



Use Java Technology to Build SOA-Based Government Platform to Achieve Intelligent Public Management

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Abstract. In the process of transformation from information society to intelligent society, the widespread use of Internet and information technology provides technical support for the government. This paper takes Harbin city government affairs open data as the research object, identifies its problems through fuzzy set qualitative comparative analysis method, and proposes to use JAVA technology to promote the establishment of SOA-based government affairs platform, aiming to comply with the trend of intelligence, develop e-government and realize intelligent public management.

Keywords: intelligent society · fuzzy-set stereotypical comparative analysis · open government · Service-oriented Architecture

1 Introduction

At present, the development of smart society has various hardware and software conditions, but the government is the key link to truly realize the smart society. In the environment of smart society and rapid development of the Internet, the government, as the provider of social public services and manager of social public affairs, must realize intelligence, make full use of Internet technology to reform itself, carry out online government services, use the network to govern society, provide high-quality services and management for society in an efficient manner, and realize the modern government's service, rule of law, and scientificization. A key part of the modernization of the national governance system and governance capacity is the construction of a high-quality service-oriented government [1], the construction of which is inseparable from the open government. The core of SOA is service, through building a SOA-based government platform, government data and information can be made public to achieve openness and transparency of government affairs, and it is an inevitable trend to implement open government affairs through information technology.

2 The Current Situation of Government Affairs Disclosure in Harbin

In 2020, the Harbin municipal government fully implements the “People’s Republic of China Government Information Disclosure Regulations”, strictly follow the requirements of the Party Central Committee, combined with the actual local situation of government information disclosure work, adhere to the “open as the norm, not open as an exception” principle, to fight the epidemic prevention and control of the battle while strengthening business work, in the active public, open on application, government information management, platform construction, etc. In terms of active disclosure, open upon application, government information management, platform construction, etc., we have maximized the role of open government affairs in promoting social and economic development, epidemic prevention and control, and resumption of work and production.

2.1 Active Disclosure

In accordance with the requirements of the “Regulations”, adhere to the open as the norm, not open as an exception, around the decision, implementation, management, service, results of open, and actively complete the work of active public. Harbin City, combined with the actual city, the initiative to disclose information in key areas, clear power list, so that the power to operate under the sun; further open regulatory information, optimize the business environment, at the same time, the timely release of epidemic prevention and control and resumption of production information, to promote the development of small and medium-sized enterprises; strengthen the public health information, according to the law to the public in a timely and accurate disclosure of information on the epidemic, real-time information to the public and the progress of response work; publicize government work reports, annual work highlights and other documents at all levels.

2.2 Open on Application

In 2020, Harbin City received a total of 2787 applications for public government information, as shown in Fig. 1, of which 1349 were disclosed, 180 were partially disclosed, 118 were not disclosed, 936 were not available, 123 were not processed, and 81 were other processed. Harbin City standardize the overall acceptance workflow, to ensure that the procedures are legal, appropriate content, to provide maximum convenience for applicants, to meet their right to know, and enhance the credibility of the government. In the process of replying to the applicants, we take the initiative to strengthen communication, answer questions and solve problems in a timely manner, and properly deal with new situations and problems that arise in accordance with the application for disclosure.

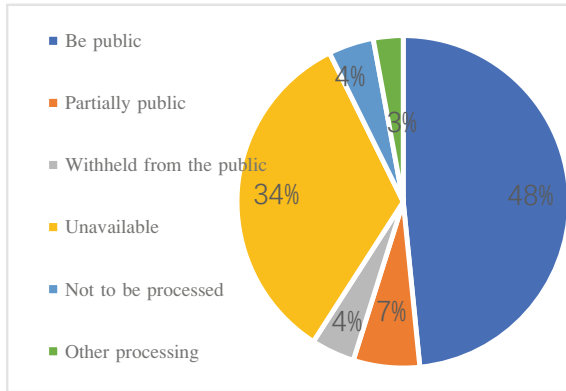


Fig. 1. Number of government information to be disclosed by application in Harbin City in 2020

2.3 Platform Construction Aspect

As a carrier of open government information, government platforms largely determine the ability of government information disclosure. By taking the data of some Chinese government information open platforms as samples, the indicators and data affecting government openness are selected, as shown in Table 1.

