Research on Computer Intelligent Electronic Information Sharing Platform System

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Abstract. With the rapid development of e-government construction, the total amount of government information resources has increased rapidly, and the quality requirements have been continuously improved, initially forming an open and shared environment for information resources. The information sharing and exchange platform is designed to solve the above problems. It aims to build a flexible, safe and reliable transmission system and provide a unified technical support environment for various applications. The information exchange and sharing platform is a basic platform facility for each application system, and the application system can exchange and share data with other application systems through the information exchange and sharing platform. Due to the lack of uniform data standards, specifications and formats, the comprehensive utilization level of information resources is limited. In order to build a computer intelligent e-government information resource sharing platform, this paper explores the establishment of an architecture for the organization, exchange and utilization of e-government information resources from a technical point of view, based on the existing research on the sharing methods and modes of government information resources sharing.

Keywords: Information resources, e-government, sharing platform.

1. Introduction
With the government's position in the national economy gradually changing from a central management and control organization to an organization providing services to the society, the radiation depth and breadth of e-government system are also increasing [1]. E-government mainly consists of three parts: digital office within government departments, information sharing and real-time communication between government departments through computer network, and two-way information exchange between government departments and the public through network [2]. In recent years, e-government has been in-depth and extensive development. Governments at all levels and government departments have established corresponding business systems and collected a large number of information resources [3]. In the process of government informatization implementation, there are many problems due to the lack of unified planning and standards for the application systems built by various units earlier, and the integration with other application systems is not considered [4]. With the vigorous development of e-government, governments at all levels and their functional
departments in the region have established their own government information management systems, with a variety of data formats [5]. However, due to the lack of unified data standards, norms and formats, the comprehensive utilization level of information resources is limited. In order to better serve the people, the government constantly pursues higher and better efficiency and quality. Strengthening the information exchange and sharing between departments is an important measure to further improve the efficiency of government office, and also a key problem faced by the government information construction [6].

With the progress of information technology and the dual track of government function reform, e-government has become the main direction of government administration reform [7]. E-government refers to the government activities carried out with the help of electronic information technology, that is, government agencies use modern information technology to realize the reorganization and optimization of organizational structure and workflow, and build a simple, efficient, clean and fair government operation mode across the constraints of time, space and department separation [8]. Resource sharing can promote e-government, improve the efficiency and quality of government work, and bring convenience and quickness to people. From the current situation of the government portal, although the construction and management of e-government have achieved great results, the overall planning mechanism is not perfect, and the phenomenon of multi management, multi investment and repeated construction still exists [9]. With the rapid development of e-government construction, the total amount of government information resources is increasing rapidly, the quality requirements are constantly improving, and the opening and sharing environment of information resources has initially formed [10]. In order to build a computer intelligent e-government information resource sharing platform, based on the existing research on the sharing methods and modes of government information resource sharing, this paper explores the establishment of a system architecture about the organization, exchange and utilization of e-government information resources from a technical point of view.

2. Demand analysis of e-government information resource sharing platform

2.1. Business requirements
For the newly developed application, it can be used as a process management system to complete the process execution of the internal business system of government departments. Business process management system provides a technical basis and platform for continuous cross-departmental process reengineering and process optimization. There are some differences between different government departments and units in the application environment and processing depth of government information resources. For those units that can meet the information resource demand simply through directory query, their business needs can be met in the resource directory service. Information exchange and sharing platform is mainly composed of metadata management, exchange service, directory service, security service and platform management. Based on these supporting modules, we can integrate existing business systems and develop new business systems to meet the needs of government information exchange and sharing. The function of data support integration system is to integrate the data of each application system in the process of information exchange, unify the format or carry out format conversion, so as to facilitate the exchange and sharing of information [11].

In the government's e-government management, the government departments or units that supply the e-government information resources should organize the information resources reasonably in the form of catalogues, so as to provide convenience for the demanders to locate the resources quickly through catalogues. In other words, the registration, publication and maintenance of e-government information resources through the directory is a business requirement that must be dealt with in order to integrate government information resources and build a shared platform. Among them, the directory management system provides information resources publishing, retrieval and positioning services for various departments, and its function design is based on dynamic structure storage, focusing on solving the problems of directory structure expansion and data management. The structure of e-government resources co-construction and sharing system is shown in Figure 1.
Figure 1. E-government resource co-construction and sharing system structure.

The access and exchange system is responsible for providing the exchange transmission and process monitoring of information resources, focusing on the unified management and monitoring of data exchange. By supporting the standard service interface, the management module of the new service can be plugged into the management platform, and the management function can be expanded infinitely. The management and maintenance of the platform is a reliable guarantee for the stable operation of the system. The management and control functions are mainly to monitor and change the business process management server, monitor and log the platform, deploy and change the configuration of the application adapter system and monitor the running status. The realization of sharing government information resources can not be separated from the support of information exchange service, so the most basic and core functional module in the sharing platform is information exchange service, which can transfer and process government management information between different departments and regions through a unified format of information resources.

