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Research and Application of Big Data in E-government

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Abstract. The wide use of modern electronic information technology, represented by big data technology, has brought people into the era of big data. Big data is affecting our work, life, even economy and the development of the society. Nowadays, the application of big data technology in e-government speeds up the development of e-government, which is important for the overall construction of e-government. This paper summarizes the application of the big data, introduces the application of big data technology in e-government. Then this paper analyzes the current situation and problems of e-government development. Finally this paper proposes the solutions of big data platform in e-government.

1. Introduction

In recent years, with the rapid development of information technology, big data become a hot topic in science and business field. Big data has become a new focus of attention, "big data era is coming". Big Data brought the opportunities and challenges in our life. Big Data refers to the new processing mode to have a stronger decision-making ability, insight discovery and process optimization capabilities of massive, high rates of growth and diversification of information assets. If enterprises want to enhance enterprise's competition and achieve greater efficiency, then enterprises need analysis the historical data, process data and mine valuable information, then make right decisions. Data processing is suitable for many kinds of application scenarios. Now big data technology is more and more applied in e-government.

The application of big data technology in e-government is to analyze massive data and process massive data and mine massive data, which can provide reliable and scientific information data, so government affairs can make correct decisions according to these information. Current e-government platform is limited to data transmission and data storage, the platform does not contain the function of data processing and data analysis and data mining. Therefore, the focus of e-government platform is design and develop the function of data mining and analysis, which has a profound impact on the overall development of e-government.

2. The Application of Big Data

Many websites produce dozens of PB data every day. The massive data is stored on the hard disk, rarely updated, it need long storage time. Large quantities of data is not easy to move and backup. So the key of "Big Data" is quick to obtain valuable information from wide variety and large data by processing and mining the data. Nowadays, Data processing is suitable for many kinds of application scenarios, such as networking, Internet, security and public services, the following examples are introduced.



2.1. Statistical Analysis of Big Data

Statistical analysis of big data is a process of organizing and collecting massive data, analyzing related data and making it effective information. For example, Taobao's "Data Cube" mainly provides industry data analysis, statistical analysis, which includes the ranking list of brand, store and product and the characteristic of purchase of crowd.

2.2. Visualization Analysis of Big Data

Big data technology can mine valuable information and knowledge which are hidden in massive data, therefore which can improve the operation efficiency of various fields and improve the intensive degree of whole social economy. Data visualization is to convey the potential characteristics of data intuitively and to display data objectively by using graphical technology, it can achieve in-depth insight, analysis and display of massive and complex data. For example, Taobao's "Data Cube" visualizes the results of data analysis simply to find the valuable information behind big data, people can easily understand the results of analysis.

2.3. Data Mining and Predictive Analysis of Big Data

Data mining refers to the process of mining hidden and unknown useful information and knowledge from a large number of incomplete, noisy, fuzzy and random data. According to the huge amount of data, we need use data mining algorithms and strategies to mine the reliable information in cloud computing environment. In our country, data mining and predictive analysis of big data is more and more application in many fields. So e-government increasingly uses data mining and predictive analysis to help decision-making. For example, government of flood control office can get useful information from the previous rainwater data by using the technology of processing and mining, then forecast this year's rainwater situation and take timely measures to prevent floods, which can reduce the losses caused by floods.

3. The Application of Big Data in E-government

3.1. Data and Resource Sharing

The application of big data platform realizes information publicity and solves the problems of difficult communication and information transmission among departments, people and governments, so big data platform realizes information and data sharing. Many approvals can be carried out on online, which brings great convenience to people's lives. For example, audit of salary taxation, people report their tax reduction projects by mobile phones or websites, and the government verifies the authenticity of the declaration projects according to website approval and data information shared by other platforms. This operation brings great convenience to people and greatly improves the efficiency of work. Thus, the use of big data platform during the overall construction of e-government can enhance the role of government in public service and social management. Different departments can share data with each other, which can conveniently and quickly verify the correctness of materials.

3.2. Improving Supervision

In big data era, e-government construction can promote interaction between the public and government departments by means of advanced networks, mobile phone and computers. Government departments can publish work items, specific processes and work objectives on the network, which can make government information transparent. So the public can easily understand and grasp the general direction of government development and government can reduce the working period and give full consideration to the opinions of the public, the public give full support on this. Big data platform provides a convenient way for public participation on achieving mutual supervision between departments, strengthening the supervision of government and public supervision of government departments. So big data platform make people more and more to trust the government, so the government's policies are easier to implement. So society will be more harmonious.

3.3. Improving the Effectiveness of Decision Making

Nowadays, data accuracy can be improved with the help of information processing technology. A large amount of data and information will be generated in e-government, valuable information and knowledge are hidden in the massive data, which can provide favorable and scientific support for the final decision-making of the government by mining and analysis of massive data, so the valuable information and knowledge can improve the effectiveness and accuracy of government decision-making.

4. Current Situation and Problems of E-government Development

4.1. Incomplete Data and Information Sharing

Though big data platform has realized information and data sharing in many governments, but the overall construction of E-government in various regions is very slow due to influenced by urban-rural differences, regional and economic constraints. From the perspective of the overall construction structure of e-government, the overall development of E-government in eastern and urban areas is relatively fast, but the overall development of E-government in western and rural areas is relatively slow due to economic constraints. Because e-government lacks a uniform platform for information sharing, so it is difficult to manage e-government and share data and information of different departments in various regions.