According to the variable measurement index and data source table, the raw data of the influencing variables and outcome variables of the openness of government data in 10 provinces in China were obtained, which are shown in Table 2:

The key to the qualitative comparative analysis method of fuzzy sets is data calibration, which is obtained by converting the raw data into fuzzy sets and matching the variables with external criteria. In this paper, we adopt continuous fuzzy sets to determine the degree of affiliation, firstly, we calibrate the original data by using the calibration function $\text{calibrate}(x, n1, n2, n3)$ provided by fs QCA3.1b software, where x is the variable, $n1$ is the threshold value of x values corresponding to full affiliation in the target set (fuzzy score of 0.95), $n2$ is the threshold value of intersection (fuzzy score of 0.5) The fuzzy set affiliation of the case variables was determined based on the above three anchor points, and the calibrated fuzzy set affiliation table is shown in Table 3:

The degree of explanation of the outcome variables by individual influence variables was analyzed to determine their explanatory power, and variables with consistency greater than 0.9 were considered essential variables and could explain the outcome variables independently, and less than 0.9 indicated that the variables needed to explain the outcome variables together with other variables, and the results of consistency and coverage analysis of variables by fs QCA3.1b software are shown in Table 4, and the consistency of all variables was below the threshold 0.9, indicating that the variables alone cannot explain the outcome variables and do not constitute a necessary condition for influencing the level of government data openness, and further group analysis of each influencing variable is needed.

Table 1. Table of variable measures and data sources

Variable Type	Variable Name	Measurement indicators	Data source
Result Variables	Level of open government data	Open Government Data Index	China Local Government Open Data Report (2nd half of 2020), Digital and Mobile Governance Lab, Fudan University
Causal Variables	Level of government information disclosure	Government Transparency Index	China Transparent Government Index 2020
	Online government services level	Government's ability to provide services online	E-Government Research Center of the National School of Administration, Report on the Survey and Evaluation of the Online Government Services Capability of Provincial Governments and Key Cities (Good and Bad Evaluation of Government Services) (2020)
	Financial Support	The general public budget states	China Statistical Yearbook 2020
	Organization	The administrative level of the government agency in charge of data opening (3 for the department level, 2 for the deputy department level, 1 for the listed agency, and 0 for no relevant agency)	Provincial government portals
	Public Demand	Number of requests for disclosure	Provincial Government Information Disclosure Work 2020 Annual Report

(continued)

Table 1. (continued)

Variable Type	Variable Name	Measurement indicators	Data source
	Big Data Industry	Big Data Industry Development Index	China Electronic Information Industry Development Institute's White Paper on the Assessment of China's Big Data Regional Development Levels (2020)

Table 2. Raw data of influencing variables and outcome variables of the level of government data openness in 10 provinces in China

Province Variables	Organization	Influence variable					Outcome variable
		Public Demand	Big Data Industry	Level of Online Government Services	Financial Support	Level of government information disclosure	Open Government Data Level
Zhejiang	2	26760	40.84	96.73	10053.03	67.38	62.56
Shanghai	2	29130	43.07	93.93	8179.28	80.03	52.28
Guangdong	2	47641	68.96	96.73	17297.85	77.26	39.13
Shandong	3	29349	51.56	79.04	10739.76	70.66	49.46
Beijing	1	36988	61.51	91.33	7408.19	80.45	35.82
Tianjin	0	3555.71	21.91	81.49	3555.71	70.33	35.59
Henan	2	19565	15.52	87	10163.93	69.59	21.11
Guizhou	3	4312	14.55	91.9	5948.74	73.41	40.33
Fujian	2	8402	30.74	90.11	5077.93	61.96	35.01
Jiangsu	1	30513	56.21	91.9	12573.55	70.4	9.27

The conditional group analysis using fs QCA3.1b, Table 5 shows that the combinations of influence variables affecting the level of government data openness are diverse, and there are four different combinations of paths, and the consistency is higher than 0.8, which indicates that these four combinations of influence variables have strong explanatory power, and the total consistency of conditional group analysis is higher than 0.9, which indicates that among the cases that meet these four combinations of influence variables, more than 92.36% of cases with high level of government data openness can be explained. The total coverage of 0.545677 indicates that the combination of the four influencing variables can explain 54.58% of the cases with high level of government data openness. The combination of variables 1 and 2 shows that the organization, public demand, big data industry, and government information disclosure level can promote the

