Research on the Construction Path of China's Smart Government Affairs with the Background of "Internet +"

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Abstract: With the rapid development of network information technology, the construction of China's digital government has been promoted, and the level of social informatization has been increasing. The emergence of smart government affairs is an inevitable requirement to promote the modernization of the national governance system and governance capacity, and also reflects the continuous optimization and upgrading of the level of government services reengineering with the government's strong support for the construction of digital informatization infrastructure. The construction and development of smart government has been the common concern of governments all over the world, but to China, as a country in the forefront of exploring digital government construction in the world, there are still many problems that need to be solved. This paper empirically analyzes the current level of government construction in China, and proposes several construction paths based on this.

1 INTRODUCTION

In order to meet the global development trend and better adapt to the needs of China's economic and social development in the new era, since the 18th Party Congress, the State Council has put forward the general plan of "Internet + government affairs services", requiring the integration of government affairs services with new technologies such as big data, Internet, cloud computing, Internet of Things and blockchain, in order to improve the overall efficiency of China's government affairs services. efficiency and cooperation level, and promote the modernization of the national governance system and governance capacity. General Secretary Xi Jinping pointed out in his speech at the 2016 Symposium on Network Security and Informatization that "we should speed up the promotion of e-government, encourage government departments at all levels to break down information barriers, improve service efficiency, let people run fewer legs and information run more, and solve the problem of difficult, slow and complicated work." After years of development, China's e-government construction has begun to bear fruit, the level of interaction between the government and citizens has also improved significantly. Currently, the number of Chinese Internet users is nearly one billion, and mobile payment and digital currency are developing rapidly. The Internet has become closely related to our lives and permeates every aspect of our daily lives. At the same time, the development of 5G technology-related products such as chip devices and smartphones in China is also becoming increasingly sophisticated. 5G technology has also contributed greatly to the medical field during the epidemic, and the significant increase in the level of informationization and digitization of the whole society has forced the government to provide higher quality government affairs services.

2 THE BACKGROUND AND CONNOTATION OF THE EMERGENCE OF SMART GOVERNMENT AFFAIRS

2.1 Background of The Emergence of Smart Government Affairs

The government attaches importance to the

construction of smart government and supports the integration of information digital technology applications in government affairs services with the fundamental purpose of improving the quality and efficiency of public services. The Fourth Plenary Session of the 19th CPC Central Committee proposed, "Establishing sound institutional rules for the use of the Internet, big data, artificial intelligence and other technological means for administrative management." In 2020, General Secretary Xi Jinping, while chairing a meeting of the Standing Committee of the Political Bureau of the CPC Central Committee, emphasized the need to "accelerate progress in the construction of new infrastructure such as 5G networks and data centers." As of June 2021, China has a total of 961,000 5G base stations, of which 190,000 were newly built in the first six months; the number of 5G connections has reached nearly 370 million households, accounting for 80% of the world, and the infrastructure coverage is a necessary prerequisite and foundation for the development of digital construction across the country.

2.2 The Connotation of Smart Government Affairs

Like smart cities, smart government has the characteristics of a Chinese imported term. In English, there is no academic concept with exactly the same meaning. Similar concepts include Smart government, Smart government affairs, u-Goverment, and government3.0. Although these concepts are expressed in different forms, their connotations and extensions are extremely similar (Zhou 2021). This paper defines smart government as follows: Smart government is based on e-government, using big data, cloud computing, Internet of Things, mobile Internet and other technologies to realize public services from all-powerful to service-oriented through data sharing, overall collaboration, and intelligent management, etc. Therefore, smart government is an inevitable product of e-government development to an advanced stage. At the same time, smart government affairs has the characteristics of customization, wisdom and big data.

2.2.1 Customization

With the application and development of the Internet of Things, big data, cloud computing and other emerging technologies, the "publicness" of public services is gradually disappearing, and people's personalized demand for public services is getting higher and higher, and more targeted and diversified government affairs services will become mainstream. This requires the government to broaden its communication channels, improve the response speed of government affairs services, and make government affairs services more flexible and diversified to meet the increasingly complex needs of the public.

