Design of Multimedia Courseware Teaching Resources Online Management System

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Abstract. In order to effectively improve the effectiveness of the operation and management of the traditional college education online management system, this paper proposes to optimize the college education online management system based on cloud computing technology. Improve the system hardware configuration based on B/s network management structure and at45db80 chip. In order to ensure the operation of hardware configuration, optimize the information classification management algorithm of college education online management system combined with cloud computing, improve the information classification algorithm and information management process according to the algorithm, and realize the design of College education online management system. Finally, experiments show that the online management system of college education based on cloud computing technology has higher effectiveness than the traditional management system, and the detection results can reach more than 90%, which fully meets the research requirements.

Keywords: multimedia courseware · Teaching resources · Online management

1 Introduction

With the continuous development of information technology, the informatization process of major universities is also accelerating. The informatization of teaching resource management has become the future development trend. It integrates a variety of information technologies such as database and multimedia, and realizes the effective management of network resources, so as to form an advanced teaching resource management platform. Today, with the rapid development of information technology, the construction of digital teaching resources has entered the Internet era. The school's "intelligent construction of educational resource management" and "digital sharing construction of educational resources" have become an increasingly prominent part of the school's long-term development [1]. A perfect management system can not only reduce unnecessary waste of human and material resources, but also effectively improve learners' learning efficiency [2]. With the further deepening of China's education reform, the information-based teaching mode has become the general trend of the development of the current era. Under the background of this era, it is of great significance to study and optimize the current widely concerned online management system of college education. In the case

of college enrollment expansion, the number of information management for students has increased sharply, resulting in the poor operation effect of college education online management system in the massive information environment [3]. Based on the above problems, combined with B/S structure and cloud computing principle, the hardware configuration and software operation algorithm of the system are optimized in order to better solve the potential problem of poor information management in the process of educational modernization.

2 Online Management System of Multimedia Courseware Teaching Resources

2.1 Hardware Structure Configuration of Multimedia Courseware Teaching Resources Online Management System

In view of the low operation efficiency of the current education online management system, the hardware structure is optimized. Combined with B/S network management structure, at45db80 chip and ASP Net processor, MoSi MCU and other equipment to improve the operation efficiency and effect of the system [4]. Before developing the teaching resource management system, we must build the corresponding development platform and install the corresponding development software in the development environment. From the technical requirements analysis of the system, we can know that the teaching resource management system is implemented based on the J2EE platform of Sun company, and takes the SQL Server 2005 database of Microsoft company as the data storage platform [5]. The overall architecture of the system adopts struts as the framework basis, which is mainly responsible for the separation of model view controller. Hibernate provides persistence services, while spring is responsible for transaction processing and working logic. The whole design adopts the object-oriented idea, obtains the basic objects according to the system requirements, and then makes the corresponding da0 implementation for each object to realize the function of accessing the database [6].

After processing the information, it will be input and coexisted in the database summary. This platform has a strong application scope and can be applied to the development of information systems with BS and CS development modes. When applied to the development of information systems based on CS structure, the development technology used is usually swing. When applied to the development of information systems based on B/S structure, the development technology used is HTML. Therefore, the application scope of J2EE platform is wide, Unlike Visual C++ technology, it can only develop information system based on CS structure. In order to ensure the management and operation effect of massive information, the hardware structure of the system is optimized. The specific structure is shown in the Fig. 1.

This paper introduces the hardware functions of the above college education online management system, in which Single-Chip Microcomputer microcomputer is added, combined with c45if data management simulator for data storage, and soci processing chips are added in the data manager to maximize the reserve space. The overall architecture of the resource management system is divided into four layers, namely infrastructure layer, data resource layer and application layer. It is composed of a platform and several
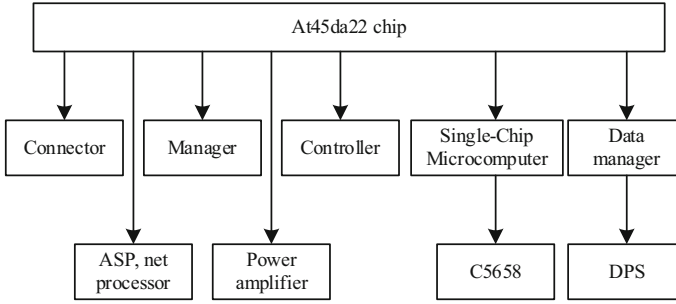
Fig. 1. Hardware configuration of college education online management system

system functional modules and interfaces. In order to realize the reasonable processing of massive data, the operation principle of the single-chip simulator of c451f system is displayed. When developing the information system based on B/S mode, the technologies available on the Web include JSP and servlets. In the traditional development mode, java code can be introduced into the JSP page to realize the business processing. Usually, JSP pages are only responsible for information display and request forwarding, which can greatly reduce the workload of the client.

2.2 Optimization of System Software Function Structure

There are a lot of resources in the teaching resource system of excellent courses. Therefore, the system administrator needs to maintain these resources, such as the management of various databases. The resource management module in the excellent course teaching resource database is mainly used to manage all kinds of resources in the database. The core module of the excellent course teaching resource system is resources, so the operation of this module should ensure the security of the system and the scientificity of the content, as shown in the Fig. 2.

The system gives different permissions to each role. The system will be divided into four modules according to the user's category: teacher module, administrator module, student module and tourist module. Except for tourists who do not need to be verified, others such as administrators, teachers and students can enter their respective pages only after the corresponding verification is successful. Perform online operations in the corresponding page module.

