Research on the Development Direction of Modern Urban Planning and Design under Smart City

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Abstract—At this stage, the overall progress of China's urbanization process is relatively rapid, and the construction of smart cities has also received great attention. Information technology has begun to be integrated into urban development, which makes urban construction move in a new direction. In the information age, a variety of advanced technologies have brought rich elements of the times to the development of cities. This not only greatly alleviates the urban diseases highlighted by modern cities, but also speeds up the pace of urban planning and development, making planning and design solutions extremely feasible, and demonstrating the reference value of informatization to urban planning. Under the concept of smart city, how to realize scientific and reasonable modern urban planning and design is a problem that needs to be further explored. Enterprises should make the overall direction of planning and design clear and effective, and build a benign and healthy city construction based on actual conditions, keeping up with the trend of the times.

1. INTRODUCTION
Based on the development of cities in my country, smart cities have become the mainstream direction. The new development model of information integration not only brings creative thinking to the development of the city at all stages, but also brings momentum to the steady progress of the city's economy. In the new era, a smart city is a new product of an effective combination of the rapid development of information technology and the sustainable advancement of the city. With the support of advanced technologies such as the Internet of Things, artificial intelligence, and cloud computing, smart cities have enabled Chinese cities to move toward a new type of smart cities, realizing digital China's construction. This can also speed up the start of a new journey, which is an important measure to effectively enhance China's overall strength.

2. DEFINITION OF SMART CITY
Smart cities are based on the development of past cities and combine advanced technologies such as the Internet of Things, cloud computing, artificial intelligence, and big data with cities to a great extent. It can make use of various communication technologies to make city management more scientific. The Internet of Things is the general direction of urban development in the global environment. It can not only bring the promotion effect to the national economy, but also make the overall level of science and technology reach a new high [1]. In essence, smart cities rely on new and diverse technologies to bring help and support to the advancement and management of the city. It can meet the different needs of
people in various periods and greatly improve the overall quality of urban life. Meanwhile, it also fits with the sustainable forward concept that China has always advocated, bringing new approaches to city management. It can open a new chapter in the development of urbanization through the construction of a new type of city, allowing the country and the city to move forward together. It is a new ecology in iterative evolution.

3. THE DEVELOPMENT CHARACTERISTICS OF CHINA'S SMART CITIES

3.1 The Emergence of New Formats and Models

China strives to minimize the gap between the rich and the poor in society, thereby accelerating the process of urbanization at all stages. China's urbanization rate has reached 60.6% in 2019. At the same time, the planning and design of modern cities under the smart city concept is becoming more and more feasible, which can combine informatization and urbanization accordingly. It also has the effect of promoting industrialization, and it can alleviate the problems of transportation resources, medical treatment and environmental protection under the trend of population concentration. In the new era, China learns from Japan, South Korea, Europe and the United States and other regions' technology and smart city construction plans, and actively explores them. China has built a cluster of smart cities, surpassing many countries (as shown in Figure 1). In recent years, China's smart city construction has maintained a rapid growth of more than 30% and has shown stability. Among them, smart government affairs and smart logistics occupy a relatively large share in the market, and have gradually moved towards the "silver economy". In the meantime, the smart home has begun to enter the next round of development, and smart medical care has also become the focus of the follow-up (as shown in Figure 2). In addition, smart cities also bring new business opportunities. New business formats and different models are showing a large number of emerging trends. The Internet industry is competing for layout and striving to seize the commanding heights of various industries in the new era. For example, Internet companies such as Tencent and Baidu have led traditional companies to move forward. Simultaneously, this can also speed up the advancement of startups such as Xiaomi and Cobos, and then make the smart city industry model and layout present a new type [2]. With the common progress of various enterprises, the planning and design connotation of smart cities has been further improved, which has also greatly expanded the service extension of smart cities.

