

Optimization Countermeasures Research of Bengbu "City Brain" Construction under the Perspective of Digital Governance

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Abstract

Both the 19th and 20th CPC National Congresses have put forward the goal of building a strong network country and a digital China. In the era of big data, the construction of the city brain is a necessary way to transform the governance of a city from traditional digitalization to a new type of intelligence. Bengbu City has also carried out the construction of the "City Brain". From the perspective of digital governance, this paper studies the current situation of "City Brain" construction in Bengbu City, combines the useful experience of relevant construction and development at home and abroad, and through comparative analysis, finds that there are problems in the construction of "City Brain" in Bengbu City and puts forward optimized countermeasure suggestions to promote the realization of digital governance in Bengbu City.

Keywords

City Brain, Digital Governance, Smart City.

1. Introduction

1.1. Research background and significance

The need for population gathering and survival eventually formed cities, which became the main objects of the national development strategy, creating many "economic miracles" in China. To continue to promote the development of the digital economy era and the process of urbanization, we need to accelerate the construction of a new type of smart city, which should promote the efficient development of urban management through the promotion of urban digitization, intelligence and smartness. In 2008, IBM formally proposed the concept of a smart city, which attracted wide attention from all over the world[1]. Smart city is the key to efficient and refined urban governance. In the collision and integration of smart city construction and the development of the times, the "City Brain" to achieve efficient governance was finally proposed for the first time at the "Cloud Conference" in 2016. In 2020, General Secretary Xi Jinping pointed out during his visit to the Hangzhou City Brain Operation Center that "to promote the modernization of the national governance system and governance capacity, we must do a good job of modernizing the urban governance system and governance capacity"[2]. In 2021, the "Outline of the Fourteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China and the Visionary Targets for the Year 2035" pointed out that "digitalization to promote urban and rural development and governance model innovation, build an urban data resource system, and promote the construction of urban data

brain", which included the construction of the city brain as an important part of the 14th Five-Year Plan[3]. In 2022, the White Paper on the Development of the City Brain points out that the City Brain, to realize efficient governance, has become an effective hand for an all-round urban governance system.

In recent years, the construction of the "City Brain" has been in full swing all over the country, and Bengbu City has followed the national guidelines and responded to the construction of the Anhui "Digital Jianghuai" project, and started to promote the construction of the "City Brain" since 2016. After continuous learning, groping, and planning to promote the pace of construction of the "City Brain" aimed at integrating various types of data, improving the level of urban management and public service levels, and promoting the wisdom of the city and sustainable development. However, in practice, there are some deficiencies in the construction of "City Brain" in Bengbu City, which hinder its development of "City Brain". Therefore, it is necessary to optimize the construction of "City Brain" in Bengbu City from the perspective of digital governance, aiming at discovering the problems, providing scientific and reasonable solutions, and promoting the landing and practice of digital governance in Bengbu City.

1.2. Current status of domestic and international research

1.2.1. Current status of domestic research

Liu Feng (2015)[4] first proposed that urban brainization is an inevitable sign of smart city construction accompanied by the combination of cities and the Internet. In 2016, Hangzhou officially launched the construction project of urban brain, which has been proved to greatly promote the modernization level of Hangzhou. Liu Feng (2022)[5] proposed the core task of urban brain construction and the key role of urban brain in the development of smart earth. Huang Meiling (2022)[6] explored and analyzed the role of urban brain in the resolution of social conflicts. Dai Jinling (2023)[7] studied the intelligent epidemic monitoring system based on urban brain, which promoted a great progress of urban brain in the medical field.

1.2.2. Current status of foreign research

"City Brain" is the advancement of smart city. IBM (2008) published the concept of "Smart Earth: The Leadership Agenda of the Next Generation" and put forward the concept of "Smart Earth"[8]. IBM (2019) proposed the plan to build a "smart city" to the US president. At present, the "city brain" abroad has made remarkable progress in the past decades and can play a role in many fields.