4.2. Insufficient public participation

Nowadays, in addition to getting a lot of public information, the public can also make suggestions to the government through social media and government websites. The way of public participation has gradually changed, and the enthusiasm of public participation has been greatly improved. However, there are still many problems in public participation. Firstly, public participation is poor. Public participation is influenced by nationality, language, economy, age, culture and region, gap between urban and rural areas is big, gap between poor information technology and insufficient infrastructure is big, which makes public participation in e-government unbalanced and makes it difficult to popularize e-government. Secondly, public participation is mostly passive. Government need adapt some methods to change the way of public participation from passive to active. The government needs to rely on information from public feedback to assist decision-making. So public consciously like to part in e-government.

5. Solutions of Big Data Platform in E-government

5.1. Constructing Uniform Technical Standards

Constructing uniform e-government technical standards is the primary factor of using big data platform in e-government. Many departments use different systems and produce various kinds of data. So we need construct uniform e-government technical standards in order to share data and information. In addition, government should take measures to ensure the security of the network.

5.2. Improving Infrastructure

Infrastructure of e-government influences public participation, so government need speed up infrastructure construction in order to improve public participation. Infrastructure of e-government generally includes platform, database and hardware. It is necessary and important to establish a reasonable and scientific framework to integrate the three parts. The government should not only strengthen the infrastructure construction of urban infrastructure, but also strengthen the infrastructure construction in rural areas and remote areas in Western China. We can improve the use and popularization of big data platform by improving infrastructure, so people can participate in e-government easily.

5.3. Increasing public participation

Nowadays, influenced by nationality, language, economy, age, culture and region, big gap between urban and rural areas, poor information technology and insufficient infrastructure, which makes public participation in e-government unbalanced and makes it difficult to popularize e-government. In the new era, computers have been widely popularized, panel computers and mobile phones have also been widely used. So government need take measures to increase public participation. For example, let the people experience convenience in e-government by improving the efficiency of online government departments. The problem of public reaction can be solved in time. People like to use e-government platform when people really enjoy the benefits of big data platform.

5.4. Developing Data Application Platform and Decision Support Platform

In big data era, information sharing can narrow the distance between regions and departments, and improve the accuracy and efficiency of data transmission, which brings great convenience to government work. So government can develop the application platform of e-government. Let the public participate in more government platforms. Every day a large amount of data and information will be generated in e-government, valuable information and knowledge are hidden in the massive data, which can provide favorable and scientific support for the final decision-making of the government by mining and analysis of massive data, so the valuable information and knowledge can improve the effectiveness and accuracy of government decision-making. So it is very important to develop an efficient and accurate decision support platform.

6. Summary

In summary, big data has developed rapidly in the domestic modern society. At the same time, it has been widely used in various fields, which has brought about changes in data and information. This paper summarizes the application of the big data, and introduces the significance of applying the big data technology in the e-government. Then this paper analyzes the current situation and problems in the development of the e-government. Finally this paper explores the solutions of the large data platform in the e-government. In order to promote the overall process of e-government construction, government need build uniform technical standards and improve infrastructure, government need increase public participation and develop data application platform and decision support platform, so as to embody the specific value of big data platform in e-government.

References

- [1] REICHMAN O J MATTHEW B.MARK P P.et al Challenges and opportunities of open data in ecology *Science* 2011 vol 311(6018) pp 703-705.
- [2] Xu Zi-pei Big data *Guangxi Normal University Press* 2012 57.
- [3] World Economic Forum Big data big impact New possibilities for international development.
- [4] Shen Da-feng Zhou Min 2013 Frontier of e-government development, *China Economic Press*, 2013 p 151-170.
- [5] Yan Xiao-feng, Zhang De-xin Big data research *Computer Technology and Development* 2013 vol 23(4) pp 168-172.
- [6] Tao Xue-jiao Hu Xiao-feng Liu Yang Overview of big data research *Journal of system Simulation* 2013 vol 8(25) pp 142-146.
- [7] Meng Xiao-feng Ci Xiang Big data management: concepts, techniques and challenges *Journal of Computer Research and Development* 2013 vol 50(1) pp 146-169.
- [8] Huang Xiao-yun Research of cloud storage service system based on HDFS *Dalian Maritime University*, 2010.
- [9] Chen Kang, Zheng Wei-min Cloud computing: System instances and current research *Journal of Software* 2009 vol 20(5) pp 1337-1348.
- [10] Wu Hao Research on information sharing mechanism of chinese government in big data era *Jilin University*, 2017.

- [11] Li Yong-zhong Zheng Tao Research on the construction of government data information sharing system *Journal of University of Electronic Science and Technology* 2016 vol 18 (02) pp 8-14.
- [12] Liu Zhi-cong Discuss the application of big data technology in e-government *Communication world* 2017 vol 12.
- [13] Wang Xiang, Li Hong-juan Application of big data technology in e-government *Electronic Technology and Software Engineering* 2018 vol 12.
- [14] Kang Ya-li, Han Ya-nan Current situation and countermeasure of e-government development in China under the background of Internet + and big data *Information Recording Materials* 2018 vol 19(5) pp 112-113.