Figure 1. Statistics of the Proportion of Smart Cities under Construction in Major Countries and Regions in the World
3.2 Industry Reform Continues to Improve
At present, the provincial and municipal governments are adhering to the new forward concept and attach importance to the construction of smart cities at all stages. At the same time, provincial and municipal governments have also begun to conduct in-depth analysis and research on modern urban planning and design, and increase overall investment. Provinces and cities link the advancement of the city with the development of regional science and sustainable advancement. In this way, it not only provides sufficient financial support, but also provides the required talents with administrative coordination methods, so that the reform trend of various industries continues to improve [3]. Due to the differences in the construction of smart cities in different cities, the modern urban planning and design schemes are also different, but from an overall perspective, they are "rules to follow." We need to formulate corresponding support policies based on the overall situation of the city and the development strategies of each stage, and introduce preferential conditions that meet the needs of smart city planning and construction. This will help make the planning direction and management approach clear and effective, so that the advancement of smart cities, the reform of various industries, and the overall development strategy of the city at different stages can be unified to a great extent.

3.3 Industry Presents Integrated Development
The forward needs of different business fields are different, and the urban planning and design under the smart city should consider them. The construction of a smart city should start from the upstream design, so that the research and development of technology, product production and manufacturing gradually extend to downstream users and consumers, and achieve vertical expansion [4]. At the same time, modern urban planning and design should also move towards horizontal development, that is, business expansion based on important areas such as smart healthcare, smart tourism, e-government, and smart transportation, so that smart agriculture, industrial interconnection, and factories can present the industrial chain Out integrated development. In all links of the industrial chain, urban planning and design should also integrate network communications, system integration, hardware equipment manufacturing, operation services, and information services to a great extent. This allows related companies to collaborate and promote the in-depth integration of multiple industries and fields, so that the entire industrial chain can operate effectively. This also makes the economy present a trend of continuous advancement, highlighting the characteristics and feasibility of modern urban planning and design under smart cities.
4. THE CONNECTION BETWEEN SMART CITY AND MODERN CITY PLANNING AND DESIGN

4.1 Smart Cities will be Reflected in Modern Urban Planning and Design
The construction of smart cities can bring new directions of transformation to modern urban planning and design, and reform the use of urban space. It can effectively alleviate the contradiction between space utilization and urban planning concepts. In the new era, the planning of modern cities needs to do the following two aspects. The first is to combine and display the conceptual value, urban functions, and quantitative development of smart cities to make the space utilization plan more feasible. The second is to transform the traditional planning concepts, so that the modern urban planning and design under the smart city focus on intensive, so that the urban space system can be healthy and sustainable. Besides, the conceptual value of smart cities can be demonstrated to a great extent through urban planning and design. This has almost brought theoretical support to the formulation of urban planning in the new era, and can also effectively improve public participation. This will also help make the governance of modern cities more scientific, public power more transparent, and support from the public, and make the entire process of urban decision-making public.

4.2 Smart Cities Demonstrate Important Value in Modern Urban Planning and Design
In the long-term development, urban planning theory has been greatly improved. It can not only absorb traditional modeling experience and the characteristics of smart cities to meet the life needs of urban residents, but also expand the economic benefits of the city [5]. Based on this, smart cities can effectively and effectively extend the forward goals of urban planning, and bring impetus and correct directions to the development of urbanization under a complete planning system. At this stage, a large number of rural people have begun to flow into the cities, and the urban infrastructure is slightly insufficient, and the housing prices in the cities are also high. The planning and design of modern cities is difficult. These conditions have a decisive effect on the political ecology of the city, and the theory of urban planning will also affect the economic ecology. In other words, the core of modern urban planning theory is the development of smart cities.

5. PRINCIPLES OF MODERN URBAN PLANNING AND DESIGN UNDER SMART CITIES

5.1 Scientific
When planning and designing modern cities, provinces and cities need to take into account the economic system at all stages of the city, education and housing. This can ensure public safety, improve the overall visibility of the medical system, and demonstrate the science and balance of the design plan. Because housing security, the improvement of public facilities and traffic radiation are the basis for realizing equality and reciprocity in life, it can also be described as the key to urban planning.

