

## Application of Big Data in Smart City Research and Planning

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**Abstract:** with the Development and Progress of the Times, Urban Planning and Construction Should Also Keep Pace with the Development of the Times, Reflecting Strong Characteristics of the Times, Specific Regional Characteristics and Unique Cultural Atmosphere. with the Support of Modern Information Technology, Big Data Technology is Widely Used in Urban Planning and Construction. At Present, Many Fields Use Big Data Analysis and Statistics to Plan the Development Direction and Way of the City Itself, and the Intelligent City Cannot Be Separated from the Support of Urban Planning and Other Information Content in the Development Process, So We Should Use Big Data Technology to Build the Smart City, So as to Continuously Improve the Level of Urban Construction, Create a More Comfortable and High-Quality Living Environment for People, and Promote Urban Construction the Overall Development of the Design.

### 1. Introduction

Be Advised That Papers in a Technically Unsuitable Form Will Be Returned for Retyping. after Returned the Manuscript Must Be Appropriately Modified. with the Continuous Expansion of the Application Scope and Depth of Information Technology, Urban Planning Business Has Realized the Effective Integration with Big Data, Making the Quality of Urban Planning Significantly Enhanced[1]. the Arrival of Big Data Era Creates Conditions for the Construction of Smart City. in the Process of Intelligent Construction, It is Necessary to Give Full Play to the Advantages of Big Data, Reduce the Disordered Consumption of Resources and Environment by Means of Big Data Analysis, Avoid the Expansion of Space Machinery, Realize the Scientific Planning of Urban Construction and Rational Use of Space, Ensure That Big Data Provides Strong Data Support for the Construction of Smart City, and Promote the Development Pace of Smart City.

### 2. The Significance of Smart City Construction under the Background of Big Data Era

Please remember that all the papers must be in English and without orthographic errors. The arrival of the era of big data provides new assistance for urban planning and construction. Under the new economic normal, we need to grasp the development opportunities in the era of big data and realize the construction of smart city with various high-tech information technology means. Smart city is the only way for sustainable development of a city. In the process of building smart city, we should give full play to the advantages of big data technology, take society, environment and management as the core elements, build a modern city characterized by green, healthy and benefiting the people, and make full use of big data technology in every link of smart city construction to provide services for the people[2]. For example, in order to alleviate the environmental pollution and energy crisis caused by urban construction and ensure the sustainable and healthy development of urban construction, we need to use big data technology for scientific and reasonable planning to realize the scientific allocation and effective use of urban space[3] Because big data technology is widely used in every field of smart city construction, such as smart transportation, smart education, smart healthcare and other aspects of city construction, big data should be used as the smart engine of smart city in urban planning, and targeted planning and design should be carried out in combination with urban construction objectives and construction standards, so as to maximize the application of big data technology Value, to promote the level of

urban planning to a new level of development, to achieve the goal of sustainable economic development in China.

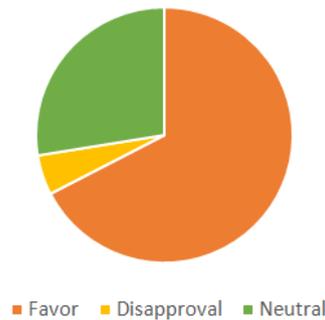


Fig.1 Research and Plan Approval in the Context of Big Data.

### 3. The Role of Big Data in Smart City Research and Planning

#### 3.1 Clear Direction for Urban Planning

The proposal of smart city is to adapt to the actual requirements of the rapid development of our country's economy and construction, and it is also the main direction of our country's future urban development and the forerunner of smart transportation[4]. At present, with the rapid development of big data technology in our country, emerging technologies, new products and new services based on big data are constantly emerging, and big data can continuously promote the rapid and sustainable growth of information industry. On the one hand, in the field of hardware and integrated equipment, big data technology will also have a very significant impact on the chip and storage industry. In addition, it will give birth to the emerging market of integrated data storage server and memory computing. Big data is a new engine for the sustained and rapid growth of information industry. New technologies, products, services and formats for big data market will continue to emerge. In the field of hardware and integrated equipment, big data will have an important impact on the chip and storage industry, and will also promote the market of integrated data storage processing server and memory computing. On the other hand, in the field of software and service, big data also promotes the rapid development of data processing and analysis, data mining technology[5]. Therefore, big data technology can provide a clear development direction for the research and planning of smart city, let more people understand the real meaning of smart city, and lay a solid foundation for the construction of our country's cities and the scientific planning of transportation.

#### 3.2 Provide Technical Support

“Big data” technology can surpass a single data source, as a collection of massive data, and “big data” provides a lot of perspectives to understand each information, so that the value of relevant information can be maximized and displayed incisively and vividly. The application of “big data” in the research and planning of smart city will become a new, more convenient and fast urban development direction, which breaks through the limitations of urban construction mode. It not only has low cost and high efficiency, but also has high practical value.

The research and planning application of big data in smart city is conducive to making urban planning and development more accurate and improving the efficiency of urban development[6]. Big data has the characteristics of large amount of information, wide sources of information, fast data processing speed and diverse nature of existence, while the large amount here refers to the huge amount of data, mainly in terms of big data storage capacity and calculation, according to IDC's “Digital Universe expansion” and the statistical data in 2010 growth prediction of global information, it shows that the global digital information produced every year in 2006 A total of 161000pb, 3000 times the total amount of information generated in the historical books; up to 2018, the total amount of digital information reached 988000pb[7]. Therefore, in the era of big data, it is

necessary to upgrade the existing data storage system, establish a larger level of database, so as to collect more massive information, and provide reliable and comprehensive reference data and technical support for the research and planning of smart city.