2.2.2 Intelligent

Relying on big data technology, smart government obtains data that can meet people's needs from a large amount of data and provides personalized and customized services with the characteristics of wisdom; by integrating and analyzing data, it greatly improves the intelligence of services; it rebuilds and upgrades the process of government affairs services and governs the management elements of government affairs services to achieve wise governance.

2.2.3 Big Data

Smart government affairs is a new product in the context of big data, is its core element. Without big data, smart government becomes water without source and wood without foundation. Through access to big data as well as analysis of big data based on intelligent decision-making, in order to achieve the precision, scientific and democratization of government affairs services. Therefore, the construction of smart government affairs must be built on the basis of big data.

3 THE EVALUATION INDEX SYSTEM OF SMART GOVERNMENT AFFAIRS CONSTRUCTION

This paper establishes a smart government affairs evaluation index system from three aspects, namely, the government's own construction, infrastructure construction, and government-citizen interaction system, which contains three first-level indicators and eleven second-level indicators.

In the evaluation index system of smart government construction, A_i (i=1,2,3) is used to denote the three -level indicators of the government's own construction, infrastructure construction and government-citizen interaction

Table 1: Evaluation index system of smart government affairs.

Government Self-construction (A1)	Infrastructure Construction (A2)	Government-Civilian Interaction System (A3)
Number of government website information disclosure (A11)	Proportion of fixed broadband users (A21)	Number of administrative reconsideration events (A31)
Business Transactions (A12)	Wireless Coverage (A22)	Number of Administrative Litigation Incidents (A32)
Number of staff (A13)	Rate of smartphone ownership (A23)	Number of reported complaint incidents (A33)
Degree of specialization of Information Disclosure Staff (A14)		
Degree of specialization of Information Disclosure Staff (A14) Number of trainees (A15)		

system, respectively. A_{1j} (j=1,2,3,4,5) is used to denote the number of information disclosure on government websites, business processing, the number of staff, the professionalism of information disclosure staff and the number of people receiving training in the first level of government construction; A_{2j} (j = 1,2,3) is used to denote the proportion of fixed broadband users, wireless coverage and smartphone ownership in the second level of infrastructure construction, respectively. A_{3j} (j= 1,2,3) denotes the number of administrative reconsideration, lawsuits and complaints in the third level of government-citizen interaction system, respectively.

4 GEEWM MODEL

GEEWM model is a combined model of gray evaluation and entropy weight method (Dong 2015, Yang 2015). The gray system theory was proposed by Professor Deng Julong (Deng 1998), which is a better solution to the problem of incomplete information and unclear relationship by limited data.

4.1 Determination of The Rating Result Matrix of The First-Level Indicators

Firstly, the evaluation matrix was constructed based on the gray correlation coefficients of the second-level indicators of the evaluated cities, secondly, the weights of each second-level indicator under the ith first-level indicator were calculated, then the entropy weight method was used to

determine the weights of each second-level indicator, and finally the evaluation result matrix of the first-level indicators was written using the entropy weights and the evaluation matrix.

1.Matrix Ai denotes the standardized data matrix of the i-th level of indicators in the smart government evaluation index system.

$$A^i = \begin{bmatrix} a_{11}^i & a_{12}^i & a_{13}^i & \dots a_{1t}^i \\ a_{21}^i & a_{22}^i & a_{23}^i & \dots a_{2t}^i \\ a_{31}^i & a_{32}^i & a_{33}^i & \dots a_{3t}^i \\ \vdots & \vdots & \vdots & \dots \vdots \\ a_{j1}^i & a_{j2}^i & a_{j3}^i & \dots a_{jt}^i \end{bmatrix}$$

where a_{jt}^i denotes the standardized data of the jth secondary indicator under the ith primary indicator of the tth evaluated city.