5.2 Predictability
In order to meet the various needs of urban residents, urban planning must adhere to the principle of foresight, and collect the required data through scientific methods, advanced tools and more systematic methods. Provinces and cities should use scientific and rapid integration and analysis, and compare and display with the help of big data, so that planning content, market capital and residents' needs can be matched. Provinces and cities should also make the public power supervision mechanism more perfect, and at the same time consider some of the needs of the surrounding small cities, showing strong foresight.

5.3 Sustainable
In the construction of smart cities, the sustainability of urban planning is a key link. In the new era, smart cities must complete subsequent planning based on the existing urban space system. As a result, all provinces and cities should ensure that the infrastructure and the original construction are effectively coordinated to make the planning and design highly feasible and stable. If different new problems arise
in the advancement of the city, modern urban planning and design will not be greatly affected. This can maintain the safety of the city at all stages and make the city move steadily.

6. MODERN URBAN PLANNING AND DESIGN DEVELOPMENT AND CONSTRUCTION MEASURES UNDER SMART CITIES

6.1 Inject All Kinds of Fresh Elements
The previous urban planning concepts have become slightly obsolete in the new era, and provinces and cities need to inject various fresh elements into their planning and design. However, to ensure that it is consistent with the forward direction of smart cities, it must not be blindly designed, let alone generalized, it must be individualized and targeted [6]. For this reason, modern urban planning and design under smart cities must scientifically consider the actual local conditions and regional planning, and complete the design according to local conditions. Specifically, first of all, provinces and cities must master the overall direction of the plan. For example, the residential environment, community, medical and teaching areas are clarified, their functions are also distinguished, and the planning scheme is refined. Secondly, all provinces and cities should complete practical functions such as traffic management, industrial parks, municipal planning, and urban greening to a great extent. Through the integration of all kinds of fresh elements, it is possible to ensure that the urban planning and the smart city concept are combined to a great extent, out of the spotless traditional concept. In this way, urban construction can keep pace with the times and keep up with the trend of the times.

6.2 Pay Attention to Infrastructure Construction
In the construction of smart cities, the construction of infrastructure is particularly important. Because smart cities must be based on multiple infrastructure constructions in the early stage to ensure the integration with the application of information technology and complete the sharing of information. Smart cities can build a systematic and comprehensive smart network through big data, Internet and other technologies, and use them in subsequent city construction. For this reason, cloud computing, mobile networks, and the Internet of Things have begun to merge and form an integrated platform. In this way, all the data generated in the advancement of the city can be collected comprehensively and accurately, and the required data can be obtained after scientific integration and calculation, which can be combined with the needs of modern urban planning and design of smart cities. This will help to complete the regulation and control of the city's operation, and also enable multi-angle analysis to ensure the feasibility of urban planning. This can not only make the city's command more comprehensive, but also make the city management model more refined. In addition, it combines the construction of basic design with the development strategy of each city to achieve simultaneous progress.

6.3 Sort out the Main Business Needs
Different regions in China have different economic levels, and there are also differences in the direction of people's livelihood work. When various provinces and cities carry out urban master planning under the smart city, although they should learn from new planning ideas, they should pay attention to the actual needs and priorities of the region to complete the planning. When planning and designing cities, provinces and cities should concentrate on dealing with key issues needed in construction, so that smart cities can show different characteristics [7]. Besides, in the planning process, provinces and cities should stand in the perspective of building smart city clusters and explore effective connections with the urban planning of surrounding provinces and cities. In this way, the industrial advantages can be complemented to a great extent, and the joint advancement in the construction of smart cities can effectively enhance the comprehensive competitiveness of the region. It is worth mentioning that city planning should sort out the main business needs. This helps to build a corresponding technical architecture system, for example, service subject requirements (shown in Figure 3), application demand
analysis (shown in Figure 4), main technical service design, and classify urban planning from strategic goals start with the vision of the city forward.