2. The basic content of "city brain" construction in the context of digital governance in Bengbu City

2.1. Current status of digital development in Bengbu City

First, the accelerated construction of digital infrastructure. Through the implementation of the strategy of "Broadband Bengbu", Bengbu has fully entered the ranks of an "all-optical network city". At present, Bengbu has been selected as a national gigabit city and the cumulative number of the 5G base stations has reached 6,510, in the city's 95 key places to achieve 100% access to the 5G network, next, Bengbu will continue to vigorously promote the construction of "double gigabit" network construction; the second is the continuous upgrading of data sharing and exchange capacity. At present, Bengbu City, big data platform to collect data catalogs 10330 categories, the collection of the city's counties and municipal departments of the total amount of data and information resources more than 4 billion, the cumulative number of service times more than 200 million times; three is the gradual improvement of the city's security prevention and control system. With the promotion and development of the "Snow-bright Project", Bengbu City has realized full monitoring coverage. By September 2020, about 18,000 high-definition monitoring points, 4,000 WIFI probes and 3,500 RFID acquisition base stations have been built.

Taking intelligent construction as the starting point, the whole network has shared video monitoring, which is available all the time, improving the level of urban safety prevention and control in Bengbu City; four is the convenience of government services has been significantly improved. Bengbu City has compiled 993 government data resource directories, comprehensively promoted "one network handling", and built a network of e-government in the city, realizing a completion rate of online affairs of 100%, and a people's satisfaction rate of 100%. Comprehensively build a three-end capacity enhancement project, including "Anhui Affairs", "Anhui Enterprises" and "Anhui Government" to meet the needs of the public, enterprises and government affairs; fifth, the urban fine governance capacity has been steadily improved. Through the construction and improvement of the digital urban management system, the "horizontal to the edge, vertical to the end, the city's unification" digital city management command mode has been established, forming an efficient supervision and command system[9]. Sixth, the urban public service level is accelerated. Gradually improve the construction of intelligent public services in government affairs, education, health, pension, community, culture and tourism, such as the currently established Bengbu population health information platform, real-time bus inquiry platform, etc. Seventh, scientific and technological innovation leads to industrial transformation and upgrading. In 2022, Bengbu City is committed to transforming and upgrading 20 intelligent factories and digital workshops, promoting the application of 150 industrial robots, and adding 2 national green factories[10]. Investment in technological reform will increase by more than 10%, and there will be 143 new industrial enterprises and a net increase of 126 high-tech enterprises.

In response to the "Digital China" strategy, Anhui promotes the construction of "Digital Jianghuai" and comprehensively promotes the modernization of beautiful Anhui. Based on this background, Bengbu City also plans and lays out the layout of "Digital Bengbu", to improve the urban digital infrastructure construction, strengthen the overall coordination of application system construction, improve the transformation ability of digital achievements to benefit the people, promote the digital transformation of Bengbu industry and realize the digital transformation goals of Bengbu City, "Digital Bengbu" from the "strong foundation, endowed with wisdom, heavy application, promote synergy" four aspects to carry out, first of all, through the strengthening of digital infrastructure, improve the data resource system, strengthen the security and protection system to lay a solid foundation for the digitization of Bengbu; Secondly, the digital platform and dual-creation platform form an innovation system, to build a new hub of digital innovation in Bengbu; then through the exploration of new practices of social governance, stimulate the new vitality of public services, and promote new modes of industrial development to promote the realization of the application of digitalization in Bengbu[9]; Finally, the city brain, the integration of the Yangtze River Delta and the digital countryside are connected to build a new pattern of regional collaborative development. The specific "Digital Bengbu" construction content is shown in Figure 1.