2.Calculate the gray correlation coefficients of the second-level indicators under the ith level index to construct the judgment matrix. Using the gray correlation analysis method to analyze the degree of correlation between indicators, we can analyze the optimal set of indicators by A_{max}^i with A_t^i ($a_{1t}^i a_{2t}^i a_{3t}^i \dots a_{4t}^i$), the homogeneity or heterogeneity of the development trend (where A_{max}^i as the reference data, A_t^i as the reference data, as the comparison data), to measure the consistency of the trend between factors. According to the formula of gray correlation coefficient, the correlation coefficient between the jth indicator of the tth evaluated city and the jth indicator of the reference indicator set can be obtained as:

$$H_{jt}^i = (\min_k |a_{kmax}^i - a_{kt}^i| + \rho \max_k |a_{kmax}^i - a_{kt}^i|)/(|a_{kmax}^i - a_{kt}^i| + \rho \max_k |a_{kmax}^i - a_{kt}^i|)$$

The formula ρ is called the resolution factor, and in general $\rho = 0.5$.

3. Determine the weights of each second-level indicator under the ith first-level indicator. The entropy weight method is used to determine the weights of each second-level indicator. The entropy weight of each second-level index is expressed by e_j^i to denote the entropy weight of each second-level index, and its formula is: $e_j^i = (\sum_{k=1}^t Y_{jk}^i \ln Y_{jk}^i)/\ln t$,

Among them $Y_{jk}^i = a_{jk} / \sum_{k=1}^t a_{jk}$, $Y_{jk}^i = 0$, $\lim_{Y_{jk}^i \to 0} Y_{jk}^i \ln Y_{jk}^i = 0$.

Determine the entropy weights of the second-level indicators under the first-level indicators of ground i. The formula is.

$$W_j^i = (1 - e_j^i)/\sum_{j=1}^t (1 - e_j^i)$$

4. Determine the evaluation result of the ith level indicator, whose formula is:

$$R^i = (W^i)TB^i$$

Among them $W^i = (W_1^i W_2^i W_3^i L W_j^i)$

4.2 The Determination of The Weight of First-Level Indicators

1. Let the evaluation matrix of the -level indicators

in the performance evaluation system of smart government be represented by R. The evaluation matrix of the first-level indicators is composed of the evaluation result matrix of the second-level indicators under this first-level indicator, which is expressed as R=(R[1] R[2] R[3] R[4] R[5])[T].

2. The judging matrix C of the performance evaluation system of smart government construction can be calculated from the formula.

3. Calculate the entropy weight of the first-level index by the formula, and calculate the entropy weight of the first-level index by the formula.

4. Let the result matrix of the performance evaluation system of smart government construction be F, and its formula is:

$$F = W^T C$$

5 EMPIRICAL ANALYSIS

5.1 Data Collection

Based on the data provided by the government information disclosure reports of Guangzhou, Wuhan, Shanghai, Chengdu, Hangzhou and Nanjing, China City Statistical Yearbook and the city's Smart Government Portal, the raw data collected are shown in Table 2.

Table 2: Data of each city.

	Guangzhou	Wuhan	Shanghai	Chengdu	Hangzhou	Nanjing
Number of mobile phones per 100 persons (per 100 persons)	270.94	301.7	234.63	292.08	344.48	539.54
Fixed Broadband Subscriber Ratio (Households/ 100 persons)	42.96	43.16	37.46	42.77	62.23	109.84
Wireless network coverage (%)	2.95	2.12	4.58	2.33	4.43	2.84
Staff professional (non-professional)	4(60)	42(685)	1(34)	5(19)	32(309)	0(5)
Number of trainees (person-time)	155	3670	80	600	2029	50
The number of government website information disclosure	1108	175247	7266	371523	79185	1009
Total number of inquiries	22340	1352	3117	3009	2940	2000
Online replies	202	97	354	407	495	79
Number of complaints	0	22	0	20	59	0
Reply to the number of complaints	0	12	0	2	57	0
Number of portal websites	1	1	1	1	1	1
Total number of letters submitted online	180	1352	10	6709	12009	5
Number of letters answered online	51	1168	1	765	120	0