![Figure 3. Schematic Diagram of the Needs of Smart City Service Entities](image)

![Figure 4. Hierarchical Characteristics map of Smart City Application Requirements](image)

6.4 *Arrange the Project Schedule Reasonably*

Modern urban planning and design schemes under smart cities cover a lot of content and should be carried out in a focused manner. In the meantime, the planning and design of smart cities should be completed in stages to avoid repeated construction. This is also the key to the construction of smart cities. Three stages can be designed according to the content of the plan. The first is based on the construction of people's livelihood services, information and communication facilities, planning broadband networks, big data platforms, public portals, etc., so that the public support system has been greatly improved [8]. Simultaneously, attach importance to application-oriented projects such as smart transportation and medical care, so that the overall water body for convenient services can be effectively and effectively improved. Because the economic growth in the previous urban planning has
not made a fair distribution of transportation resources and other resources, we must incorporate green travel in the planning and design of smart cities to make the framework of roads more integrated. This can highlight the connotation of the smart city concept, make transportation planning extremely inclusive, and ensure that the structure of urban operations is more scientific and reliable.

6.5 Hierarchical Planning of Urban Construction
In the new era, to do a good job in urban planning and design, provinces and cities must proceed from a strategic point of view, so that the characteristics and natural endowments of cities can be displayed to a great extent. In this way, the level of intelligence can be changed layer by layer, and the level of intelligence can be raised to a new height. As for the planning of the new urban area, provinces and cities should highlight their late-comer advantages, and through refined planning, relying on advanced ideals and creative thinking, the city can leap forward to a higher level. For established cities, provinces and cities should consider the law of their advancement, change the past development model under the premise of environmental pollution or resource sacrifice, and make planning more long-term. To this end, all provinces and cities should plan for urban construction at different levels. First of all, provinces and cities need to build high-level provincial-level smart cities. Secondly, provinces and cities should build prefecture-level smart cities that integrate urban and rural areas. Thirdly, provinces and cities should show unique county-level smart administrative regions. Fourth, provinces and cities should build smart cities that require innovation zones that cover new technologies and new spaces, so that new models can be implemented in new cities and new areas, so that the management of new areas has extremely high service utility.

6.6 Improve the Planning Evaluation System
In recent years, the pilot work of smart cities has achieved certain results, and the Chinese government has also released relevant dividends accordingly to attract this investment. In 2018, technology investment was 20.053 billion U.S. dollars, and technology investment in 2019 has reached 22.879 billion U.S. dollars, an increase of 14.09%, and showing an upward trend year by year (as shown in Figure 5). In the new era, if the construction plan is to be highly coordinated, all provinces and cities must effectively integrate their business and applications, but they cannot do without the improvement of the evaluation system. When planning and designing a city under a smart city, all provinces and cities should take service as the main line, starting from local construction and moving towards the overall situation, led by the government. At the same time, all provinces and cities should actively seek cooperation with enterprises to achieve coordinated transformation. This will also help to achieve cross-regional, cross-business and cross-level integrated smart development, greatly enhance the maturity of smart cities, and enhance the happiness of citizens in urban life. With the improvement of the planning evaluation system, city planning should learn from the "Internet of Everything + City" plan, and simplify offline business processes through the Internet, artificial intelligence, 5G, and the Internet of Things. This can not only integrate the development of the city, but also increase the transparency of society. Furthermore, this can not only effectively solve the problem of information asymmetry, but also reduce the difference between regions.
7. CONCLUSION
The construction of smart cities has become a necessary trend in world development in the new era. China is adhering to the advanced concept of sustainable development to accelerate the development of modern cities and gradually transform them into smart cities. China has combined advanced technologies such as Internet technology, intelligent perception, information technology and big data to a great extent not only to bring convenience to people's fast-paced work and life, but also to bring people new life patterns and ideas. Under a virtuous cycle of development model, through scientific and reasonable modern urban planning and design, China strives to raise the level of urban management to a new level through smart means. In this way, the overall comfort of the city can be improved, and the original productivity of society can be greatly improved. In addition, the production model has also been effectively and effectively optimized in smart cities, which is bound to accelerate the pace of the city. In this way, the construction of smart cities and the social economy can develop together, creating a new win-win situation.

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