Analysis of Digital Museum Reading System under Multimedia Digital Display System

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Abstract

Digital libraries and digital museums came into being at the historic moment, and gradually became a hot spot for countries to compete for investment. However, at present, general digital museums are often designed and implemented independently according to different needs and contents, and operate in a single system environment. With the development of science and technology, a new, more intuitive and fast digital media has appeared in front of us. Compared with previous media, multimedia technology has obvious advantages. It integrates various information such as text, pictures, animation, sound, video and so on, which can be conveyed to the audience in the most convenient and intuitive form. In this paper, the digital museum reading system is analyzed and designed under the multimedia digital display system, and the process of museum system infrastructure and database design is expounded, which is beneficial to the construction and development of Hunan digital museum and also provides a reference model for the construction of information platforms in other fields.

Keywords

Multimedia digitization; Digital museum; Reading system.

1. Introduction

With the rapid development of the Internet and the increasing popularity of high and new technology, the orderly organization of online information has attracted more and more attention all over the world. Digital libraries and digital museums came into being, and gradually become a hot spot for countries to invest. However, at present, general digital museums are often designed and implemented independently according to different needs and contents, and operate in a single system environment [1]. Once the system goes online, the architecture of the system cannot be changed at will, and if the functional modules in the system are to be modified, updated or deleted, the system must be stopped first, which will cause great inconvenience in practical use. Digital museum is an information system that collects and manages all aspects of cultural heritage information in digital form, realizes the permanent preservation of cultural heritage information, and can provide users with digital display, education, research and other services through the Internet [2-3]. The Ministry of Education launched the "China University Digital Museum" project in, which is a service-based distributed system. Different sub projects are located in different network nodes and systems. Therefore, the digital museum system in the project should realize business integration and information sharing among museums, improve the reusability of modules in a single system and avoid the waste of development resources [4].

With the development of science and technology, a new, more intuitive and fast digital media has appeared in front of us. Compared with previous media, multimedia technology has obvious advantages. It gathers various information such as text, pictures, animation, sound, video and so on, which can be conveyed to the audience in the most convenient and intuitive form [5-6].

Through the application of digital multimedia display technology in design and construction, some new forms with strong digital characteristics have been produced on the basis of traditional material space, and exhibition hall forms which are suitable for various sensory interaction modes such as sound, light, taste and sensation have emerged at the historic moment. Digital construction of the museum is the digital construction of the basic information of the museum-mainly aimed at the collection and production of multimedia information in museum collections, including collection shooting, collection scanning, sound recording, animation production and image output, etc. [7]. The following is the author's experience and experience in the collection shooting, picture scanning and sound processing in practical work. Multimedia technology makes it easier for people to get the information they need, and they can get the information they want and know what they want without leaving home. Multimedia plays a great role in business, teaching, news, publishing, internet, entertainment and other industries [8].

2. Structure and User Interface of Multimedia Digital System

2.1. System Structure

The core of digital multimedia component design is to use the general design mode, which is convenient for users to get familiar with and use quickly. Firstly, the network multimedia database associated with digital multimedia components is established to facilitate users to obtain knowledge quickly; Secondly, the function of supporting the search of local and Internet files and the playback of mainstream audio and video files is designed; Then, provide an easy-to-use external integration interface to facilitate the matching and integration with various virtual museums; Finally, the good cross platform performance of components can meet the needs of users to visit virtual museums and learn knowledge through any hardware anytime and anywhere [9]. The use of multimedia assisted display system, cultural relics catalogue publishing system, collection comparative research and identification system, combined with Archaeology and historical data system, will have an impact on a wider range, and even go deep into all levels of culture and entertainment; Use correct historical knowledge and understanding to influence people. With the support of cultural relics, history and archaeological resource databases, explain the evolution of human history and nature in an interactive way, and realize the transformation of time and space through virtual reality technology, so as to bring modern people into the vast historical space, break through the limitations of space and time, and serve the society in a wider range [10]. Digital media player mainly realizes the functions of player panel control, playback and pause of audio / video files, fast forward, stop, volume adjustment and progress drag. The system structure of the whole digital multimedia component is shown in Figure 1.
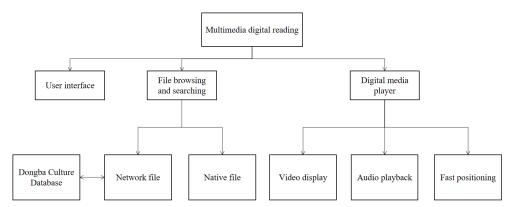