5.2 Model Solving

5.2.1 The Evaluation Result Matrix of First-Level Indicators

1.The first level indicator of the smart government performance evaluation system, "the government's own construction", is represented by A^1, which is based on the data obtained after standardized processing:

$$A^1 = \begin{bmatrix} 0.000267196 & 0.016887351 & 0.016887351 \\ 1 & 0.210993377 & 0 \\ 0.327968037 & 1 & 0.115753452 & 0.131988925 \\ 0.011566667 & 0 \\ 0.081717452 & 1 & 0.041551247 & 0.026315789 \\ 0.465373961 & 0 \\ 0.253333333 & 0.232992701 & 0.111764706 \\ 1 & 0.292527508 & 0 \\ 0.029005525 & 1 & 0.008287293 & 0.151933702 \\ 0.546685088 & 0 \end{bmatrix}$$

This indicator is a positive indicator, so according to the method of selecting the optimal indicator, we can know the optimal set of indicators for the first-level indicator "government self-building" $A^1_{max} = (1\ 1\ 1\ 1\ 1)^T$.

2.Calculate the correlation coefficients of the second-level indicators under the first-level indicator "government self-building". In the calculation process, the optimal set of indicators A^1_{max} is the reference data, $A^1_t = (a^1_{11}\ a^1_{21}a^1_{31}\ a^1_{41}\ a^1_{51}\ )^T$. The gray correlation coefficients among the factors are calculated by Equation (3). H^i_{jt} Using the calculated gray correlation coefficients, we can obtain the judgment matrix B^1 in order.

$$B^1 = \begin{bmatrix} 0.333392721 & 0.485559572 & 0.337128808 & 1 \\ 0.387895602 & 0.333333333 \\ 0.426609526 & 1 & 0.361207323 & 0.365494117 \\ 0.335923678 & 0.333333333 \\ 0.352539063 & 1 & 0.342830009 & 0.339285714 \\ 0.483266399 & 0.333333333 \\ 0.401069519 & 0.394630718 & 0.360169492 \\ 1 & 0.451886517 & 0.333333333 \\ 0.339906103 & 1 & 0.335185185 \\ 0.370901639 & 0.524485656 & 0.333333333 \end{bmatrix}$$

3.Calculate the weights of the secondary indicators under the first-level indicator "government self-building", resulting in.

W^1 =(0.22491,0.203807,0.226611,0.123863,0.22081)T

4.Calculate the evaluation result matrix of the first-level indicator "government self-building", and get.

R^1 = (0.366551, 0.809315,0.345753, 0.582047, 0.437002,0.33333).

Similarly, according to the method of calculating the first-level indicator "governmental construction", the evaluation result matrix of the first-level indicator "infrastructure construction" can be calculated as:

R^2 = (0.375308,0.358234,0.510538,0.360248, 0.555983,0.844275)

The evaluation result matrix of the first-level indicator "government-citizen interaction system" is calculated as:

R^3 = (1,0.68261,1,0.83826,0.333333,1).

5.2.2 Calculate the Weight of First-Level Indicators

1.The evaluation matrix of first-level indicators in the performance evaluation system of smart government construction is represented by R, which is composed of the evaluation result matrix of each first-level indicator:

$$R = (R^1, R^2, R^3)^T = \begin{bmatrix} 0.366551 & 0.809315 \\ 0.345753 & 0.582047 \\ 0.437002 & 0.333333 \\ \\ 0.375308 & 0.358234 \\ 0.510538 & 0.360248 \\ 0.555983 & 0.844275 \\ 1 & 0.68261 \\ 1 & 0.83826 \\ 0.333333 & 1 \end{bmatrix}$$

According to the calculation results of the evaluation matrix of the smart government affairs construction performance evaluation system, the optimal index set of the smart government affairs performance evaluation system is selected as:

$$R_{max} = (0.809315, 0.844275, 1)^T$$

2.The judgment matrix of the performance evaluation system of smart government construction is calculated as:

$$C = \begin{bmatrix} 0.429499 & 1 & 0.41829 & 0.594601 \\ 0.47238 & 0.411871 \\ \\ 0.415472 & 0.406815 & 0.499698 & 0.407817 \\ 0.536299 & 1 \\ 1 & 0.512251 & 1 & 0.6733 & 0.333333 \\ 1 \end{bmatrix}$$

3.Calculate the entropy weights W of the smart government performance evaluation system:

$$W=(0.352308 \quad 0.328894 \quad 0.318798)^T$$

5.2.3 The Evaluation Results of Smart Government Affairs Construction

The final performance evaluation matrix F of smart government construction for the six cities Guangzhou, Wuhan, Shanghai, Chengdu, Hangzhou and Nanjing is calculated.

$$F=(0.606761 \quad 0.649411 \quad 0.630513 \quad 0.558258 \quad 0.449052 \quad 0.792798)$$

In summary, it can be seen that the above six cities in the order of high to low level of construction of smart government affairs: Nanjing, Wuhan, Shanghai, Guangzhou, Chengdu, Hangzhou.