2.2. The progress and effectiveness of the construction of City Brain" in Bengbu City

Bengbu "City Brain", the full name of Bengbu "City Smart Brain", in November 2023 in Bengbu completed and officially opened, is the first municipal function in Anhui Province "City Brain". Bengbu "City Brain" is constructed under the innovative "1+2+2" general framework, based on big data, with the provincial integrated database platform Bengbu sub-platform as the key construction content, and with the help of new era technologies, such as big data, artificial intelligence, blockchain, and IOT perception, to accelerate the comprehensive perception of the city, promotes the intelligent and digitalized development of Bengbu, and adds new kinetic energy to the socio-economic development. In the "1+2+2" mode, "1" represents a new set of digital infrastructure, mainly including the e-government external network and the main and

backup government cloud data center, "2" represents two digital governance platforms, mainly including data management platform and application management platform, "2" represents the improvement of two major security systems, namely the security system and operation and maintenance support system construction, to promote the transformation of digital city construction from "chimney type" to "platform type", and to build a new paradigm of an urban smart brain. A sketch of the specific relationship between the three is shown in Figure 2.

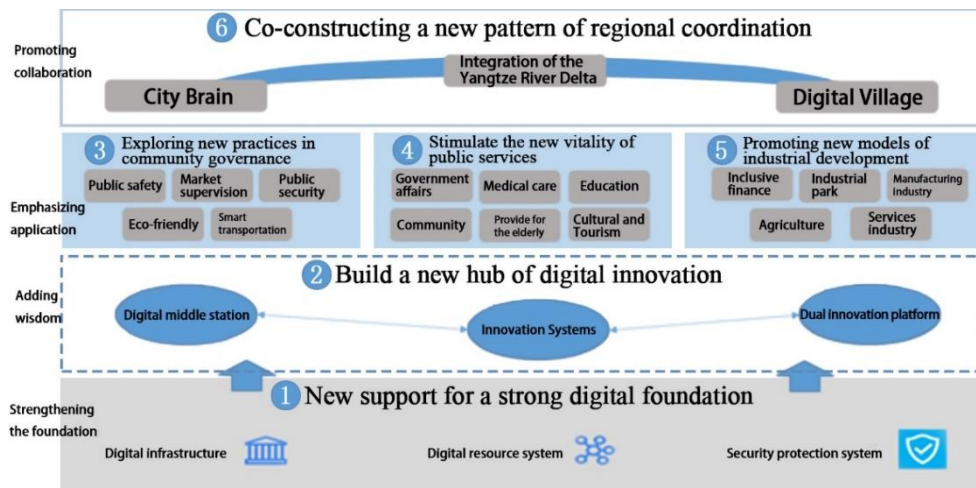


Figure 1: Framework diagram of "Digital Bengbu" task system Image source: Master Plan for the Construction of "Digital Bengbu" (2020-2025)

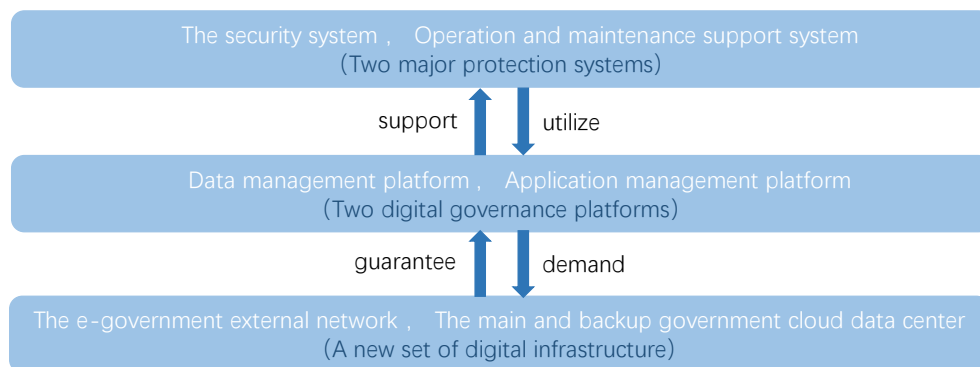


Figure 2: Bengbu City Smart Brain "1+2+2" model framework diagram

Bengbu City's "City Brain" construction also focuses on promoting the construction of "four major projects" such as the integrated database platform iteration project, the three-end capacity enhancement project, the data project and the scenario innovation project, etc., to break down the information barriers, connect and integrate the data and information, enhance the speed of business processing, promote the "data empowerment intelligent governance", "run once at most", "business multi-cross collaboration" social environment, and bring into full play the role of the city digitization of the benefit of the people[11]. A brief description of the "four major projects" is shown in figure 3.

