Design and Implementation of Digital Library

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Abstract. With the continuous development of computer technology and wireless Internet, the number of mobile phone users is growing at an unprecedented rate. As the content of traditional culture, libraries have also undergone tremendous changes nowadays. In the wireless network technology, database technology and software engineering technology, the research of digital library innovation, in this context, as design research and development of mobile digital library. The digital library based on mobile Web is a further innovation of digital library service. It consists of mobile terminals (including mobile phones, tablet PCs, etc.), wireless networks (including 4G and Wi-Fi, etc.) and digital library application system composed of three basic elements. People are not limited by time and space. They can easily access library system at any time and place by means of various devices on the palm, and carry out the functions of browsing and pre-borrowing of books and other information.

Introduction

At present, computer technology continues to develop, wireless network speed continues to rise. The way people communicate has changed dramatically, and mobile communications and mobile 4G networks are more essential means of communication. In the 4G network, the speed of mobile network has been greatly improved. At the same time, high-speed wireless network has also brought many mobile network information services. The library provides abundant resources for readers, and in the development of computer technology, digital library also provides books and information services for readers in an information mode. With the rapid development of mobile network technology, the application of digital library is changing quietly. The digital library system based on mobile network has integrated modern computer science and technology, wireless network technology and database management system technology, and has been developing continuously. The digital library system of mobile network, to provide users with a more extensive mass of library information and resources, so that readers can access various books information whenever and wherever possible to greatly improve the traditional library, service capacity, service quality and service level. The purpose of this paper is to realize the digital library system based on mobile Web. On the basis of the existing Web network platform construction, using mobile Internet technology, Web program development technology, database system development technology, etc. Combined with the current popular tools such as ASP.NET, JQuery, Mobile and so on, it provides an effective solution for the implementation of mobile Web based digital library system.

Introduction to Mobile Web

The system architecture of Web applications is commonly referred to as the browser server architecture (B / S architecture). In this architecture, users use the Web browser as the client to access the server-side Web site, which downloads the data of the web site and caches the data on the client. The browser displays the page of the web site and the user operates in the browser.

Compared to the client architecture of the C/S system architecture, the Web application has several advantages over the B/S system architecture:

(1) Independent of client platform. The Web application runs in the browser. Therefore, users regardless of what the machine, what kind of what kind of hardware configuration and operating system, as long as the user support standard Web browser and client will connect to the Internet, you can run the Web application and the access to the site.

(2) The system is easy to maintain. We have deployed web applications on remote servers and only need to change the application on the server side when the application is re - released or updated. Local clients do not need any changes. The client browser simply accesses the web site to access the latest version of the Web application on the server side.

(3) User data is easy to manage. In the B/S architecture, user data is stored on the remote server side and can be operated directly on the server side to manage user data. On a single client, the system does not need to do administrative actions.

System Architecture Design

For clients, you can access the system Web site only through the browser. However, as the current mobile platform system varies and the browser kernel is different, the same web site has different effects on different browsers. Based on mobile Web digital library system, we will develop thin client based on Web Kit, load server web site, and further realize the cross platform operation of the system. And the software application is deployed on the server side, which can realize the separation between the front and the back, greatly reducing the coupling between the server and the client. System server developers and managers can focus on the development and maintenance of the server, while strengthening the security of the system program; The client developers and managers of the system focus on developing thin clients on different platforms to parse the same web page to display the same interface.