5.3 Results Analysis

According to the results of the evaluation of the performance of smart government construction can be seen in Nanjing smart government construction effect is the best, followed by Guangzhou, Shanghai in these six cities in the disadvantage.

1.The weight matrix of the smart government affairs performance evaluation system shows that the government's own construction is the largest proportion of the current smart government affairs performance evaluation system. In this aspect of the government's own construction, Wuhan is the best among the six cities, followed by Chengdu, and Guangzhou, Shanghai, and Nanjing are not very different in this aspect. Therefore, Guangzhou, Shanghai and Nanjing can make efforts by increasing the number of information disclosure on government websites, strengthening the online government office, increasing the number of government websites and strengthening the training of government staff.

2.In terms of infrastructure construction, Shanghai and Hangzhou are better built, while Wuhan and Chengdu are at a disadvantage among the six cities, so Wuhan and Chengdu can make efforts in fixed broadband usage, wireless network coverage and smartphone ownership, and vigorously improve the level of urban smart government construction.

3.In terms of the interaction system between the government and the public, Guangzhou, Shanghai and Nanjing are better built, and the citizens are more satisfied with the government, but relatively speaking, Hangzhou is less invested in this area.

From the perspective of indicators, the government's own construction of this indicator in the performance evaluation system of the construction of smart government affairs services accounted for a larger proportion, Shanghai in the infrastructure and the construction of the government-citizen interaction system are relatively good, but because of the lack of the government's own construction, so the overall situation of the construction of smart government affairs services in the six cities in the lower level. It can be seen that the construction of smart government affairs is a whole, any lack of one aspect may cause the construction of smart government affairs can not meet expectations. Although Nanjing is in the middle level in the construction of government itself and infrastructure construction, it is in the leading level of smart government construction among these six cities because of the balanced development in these three aspects.

6 THE CONSTRUCTION PATH OF SMART GOVERNMENT AFFAIRS

6.1 Improve the Institutional Mechanism of Government Affairs Services

The goal of smart government is to improve the internal structure and process of government organizations through digital technology, optimize work content and provide more convenient services. To improve the government service system and mechanism, we need to reform the government at all levels of government, from top to bottom, and fundamentally adjust the technology application and business development of the government, organizations or departments (Wang 2019).

First of all, we should take the "one table project" as the main grip to promote the business process integration of government departments. The so-called "one table project" is to draw on the experience of South Korea, Singapore and other countries in the construction of smart government, combining information from different enterprises and citizens into one table, and then combining the data in the table into different services according to the needs, turning the "information islands" caused by the original segmentation This will transform the "information silos" caused by compartmentalization into a dynamic "data ocean", reconstruct the service model, improve administrative efficiency, and

promote the modernization of government governance capacity.

Second, update and transform the current government management service concept. To achieve such a change, on the one hand, the government should take meeting public demand as the starting point for designing smart government service systems and providing more convenient and accurate government affairs services; on the other hand, the construction of smart government affairs services should be tested by the convenience of public use.

Third, establish a new responsibility and incentive mechanism. There are three main points: First, in response to the new background of smart government, new division of responsibilities for government departments and their staff should be added to supplement and improve the existing functions. Second, to change the existing performance-oriented phenomenon of smart government, provincial governments should set up evaluation criteria based on the development goals of local government, and promote the construction of smart government by establishing a performance evaluation mechanism that integrates construction, evaluation, and improvement. Third, on the basis of the assessment to establish a corresponding incentive mechanism, according to the assessment of the construction of smart government and the situation to determine the direction, strength and structure of the investment of funds to stimulate the enthusiasm of government departments at all levels to continuously improve their own construction.