Table 3. Fuzzy set affiliation table of variables affecting the level of government data openness and outcome variables in 10 Chinese provinces

Province Variables	Organization	Influence variable					Outcome variable
		Public Demand	Big Data Industry	Level of Online Government Services	Financial Support	Level of government information disclosure	Open Government Data Level
Zhejiang	0.501	0.46	0.47	0.95	0.61	0.18	0.98
Shanghai	0.501	0.56	0.54	0.8	0.36	0.95	0.9
Guangdong	0.501	0.98	0.97	0.95	0.98	0.89	0.56
Shandong	0.95	0.57	0.77	0.04	0.69	0.51	0.85
Beijing	0.13	0.86	0.92	0.48	0.26	0.96	0.45
Tianjin	0.02	0.05	0.1	0.07	0.03	0.48	0.44
Henan	0.501	0.26	0.05	0.23	0.63	0.39	0.1
Guizhou	0.95	0.05	0.05	0.54	0.12	0.71	0.6
Fujian	0.501	0.08	0.22	0.4	0.08	0.01	0.42
Jiangsu	0.13	0.63	0.86	0.54	0.85	0.48	0.02

Table 4. Consistency and coverage analysis

	Consistency	Coverage
Organization	0.684775	0.777588
Public Demand	0.545113	0.644444
Big Data Industry	0.607143	0.652525
Online government service level	0.738722	0.786000
Financial Support	0.531955	0.613883
Level of Government Information Disclosure	0.708647	0.678057

open government data level. Harbin City has used the Internet and other technologies to build an open government data platform and use new media to carry out government management work so as to broaden the field of government openness, and at the same time, it has also improved and upgraded the government website to enrich public information. However, compared with other provincial capitals, there is still a need to further improve the platform construction work and improve the quality of public services.

Table 5. Combination of variables influencing the level of government data openness

	Configuration 1	Configuration 2	Configuration 3	Configuration 4	
Organization	●	●	●	●	
Public Demand	●	●	⊗	⊗	
Big Data Industry	●	●	⊗	⊗	
Online government service level	●		●	●	
Financial Support		●	●	⊗	
Level of Government Information Disclosure	●	●	⊗	●	
Consistency	0.931762	0.943328	0.805036	0.857988	
Original Coverage Rate	0.282331	0.344173	0.186278	0.272556	
Unique Coverage Rate	0.0114663	0.0883459	0.0734936	0.0789474	
Total Consistency					0.92364
Total Coverage					0.545677

* “●” means the influencing variable is present, “⊗” means the influencing variable is not present, and blank means the influencing variable does not affect the result.

3 Problems of Open Government in Harbin

Harbin City conscientiously implements the “Regulations of the People’s Republic of China on the disclosure of government information”, in the city to promote the work of a comprehensive. At present, in the open government, Harbin City has made certain achievements, but there are still some gaps and problems.

3.1 Lack of Capacity of Public Affairs Personnel

The construction of service-oriented government is inseparable from the improvement of the service consciousness of public officials, and the same is true for government affairs disclosure. As a public servant of the state, the primary duty of public affairs

personnel is to serve the people wholeheartedly, the establishment and improvement of the service consciousness of public officials can promote the government to carry out information disclosure work in an orderly manner, but at present, individual departments have a low service consciousness, a serious tendency of “officialdom” and a lack of “people-oriented” ideology, resulting in their work process does not protect the people’s right to know, the right to participate, the right to supervision and other rights [2], the phenomenon of management over service, and the people’s legitimate exercise of the right to information. In the process of their work, they do not guarantee the realization of the people’s rights to information, participation and supervision, and they emphasize management rather than service, while the people’s legitimate exercise of rights is the best manifestation of the people’s mastery and the realization of democratic politics. At the same time, some government officials have a lack of understanding of the importance of this work, fail to perform their duties, fail to accurately grasp the policy content, do not have the relevant professional knowledge and ability, which hinders the healthy development of open government work.