#### 4. Application of Smart City and Big Data in Planning and Construction

##### 4.1 Data Center Construction Planning Based on Big Data

Data center is the basic guarantee for building a smart city, and the construction of data center cannot do without the support of big data[8]. The construction of data center is to integrate the resources of big data Internet of things, Internet, cloud computing and other modern information technologies, so as to build the basic information platform of big data. Collect and transfer the data information of existing departments in urban planning and construction to the government data service platform with standard interface and authority control based on big data framework, professionalize it and share and disclose it in a controlled way. Relevant government departments manage relevant data in a unified way, providing a platform for data docking and fusion between different departments, so as to provide data support for urban planning applications. With the help of data center, we can carry out selective and controlled data development for the society, expand the field of industrial development, and contribute to the growth of urban economy.

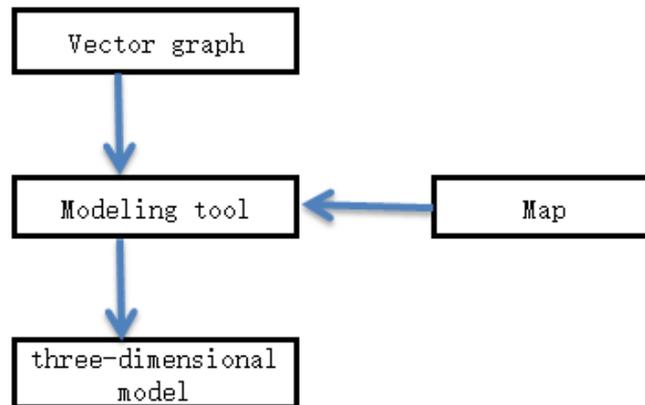


Fig.2 Plan Flow Chart.

##### 4.2 Application of Big Data in Smart City Spatial Planning

Based on the information technology, it can realize the reconstruction of urban spatial system, so as to meet the needs of urban development[9]. The application of municipal decision and management. Help the government to establish e-government system and build a bridge between the people and the government. Through the big data platform, people can not only understand the relevant policy information of the government, but also communicate with the direct government in the terminal application and participate in the policy making. Improve resource utilization. To create a big data center in urban spatial planning can fully understand the traffic and logistics situation of the city at different times and places. With the comprehensive information platform created by big data, you can always understand the traffic signal and traffic command system of each intersection of the city, and check the data and information of the logistics distribution center, logistics transportation center and other institutions, and according to the logistics traffic Dynamic adjustment is made to realize efficient utilization of urban land and traffic resources. Use big data to reasonably plan urban spatial capacity and population development trend. After the state fully liberalizes the two child policy, taking into account the growth of urban population in the future, we use big data to analyze the future urban land use and population expansion, and estimate the resource carrying capacity of each unit in the urban area, so as to ensure that the spatial capacity of the smart city is in line with the population development trend.

### **4.3 The Application of Big Data in the Establishment of Rationalized Multi-Dimensional Collaborative System**

In the process of planning and construction of smart city, multiple departments need to work together and cooperate closely. In the process of applying big data, different departments have their own standard system. At the same time, under the influence of administrative management, it is easy to cause problems in urban planning and construction. For example, there are many participants in urban planning, which is likely to cause problems such as confusion of planning system and insufficient data protection, and the overlapping of urban planning content and planning system, which seriously affects the efficiency and quality of smart city planning. In addition, the planning and construction of smart city should comprehensively consider the geological conditions, natural conditions and other factors of the construction area. These massive basic information can produce more reasonable planning and research results only through the analysis and sorting of big data. At the same time, with the support of high-tech information technology, the system standards of different departments are unified, and the principle of multi compliance is followed. Based on the comprehensive analysis of the original urban planning guidelines, the optimization and innovation of urban planning guidelines are realized, and then a coordinated development mechanism is established.

### **4.4 Application of Big Data Resources**

In the planning of smart city, we should not only reflect the spatial advantages of urban planning, but also realize the scientific allocation of human resources. In the overall planning of smart city, relevant management departments need to integrate talents, technology and other related resources in combination with the needs of urban planning, so as to provide technical support for the planning and construction of smart city. In the current era of big data, relevant departments should deeply explore the convergence point between self media and smart city planning, give full play to the application advantages of self media technology in smart city planning, so as to create conditions for its scientific development.

## **5. Conclusion**

In urban planning, the perfect integration of smart city and big data technology has injected more scientific and technological content into the urban planning business, improved the efficiency of multi department cooperation, and guaranteed the quality of work. Based on the characteristics of smart city, such as diversity of elements and strong information mobility, only by virtue of the advantages of big data technology can we collect, sort out and accurately analyze and calculate massive engineering planning data, and then provide accurate data reference for urban planning decision makers through a series of intelligent processing, which can not only promote the innovation of business and working methods related to government functions Transformation, at the same time, can make the business process of urban planning more efficient and reasonable, and create favorable conditions for the realization of information sharing among various core systems of the city.

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