

Design of E-Government Platform Based on Big Data Technology

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Abstract: With the rise of e-government concept, big data technology helps e-government usher in a new breakthrough. This paper proposes to integrate big data related technologies into e-government platform. Combined with the current construction background of e-government platform, and analyzes the needs of e-government platform, puts forward the platform design principles, and constructs a three-tier data sharing platform framework based on data layer, support layer and application layer. The construction and technical support of the platform are described. The construction of e-government platform based on big data technology helps to realize resource sharing among different departments, improve the comprehensive operation efficiency of all parties, and provide higher quality government services for the people.

Keywords: big data; E-government platform; Data sharing; visualization

1. Introduction

With the development of information technology, the era of big data is coming rapidly. All walks of life have been widely affected by big data technology. In this context, e-government work should also be combined with the characteristics of the big data era to timely change ideas: speak with data, make decisions with data and manage with data[1]. Since the national big data action plan policy was put forward in 2015, local governments have actively built government big data platforms. Local governments gather all operation data of various departments and industries and various types of government related data from the internet through the platform, so as to improve the government's ability to govern and serve the masses [2]. Many scholars have also conducted relevant research on the e-government platform combined with big data technology. Some scholars have studied the architecture of e-government database and designed a framework of e-government shared data resource database [3]. Some scholars proposed the design of e-government platform based on cloud computing technology [4]. Some scholars have proposed a cloud service platform to maximize the value of government big data combined with artificial intelligence technology [5]. This paper analyzes the requirements of e-government platform, analyzes the design principles of e-government big data platform, and puts forward a "one-stop" e-government platform architecture based on big data storage, mobile Internet, data analysis and processing technology, in order to provide some ideas for the construction of e-government big data platform.

2. Demand Analysis of E-Government Platform

2.1 Building Government Big Data Platform

Different management departments often adopt different standards and different government platforms, which makes it difficult for departments at all levels to connect horizontal information [6]. Although different functional departments are integrated into a unified government website, the data are still independent, and there are many "information islands". There are repeated work among departments, and the same information is scattered among different functional departments, so the data cannot be unified. Therefore, an e-government platform based on big data is needed to integrate the information, unify the information resource database, and build a platform based on government big data.

2.2 Build a Perfect Shared Data Resource Database

Government data comes from a wide range of sources, but it is difficult to integrate government data, which from different departments, different businesses and different degrees of integrity directly. Therefore, we should adopt appropriate collection methods to collect data timely, effectively and reasonably. At the same time, some government departments do not have perfect data analysis tools, and some grass-roots staff have insufficient data application ability, so it is difficult to really give full play to the advantageous role of government big data. Therefore, to build a government data platform, we must first build and improve the data resource database.

2.3 Deeply Integrate and Analyze Basic Data and Business Data to Provide Management Decision-Making Basis

"Decision making with data" [7] is a new and deeper demand for government data governance. However, a large number of government information resources have not been fully utilized, resulting in a waste of data resources, which is not conducive to giving better play to the role of data resources in the transformation of social governance mode [8]. Therefore, it is necessary to combine the basic government data, business rules, data types, etc., and adopt a variety of methods to tap the deep-seated business needs, provide effective service basis, and better serve the society.

2.4 The Aging Society Puts Forward New Requirements for E-Government

The e-government platform provides more convenient services for enterprises and citizens. The traditional offline government is also gradually transitioning to online, but it has also encountered a series of problems. China's aging population is increasing. How the elderly quickly learn to use the government affairs platform to handle business and how to solve the problems encountered in the process of handling business are problems that can not be ignored in the construction of the government affairs platform. Combining modern digital technology with platform construction can improve the user experience of the elderly and create convenience for the elderly users.

3. Design of E-Government Big Data Platform

3.1 Design Principles

(1) Security

Because government information involves more privacy of users, it requires high security in the storage and transmission of information to a certain extent. By establishing a perfect system security management system and management scheme strategy, the security of information accessed to the system can be guaranteed.

(2) Reliability

The government service platform needs to provide services for different users around the clock. The system must have good reliability to support the efficient and rapid benign operation of various government services. The platform needs to carry out all-round reliability design and planning, and do a lot of effectiveness tests to ensure the stability and reliability of the system.

(3) Normative

The construction of government service management platform is based on various standards and norms of government service. Each module and function set by the platform must comply with various management systems and standard documents of local government. It is necessary to ensure the consistency of system platform and entity service hall with national and local regulations.

(4) Convenience

Let users more conveniently understand the entrance of handling different businesses and the handling methods on the Internet. Avoid repeated filling in materials and inability to clearly know the progress of work in the process of work. Therefore, in the system design, we should first consider the clear positioning of the service entrance of administrative services, so that users can handle various businesses quickly and conveniently after entering the system.

