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Application Strategies and Fields of Digital Technology in Urban Public Service Resource Allocation

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Abstract. This article discusses the application of digital technology in the allocation of urban public service resources, emphasizing the importance of big data, the Internet of Things, and artificial intelligence technologies in improving the efficiency of resource matching. In the field of transportation, by setting up sensors and monitoring equipment, establishing regional traffic information exchange platforms, intelligent traffic light systems, and real-time dispatch systems have effectively alleviated traffic congestion and optimized the allocation of public transportation resources. In terms of public health, digital technology has improved the efficiency of medical resource scheduling, especially in responding to sudden public health events, by real-time monitoring and dynamic assessment of medical needs, ensuring public health safety. Public safety management has achieved comprehensive urban security through digital monitoring systems, with intelligent monitoring platforms automatically identifying abnormal behaviors in areas with high crime rates, enhancing the accuracy of police force strikes and prevention capabilities. The intelligent supply of public sports resources has improved the health levels of residents through personalized services, using digital technology to collect residents' health data and exercise needs, formulating personalized exercise prescriptions, and achieving scientific management and digital supply. The article concludes that with the continuous advancement of digital technology, the management and optimization of urban public service resources will become more efficient and accurate, promoting a comprehensive upgrade and intelligent development of the urban public service system.

Keywords: Information technology, Urban services, Resource scheduling, Intelligent monitoring, Big data processing.

1. Introduction

With the deepening of modernization, the size of urban permanent population and urban volume have been greatly expanded, and the urban system is generally facing greater population pressure. The resulting shortage of natural resources and social resources and the fragility of ecological environment have become important issues at present, and the increase of service supply density required by public services within cities has therefore become the main trend that cannot be ignored in the current urban public service field[1]. With the end of the incremental era and the initial construction stage, the urban layout of most cities has been finalized, and the total amount of public service resources maintained has basically reached a stable state[2]. Therefore, the efficient allocation of existing public service resources will be the first choice to improve urban living standards and service capabilities.

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At present, the supply of public service resources in many cities still stays in the fixed and mechanical mode left over from the era of urban scale increment, lacking the real-time follow-up ability of digital technology on the population structure, flow dynamics and subsequent demand changes of surrounding citizens, which cannot well meet the increasing quality of life needs of urban residents and the expanding total demand types, and there are many waste of resources[3].

Therefore, it has become an important research direction to use digital technologies such as big data, Internet of Things, and artificial intelligence to achieve efficient allocation of urban public service resources and improve resource utilization rates and service levels.

The way digital technology participates in urban public services is to efficiently connect the supply and demand sides through massive data and calculations, achieve more accurate matching, and make the limited stock resources more efficient[4]. At present, the expansion of big data and the development of Internet of Things technology have effectively improved the feasibility of guiding the efficient and accurate connection between the supply of urban public service resources and the needs of citizens. Big data technology provides the possibility for cities to collect and process a large amount of data from all parts of the city and obtain valuable information from it. However, the extensive use of Internet of Things technology makes the supply of urban public services with high degree of informatization become a reality through the extensive use of integrated sensors, radio frequency identification and Bluetooth[5].

The research theme of this paper is to deeply summarize and analyze the key role of digital technologies such as big data, artificial intelligence (AI), and Internet of Things (IoT) in optimizing the efficiency and accuracy of urban public resource allocation and the various paths of their application. Under the background of accelerating global urbanization, cities are facing increasingly complex problems of resource allocation and service supply[6]. Especially under the circumstances of growing population, resource shortage and increasing pressure of urban system operation, how to efficiently and accurately allocate limited public resources has become a core challenge for city managers to solve urgently.

2. Methodology

Big data and Internet of Things technologies are the most common forms of digital technology participating in the supply of urban public services.

The application mode of the former is mainly to establish a unified big data sharing platform. Through a standardized and unified urban data system, all data collected through various sensors are uniformly served to all subsystems within the city according to the use rights. First of all, it is necessary to break through the barriers between many subsystems from the data level, integrate equipment detection data, data from various fields, camera video, Internet data, etc., and improve the closeness and timeliness of data interaction[7]. Secondly, it is necessary to establish data standards to lay the foundation for integrating multi-source data fusion analysis from many channels, and to classify a series of data generated in urban production and living actions, including data aggregation, data model, quality evaluation, and data application, into a common data standard system. Finally, a multi-dimensional data circulation system is established to integrate and analyze the aggregated data according to different types, levels and topics, and build a complete city indicator system, which can not only describe the overall situation of the city in real time, but also support the refined management and intervention of the city[8].

The application method of the latter is based on making full use of Internet of Things technology to integrate various information sensing devices such as cameras, environmental sensors, GPS, etc., and integrate various data generated on the demand side, connection side and supply side in the process of urban production and life. Integrate into a huge dynamic intelligent sensing neural network. Then, by combining image, voice, fingerprint, RFID and other technologies, automatic data collection can be realized, the collection workload can be reduced, and the human resources needed in the fields of management and statistics can be saved.

At present, the smart platform that has been put into small-scale use in some cities is the product of a high combination of big data technology and Internet of Things technology, effectively breaking

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through the time and space constraints, and showing excellent performance in collecting data information around the clock, mining data cores, and analyzing changes in service demand[9]. The service decision-making mode of algorithm replacing experience has also promoted the rational allocation, instant supply, and instant advancement of business processes in urban public service resources to a certain extent, thereby providing a public service system with higher informatization, accuracy and service efficiency.

