Application of Three-dimensional Digital Model in Digital Archive Ubiquitous Intelligent Service

Ren Ling-ping¹ ,Dou Li², Li Li³
¹,²,³Tianjin University of Technology and Education, Zip code 300222, Tianjin, China
*mailbox: ¹383746957@qq.com, ²mydl0502@sina.com, ³lili8cn@126.com

Abstract: With the rapid development of information technology and mobile Internet technology as well as the rapid spread of smart phones, the way of the information obtained by people is more dependent on mobile devices. The traditional archive service model can no longer meet the needs of users. The way of archival information services should also keep up with the times. Based on the fully analysis of the current archival information service methods, the main modes of the current archive information service mode are analyzed in this paper. A three-dimensional digital model is put forward, The application of the three-dimensional digital model in the ubiquitous intelligent service of digital archives is studied. Its purpose is to organically combine archive management ideas, systems, organizational methods, management measures, and modernization of management talents, to further realize the sharing of archive information resources. It will provide an effective guarantee for the archives ubiquitous intelligent service.

1. Introduction
Today, with the rapid development of computer technology, multimedia technology, network technology and mobile technology in the information age, the construction of a new model of archive management is an urgent need for the scientific management of archive resources, the sharing of archive resources, and the security and efficient of the ubiquitous intelligent services. Based on the current methods of archive information services fully analysed, the application of the ubiquitous intelligent service models for digital archives are studied, its purpose is to organically combine archive management ideas, systems, organizational methods, management measures, and modernization of management talents, etc. The best archival utilization, economic efficiency and social efficiency obtained has unique academic value and important practical significance for further research on open sharing and ubiquitous intelligent services in China.

2. The Analysis of the main mode for archive information service methods
The definition of the archives can be expressed as the record of information which formed in the social activities with real credentials[1].Currently, the current archive information service methods mainly include[2]: traditional service, modern service, tracking service, and ubiquitous intelligent service, etc. These service methods have different functions and the different tasks were completed at different times.
2.1 Traditional service
The current day-to-day service work done by the archives department is: the current day-to-day service work done by the archives department is: archive reading service, archive copying service, archive lending service, and certification service, etc. The services are usually carried out in the form of physical archive utilization in the archives (fixed location). The services can be completed with the help of management personnel.

2.2 Modern service
The file management personnel use the online software of the computer to find the file information needed by the user through the dialogue interface. The file manager uses the online software on the computer to find the archive information required by the user through the dialogue interface, and provides the user with general services. It usually finds the required files by searching the directory database.

Although computer searches are also used, to some extent, the utilization rate has been improved to a certain extent, it still cannot keep up with the demand for ubiquitous services for archive information in the information age.

2.3 Tracking service
The tracking service method includes information mining and tracking services for archive information. Because the tracking service of archive information is one of the more important contents of archive service work, it has a wide range of applications in the current research projects and is one of the main sources of scientific and technological information.

Therefore, through the steps: the problem analysis, tracking, service, and effect feedback based on specific profile information, the information mining and tracking services are completed for the development of new products, the introduction of technology and related research projects. At present, this model can be very little.

2.4 Ubiquitous intelligent service
The ubiquitous intelligent service mode is a personalized intelligent service mode, including regular service or fixed-item service. The network can be accessed at any time and anywhere through computer terminals, iPad, mobile phones, or through QQ, Weibo, WeChat, E-mail, and Two-dimensional code technologies. In the past, users went to the archives room to access, and now their access via the Internet. The services from passive services to active services, At the same time, its services from the archives of the physical services into knowledge information services. At present, this model is only carried out in a very limited scope and the scope of services is extremely limited. The comprehensive development of digital archive ubiquitous intelligent services is a trend for the development of the archives industry in the future.

The characteristics of the ubiquitous intelligent service method are the combination of proactive services and targeted services. The active service[3] is that the archivists actively participate in the research and development of research projects, and provide the required file information for the research group, and investigate the information dynamics of research projects, write special reports, etc., and track the latest literature information and development trends. Targeted service is the directional service of archive information, which selects the content related to research topics from many research projects, and mines the valuable information and provides it to the research group in a certain fixed service. The organic combination of the two has greatly promoted the establishment and improved the service system for archive utilization, especially for the research of scientific research projects.

3. Application of Three-dimensional digital model
On the basis of the digital archive ubiquitous intelligent service platform, which is based on mobile devices, the existing digital archives are managed in a centralized manner, and finally the organization
integration, function integration, resource integration, technology integration and service integration are realized. Through this platform, the research on ubiquitous intelligent service model is carried out.

### 3.1 Three-dimensional digital model

Three-dimensional digital model: that is based on three service modes of the needs of users, service methods and service evaluation, through the digital service platform. Among them, the demand of users refers to service content required by the user at any time and place; the service matter refers to the way in which the users are divided into several categories by analyzing the needs of the users, and the platform provides corresponding services for the users of different types. The service evaluation refers to service evaluation refers to the feedback and evaluation of the services provided by archival agencies and platforms, and suggestions for improvement.