3.2 The Construction of Government Affairs Platform is Not in Place

The development of public affairs work can not be separated from the innovation of the public form and the construction of the platform, only then can better meet the needs of the public. At present, there are various ways of government affairs platform in Harbin, but the platform construction needs to be strengthened. First of all, the platform provides services lack of interactivity, the application system of each department, database interactivity to be improved, the lack of communication and interaction between the various government departments, hindering the public to do things smoothly, “run legs” “grinding mouth” situation [3], the government efficiency is also greatly reduced. Secondly, the government open platform architecture lacks stability in data, the quality of government data information is greatly reduced, and the stability of associated nodes is also lacking, which limits the good development of the platform; finally, the number of open government affairs platform is very limited, only limited to simple matters and limited information disclosure, such as social security, education and culture, health care and other content, about the approval. Finally, the number of open government affairs platform is very limited, only limited to simple matters and limited information disclosure, such as social security, education and culture, health care, etc., but the content about approval and management, administrative processing, etc. is very lacking, which is difficult to meet the public demand, and the data and information management ability is limited, which cannot achieve the goal pursued by government affairs disclosure.

4 Countermeasures to Improve the Openness of Government Affairs in Harbin

4.1 Strengthen the Business Training of Public Affairs

First of all, we should train the personnel related to governmental affairs openness in terms of ideology and consciousness, whether they are leading cadres or full-time

personnel, to change their mindset, establish the idea of “people-oriented” [4], cultivate the awareness of governmental affairs openness, make them realize the importance of governmental affairs openness to the construction of service-oriented government and the modernization of the country’s governance embodiment and ability to govern, so that they can start from themselves, correct their work attitude, and actively respond to the needs of the public. Second, professional training for public affairs personnel, through a variety of ways to carry out regular education and training, you can organize professional scholars and professors with expertise and practical experience in training, and constantly improve the information literacy of public affairs personnel, the ability to interpret policies, and build a group of excellent public affairs team with a sense of service, professionalism and business proficiency. Through various forms of training to ensure that the public affairs personnel establish a sense of service, enhance the ability to grasp policies, ensure the timely release of information and correct interpretation, and constantly improve the quality and efficiency of government services.

4.2 Improve the Construction of the Public Government Affairs Platform

Under the wave of continuous development of information technology in society, national governance is supported by technology [5], and so is the openness of government affairs. Service is the core of SOA, and the establishment of SOA-based government platform can unite the applications and enhance their relevance and integration, which can improve the quality of government services and enhance management efficiency.

Firstly, to establish a sound open government data platform with high interactivity based on SOA, to promote the maximum service between data and functions, to realize the organic combination of each function of the platform, to improve the quality and efficiency of management and service; to realize the integration of data resources, application, opening and guarantee of the platform; secondly, to make HDFS, distributed file design, FSdata design, etc. as the top priority of data integration node design, as shown in Fig. 2, to ensure the benign operation of the data platform.

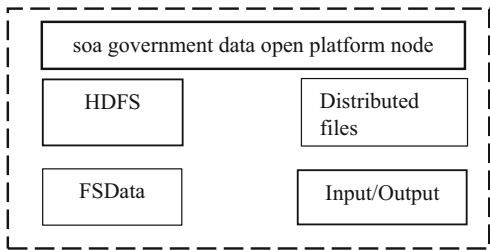


Fig. 2. Data integration node design

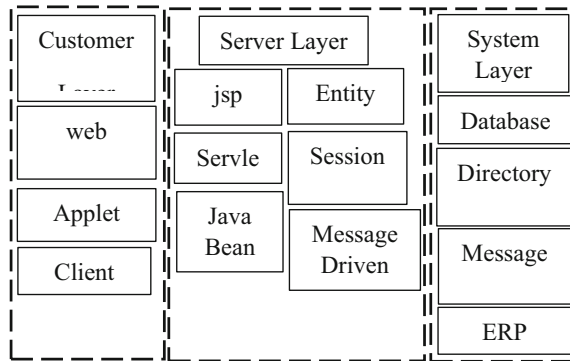


Fig. 3. JAVA technical architecture design diagram

Finally, JAVA application technology can be used to promote the construction of the government data platform, as shown in Fig. 3, java can divide the services provided by the government platform into different units, so that each unit can still give full play to its own role under the premise of interaction, to achieve the differentiated management and highly joint SOA government platform, and to promote the highly integrated and shared government data and information under the support role of java.

5 Conclusions

In the context of the intelligent society with the rapid development of information technology and the wave of democratic political development, governments at all levels should respond to the needs of the times, use modern information technology to establish and improve the government affairs platform, strengthen the disclosure of government data and information, do a good job of open government affairs, build a service-oriented government, constantly interact and communicate with the people, and improve the quality of public services and the credibility of the government.

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