

The Development of E-government under the Influence of Big Data

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Abstract—Countries around the world have introduced various new policies to adapt to the development of big data. The Chinese government also attaches great importance to the big data industry. The main purpose of this paper is to explore specific methods and suggestions to improve the management mode of the government under the background of big data. By analyzing the impact of large data on E-government and the current situation in China, combining with the existing research and related data, this paper puts forward the challenge to deal with the big data. Only a comprehensive government platform is established, the large data information is collected, the analysis of the data is deeply excavated, and the development of large data and the reform of the administrative system will be integrated and interactive. It can truly transform the challenge into an opportunity for development.

Keywords—big data; e-government; public management

I. INTRODUCTION

Twenty-first Century is the era of data information development, mobile Internet, social network, electronic commerce and so on greatly expanded the boundaries of the Internet and the scope of application, various data are expanding rapidly and larger, the information society has entered the era of big data. Big data will be widely used in the government's public services, medical services, retail, manufacturing, and personal location services, and will produce huge social and industrial space.

In the era of big data, e-government will face many challenges, such as the challenge of information disclosure, the challenge of sharing and integrating cross departments, the challenge of social management, the challenge of public service and so on. How to use big data resources, improve the government's service ability and prediction ability, and strengthen the rational practice of government administration, is an important issue to be considered in the development of E-government in China.

II. BIG DATA AND E - GOVERNMENT

Big data means that the size of data set has exceeded the ability of typical database software tools to capture, store, manage and analyze [1]. Big data has 4V characteristics of "Volume, Variety, Velocity and Value" [2].

Big data is becoming a new driving force for social innovation in twenty-first Century. Similarly, the change

triggered by big data also promotes the development of E-government in all countries in the world [3-4]. In May 2010, the Australian government issued an "open government Manifesto" to enhance the transparency of the government. At present, more than 30 countries in the world have joined the ranks of open data. Driven by global open data, in November 2011, the EU explicitly put forward an open data strategy. In March 29, 2012, the Obama administration of the United States launched the "big data research and development plan", which raised the understanding of big data to the level of national development strategy, proposed a breakthrough in the core technology in the field of big data processing, accelerated innovation in the field of science and engineering, and strengthened the development plan of the national competitiveness of the United States in the era of information and interest. In July 2012, the United Nations issued a big data government white paper, "big data for development: challenges and opportunities", pointing out that big data is a historic opportunity for the United Nations and governments to explore how to use big data resources, including social networks, to benefit mankind. The United Nations points out that the era of big data has come, and the great wealth of data resources that people can now use, including old data and new data, can be used to carry out unprecedented real-time analysis of the population. The report also takes the growth of social network activity in Ireland and the United States as an example of the early signs of rising unemployment, indicating that if the government can reasonably analyze the data resources it has, it will be able to "come in" and quickly respond. The report also explains how big data can help governments better respond to changes in social and economic indicators, such as income, unemployment, food prices and so on.

III. THE IMPACT OF BIG DATA ON E - GOVERNMENT

Big data is becoming a resource, a production factor, penetrated into various fields, and the influence and development trend of big data on E-government is shown in Figure I, which is mainly shown in the following aspects.

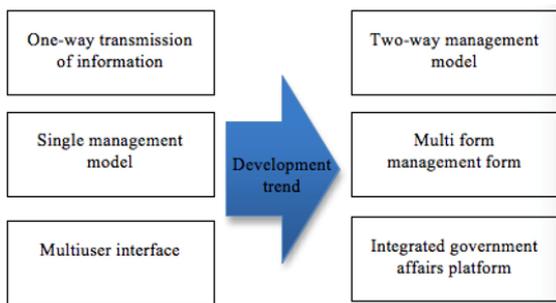


FIGURE I. THE DEVELOPMENT TREND OF E - GOVERNMENT

A. *The Change of Communication Mode and Management Mode Form a Two-way Management Mode*

The traditional way of social management is basically a one-way transmission, the government makes policy to the public, collect opinions, formulate policy changes, implement policies, the public is mainly passive acceptance of the policy.