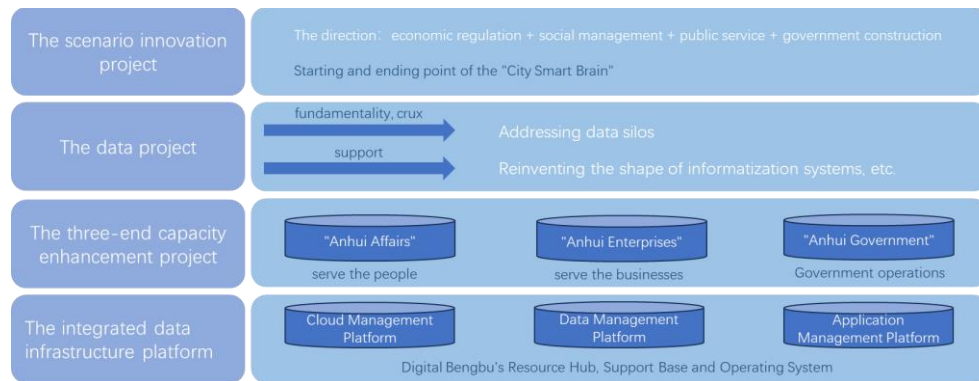


Figure 3: Sketch of the introduction of the "Four Major Projects"

3. Domestic and international relevant experience

3.1. Analysis of smart city cases abroad

Digitalization, smartness and intelligence are the key elements for the successful implementation of urban management, and a smart city is the key to efficient and refined urban governance. But the development from "Smart City" to "City Brain" is the inevitable result of the development of the times. Therefore, while exploring "City Brain", we can also understand and analyze the cases of foreign smart cities.

3.1.1. Smart City Construction in Malaysia

To promote the development level of urban information and improve the level of urban economic development, Malaysia has established a "multimedia super corridor" through innovative measures, successfully entered the information era and formed a new front-line smart city. The main functions of the "multimedia super corridor" are: first, to make the government work more efficiently through the e-government application system; secondly, to provide a good business environment for the public through e-commerce, and to promote the long-distance expansion of the business territory; thirdly, to improve the teaching mode through the smart school, and to help everyone to learn anywhere, not just confined to the campus; finally, innovate the medical service mode through telemedicine and promote the intelligence of medical service.

In the construction of smart cities in Malaysia, what is worth learning from is that the government is the main leader in the construction of a "multimedia super corridor", and it has also established a series of clear and clear policy measures to promote the construction of super corridors. By introducing a series of preferential policies, it can attract a large number of excellent enterprises and personnel to participate in the construction, and can also retain talents and stimulate the enthusiasm of staff through encouraging policies[12].

3.1.2. Smart City Construction in Germany

With the development of smart cities in the European Union, the development of smart cities in Germany is becoming more and more efficient, and its smart development is mainly in the comprehensive collaboration between cities, federations, enterprises and research institutions. Its construction focuses on ecology, energy conservation, transportation and other fields, and combines the actual development of each city to develop its smart city construction plan. However, the main construction direction is to improve residents' quality of life, improve urban competitiveness, promote energy conservation and emission reduction, and maintain sustainable development[13].

In the construction of smart cities in Germany, what is worth learning from is that the government and enterprises carry out exchanges and cooperation to jointly build smart cities. German government-enterprise cooperation mainly adopts the PPP mode: one way is that the

government will first set the goal of long-term development and construction projects, then attract the attention of enterprises with financial subsidies, guide each participating enterprise to conduct relevant research on the project, and finally select suitable enterprises to cooperate; the other way is that some large German enterprises, such as BMW, will select regions nationwide to pilot a project or a product, and if the city is interested in the project, it will actively cooperate with the enterprise to launch a pilot competition.

