The Application of Cloud Computing in the Construction of Regional Digital Archives  

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ABSTRACT

Based on the full analysis of the difficulties, the challenges and the application value of cloud computing in the construction of the regional digital archives, the paper puts forward the implementation scheme of regional digital archives construction, and provides a strong theoretical and technical support for the construction and utilization of Regional Digital Archives.

Keywords: Cloud computing, regional digital archives, implementation scheme

1. INTRODUCTION

In recent years, the construction of regional digital archives becomes the developing direction of the archives science. The construction of regional digital archives is still in the initial stage, and construction of the high level regional digital archives needs to be developed further. Cloud computing theory and technology in many fields are applied maturely, in order to solve the problems of the Regional Digital Archives in many aspects such as the infrastructure, literature resources, and information services and so on. It is gradually that Cloud computing techniques are applied to building the regional digital archives and integrate the theory and business knowledge of archives management and the archive data to the cloud computing architecture; it will reflect a deeper level of value [1].

2. THE DILEMMA AND CHALLENGE OF DIGITAL ARCHIVES IN THE ERA OF CLOUD COMPUTING

In the process of building the digital archives in China, the archives information resources are in the discrete state before. The development of information technology promotes to produce a huge conflict between information service and user's demands. On the one hand, the information technology requires the archives management personnel to update their business knowledge and work ideas, improve their creativity; on the other hand, the archives need to upgrade the network communication facilities, improve the security measures against the uncertain attacks which always are threatening the digital archives and information resources.

Once applying cloud computing services, the digital archives will have the ability to use, safe, and sharing, change the ways of data service and management, and then the real demand of the digital archives accords with the technical characteristics of cloud computing which will be used in the data management of digital archives and the dynamic demand of users [2].

3. THE LOCATION OF CLOUD COMPUTING SERVICES IN REGIONAL DIGITAL ARCHIVES

3.1 Analysis of the Requirement of Digital Archives Construction

Under the application of cloud computing, the digital archives make changes from building business management system by themselves to purchase the relative standard of information services. Cloud computing is suitable for basic level archives. Firstly, it is the fact that the archives management system is relative weaken of the digital Archives, social information get into all aspects of the work, the resistance are small from the ways of traditional thinking and business processing, so it is more suitable for a thorough reform. Secondly, for the standardization of construction, the basic level of the business management system is lowly, so as to that there is no great resistance. Thirdly, the implementation of digital archives construction can improve the entire archives domain business and management standardization, especially be beneficial to the grassroots archives. Finally, cloud computing services are international standards for the implementation and application of the external environment.

Cloud computing applied to the grassroots archives is only the first step application of cloud computing services in the digital archives, the interconnection among the regional digital archives is the most important. Using the open sharing technology of cloud computing, the regional digital archives services center provides the service access to the archives in every region. On the whole, the implementation of cloud computing digital archives can save the cost of resource construction, improve the quality of the archives, and promote the standardization of the work of archives industry [3].

3.2 Model of Application of Cloud Computing in the Digital Archives

Before choosing the application mode of cloud computing in the digital archives, the business system and the support system of the archives must be clarified. The
core business system is running most of the core data, the stability and reliability of the system is related to the overall service quality. The support system of the archives is similar to ones of other industries, and has little to do with the business, which can be maintained by the third party. For the regional cloud digital archives, this paper puts forward that there are two forms of application:

- **Archives service system.** In the paper, it is the business system of the basic level archive organization, generally runs inside the organization, and is responded by the management information department of the archives. In the regional digital archives, the archives management information system in the cloud computing platform directly stores the relevant information of the region archives. The security and the stability of the data are very important. Through the mutual connection between the various levels of archives, it achieves the sharing of archival information, improves the efficiency of the achieve service information [4].

- **Assistant support system of the Archives.** Cloud computing platform is suitable that the business doesn’t require highly about business data confidentiality, assistant support system is suitable for this feature, but also can make full use of the dynamic development of cloud computing platform technology and services to reduce the cost of infrastructure and management maintenance [5]. As shown in Figure 1, the periphery of the e-mail system, office automation systems, etc., can be maintained by the cloud computing service providers, thus, the archives management agencies obtain high quality software services and maintenance.

4. IMPLEMENTATION SCHEME OF CLOUD COMPUTING SERVICE PLATFORM FOR REGIONAL DIGITAL ARCHIVES

Based on the guidance and the application of cloud computing technology, the construction of sharing service platform of the regional digital archives will be organized by the third party cloud service platform, form a archive information resource service cloud, and then improve the efficiency of cloud computing in digital archives.

