Research on Ubiquitous Intelligent Service of Digital Archive Resources

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Abstract—**The ubiquitous intelligent service of digital archive resources based on mobile devices has become an inevitable trend in the development of the information age. This paper proposes system structure and the optimization process for the maintenance of digital archive ubiquitous intelligent service platform based on mobile internet technology. A digital archive information resource library is designed, and the system upgrade and expansion process is given. It will have a significant significance in promoting the rapid development of the archives industry.**

Keywords-Digital Archives; Ubiquitous Intelligent Services; Database; Data Management System; Mobile Devices

I. INTRODUCTION

With the rapid development of China's mobile Internet technology and the wide application of intelligent terminals, users access the mobile Internet anytime, anywhere through smart terminals. Users accessing the mobile Internet anytime and anywhere through smart terminals and obtaining digital archive resources ubiquitous intelligent services have become a social need[1].The digital archive ubiquitous intelligent service platform based on mobile internet technology not only makes archive management, service, information sharing, etc. integrated on one platform, and realizes the integration of digital archive information retrieval and utilization, but also it can promote the integration of archive information resources and further realize the sharing of archive information resources. At last, it will provide an effective guarantee for the ubiquitous intelligent service of archives.

This paper proposes system structure and the optimization process for the maintenance of digital archive ubiquitous intelligent service platform based on mobile internet technology. A digital archive information resource library is designed, and the system upgrade and expansion process is given. It will have a significant significance in promoting the rapid development of the archives industry. It will lays the foundation for further realizing the ubiquitous intelligent service of digital archive resources based on mobile devices.

II. DESIGN OF DIGITAL ARCHIVES INFORMATION RESOURCE LIBRARY

A. System design

The digital archive ubiquitous intelligent service platform based on mobile internet technology mainly consists of four levels, namely user presentation layer, application service layer and database layer. The system architecture is shown in Fig.1.

Most of the services on the platform can be done on the mobile terminal, at the same time, a PC terminal page

is provided, which is convenient for the user to operate the system according to their needs.

The user presentation layer has pages customized for different terminals, including login pages, search pages, archive management pages, etc..

The application service layer implements specific business logic, mainly including related modules such as login verification, archive retrieval, and data storage, etc..

The digital archive information resource library[2] is mainly composed of archive directory database, archive full-text database, multimedia archive database, meta-database, etc. .Most of them are managed through the use of database technology[3].
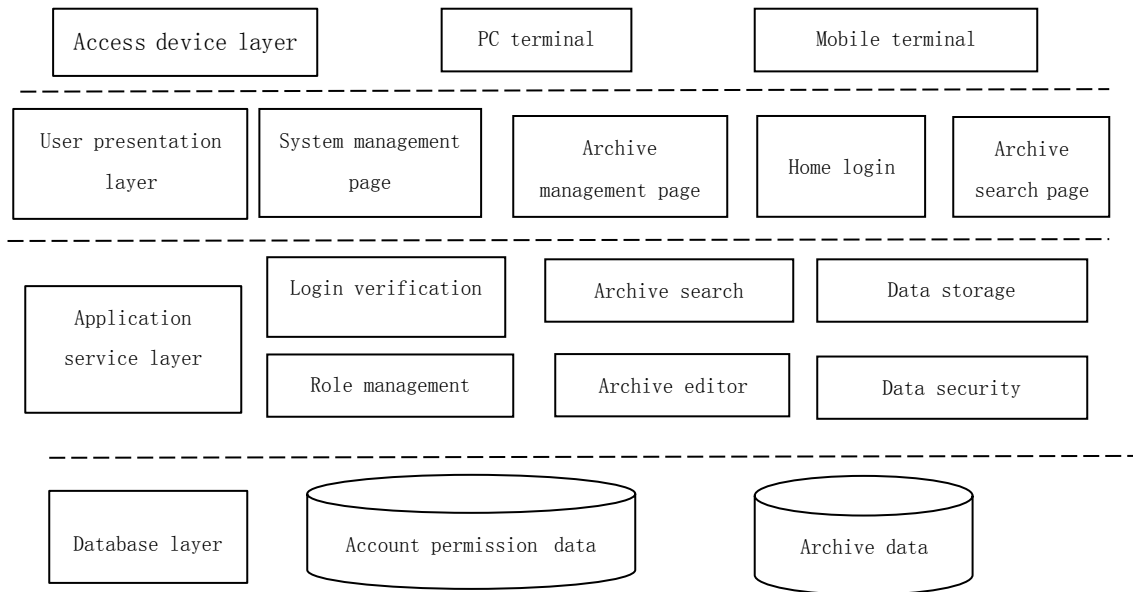

Figure 1.   System architecture of digital archive ubiquitous intelligent service platform based on mobile internet technology

B. Database design

A unified modern information management system will be established in China to share relevant information and form a huge national database[4].