In the era of big data, with the development of social media, the public requires active participation in social management. Whether the government has consciously invited the public to participate, the public has gradually participated in social management through micro-blog and the Internet.

Therefore, in the era of big data, social management has become a two-way management mode. It is necessary for the government to adopt more open and active communication to collect information. The public expresses their opinions through certain channels, advises and suggestions, and participates in social management.

B. *The Change of Social Form Requires the Innovation of Social Management*

The changes brought about by the network society, such as social networking, bring new challenges to the current social management and require the government to provide innovative services. Through the deep penetration and integration of information technology and service management functions and processes, new government services and management forms are formed. Through the development of information support ability and level, it promotes the promotion of government decision-making, management and service level, and promotes the social operation mode, work mode, life style, organization form and behavior, and so on.

C. *The Change of Social Structure Requires the Cooperative Work of the Government*

In the new era, the government needs to carry out the reform of the Ministry of Commerce and establish a service-oriented government. This needs to establish a comprehensive platform for government affairs. This platform should not only be a comprehensive government information platform, but should also integrate government management mode and build an organic whole on this basis. Based on the analysis of new technology and big data, we should change the way of government management and improve the efficiency of government management.

IV. THE PRESENT SITUATION OF THE DEVELOPMENT OF E-GOVERNMENT IN CHINA

As we all know, the history of E-government Based on Internet is not long either at home or abroad. The use of modern electronic information technology by our government starts with OA. Since 1980s, China's government information technology has roughly experienced the three stages of the "office automation", "government Internet" and the comprehensive promotion of capacity building and the "application leading" stage at the present stage of the single machine application stage [5].

With the innovation and development of Internet technology in China, Jindong Zhang, chairman of the CPPCC National Committee and chairman of suing cloud merchant, proposed to develop e-government in the era of big data and establish a unified national e-government platform to better improve administrative efficiency, further reduce administrative costs and give full play to the function of social management. There is a strong response. At present, China has promulgated a series of policies to promote the development of big data industries. The national development and Reform Commission put forward opinions on strengthening and improving the national e-government project [6-7]. In September 2015, the State Council issued the "program for the promotion of big data development", which aims to promote the development of China's data technology. The data will be regarded as a strategic resource [8-9]. "Planning" in 13th Five-Year specifically mentioned: the implementation of network strategy; the implementation of the "Internet plus" plan of action; the development of the implementation of the national data sharing economy; strategy; implement innovation driven development strategy [10]. This indicates that big data has been incorporated into the strategic level of innovation by the national government and has become one of the core tasks of the national strategic plan. The introduction of these policies shows that our government attaches great importance to the big data industry, and its strategic objectives are clear and clear [11-12]. This situation has enabled our independent innovation leader enterprises to usher in great development opportunities. Therefore, how to make big data play a greater value in government information engineering has become a hot topic at present.

With the strong support and promotion of the state, China's e-government has made great progress and the market scale continues to expand. According to the data, in 2010, the size of the E-government market in China broke through 100 billion yuan, and the size of the E-government market in China reached 277 billion 200 million yuan in 2017. It is predicted that in 2018, its market size is expected to exceed 300 billion yuan. Since the 2011 year of "Chinese government micro-blog", after a few years of development, government micro-blog has rapidly developed into an important platform for public administration and network administration. The official micro-blog Ministry of public security, "the Ministry of public security plays four black and four hazards," now has more than 29 million 230 thousand fans. And micro-blog's "wave" has not yet cooled down, and the "wave" WeChat followed. Government WeChat developed rapidly in 2014, unlike government micro-blog. Government WeChat, with the help of

subscription number and service number, pays more attention to the realization of "micro service", so that the public can use inquiries and declarations at anytime and anywhere. At present, the number of active users of WeChat in China has reached 1 billion 340 million [13], and the number of official WeChat public accounts has exceeded 170 thousand [14].