Figure 1. Structure of multimedia digital reading system

Under the new situation of digital museum, research will become simple and fast. Cultural workers only need to query the required cultural relics from the cultural relics database, and the times, characteristics and pictures of cultural relics will be displayed, and the pictures can also be enlarged to show details. The digital research has greatly reduced the pressure of library cultural workers and improved the working efficiency of researchers.

2.2. Analysis of Basic Information Platform

The traditional implementation scheme of digital collection is simply to register and retain the basic parameters such as the size, weight and image of the collection through database technology. After using multimedia technology combined with database technology, the original boring collection management system can be added a lot of vitality, and the characteristics of each detail of the collection can be understood through the powerful demonstration means of multimedia technology, At the same time, it can also understand the relevant background information of the collection in detail, so that the audience can clearly understand all kinds of relevant information of the collection, and effectively realize the digital management of cultural relics in the collection. Basic information platform is the core of information security system, which determines the quality of digital museum and is the most important part of the whole system. It consists of virtual museum, information storage database and information management system. The composition and functional analysis of each part of the basic information platform of digital museum are shown in Figure 2.
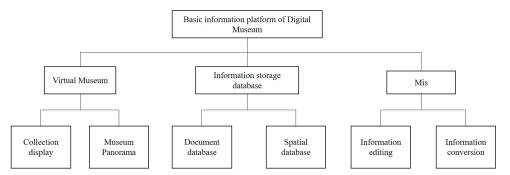

Figure 2. Basic information platform of digital museum

The basic information platform allows different applications to exchange data and participate in business processes, no matter what operating system or programming language they use behind each other. It connects different functional units of application programs through well-defined interfaces and contracts between these services, so that services built in various systems can interact in a unified and universal way. Users can browse the information in the museum and retrieve the collection information in the museum through the network just like visiting a physical museum, so as to provide collection display and Hunan dialect information retrieval services to the public. In the museum, different display forms are adopted, and the display contents are presented in vivid, vivid, intuitive and interactive forms through the layout compatible with the contents. With the visual and auditory immersive experience as the entry point, visitors can participate in it and deeply appreciate the profoundness of Huxiang culture.