The data in the archive directory database is stored in the computer according to certain field requirements. It is divided into a case-level directory database and a file-level directory database. The archived electronic files and the digitized traditional carrier files are arranged in the archive full-text database according to a certain classification and sorting manner, and managed by attaching them to the archive directory database. In the multimedia archive database, the photo, audio and video files are edited, organized and stored through specialized

technologies and equipment. The content, structure and background of the digital archive, as well as features, changes, etc., which are truly recorded by the digital archive metadata in the metadata database.

The database in the system is designed using the ER model, which makes the relationship between different data more clear and accurate, and communication between developers and archivists on software requirements more convenient. The system E-R diagram is shown in Fig.2.
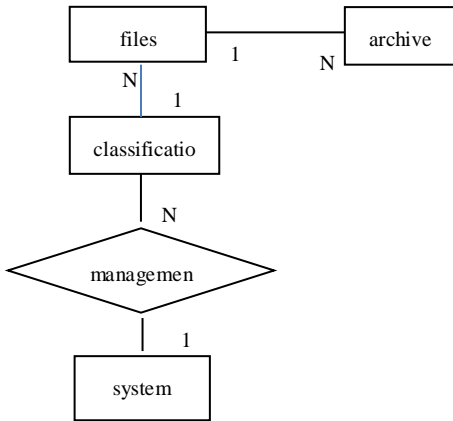
Figure 2.   System E-R diagram

III. THE MAINTENANCE AND OPTIMIZATION OF
DIGITAL ARCHIVE UBIQUITOUS INTELLIGENT SERVICE
PLATFORM

A. Platform maintenance and optimization process

The process of maintenance and optimization for digital archive ubiquitous intelligent service platform based on mobile internet technology is shown in Fig.3. According to the daily maintenance requirements of the platform, through the uninterrupted service design, system change warning and data management system design, the excellent archive management services can be provided by the platform to users.

B. Maintenance and optimization process of the software system

The maintenance optimization process[5] of the software system is as follows:

1)   The performance data generated during the system operation are regularly analyzed to determine whether there is a running bottleneck in the system. The analyse of relevant data are used to determine whether the system needs to be upgraded or expanded.
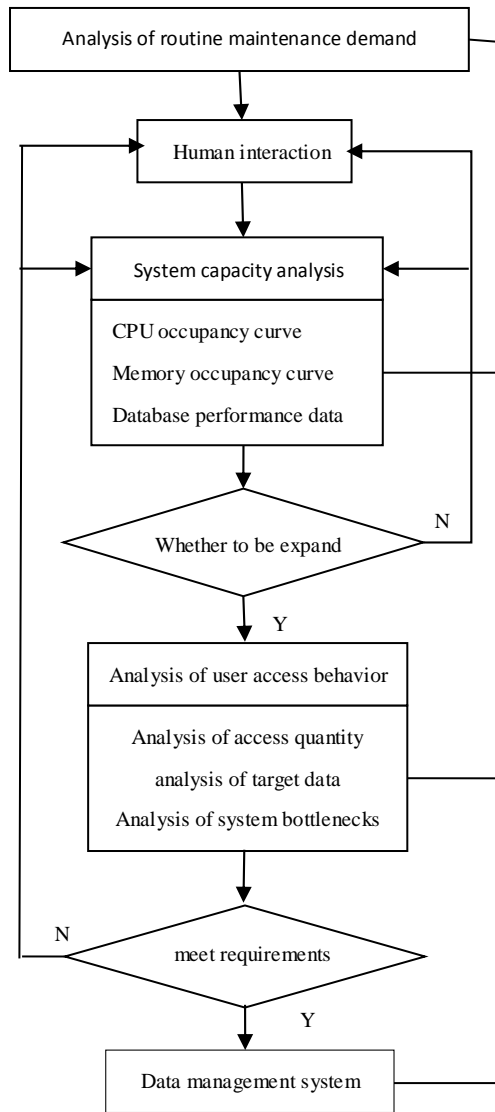