V. THE DEVELOPMENT DIRECTION OF E-GOVERNMENT IN CHINA

China has developed e-government since the 80s of last century, and has undergone three changes before and after the transition from e-government to e-government. With the rapid development of the Internet and the coming of the era of big data in twenty-first Century, the e-government will face unprecedented opportunities and challenges in the context of our country's great boost to the Internet industry. Therefore, we should attach importance to the development direction of E-government in our country.

The government should study and deploy "big data" as early as possible, and it can start from the following aspects.

A. Building an Integrated Government Platform to Effectively Promote Resource Integration

At present, after more than 10 years of government information construction in China, the core business of most government institutions has completed different degrees of information, and the provision of network public services is also popularized in different depths. However, the information platform of various departments is a unique system. Data from different departments do not have unified collection standards, nor have they been interoperable. For example, the data of the information bureau and the Bureau of meteorology, the Bureau of statistics and the social security bureau are not universal, let alone the integration of resources. Obviously, "data out of many doors" leads to "data islands". This situation is a serious violation of the original intention of government informatization. The reason is that the information center of the previous departments is basically a service organization, the main responsibility is to manage the network of business departments well, and the virus will be killed clean. Two, different business departments have their own independent business system. They only submit data from their own departments and no longer report to higher level leading departments. The three is that these data are generated in separate business systems, and there is no correlation between data and data and different business systems.

Therefore, it is necessary to establish a comprehensive government platform including a unified network platform, a unified data platform and a unified service channel and means. The structural model is shown in Figure 2. The unified network platform refers to the realization of the connection between the internal and external network of E-government on the basis of ensuring security and the integration of network platforms such as website, WeChat, micro-blog and so on. The unified data platform needs to build a data center integrating centralized database, exchange sharing platform, information resource catalog and standard. The unified service channel and means require the government affairs platform to integrate the multi

form user port and carry on the effective docking, and realize the functions of the government service center, the government service hotline, the street community service center, the archives service center, the citizen electronic mailbox, the social security card and the end of the public service. To provide the public with one stop service, one network connection, one service and one card access service.

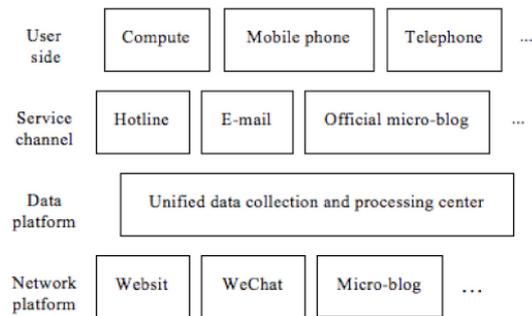


FIGURE II. STRUCTURE MODEL OF INTEGRATED GOVERNMENT AFFAIRS PLATFORM

The comprehensive e-government platform based on big data can really cross the gap of internal government synergy, greatly improve the efficiency and reduce the cost of government operation. First, there are some obstacles in the government's internal cooperation in addition to the ideological barriers. With the development of big data technology, the government across the system, across the platform and across the data structure will make the vertical and horizontal departments of the government smooth and synergistic in technology. Secondly, the number of big data technology will be used. The response time of acquisition, processing and analysis has been greatly reduced, and the work efficiency has been significantly improved. Under the comprehensive government platform, the phenomenon of information island will be reduced greatly, so as to improve the efficiency of cooperation and work for the government, improve the government's social governance and public service ability.

B. Building a Big Data Center to Collect Data

To build big data center, strengthen the acquisition, organization, analysis and decision of government data, realize the unified management of government information resources by cloud computing technology, the development and utilization of government resources according to laws and regulations and the needs of various departments, can improve the utilization rate of equipment resources, avoid duplication of construction and reduce Maintenance cost.