(5) Fusion

We should be application-oriented, integrate government data and realize the full integration of government data resources. Through association comparison, we can explore more data value in the association relationship of data. Clarify the ownership, use and management rights of data and the use relationship between them, clarify the rights, responsibilities and interests of all parties, and promote all departments to share data sources.

3.2 Platform Architecture Design

Based on big data storage, mobile Internet, data processing and other technologies, the system constructs a "one-stop" e-government platform architecture. From top to bottom, the architecture is mainly divided into three levels: data layer, support layer and application layer. As shown in Figure 1.

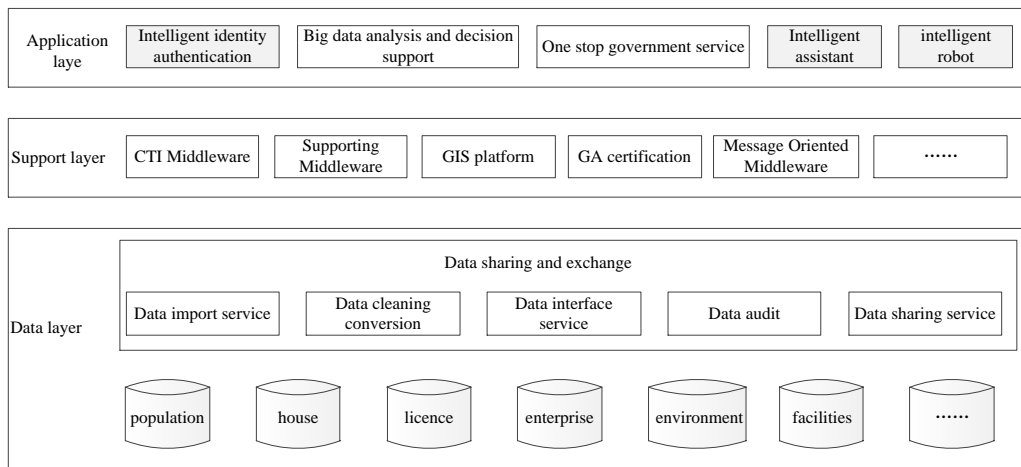


Figure 1: System framework

Data layer: the data of this layer mainly includes population data, house data, electronic license data, enterprise data, urban environment data, facility data, etc. data collection, storage, exchange and sharing are realized through data import service, data cleaning and conversion, data interface service, etc.

The supporting layer plays a connecting role in the whole frame. It mainly includes some middleware, industry standards, etc. it is a pure technical support part, which will not be repeated here.

The application layer is the core functional layer of the framework. The massive text data, image data, video data, etc. provide a good data foundation for the analysis and mining of government big data, and the analysis results can also assist users in scientific management and decision-making [9]. Therefore, it is possible to provide auxiliary decision-making after processing, fusion, analysis and processing of information. The network service platforms include web service platform, mobile app, wechat official account Self service terminals provide diversified and practical services for enterprises, users and functional departments.

4. Key Technologies

(1) Data storage implementation

The storage process of the platform is designed as follows: the massive data collected is distributed and stored on HDFS through Hadoop framework, and the data is analyzed through MapReduce, and stored in the database after the analysis. The front-end page requests to obtain the data in the database, and the visualization effect of the data in the database is displayed to the user by calling echarts visualization library, or the data is displayed to the user in the form of general information. Hadoop distributed framework is responsible for the storage, data analysis and calculation of massive data processing and operation. The web server is mainly responsible for processing the request of the front-end page and returning the corresponding data. The database is mainly responsible for storing, querying, indexing, updating and loading database data.

(2) Data visualization technology

Visualization technology is mostly used for data statistics and analysis. With intuitive images such as histogram, pie chart, thermal diagram, rising sun diagram and other chart information, combined with the interaction between users and the system such as click and hover, the image can clearly, dynamically and vividly display data change trend, statistical distribution proportion and other information. The implementation of visualization technology can choose the echorts visualization library. Echorts is a pure JavaScript chart library. In the face of the same resources, the visualization speed is much faster than other methods. The bottom layer of echorts relies on the lightweight canvas class library zrender, which also makes it faster in dealing with data flow.

5. Conclusion

This paper analyzes and designs the E-government big data platform in detail. Firstly, this paper studies the problems existing in the current e-government data application, such as "information island", data not really shared, repeated work between departments, and government big data not playing a real role. At the same time, aiming at the above problems, this paper determines the system requirements of government big data platform, then designs the platform framework, and puts forward some key technologies used in the system implementation. It is hoped that the construction and application of the platform can effectively help social progress and development.

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