2.2. Functional requirement
In order to expand the directory structure, the system should design the management of the directory structure, and all functions should be developed based on the dynamic directory structure. By realizing the flexible customization of metadata structure and common code table, the generation of related library tables and indexes, and realizing the dynamic storage of directories, the metadata navigation definition metadata approval process is established. The benefits of sharing platform are related to the sharing scope of information resources, that is, the wider the sharing scope, the higher the benefits. The information sharing platform itself does not provide a security support platform, but forms a security service system by providing an interface to a separately developed security support platform. This service system separates the specific implementation of the security system from the security service interface, and enables the application system to communicate with the specific security service through the standard security interface, thus realizing the plug and play of the security support platform [12]. The construction of e-government information resource sharing platform is not a short-term and static project, but a long-term information service project. Such a long-term service business is bound to have huge construction, operation and maintenance costs.

In the functional module of information exchange service, the integration and sharing of e-government information resources mainly covers several sub-functional modules such as information exchange, management of communication nodes and management of business processes. Among them, the communication flow management and communication exchange management in the process of sharing e-government information resources are mainly realized through the communication node management function. The core elements and relationships of e-government resources co-creation and sharing mode are shown in Figure 2.
Figure 2. The core elements and relationships of the e-government resource co-creation and sharing model.

For any government or organization, it is a heavy burden. If this service can not bring reasonable benefits, it will be difficult to sustain. Therefore, if we decide to build an e-government information resource sharing platform, we should first consider whether the benefits brought by information sharing can outweigh the cost burden of construction and maintenance [13]. From a technical point of view, the information exchange and sharing platform will provide transparent information exchange among heterogeneous systems across networks, operating systems and databases for various application systems, and greatly simplify the difficulty of mutual visits among various application systems. All applications are connected with the information exchange and sharing platform. Any application data request is transmitted to the corresponding destination application through the information exchange and sharing platform, and any message can be converted into the required data structure on the information exchange and sharing platform and then transmitted to the destination application system.

3. Design of e-government information resource sharing platform
With the rapid development of e-government, the sharing of government information resources has been promoted, but the platform system is still not perfect, which needs to be explored continuously. Before discussing the platform design, we should understand the meaning of resource sharing and the necessity of building a shared platform. As for the resource catalogue, it is not only for the index demand of the current resources of the districts and commissions, but also for the description of relevant information, including various existing resources and their categories, ownership units, etc. For information resources, the conceptual model needs standard specification, directory service and database to design directory system. The regional e-government engine sub-platform is a business logic middleware for accessing various e-government application systems, etc., and establishes an e-government application running engine that supports the functions of business approval, supervision and supervision in e-government through the connection with various government information resource banks. In the e-government information resource sharing platform, users need to pass the secure login authentication before entering the system, and when the number of authentication failures reaches a predetermined standard, the set user locking measures can guarantee the security of the platform. In addition, when designing the sharing platform, we should pay attention to designing a scientific and perfect user authority system, and grant different access rights and operation rights to different users based on their level. The system construction idea is shown in Figure 3.
The data mining process in e-government information resources sharing, that is, all government departments make all kinds of information resources owned by the departments open to the greatest extent, so that other departments, individuals and enterprises can use these information resources fairly and openly through the network. The data mining process in e-government information resource sharing is shown in Figure 5.

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From the perspective of government information resources, core metadata is the most basic item, and in the process of expanding metadata, it needs to be based on the needs of government information resources management. The government information resource directory contains two directories: resources and services, in which the service source directory depends on its core metadata, and the resource information directory also depends on its core metadata. Database is an effective tool to realize the structured storage and management of data, but it is mainly developed for the processing of application transactions, and its response to high-level data analysis needs is insufficient. With the improvement of application requirements, people hope to be able to access and integrate data from various data sources, fully tap existing data resources, capture, analyze and communicate information for complex data analysis, and find data relationships that were not recognized or recognized in the past, so data warehouse technology came into being.

The directory of information resources is mainly based on information description items, that is, the structure of resources is recorded by metadata items, and then its own attributes are recorded [14]. When compiling the catalogue, it is actually combing the business. By mining, sorting and standardizing the data, the whole process of producing information resources can be thoroughly explored. Figure 4 shows the computer intelligent electronic information sharing structure.

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**Figure 3.** System construction ideas.

