and Intelligent New Urban Construction

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Abstract

Smart towns are the product of a new round of information technology reform and the further development of the knowledge economy. It is an inevitable trend of the deep integration of industrialization, urbanization and informatization. It is an effective way to comprehensively solve the "urban disease" and is a sustainable Urbanization development model. From a technical point of view, smart towns are constructed through advanced technologies such as the Internet of Things, cloud computing, remote sensing, global positioning, virtual reality, and heterogeneous data integration. Towns that are more intelligent in terms of interconnection and management decision-making. Smart towns have introduced the concepts of "smart cities, smart industries, and smart sciences" into towns. Based on the ecological, networked, digital, and well-being of towns, smart towns can be built to provide urbanization with habitability, production, leisure, Work, a convenient and beautiful environment, so as to accelerate the construction of industrial towns, cultural towns, and technological towns, and promote urban economic and social progress. The smart construction of characteristic small towns is an effective carrier of new urbanization and a typical application of smart cities. Through the widespread adoption of "Internet+" solutions in towns, villages, communities, streets, development parks, schools, etc., The ubiquitous connection and full integration of people's livelihood, industry, security, education, etc. with the Internet will comprehensively improve the level of social governance, government service capabilities, economic development vitality, and the quality of life of residents, and provide strong support for public entrepreneurship and innovation.

Keywords

Smart Town; Internet+; Network Security; Smart Scene.

1. The needs of smart towns

A smart town is also a smart organism, and there are various levels of needs like people. It is not enough to have only "smart brains" in cities and towns [1]. It is also necessary to build organisms so that cities can be as sophisticated, intelligent, and closely coordinated as human bodies. Integrate the physical world with the digital world to realize the digitization of all the elements of the town, the real-time visualization of the state of the town, the coordination and intelligence of town management decision-making, and ultimately drive the intelligent upgrade of town management and services [2].

The basic connotations of new smart towns are intelligent infrastructure, refined urban management, livable ecological environment, and long-term network security. Among them, the infrastructure is based on the promotion of the integration of physical infrastructure and information infrastructure, and the construction of urban smart infrastructure. The new generation of information and communication technologies such as 5G, AI, Internet of Things, cloud computing, big data, edge

computing, and mobile Internet are used in cities and towns. The full use of various fields of economic and social development is the main line, and the maximum development, integration and utilization of various urban information resources is the core. Provide inclusive services for multiple groups and across the digital divide to the majority of smart town entities, open up the urban operation system and the public to build and participate in channels, and innovate the cooperation mechanism of government and enterprises, think tanks, scientific research institutions, investors and other multi-stakeholder parties. Build a large ecosystem that is inclusive, universal, and diverse [3].

With the massive application of information technologies such as the Internet of Things, cloud computing, big data, edge computing, and mobile Internet in the construction of new smart towns, the level of informatization of cities has been rapidly improved. Thanks to policy and industrial support, the number of smart cities in my country has also increased. Rapid improvement, data shows that by 2020, the number of smart cities under construction in my country will exceed 500 [4]. In order to avoid the effect of information islands, smart towns start with isolated system data sources for collection, integration, storage and management. Such a huge data resource relationship, information interaction and process between people, people and things, things and things, massive data collection and storage analysis, useful information mining between systems, between people and things, between people and people The connection law of the city, etc., will inevitably lead to the existence of a large number of information systems in smart towns and the generation of massive amounts of valuable information in these systems [5]. This information is undoubtedly an important strategic resource for towns and even the country.

The construction of new smart towns will be implemented in urban governance, government's urban services and management, etc. This also makes many local governments the purpose of building new smart towns. From the perspective of smart town development strategy, we must pay attention to the governance of towns, the development of residential society, the cultivation of smart industries, the transformation of traditional industries, and the smart intelligence in key areas such as innovation in characteristic towns. From the perspective of the construction path, it is necessary to use modern Internet, big data, cloud computing, Internet of Things, mobile Internet, blockchain, artificial intelligence and other new technologies to accelerate the process of urban informatization, and pay attention to the spatial layout of the city and the application of geographic information systems [6]. In this way, the comprehensive competitiveness of cities and towns will be improved, and the people's sense of convenience, security, sense of acquisition, participation and happiness will be improved. With the comprehensive application of 5G+AICDE technology, the functions of scenarios such as smart manufacturing, smart transportation, smart medical care, smart education, smart government affairs will become more and more powerful, completing the development goal of building a smart town ecosystem [7].

2. Application of smart environment

The smart industry is inseparable from the technical support of AICDE. The construction of smart towns will drive the establishment of manufacturing innovation centers or industrial innovation centers in the fields of integrated circuits, artificial intelligence, big data, new materials, etc., and promote the transformation and upgrading of regional industries, such as unmanned Lean production and digital industry models such as factories, 5G process manufacturing, equipment manufacturing, and smart manufacturing cloud platforms, improve workshop efficiency through collaborative robots and AR smart glasses, help workers in the entire assembly process, and optimize suppliers' internal and external Accessibility and transparency of data reduce logistics and inventory costs. The cloud-based network management solution ensures that intelligent manufacturing realizes data sharing in a safe environment. Innovation is the core of urban industrial development. Wisdom has been integrated into traditional industries such as manufacturing, furniture and building materials, clothing and textiles, and it has also led to the rise of a number of high-tech industrial chains such as industrial alliances and industrial parks, which can accelerate the formation and development of urban industrial characteristics. Agglomeration [8].