In addition to the traditional e-government website, information gathering channels can also include mobile terminal APP, official WeChat, micro-blog, public service hotline, etc. The mobile terminal can be a good platform for the communication between the government and the public. On the one hand, the government can publish information to the public. On the other hand, the terminal of the mobile phone can also be used as a government terminal. The staff of each department can give feedback to the higher authorities or the level departments to communicate. The official WeChat

and micro-blog have now become a hot spot of public concern, and WeChat and micro-blog can be more deeply excavated and developed as a division platform for comprehensive government affairs. The public service hotline itself has undertaken a lot of information collection and supervision work, and its growth rate is very rapid. Now the public service hotline in large cities tends to be integrated. The integration can be made in two directions, one is an emergency hotline, such as 119, 110, 999, and the other is the government's non emergency service hotline, such as the 12345 mayor hotline in Beijing and Shanghai, and the 12316 hotline, etc.

According to the different service content and data types of government administration, the resources are integrated with the existing technical means and network platform, and the specific planning model is shown in Table I.

TABLE I. THE PLANNING MODEL OF THE DATA CENTER OF GOVERNMENT GOVERNMENT ORGANS

type	Service column	data type	Application platform
E-government	Administration of government affairs	Social security, medical treatment, certificate handling, qualification accreditation, marriage registration, social assistance, family planning, etc.	Web site, service hotline
	Government information acquisition	Government regulations, procedures, institutional responsibilities, personnel exemption, information disclosure, etc.	Web site, mobile terminal APP, WeChat public number
Life service	Life service inquiry	Personal medical account, traffic card balance, government department service hotline query, bus trip map, public facilities inquiry, etc.	Mobile terminal APP, WeChat public number, service hotline
	News dynamic tracking	News, video and other important news; weather, traffic and other convenient prompts; special reports, etc.	Website, mobile phone terminal APP, WeChat public number, official micro-blog
Platform interaction	Leadership mailbox at all levels	The mayor's mailbox, the municipal Party leader's mailbox, the Department's county leaders' mailbox, etc.	Website, WeChat public number, official micro-blog
	Online interview	Interview, notice, interview, news and government affairs interactive interviews, etc.	Website, mobile terminal APP, official micro-blog
	Report	Report on fire hazard, traffic violation report, etc.	WeChat public number, official micro-blog, service hotline

Through online interaction, the public will become the node of the government process, so that the public can participate in the policy making and implementation, the evaluation and supervision of the effect, making it possible for the people to participate in the political and political affairs. In addition to listening to public opinion and resolving social contradictions on these social networks, the data generated on social networks can help the government to solve some of the problems that have long been plagued by the government.

C. Combining Government Data Analysis and Mining, Improve the Efficiency of Government Public Management

Government departments have a large number of information resources, in the big data age not only to share these data, more importantly, to use big data resources to improve the government's service capacity and prediction capability [7].

The United Nations Global pulsation plan lists the three contents of the data's analytical value, the relevance of data and policy and the privacy of personal data as a possible problem in the era of "big data". Data analysis is the core of the whole big data processing process, because the value of big data comes from the analysis process. Data extracted and integrated from heterogeneous data sources constitute raw data for data analysis. Depending on the needs of different applications, all or part of these data can be selected for analysis.

Data mining can provide real-time and effective information needs. The government departments should give full play to the functions of the government and effectively monitor and manage them. At the same time, in order to enhance the timeliness of communication between the people and the government, the government should grasp the effective information in time. The mining results can be used for analysis and decision making. Although the existing database system can efficiently implement the functions of data entry, query and partial statistics, it can not find the relationship and rules in the data, and can not predict the future development trend according to the existing data. Therefore, the government affairs system urgently needs to have an intelligent auxiliary decision support system.

With the improvement of data analysis ability, the positive effects of big data and government information opening will converge into a huge flood, and promote the further opening of government information resources. More and more mature analysis practice and application and mining tools make public information be effectively used and developed and applied. Big data can improve the scientificity and accuracy of government decision making, improve the government's ability to predict and predict and respond to emergencies. More and more governments abandon experience and intuition and rely on e-government data analysis to make decisions. Now the big data goes beyond the traditional method of data analysis. It can not only analyze and mine the standardized and semi normalized data, but also make deep mining and artificial intelligence for the speech and graph. The in-depth and extensive application of big data will bring scientific and precise decision support to the government.