3.2. Case analysis of "City Brain" in China

3.2.1. Hangzhou City's "City Brain"

In April 2016, Hangzhou pioneered the concept of "City Brain" in China. Taking the long-standing urban traffic congestion problem as the breakthrough point, the Hangzhou government actively explored the governance method, calculated the real-time traffic optimization plan based on the massive data generated by road facilities every day, and could ease the urban congestion problem. The success of digital traffic governance made the Hangzhou government realize the importance of smart city construction and then upgraded the urban brain traffic system to take a step towards urban governance. At the same time, it also realized the coverage of multiple application scenarios such as transportation, medical treatment, culture and tourism, government affairs, etc., integrating 38 application scenarios and 383 items that can be done. As long as you download an APP, it is equivalent to packing the urban brain into a mobile phone.

What is worth learning from the construction of Hangzhou's "City Brain" is how to carry out data capture. Before getting through the various departments, there are still disadvantages of data quality problems, and the training of the "City Brain" needs first-hand data, so it is necessary to further data sources. The Hangzhou government joined forces with the technical department and the experts of the Yunqi Engineering Institute to break the data barriers, further improve the efficiency of urban governance and improve the lives of residents.

3.2.2. "City Brain" in Haidian District, Beijing

In 1999, Beijing first proposed the idea of "digital Beijing". It is the first city in China to propose the construction of a smart city. In 2012, the Beijing Municipal Government began to promote the construction of smart cities, and is committed to building Beijing's unique "urban smart hub". In February 2021, Beijing's Haidian District took the lead in introducing the "City Brain" project, integrating technologies and resources in different scenarios to achieve comprehensive analysis and intelligent decision-making of the city's status, including situation judgment, data analysis, comprehensive decision-making, simulation and deduction, and collaborative business. Yu Jun, secretary of the Party committee of Haidian District, said that Haidian will fully promote the urban brain by the end of 2022, and improve the region's modern, intelligent and refined governance capacity. The construction of the Haidian City Brain is aimed at accelerating updates and iterations, transforming cutting-edge technologies into new management and service capabilities, focusing on grassroots governance and people's services, and promoting the development of more application scenarios[14]. In addition, Haidian is prepared to build more smart communities, including upgrading water supply, elevators and firefighting systems, to improve the level of intelligent operation. The Haidian City Brain is a smart, refined and efficient urban governance command center, that will provide strong support for the district's urban development and livelihood services.

The most worthwhile reference for the construction of the "city brain" in Beijing's Haidian District is its top-level design. From a holistic perspective, it considers all levels and elements of the project in an integrated manner, transforming cutting-edge technology into new service capabilities and making science and technology work better for people's livelihoods.

4. Conclusions of the study and recommendations for countermeasures

4.1. Summary

First of all, the overall coordination between various departments in the construction of Bengbu's "City Brain" is not enough. In the construction of "City Brain", the unified cooperation and division of labor among various departments is the key. However, in the current division of labor of the same task, each department performs its duty and works on its independent working platform, so that various parts cannot establish effective and seamless connections, and the efficient exchange and sharing of data between each department is still difficult to achieve. Although Bengbu has integrated, analyzed and collected some data, there is still a large number of independent data outside. In short, Bengbu City lacks a standardized and orderly coordination mechanism both vertically and horizontally among various departments, which increases the difficulty factor of cross-departmental business collaboration.

Secondly, the ability to benefit the people in the construction of Bengbu's "City Brain" needs to be strengthened. At present, the vast majority of citizens still do not understand the concept of "City Brain" and urban digitalization and do not relate them to their life development. In addition to the lack of attention, the experience of Bengbu's "digital results of the application system" is not enough. For example, in the offline survey process, most citizens still do not understand what are the main functions of "Anhui Affairs". Therefore, the ability of digital achievements to benefit people needs to be further improved, and the task of enhancing the sense of happiness of citizens is urgent.