4.1 Construction of the Cloud Computing Platform of Regional Digital Archives

The unification of the implementation of archives management standards is the premise of regional digital archives management system. Once the archives management system is set up by the archive management agency cloud, management personnel can transmit and get the archive data from the archive cloud, at the same time, according to different user experience, provide a variety of access methods, such as computer, mobile phone and others. The archives service such as data exchange, storage, search, share, and so on, are completed by the provider's cloud services. According to the requirement of new users, the archives cloud can adjust dynamically. Figure 2 is the design ideas of regional digital archives system based on cloud computing.

![Digital archives system of the central plains economic zone in China on cloud computing based on cloud computing](image-url)
Cloud computing services storage architecture includes two cloud levels and three elements which are private cloud, public cloud, and third party cloud, content as shown in Figure 3. Cloud storage management system of core business systems achieve the integration of regional digital archives information resources based on application of various cloud services interface and technology.

Figure 3: Data storage center based on cloud computing

Private storage cloud exists in the archives information service organization, particularly exists in the large archives and the third party service agency, its service is only open to the users inside the organization, provides technical means to integrate the discrete storage node's archive data, and satisfies the real-time response of the regional archives storage and exchange. It is necessary to design dedicated data channel for data exchange between the private storage cloud and other two kinds of Storage Cloud. The third party storage cloud is generally built by large cloud computing service providers of Commercial Storage Cloud. If private storage cloud data does not involve privacy requirements, it can be transferred to the third party storage cloud, on the one hand, part of the digital archives themselves do not have the information processing department or the ability to handle information. On the other hand, part of the private cloud data is semi-structured, unstructured, some data has special requirements on the independent storage and exchange. If the digital archives process the data independently, it means high cost, difficult. Thus, which private cloud data are transferred to the third party storage cloud, can achieve better data backup, disaster recovery and other functions.

Public storage cloud is the external cloud. Getting the appropriate authorization and accessing the interface of public storage cloud, the users can exchange data directly and get conveniently data with the public storage cloud. In the public storage cloud, the Regional Digital Archives build data exchange interfaces and mechanisms, effectively process the data exchange requirement of private storage cloud storage and third party storage cloud.

4.2 The Deployment and Operation of Cloud Computing Services

4.2.1 Cloud Computing Services Deployment Planning

If the Regional Digital Archives migrate fully the existing information technology infrastructure and services, and deploy in the cloud computing services, it will face a lot of challenges and difficulties. To achieve a better step is a better choice.

For building cloud computing data service center, firstly, based on cloud computing technology, according to the local characteristics of the archive management business, should do the distribution and hierarchical deployment of infrastructure and data resources. Secondly, for the technical and security requirements of the archive system, should adjust reasonably the storage pool and server pool of resources. Finally, for the user's personalized services, external environment, value-added and other requirements, should build internal infrastructure cloud.

In the deployment of cloud computing architecture, the digital archives can utilize some cloud computing management configuration tools, such as Hadoop/VMware to provide open infrastructure. Cloud computing infrastructure can accommodate a variety of services, through the SOA service registration functions, archive business management can be registered in one, at the same time, can use the SOA infrastructure to provide the dynamic management functions, optimize service model so as to that users can get personalized service from the SOA archive data pool. Cloud computing center management personnel can monitor the operation of the service based on calling the service interface. The Regional Digital Archives cloud computing deployment planning, as shown in Figure 4.

Figure 4: The regional digital archives cloud computing deployment planning
4.2.2 Mode of Cloud Computing Services Operation and Maintenance

Application of the cloud computing services, the regional digital archives not only get the transformation of the mode of architecture, but also promote the transformation of the business service mode of archives management system. With the continuous application of computer and communication technology in the business management system, the information resources of the Regional Digital Archives would be stable and secure. The service mode of cloud computing provides the technologies and the ways for users to deploy and use the operation and maintenance system.

The Regional Digital Archives cloud computing services make great changes in the operation and maintenance mode. Firstly, Application of cloud computing services and a variety of cloud services tools, the Regional Digital Archives monitor the range of potential hazards. The tools update with the progress of information technology, and thus their operation and maintenance become relatively active. Secondly, when facing with new institutions and new users, only need to increase the interface of monitor software and data parameters in the network system. For the resources control of entire system, it is not too big change, and thus become quite simple. Thirdly, to deploy the data and the business systems in cloud by the operation and maintenance services of resources, it will significantly reduce the operation and maintenance costs.

Cloud computing providers serve the user through monitoring system, improving the daily maintenance and data backup, and so on. According to the business requirements of the archives, service providers expand service scope of the platform, keep up with the progress of the technology, expand the service ability of cloud computing to meet the development of the archives, and match the service ability of the regional digital archives with the development of dynamic personalized requirement in time.

5. CONCLUDING REMARKS

Application of the related tools and technology of cloud computing technology, for the Regional digital archives construction, it is still in theoretical research, and the practical application is also to be developed. Fully grasping the theory, technology, service and other characteristics of cloud computing services, the service and management of the core business of the Regional Digital Archives would further promoted the service capability of the regional digital archives.

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