The architecture of Digital Library Based on mobile Web can be divided into three parts, data processing layer, service presentation layer and thin client layer. The system architecture is shown in fig. 1:
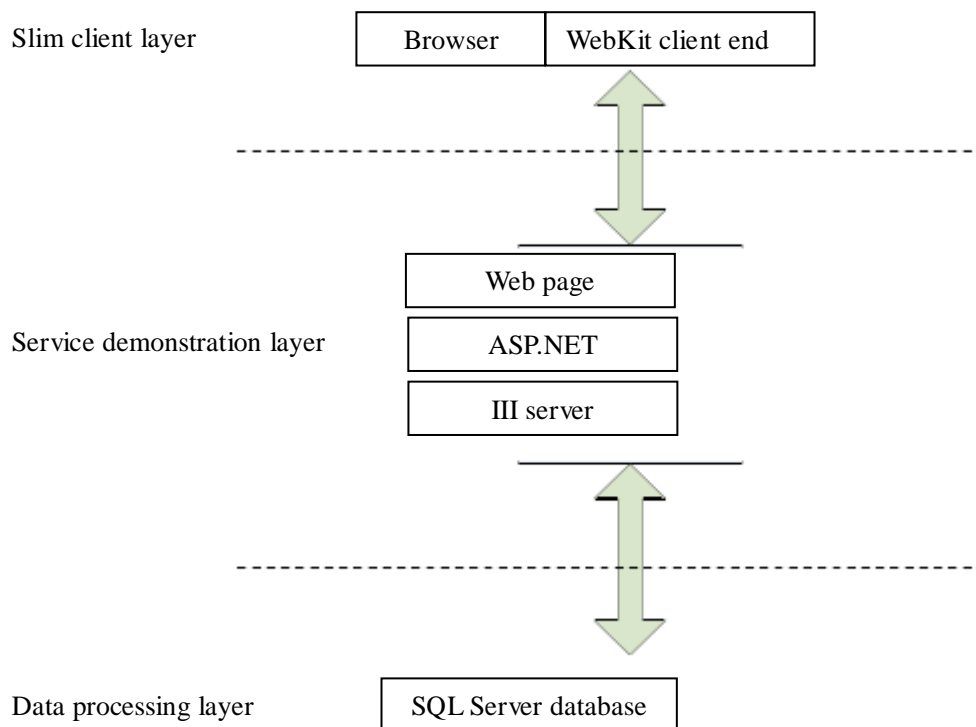
Figure 1.   System Three-Layer Diagram

System Database Design

The database system of software is used to store data records in the system, and it has the characteristics of simple operation, convenient and quick. Common data models include

hierarchical model, mesh model and relational model. In recent years, the majority of database system researchers focus on relational model databases. The E-R (entity relation) method is the most widely used method of modeling relational models.

The digital library system based on mobile Web has designed the E-R diagram of the key functional part of the system according to the needs of user information storage and processing. As shown in fig. 2:
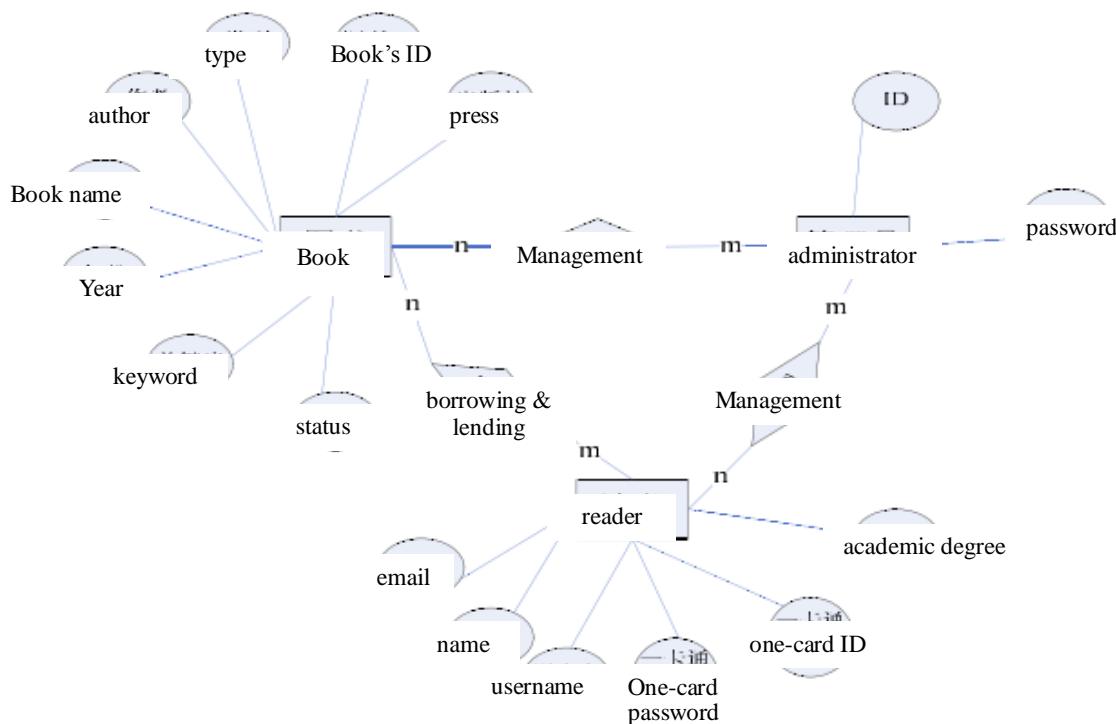