3. Implementation of Digital Museum Reading System Based on Multimedia Digitization

3.1. Design of Digital Museum System

Digital multimedia technology is a technology that integrates audio, graphics, text, video and other media through computer software. That is, through the binary algorithm of the computer, text, graphics, images, sound, animation, video and other media are converted into signal sources that can be compatible and processed by the Internet and the computer, which are integrated to establish a logical connection, and they are processed by sampling and quantization, coding and compression, editing and modification, storage and transmission and reconstruction of display. As the data transmission between systems has higher requirements for the integrity of digital resource information and the transmission environment is more complex, the transmission process is also more complex. The transmission between systems is further analyzed below. According to the characteristics of the museum, adopt advanced and mature digital technology, set goals on the basis of understanding various business work of the museum digitization, increase business processes and information processes through organization and management, and put forward clear requirements for information transmission, processing, storage and service, operation maintenance and information security; Secondly, it describes and defines the architecture, functional modules, internal and external relations, system interface, database classification and operation environment of the digital platform, so as to provide basis for technical implementation. The collections displayed in the museum are mainly important historical materials for learning and research. Its information content is mainly text, picture and video description. In the process of experience query that is finally presented to visitors in a clear, hierarchical, intelligent and intuitive way, the display content is integrated into the whole display framework. Through the streamlined node content layout, visitors can understand it step by step through the set visiting streamline, so as to realize rapid roaming in the spatial scene. According to the description in the digital museum system project book, the system mainly provides the following functions to provide browsing functions for all users, so that they can view all existing digital images and other relevant information in the database, and users can choose the browsing order according to their own usage habits. The digital museum system architecture is shown in Figure 3.
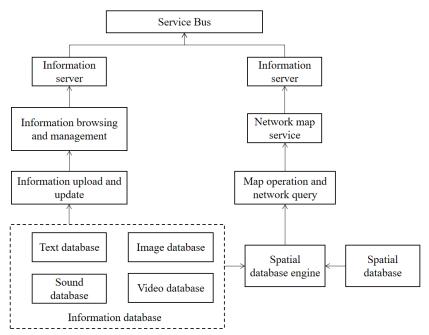

Figure 3. System architecture of digital museum

In the information browsing layer, users can display culture, retrieve, convert and collect information through the browser, and its other business interface is convenient for users to update and maintain data. The middle application support layer connects the database with the browser to realize the information management function based on GIS; The text, picture, sound and video databases in the back-end database constitute an information database, which can collect, browse and update information corresponding to different regions by connecting the spatial database engine with the spatial database.

3.2. Implementation of Digital Museum System

According to the requirements of the system, the transmission of data related to digital resources includes descriptive metadata and control metadata of the collection itself, documents and related information. Considering the universality, the system adopts XML document standard in organizing data. The purpose is to sort out the transmitted data related to digital resources, so that the receiving system can analyze and process them accordingly. After the technical realization is completed, the software platform should be improved through the practical application of each part, and then the digital processing of collections and materials should be started, various databases should be established, and then put into full operation when the conditions are ripe, and corresponding management specifications should be formulated at the same time. Before the formal operation, there are two important links: one is the computer digital training of the museum's own business personnel, and the other is to establish a working operation mechanism suitable for the digital museum. The system should realize the transparent access of users to the collections of local museums and the unified management of digital resources of museums by administrators. The digital center is responsible for storing and displaying copies of all digital collections, and also interacting with museums through the network. Since there are copies of digital collections in various places and centers, it is necessary to solve the corresponding relationship between them and carry out unified identification. It is also necessary to solve the version control of digital collections between local museums and data centers to maintain the consistency of the two. After years of development, museum digital informatization has gradually become mature, and cultural relics database is the top priority of Museum informatization. Therefore, only by strengthening the construction of cultural relics database management system can we effectively improve the level of cultural relics protection and management, and show the history of "living" more systematically and timely in front of the world.

4. Conclusions

In the era of rapid development of science and technology, the extensive application of multimedia technology and the development and utilization of information resources are playing a very important role in various fields. With the improvement of comprehensive national strength, China's information digitization has entered a new stage of development, and the informatization and multimedia digitization of museums have become the development trend, so the construction of digital museums is imperative. In the process of designing and implementing the architecture of the digital museum system, firstly, the component control method in the architecture was deeply studied, and the modification and expansion of the service component description language file was proposed, and a new service control center module was added to manage the state and control the use of the modules in the system. Through the construction of digital museum, it provides a new method for the protection and inheritance of culture, which will definitely have a positive impact on the acquisition of users' knowledge, the destination of homesickness, the identification of interesting groups, the formation of cultural industries and the orientation of social values. Therefore, in this paper, digital multimedia components are used to display culture in a dynamic way, so that visitors

can understand the cultural connotation contained in cultural relics through a combination of digital static cultural relics and dynamic images, so that more visitors can understand and learn the specific content of culture through virtual museums, and play a great role in cultural protection, inheritance and development.

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