6.2 Strengthen The E-Government Regulatory System and Information Security Construction

The Internet is not a place outside the law. At present, the Chinese government is lagging behind in the laws and regulations related to data sharing and business collaboration, and there is an urgent need to build a legal protection system suitable for the construction of smart government in China. In the context of "management and service", we should improve the legal system and system of smart government from three aspects.

First, we should pay close attention to the trend of information security of smart government affairs, combine the practical application of China's smart government affairs, clarify the concept of information security of government, establish the corresponding principles of protecting information security of smart government affairs, and start the

legislative work to clarify the protection object, protection scope, protection mode, emergency measures, relief ways and accountability mechanism of information security. Joint universities, research institutes and other research institutions to establish a legal framework for information security of smart government affairs services, including pre, during and post response strategies.

Secondly, promote the revision of relevant laws, change the focus to the direction of information security management of smart government affairs services establish the concept of whole process management of government information, the whole process of leaving traces, electronic signature authorization, etc., and modify or repeal the original corresponding provisions. For the collection of government information, the scope of archiving, authority, duration, destruction, etc. should be redefined and standardized, and on this basis, fully assess the risk of information security and clarify the emergency measures for adverse consequences. By clarifying the basis of punishment, penalty standards and other contents, the implementation of information protection should be strengthened in order to guarantee the absolute security of government information to the maximum extent.

Third, improve the legal system and rule of law the information security prevention and control. The legal status of information security should be improved, and the introduction of administrative regulations on information security should be accelerated. In addition, the legal gaps of information security of government affairs, such as the emerging concept of information security of smart government affairs affairs, constitutive elements, regulatory procedures and conditions, legal responsibilities and penalties, etc. should be supplemented and improved. Finally, the construction path of "current law revision + future special chapter legislation" will be formed to promote the establishment of information security legal system in a gradual and hierarchical manner and realize the rule of law of information security (Gai 2021, Niu 2021).

6.3 Pay Attention to The Introduction and Training of Digital Talents

Whether it is developing 5G technology or building a digital nation, excellent digital talent is the basic guarantee for its continuity. Digital talent is the foundation for building smart cities and digital government. Cultivating digital talents is a systematic process:

First, the government should fully utilize service outsourcing and resident service models to alleviate the shortage of information technology talent teams, while cooperating with high-tech enterprises to provide basic operation and maintenance services in the form of outsourcing, and outsourcing services and materials in different combinations with the actual demand as the starting point.

Second, establish a new mode of joint learning and exchange, break the barriers of human resources flow between regions, industries and departments, share top experts' ideas on the basis of saving money and reasonable coordination, and promote the training of talents in the fields of big data, cloud computing, Internet of Things and artificial intelligence through training innovation.

Thirdly, we employ supernumerary personnel and teams in the fields of operation and maintenance, customer service, and application development to enrich the work force and give them corresponding treatment and remuneration. Continuously grow the team of external personnel according to the stage needs, and cooperate well with institutional personnel to bring out the maximum strength. Fourthly, we should cooperate with universities, attach importance to the development of communication technology, information engineering and other related disciplines in the "double first-class" universities and provide financial support, take advantage of the local universities and encourage special research through the "excellent talent program"; support engineering colleges and universities to set up Support engineering colleges and universities to set up related majors, systematically train and reserve technical talents, and lay the foundation for sending high-quality talents to the society in the future; through government departments, higher vocational colleges and universities will join hands with high-tech enterprises to carry out practical training and internship, and continuously train vocational and technical talents.

7   CONCLUSIONS

Smart government reform in the "Internet +" era is about improving people's wellbeing and modernizing China's governance system and capacity, and should receive timely attention and progress. Starting from the innovation of information technology to drive government governance, this paper sorts out the basic background, connotation, construction significance

and development trend of smart government, investigates the main problems existing in smart government, and puts forward the optimization path of smart government. However, the analysis of the existing problems and optimization path of the current reform needs to be further integrated and optimized from the perspective of public administration and other disciplines. All in all, smart government service reform in the Internet era still needs to be optimized and promoted, and will become an important strategic highland of public governance reform.

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