D. Integration and Interaction with Administrative System Reform

In the era of big data, the development of e-government should focus on public service and develop "innovative" service oriented government. With the direction of business linkage, it supports fine management. A long-term mechanism for interdepartmental and cross regional information system interoperability and resource sharing is formed. First of all, achieve the integration of existing departments based on existing processes. Then, the reconstruction of basic process and innovation of institutional transformation are realized. "Integration" is not only the advanced stage of public management, but also the advanced stage of information. It is different from the traditional government management, but also different from the general electronic government. The main difference is reflected in the new model of public management and service, which is supported by information, to achieve a strategic transformation to a service-oriented government, and to form a new public governance pattern.

The key to the establishment of an innovative service oriented government is to simplify and optimize government work processes based on the concept of large systems. The goal of information service is to achieve information sharing and inter departmental collaboration. With new technology as the framework, we should promote application deepening and resource integration, and promote decision-making science, precise management and service in place. The new model of "innovation" service electronic government should focus on improving the public centered online service, effectively promoting the government to change to the active service, and effectively promoting the one-stop comprehensive service for the grass-roots community, and promoting the office and interaction of the civil service online.

VI. SUMMARY AND PROSPECT

In a word, with the rapid development of the Internet industry, such as cloud computing and Internet of things, data has shown an explosive growth trend. People are being surrounded by the flood of data. The era of big data has come. Big data brings opportunities to e-government innovation, but also brings great challenges to traditional public management methods. In the face of opportunities and challenges, how to release the value of government data and contribute to social development; how to complete the combination of big data and new technologies, create more new specialties and fields; how to transform the challenge of big data into great development opportunities through the national strategy, thus winning the competitiveness of the commanding heights of science and technology, The question we have to think about. Seize the opportunity and face the problem, we can further promote the transformation and development of e-government development mode and implementation path in the new era and new conditions.

REFERENCES

- [1] J.Manyika, M.Chui, B.Brown, et al.Big data: the next frontier for innovation, competition, and productivity. Report, McKinsey Global Institute, May 2011.
- [2] Ling Cao. Big data Innovation: a study on the EU's open data strategy. *Information Studies: Theory & Application*, 2013, 36(4): 118-122.
- [3] XiaoFeng Meng,Xiang Ci. Big data management: concepts, technologies and challenges. *Journal of Computer Research and Development*, 2013, 50(1): 146-169.
- [4] MingGao Li. Big data on e- government. *Informatization Construction*, 2013 (1): 18-19.
- [5] XiangDong Wang. The progress, current situation and development trend of E-government in China. *E-Government*, 2009(07):44-47.
- [6] Jian Ding. Analysis of the promotion effect of big data on government 2.0. *China Information Times*, 2012 (9): 12-14.
- [7] MingQi Chen. A comparative analysis of Sino US big data development strategy of the national development strategy of big data ready. *People's Tribune*, 2013 (10): 28-29.
- [8] HuaHuan Huang,LiFang Xue.Big data, big government affairs, new network -- development direction of e-government network in big data Era. *E-Government*, 2013 (5): 104-109.
- [9] XiaoQin Liu. On Clean Government Construction under the Background of Big Data. *Chinese Public Administration*, 2015(12):113-117.
- [10] Hao Yu. Opportunities, challenges and Countermeasures of government data management in the era of big data. *Chinese Public Administration*,2015(3): 127-130.
- [11] KangZhi Zang,Tong Zhang. Thinking and social change requirements in big data. *Theoretical Exploration*,2015 (5): 5-14.
- [12] HaiHua Sun. A summary of the view of the era of "big data".*Review of Economic Research*, 2015 (26): 74-87.
- [13] Chinese storage. WeChat users latest data: monthly active users reach 549 million, paying 400 million of users. 2016(8).
- [14] Tencent. 2017 WeChat Data Report, 2017(11).