Then, in the further construction and improvement of Bengbu "City Brain", there is a serious lack of composite professional talents support. Because Bengbu "City Brain" construction started late, the various departments understand management, data, and the technology of the composite talentless, and the synergistic cooperation between the various departments of the "City Brain" innovative construction is more difficult to carry out. In addition, at present, the teaching of students in universities is mainly based on theoretical knowledge inculcation, and lack of professional training, and most of the excellent talents will choose to leave because of the city's economic development, salary level, welfare treatment and other factors, resulting in a large number of excellent talent outflow, exacerbating the slow development of the city's digitalization problems.

Finally, Bengbu's information security protection measures still need to continue to be improved and strengthened. At present, Bengbu's large amount of data into the integration platform, the operation of the platform security, data security, system security and so on have put forward higher requirements. In addition, in the construction of Bengbu "City Brain", iFlytek Co., Ltd. and Bengbu Unicom Corporation joined the cooperation. To prevent some enterprises from unauthorized integration of data gathered for secondary use, the possibility of information leakage occurs, and the need to further enhance the data security protection capabilities.

4.2. Proposal

First, strengthen the overall coordination between various departments, and clarify the main responsibility. The promotion mechanism of "City Brain" establishment with unified leadership and reasonable division of labor can be established: first, realize the overall planning of one department, second, realize the expansion of two aspects, third, establish the department joint review mechanism, fourth, establish the linkage mechanism between the upper and lower levels, fifth, establish the expert review mechanism. Organically link various departments, and continue to adjust and collect the scattered information, improve the construction of the unified big data platform of the whole city, unify the information standard, increase the number of interfaces of the data sharing platform, through the accurate and reasonable division of labor

of the leading body, refine the work allocation, make the work efficiency of various departments highly efficient, reduce the waste of time and resources, and make the work practical.

Second, improve the public service system of "City Brain" and popularize the functional knowledge of urban digitization to the public. The government should increase the publicity of "City Brain", and collect the opinions of the public through multiple channels, such as publishing advertisements on major platforms, issuing online questionnaires with prizes, setting up offline publicity boards and suggestion collection boxes, etc., and jointly build "City Brain", promote the construction of six "smart" projects, namely smart government, smart education, smart health, smart pension and smart culture and tourism, to improve the ability of "City Brain" to benefit the people and serve the people.

Third, the establishment of Bengbu's "City Brain" specialized team, focusing on talent training and introduction. Combine the composite talents who are proficient in all aspects of the construction of "City Brain" with all-around experts to jointly promote the construction of Bengbu "City Brain". Establish and improve the composite talent training, introduction, and employment program, enhance the major universities to cultivate professional talents to lead the guidance, promote the construction of data research institute, can refer to the Malaysian government to build a series of preferential policies for the construction of smart cities, improve the welfare system of talent introduction, and actively explore the diversified cooperation mode of the government and all kinds of social capital, attract the city and the province's outstanding enterprises to jointly build and cooperate in the construction of "City Brain", flexibly formulate employment plans for special positions, to realize the cultivation, introduction, retention and utilization of talents.

Fourth, strengthen the digital resources security protection ability, and improve the information security system. Strengthen the digital protection measures, such as establishing a risk assessment, collection, storage, backup, emergency management, data conversion and cleaning up the information security system. It is also possible to formulate unified standards for data security protection in all sectors and regions, strengthen information security warning levels, ensure the information security emergency work can be carried out promptly, and enhance the supervision of the implementation of the work, such as strictly implement the "Bengbu City network security work responsibility system inspection and assessment measures", organize the implementation of the party committee (leading group) network security work responsibility system special inspection and assessment. Then should also enhance the cooperation enterprise to use the data of the supervision, prevent the enterprise from gathering information of secondary use and disclosure, and promote the key enterprises to improve the information security protection measures.

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