With the rapid development of cities, people have higher and higher requirements for living standards, higher and higher food quality, and higher and higher requirements on the living environment, especially whether the water, soil, and air are safe. Based on cloud computing, data mining and other technologies to build an environmental intelligent diagnosis platform, establish a modern intelligent community's drinking water standards, green belt soil quality and community air quality intelligent monitoring system, realize internal safety control, external information services, multi-system online analysis, and foundation Business data sharing, while providing material guarantee for the harmony of the residential environment of the community [9]. In response to the actual needs of each community, custom-developed intelligent monitoring systems for water, soil, and gas containing specific monitoring parameters are collected to collect important indicators in the life process of the community, such as the pH of drinking water, the content of soil nutrients in the green belt, and the concentration of atmospheric particles. The high-definition camera connected to the monitoring point of the community is configured to obtain real-time image information and so on.

The intelligent monitoring system can customize the collection point, collection frequency and collection parameters. With ready-made meteorological equipment, the soil condition can be monitored in real time. Equipped with a network control system as required to remotely control water, soil and gas monitoring equipment to realize the information monitoring and monitoring of the drinking water standards of the community, the soil quality of the green belt and the air quality. On-site remote monitoring equipment automatically collects real-time soil moisture data and uses GPRS wireless network to realize remote data transmission; the monitoring center automatically receives and stores the data of each monitoring point and sends it to the database. The data collected by the network environment and device status data can be collected to the smart gateway through wifi wireless ad hoc network, GPRS mobile network, ZGB wireless ad hoc network, etc. The smart gateway is equipped with independent application software and monitoring display screens, which can view the on-site environmental conditions in real time and realize monitoring visualization. At the same time, through remote environment monitoring, it is convenient for management personnel to remotely monitor the growth of crops online, so as to satisfy information management personnel for acquiring, backing up, and analyzing and processing on-site data information and image information [10].

The monitoring platform realizes the visual display of real-time environmental data and seedling situation data, and remote viewing and management of intelligent facilities. Through the platform, the environmental data warning value can be set, the system automatically warns, generates warning events, and prompts managers to manage and control through mobile phone text messages and webpage alarms for decision-makers to make appropriate analysis and decision-making.

3. Application of smart building

Regardless of whether it is a smart city or a smart town, security is a project that the government should focus on. In order to enhance the competitive advantage of smart towns, the municipal council needs to sense the pulse data sensor of the town, and also need to be equipped with high-definition video surveillance to monitor traffic flow and community safety. The camera provides real-time image information for the advancement of the construction of a happy, safe and smart town.

Wireless video surveillance can expand more effective and practical application scenarios while simplifying system deployment. Video surveillance in the 5G era is evolving into 4K full HD surveillance. Various countries and regions are stepping up the deployment of video surveillance equipment. The current density of video surveillance in Beijing is 59 cameras per thousand people.

Video image monitoring is of practical significance for smart security. While providing security, it can also improve the work efficiency of institutions. Its applicable scenarios in cities and towns include but are not limited to the following types of scenarios. The first category: shopping malls, schools, Prosperous public places such as hospitals and activity centers; the second category: commercial and financial places such as banks and securities funds; the third category: transportation

stations such as bus stations and logistics distribution centers; the fourth category: flood control facilities such as rivers, rivers, and reservoirs ; The fifth category: important infrastructure such as energy grids, telecommunications data centers, power stations, etc.; the sixth category: crime-hit areas or areas with high crime rates. Under the premise of controllable costs, the improvement of surveillance cameras' ability to collect and analyze data has stimulated the growth of demand for cameras [11].

The mainstream market for surveillance cameras currently includes 4M, 6M, and 8M pixel IP cameras. 4K resolution surveillance cameras are expected to be promoted in 2020. The latest video cameras have many extraordinary features, such as high frame rate, ultra-high-definition, and wide dynamic range cameras. These features require huge data traffic to support them. 5G technology is integrated into them to coordinate the construction of smart security in cities and towns.

Mobile operators have advantages in AI-enhanced cloud services. AI can enable computers to extract large amounts of data from images, sounds, and texts, such as face recognition, vehicle license plate recognition, or other video analysis. For example, the detection of intruders by the video surveillance system can trigger the automatic lock of the relevant access control, and control the intruder before the arrival of law enforcement personnel.

4. Application of smart logistics

With the development of urbanization and the construction of metropolitan areas, people's travel involves urban interiors, metropolitan areas, urban agglomerations, and multiple spatial circles across non-neighboring provinces, with massive populations and complex structures. Traffic travel exhibits new characteristics, namely, hierarchical travel distance, diversified travel purposes, and randomized travel from day to day. Its service carriers involve multiple modes of transportation such as expressways, urban roads, rails, and aviation, forming a multi-mode travel chain. These new features require the construction of a comprehensive transportation network.

If you want to truly open a smart dialogue between the car and everything around it, and enable more demanding, more complex, and larger data traffic applications, 5G is the best choice for infrastructure. By providing ultra-large bandwidth and low-latency networks for automobiles and road infrastructure, 5G can provide high-level road perception and precise navigation services, support frequent information exchanges between vehicle control systems and cloud systems, and reduce human intervention to achieve unmanned vehicles Driving, promoting new breakthroughs in the field of autonomous driving in China and the development of the automobile industry, and can also provide new solutions to the chaotic problem of urban traffic driving.

The external manifestation of the new smart town is the extensive use of a new generation of information technology. Its fundamental internal construction concept is still people-oriented. It is built around the organic unity of people and towns, people and society, people and nature, and people and the future. It will be advanced The integration of information technology and people-oriented construction concepts, through the construction of more convenient, efficient, and flexible application systems, continue to provide residents with high-quality public services.

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