Figure 2.   System E-R Diagram

The overall task of digital library system development is to realize the borrowing and management of books. The system has readers oriented books and personal information query interface, and also has an administrator oriented library management interface. Readers' main concerns are as follows:

(1) The system provides the method of inquiry books, how to use the current books to borrow is expired;

(2) They are borrowing or borrowing books and other information.

Design of Key Module Functions

The function of the book inquiry module is provided to all users. For readers, users can use the browser to access the library system site through the mobile terminal and inquire about the book information in the library; Readers can borrow the books they find in the library. For the administrator user, access to the digital library site through the browser, can the book information query, to find the books, the administrator can edit, modify, delete and other information options. The program flow chart of the book inquiry module is shown in figure 3:
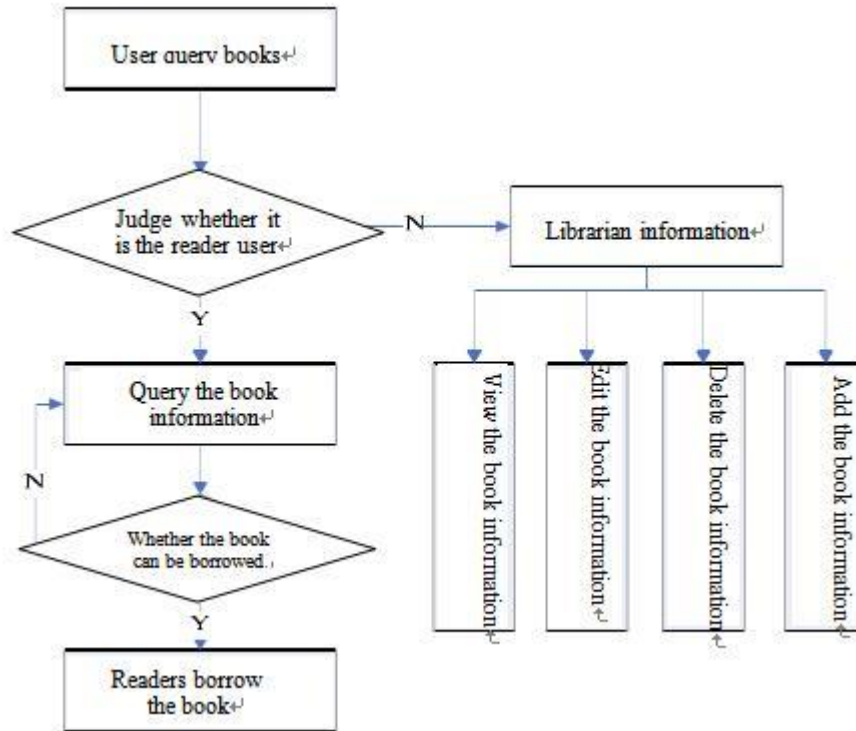
Figure 3.   Library query module program flow chart