3. Key areas of urban public service resource allocation

3.1. Traffic resource allocation

The transportation system is the artery that maintains the operation of the urban system. Efficient and accurate allocation of public transportation resources and the supervision and guidance mechanism of the transportation system can effectively improve the internal ecology and personnel circulation capacity of the city. While fully meeting the commuting needs of citizens, it also makes the connections between various parts of the city closer.

At the specific application level, information can be collected and disseminated by extensively setting up sensors, monitoring equipment, and building a large-scale regional traffic information interaction platform. By sharing data such as road conditions, the distribution of public transportation resources such as taxis, buses, and subways and specific location information, residents decision-making ability in solving commuting needs and the regulation and command ability of housing-related departments can be improved. Based on big data analysis, the intelligent signal light system can dynamically adjust traffic signals to alleviate congestion during peak traffic hours. At the same time, with the help of mobile applications, residents can get the operation of public transportation in real time and make more reasonable travel choices. Traffic management departments can also optimize the scheduling of buses and subways based on big data analysis to achieve efficient allocation of traffic resources. Through these intelligent dispatching methods, vehicle idling rates can be effectively reduced, carbon emissions can be reduced, and commuting efficiency can be improved.

3.2. Public Health Resources and Risk Management

Public health is an important field of urban life, which is closely related to the safety and health protection of urban residents lives and property.

The efficient dispatch of public health resources located in the city and the supervision of possible public health safety risks or ongoing public health events in various areas within the city are two very important parts in the field of public health, and they are also the most important parts in this field[10]. Two links suitable for digital technology intervention. Relevant data and distribution status can be collected through mobile smart devices and online medical service reservation platforms, and public health safety can be ensured by analyzing and processing the obtained information to dispatch medical resources in real time or carry out health risk management and control. Especially in public health emergencies such as epidemics, intelligent platforms can monitor patient data in real time, dynamically assess medical resource needs in different areas of the city, and achieve accurate allocation[11]. At the same time, by monitoring residents health data, potential public health risks can be identified in time and effective measures can be taken to avoid the spread of the epidemic.

3.3. Public safety and police allocation

Urban public safety refers to the basic public services provided by social and social administrative agencies to prevent and deal with various public safety incidents, accidents and disasters, protect residents lives and property safety, and reduce social harm and economic losses.

Urban public safety is also an important field for urban residents to consider urban human settlement index. Accurate and efficient urban public safety service rationing has positive significance for maintaining urban harmony and stability. With the continuous expansion of the scale of cities, the scale of administrative governance of cities has also increased substantially, and the public security problems

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that occur in cities every day are increasing and scattered, which greatly increases the difficulty of governance. However, due to financial constraints, the urban public security governance team usually cannot be expanded in the same proportion[12]. Therefore, the digital sharing channels of all parties involved in public security should be opened, the digital risk management mechanism should be implemented, and all kinds of sensors, sound and light monitoring equipment and police service platforms should be used to collect and integrate real-time public security information, so as to achieve all-weather and all-round guarantee for city security. In areas with high crime incidence, the system will automatically identify abnormal behaviors and notify patrol police forces to achieve precise strikes and real-time prevention and control. At the same time, the intelligent monitoring platform can also collect safety data in different areas of the city, help city managers optimize the distribution of police forces, and ensure full coverage of public safety at all times.

3.4. Sports Resources

Urban public sports service is a public sports resource for urban residents to use together. With the development of economy, the living standard of urban residents is getting higher and higher, the requirements for quality of life are improved, and the demand for urban public sports services is also increasing[13]. Public sports services help to improve the health level of urban residents, promote citizens to develop good living habits and better ensure the quality of life. However, there are still many defects in the supply of community public sports services today, such as the mismatch between urban public sports resources and urban peoples sports service demand[14].

It is an effective way to solve this problem to promote the scientific allocation of resources and the digital supply of public sports services with the help of big data, Internet of Things, information cloud and other technologies. By using digital technology to collect residents health data and sports needs, personalized exercise prescriptions are formulated, and scientific management and digital supply are realized[15]. For example, an online sports service distribution platform is built, so that residents can complete the service application process in the platform, and feedback can be given in the platform after use. Platform-related workers can optimize the next service distribution according to residents feedback, so as to achieve benign interaction. Through the online sports service platform, residents can make reservations for public sports facilities such as gymnasiums and swimming pools, and submit feedback according to their usage. Based on these data, city managers can adjust resource supply in real time to meet residents personalized sports needs[16]. In addition, digital technology can also provide residents with personalized healthy exercise programs and promote the promotion of healthy lifestyles.

4. Conclusion

By analyzing the application of digital technology in the allocation of urban public service resources, this paper reveals the key role of big data, Internet of Things and artificial intelligence technology in accurately matching resource supply and demand. In the field of transportation, intelligent signal lights and real-time dispatching systems have effectively alleviated traffic congestion and optimized the allocation of public transportation resources. In terms of public health, digital technology has improved the scheduling efficiency of medical resources, especially in response to public health emergencies. Public safety management has realized all-round urban safety guarantee with the help of digital monitoring system, while the intelligent supply of public sports resources has improved residents health level through personalized services. In the future, with the continuous advancement of digital technology, the management and optimization of urban public service resources will be more efficient and accurate, promoting the comprehensive upgrading and intelligent development of the urban public service system.

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