**Figure 4.** Computer intelligent electronic information sharing structure.
The information resource catalogue is mainly based on the demand orientation, and takes the exchange and sharing of government information resources as its support, and gradually develops into the basic support to achieve this goal. The information resource sharing platform can realize the interaction and integration of information resources between vertical agencies and horizontal departments of the government, provide effective integration means for the acquisition and sharing of resources, promote the information sharing and integration among various departments, and establish an electronic public information resource library [15]. During the construction of information resource catalogue system, there are many departments involved, and all information resources can be managed by catalogue. In this way, business departments can be provided with corresponding services such as registration and management, and their directories can be used to realize functions such as query, location and retrieval, and finally realize search services. Designing an information resource sharing platform will help guide social forces to participate in the utilization of information resources and give full play to the maximum potential of data. We should integrate government information resources through advanced data sharing technology, share information resources through the network, and promote the openness of information resources.

4. Conclusions
Government information resource sharing platform is a comprehensive project, which has achieved good practical results since its application, and provided convenience for government affairs and information resource demanders. The information resource catalogue is mainly based on the demand orientation, and takes the exchange and sharing of government information resources as its support, and gradually develops into the basic support to achieve this goal. With the increasing number of commissioned offices using the platform, the access efficiency of the platform has declined, so it is necessary to conduct a comprehensive test on the performance of the platform and take countermeasures. From a technical point of view, the information exchange and sharing platform will provide transparent information exchange among heterogeneous systems across networks, operating systems and databases for various application systems, and greatly simplify the difficulty of mutual visits among various application systems. Designing an information resource sharing platform will help guide social forces to participate in the utilization of information resources and give full play to the maximum potential of data. We should integrate government information resources through advanced data sharing technology, share information resources through the network, and promote the openness of information resources. According to the different definitions of information exchange and sharing platform, a variety of specific applications and platforms can be extended, thus fundamentally
improving the wide applicability of the basic platform and accelerating the speed of government informatization construction.

References

[1] Liu Yu, Yu Zhiting, Xu Ting, et al. Research and discussion on the creation of a shared platform for the integration of production and education of electronic information under the background of new engineering [J]. Education Modernization, 2020, 7 (13): 87-88.

[2] Zhang Fang. Application of medical electronic medical record data sharing in traditional Chinese medicine [J]. Guangming Traditional Chinese Medicine, 2019, 328 (15): 155-157.

[3] Shi Xufang, Zhang Chengshuang, Liu Mingjun, et al. Agricultural machinery public service platform promotes the high-quality development of the industry [J]. Information Technology and Informatization, 2019, 229 (04): 49-50.

[4] Ye Liangyan, Jiang Guocui. Research on multi-faceted security defense strategy of university teaching resource sharing platform based on cloud computing mode [J]. Computer Knowledge and Technology, 2015, 11 (028): 59-60.

[5] Bai Jing, Feng Danwa, Zhang Rui. Research on Government Public Cultural Information Services Based on Public Satisfaction [J]. Information Science, 2019, 037 (009): 17-21.

[6] Hu Hu, Zhang Jie, Ding Yan, et al. Construction and application of military electronic medical record information sharing service platform [J]. Chinese Journal of Health Information Management, 2018, 15 (03): 55-59.

[7] Huang Xiaotian, Wu Xiaohong, Wu Xiaoqiang, et al. Design of laboratory monitoring system based on wireless sensor technology [J]. Microcomputers and Applications, 2015, 34 (004): 4-7.

[8] Yang Xiaojuan, Li Jun, Ma Ya, et al. Analysis of the implementation strategy of regional medical information sharing in Lanzhou area [J]. Gansu Science and Technology, 2020, 36 (18): 25-28.

[9] An Daoling. Design and implementation of government information resource sharing platform [J]. Electronic Technology and Software Engineering, 2019, 163 (17): 267-268.

[10] Zhou Yujian, Lv Yanli. Security guarantee for open sharing of e-government information [J]. China Science and Technology Resource Guide, 2016, 48 (003): 78-83.

[11] Rao Dongning, Huang Sihong, Jiang Zhihua, et al. E-government information resource sharing and integration trends [J]. Computer Knowledge and Technology, 2018, 014 (010): 259-260+272.

[12] Ma Qingxiao. Research on Information Sharing in the Grassroots Government E-government [J]. China Management Information Technology, 2018, 021 (002): 103-104.

[13] Chen Yan, Li Jun. Research on the protection of personal information privacy rights in e-government information resource sharing [J]. Rural Economy and Technology, 2019, 30 (01): 271-273.

[14] Zhong Guangming. Construction of e-government information resource sharing system under cloud computing environment [J]. Engineering Technology Research, 2019, 004 (011): 255-256.

[15] Chao Xiaodong. On the influencing factors and security risks of e-government information resource sharing [J]. Information and Communication, 2018, 188 (08): 138-139.