This part of function module mainly faces the backstage management personnel, the realization function is the warehousing, the new purchase book and the clean waste book. When a new book enters the library, the librarian adds books and information to the system and specifies the location of the book, and writes the relevant information to the database. After the addition, the reader can inquire and borrow the book. When cleaning up the waste books, the administrator finds and deletes the book in the system and updates it to the database as well. At this point, the reader will not be able to access the book. The program flow chart of the library information management module is shown in fig. 4:
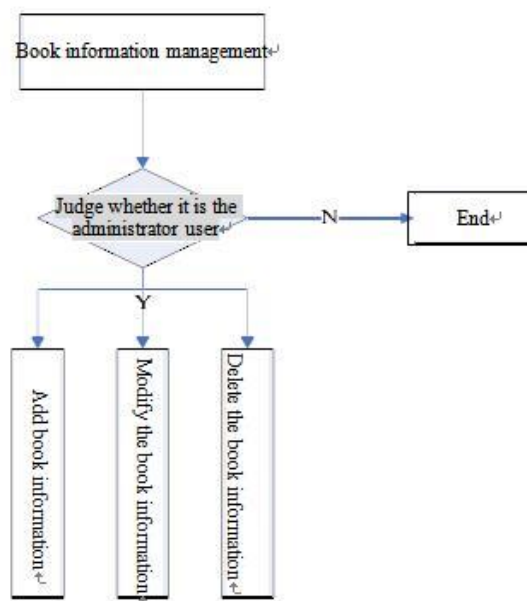

Figure 4.   Library information management module

Conclusion

This paper starts with the analysis of the development of mobile digital library and the application of mobile Web technology. Based on the study and research of ASP.NET technology, IIS server, Android platform and related technologies, the mobile digital library system is designed and implemented by using the mobile Web development technology. The main work and achievements of this thesis are as follows:

(1) The application of mobile Web technology in digital library information system is deeply analyzed and studied.

(2) The system feasibility analysis, system requirement analysis, system architecture design, system database design and system detailed design of the digital library system based on mobile Web are carried out. On this basis, the mobile digital library has been developed.

(3) After the completion of each functional module, the system function modules are displayed.

References

[1]. Pan M L, Xiong Y M. Discussion on Cultivating Professional Skills of Computer Application Talents in Higher Vocational Education[J]. Computer Knowledge & Technology, 2016.

[2]. Xu Y, Zhenjiang. The Computer Application in the Personnel Management of Government Institutions[J]. Wireless Internet Technology, 2016.

[3]. Fraqueiro F R, Albuquerque P F, Gamboa P V. A computer application for parametric aircraftdesign[J]. Open Engineering, 2016, 6(1):432-440.

[4]. Dong Y. Practice and Exploration of the Inquiry Based Teaching Method in the Basic Course of Computer Application in Medical College[J]. China Continuing Medical Education, 2016.

[5]. Ping-Xia H U. The Micro Class Design and Production Practice of "Computer Application Foundation"[J]. Computer Knowledge & Technology, 2016.

[6]. Zhao Y, Hao L, Jilong L U. Focus on the Process and Ability of Non Computer Professional Computer Application Teaching Reform[J]. Guide of Science & Education, 2016.

[7]. Victor S R. Critical Analysis of Computer Application at Secondary Schools[J]. 2016.

[8]. Qi Y. Exploration curriculum based micro Computer Application Foundation Teaching Reform[J]. Computer Knowledge & Technology, 2016.

[9]. Goutam G. Computer application maturity illustration system with single point of failure analytics and remediation techniques[J]. Journal of Convergence Information Technology, 2016, 6(3):132-145.

[10]. Lebeau M J, Phukan P. Computer application data in search results[J]. 2017.

[11]. Hackborn D K, Bort D P, Onorato J M, et al. Computer application pre-permissioning[J]. 2017.

[12]. Guo Y T, Huang X, Chen M, et al. Research Progress on Computer Application in Chemical Industry[J]. Guangzhou Chemical Industry, 2016.