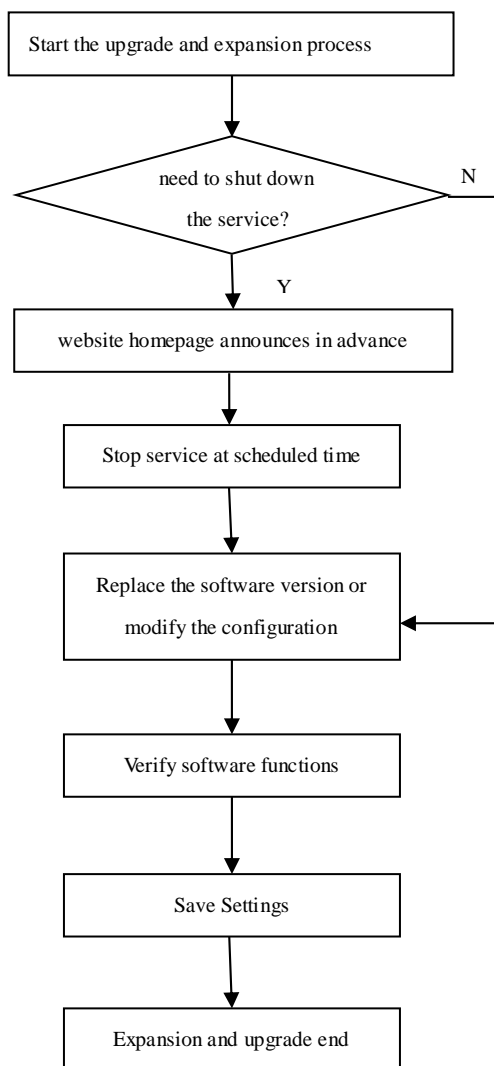Figure 3.   Software maintenance and optimization process

Figure 4. The process for system upgrade and expansion

2) If there is a bottleneck in the system and the process for user accessing is not smooth or wrong, the system is specifically adapted and optimized for the characteristics of user access.

3) After the system is optimized, its operating status are continuously observed.

C. *System upgrade and expansion process*

In the maintenance and optimization process of the system, when there is a problem in the system that needs to be upgraded and expanded, a series of measures are needed to change the system, so as to avoid negative impact on the use of users. The upgrade and expansion process used for system is shown in Fig.4.

IV. APPLICATION OF THE PLATFORM FOR DIGITAL ARCHIVE UBIQUITOUS INTELLIGENT SERVICE

A. *Application investigation and analysis*

In the application and promotion of the digital archive intelligent service platform using mobile internet technology, the following issues are mainly investigated:

1) Whether the interface is friendly and easy to update;

2) Whether resources can be seamlessly linked and personalized;

3) Whether the user is comfortable, whether the archivist is convenient to use;

4) Whether the data import and export is convenient;

5) Whether the file organization can unify the standard and share resources;

6) Whether it can meet the various requirements of users and so on..

After a few months of trial operation, according to the user's reaction, although there is much progress than the existing software platform, there are many places that need to be improved, such as further improvement of software functions and further optimization of the system, etc.

B. *Further improvement of software functions*

The main consideration is to improve the three functions of the software system:

1) regular functions, such as: user registration and login, dynamic information of the page, online exhibition hall, etc.;

2) functions that the service user should have, such as: retrieval and query function, archive database, Appointment check files ,and other iteration and updates of the version;

3) ubiquitous service functions, such as: active services, selection of service strategies, and service evaluation, etc.

C. *Further optimization of the system*

System testing is constantly being carried out and bottlenecks are identified to optimize the system. By studying relevant foreign technical standards, we will make revisions according to the practical characteristics of China and make them localized. At the same time, the feasibility and applicability of its implementation will also be studied, formulate application technical standards in the business links of archive information collection, management, and services, etc. In order to realize seamless use of archives information resources, the application of technical standards in the business links of archives information collection, management and services need to be formulated.

At present, substantial progress has been made in the innovation of archive utilization service model and the opening of archives information. The degree of integration and sharing of archives information has been significantly improved, and the use of archives services has become more convenient and inclusive. In the future, we will further improve the archive utilization system, complete the integration of archive information resources, further realize the sharing of archive information resources, and provide effective guarantee for the ubiquitous intelligent services of archives.

V. CONCLUSION

The research on the ubiquitous intelligent service of digital archive resources has become one of the advanced topics that people are actively studying in recent years. With the extensive development of human society to information and knowledge economy, and the awakening of the people's right to know information, archives information resource sharing has become a social demand, a developmental need of the times, and a general trend. Based on the development of a digital archive ubiquitous intelligent service platform for mobile internet technology, a digital archive information resource library is designed, and the platform is maintained and optimized. At the same time, the proper system upgrades and expansions are being done.

In the long term, the ubiquitous intelligent service of digital archives based on mobile internet technology has unique academic value and important practical significance.

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