### 3.2 The archive service method based on three-dimensional digital model

The so-called the archival service method based three-dimensional digital model is based on the service platform. According to the needs of users, the intelligent service and evaluation is automatically completed. In other words, it is the service method that is centering on the user and providing the user with various personalized demand.

![Fig. 1 the archive service method based on three-dimensional digital model](image)

The archive service method based on three-dimensional digital model is shown in Fig. 1.

Utilizing the software, which is in the unit, embedded in the mobile ubiquitous service platform, quickly enable users to enter the rapid retrieval and query system through efficient information interaction between the user population and the archival community, and obtain the required archive services based on the three-dimensional digital model.

The potentially available archival resources in digital archive resources can be fully mined. The advanced information development tools can be applied to the scientific and diversified use and service for the digital archives in order to improve the quality of archives digital resources development. In the case of obeying certain rules, it can greatly meet the user's demands for archive information.

#### 3.2.1 Query and search services

Using search engines, the related content in the database can be searched and queried. The performance of the on-line retrieval system for the database is further improved on the basis of optimizing the search of the homepage layout, simplifying the search method, shortening the search path, providing search assistance, and friendly displaying the results of search.
3.2.2 Consultation service
Through real-time interaction, the users and archive managers are closely connected to achieve an organic combination of online and offline\(^4\).

3.2.3 Personalized service\(^5\)
The use of computer networks, artificial intelligence, data mining and other information technology, the user's background, habits, preferences and requirements will be analyzed in order to provide integrated services. The service emphasis on service time and space, service content and service methods. It innovates the different service projects and carries out targeted push services, intelligent search services and information management services, etc.

3.2.4 Featured service
Around a theme, a special service for digital archives can be carried out. Through the technical analysis of big data, it can find out which archive resources are used more frequently, and write more detailed guidelines. At the same time a column can be opened up to provide featured services.

3.3 The service model based on personalized needs of users
The personalized service of archive information means that the user is as the center to provide users with services to meet their various personalized needs, which is based on the using behaviors, habits, preferences, and characteristics of users. Among them, it is the most critical to the analysis for the archive requirements of users, and the analysis of the user's behavior is the basis for the development of personalized services.

Through the analyzing archive information left after searched, screened, acquired and exchanged by the user logging in to the mobile platform, it can be determined what type of user the registrant is, which archive is needed, what is the main content, what is its form, what are their real needs and potential needs, what kind of service is needed, their preferences for information, their ability to access information, and so on. In this way, the user's behavioral characteristics are obtained to lay the foundation for better personalized service. At present, this kind of personalized service has not been widely applied in the archives industry. The service model based on the user's personalized needs is shown in Fig. 2.

![Digital archive ubiquitous intelligent service platform](image)

**Fig. 2** The service model based on personalized needs of users

A membership system can be adopted and personalized services can be tailored to a certain group of people. For paid or unpaid services, the free or fee-based services can also be provided under appropriate conditions.
The backstage archives service personnel custom relevant service content and research service content for users. Through the digital file ubiquitous intelligent service platform to communicate directly with users and conduct consulting services.

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3.4 Archive service based big data
In the current situation, the concept of big data has gradually been accepted by people, and it has gradually penetrated in the process of social development. Applying big data technology to the archive ubiquitous intelligent services, in terms of its implementation, it not only makes data processing more diversified and more convenient, at the same time, it can also change the way of thinking[6]. The archive service model based big data is shown in Fig.3.

The users will leave a lot of information after visiting the platform. On the one hand, the useful data of users can be collected by analyzing the information when users register, the logs and cookies kept during visits, the needs and behaviors of the archives, etc., On the other hand, it can also be combined with a questionnaire surveys, interviews and exchanges, user evaluations and feedback, etc. to complete the user's information collection. Thereby a personal information database for the archive users can be created and archive users can be classified. Finally, the main needs for a certain group of people are analyzed and determined based on big data, the user models are also built. At the same time, on this basis, the relevant digital archive information is actively collected, a new collection structure is established and the archive information is actively pushed to the user.

On the basis of the big data applications in the digital archive ubiquitous intelligent service, the archives science management mechanism is established by using the technologies such as a computer, multimedia and mobile networks. The archive management ideas, systems, organizational methods,
management tools, and management talents are organically combined. Thereby, the best archive utilization, economic efficiency and social efficiency can be obtained.

4. Conclusion
At present, the archival service method based on the three-dimensional digital model has not been universally recognized. On the whole, archival institutions are at a disadvantage in the fierce competition in the information age. The application of three-dimensional digital model in the ubiquitous intelligent service of digital archives has important significance for improving the competitiveness of archives institutions and promoting the rapid development of archives.

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