Combined with the online management information processing flow of higher education, the information processing algorithm is optimized. If the information collection of the online management system of higher education is E_A^k, the information sets can be divided into K, the common feature is A and the abnormal feature is W_B^k, Then any information features of the data set are collected:

$$Q^k = \sum_{t=1}^{N_t} \frac{\Delta t K_f}{E_A^k - W_B^k} \left(\frac{H_{gb,i,t}+1}{H_{rg}} \right) \tag{1}$$

where K_f indicates the information characteristics during system operation H_{rg} is the resolution level, $H_{gb,i,t}$ represents the data fusion value. The relationship between dependent
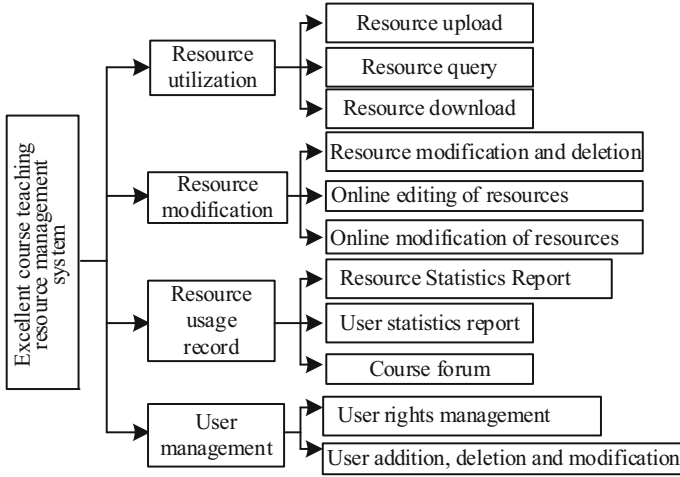
Fig. 2. System software function module diagram

variable $y(x_n)$ of information management program and independent variable $x(y_n)$ of teaching program is calculated by combining cloud computing and Euler algorithm. Therefore, increasing the number of information resources can improve the storage efficiency of information resources. Further divide and calculate the characteristic categories and grades of college education information, which can be recorded as follows:

$$\begin{cases} A_s = W_B^k + Q^k[y(x_n) - x(y_n)] \\ A_n = H_{\mathrm{gb},i,t} - \eta[y(x_n) - x(y_n)] \end{cases} \tag{2}$$

If the secondary user participates in the resource allocation process for the primary user, if the primary user resource node packet is allocated with the secondary user, the equivalent packet transmission rate of the primary user after allocation represented by R_{SP} is calculated by the following formula:

$$\lambda = \frac{pA_s \oplus A_n}{H_{\mathrm{gb},i,t} - L} - \eta * R_{SP} \tag{3}$$

Based on the above description, the resource allocation delay model is established by using the following formula:

$$q = \frac{N - 1}{R_{SP} - \lambda} + (A_s - A_n) \tag{4}$$

According to the resource integration platform structure, it is assumed that there are e information resources, and the subcarrier bandwidth of each resource integration is n_0. In the resource integration cycle, the channel gain is $P(A, B, C)$, dt represents the noise power density. The efficiency of information resource integration is:

$$\eta_2 = \sum_{\beta=1}^{N} G \sum_{\chi=1}^{2} K(\varpi - \tau) \tag{5}$$

Table 1. Functional modules of teaching resource database system

Serial number	Functional module	Completed functions
a	Login module	Log in to the system through account and password
b	Course information module	Browse the module, and teachers add, modify and delete the module
c	Course resource management module	Teachers maintain, modify, delete and update the module resources
d	Online learning module	Students browse the resources of this module
e	Online operation module	Students browse and submit homework, feedback information and other functions, and teachers browse and comment on the submitted information
F	Automatic scoring module	Score and record the objective part of students' homework

Table 2. Test registration login

Input	Expected results	Actual results	Pass or not
ID: no password: None	Login failed	Login failed	pass
ID: SS password: None	Login failed	Login failed	pass
ID: no password: PP	Login failed	Login failed	pass
ID: SS password: PP	Login succeeded	Login succeeded	pass
Click the register button	Jump to the registration page	Jump to the registration page	pass
Registration information	login was successful	login was successful	pass

Further, the course resource browsing service module is optimized to provide the function of browsing course teaching resource information by. According to the needs of students, the functions of login, browsing course information, browsing course resources, online learning and online homework are realized. Based on the above demand analysis, the following system function modules can be established, as shown in the Table 1.

Combined with the above research results on system security, feasibility and functionality, in order to meet various needs of users, the system must meet the following conditions. Compliance with functional conditions: the software functions meeting the needs of users are consistent with their matching teaching industry.

2.3   Implementation of Online Management of Teaching Resources

Table 3. Test resource management

Input	Expected results	Actual results	Pass or not
Click the download button	Download start	Download start	pass
Resource score	Receive score	Receive score	pass

The relevant management personnel of the teaching resource database are not only responsible for reviewing the data uploaded by registered members, but also need to accept the data ready for warehousing. Therefore, you need to have permission to batch store teaching resources. Permission and function to batch delete some outdated teaching resources. In addition to the above main functions, teaching resource database managers can manage the level, scope of application, relevant resource evaluation and logs of resources. When SQL Server database and net are used at the same time, net integrated database interface tool ADO Net will provide greater convenience for the application of SQL server. Both are the application platform developed by Microsoft. The combination of the two will give better play to the functions of both sides. In addition, since the 2005 version, SQL server databases are also developed based on the net framework, so SQL server databases will provide more efficient and stable services for applications under the connection of the net bridge. The SQL Server database connection diagram is shown in the Fig. 3.

The design of the database system of teaching resources for quality courses requires a lot of interactive data. These interactive data require constant access to the database, and the steps are roughly the same, including connecting to the database, manipulating the database, and closing the database. To solve this problem, connection pooling technology can be used to solve database connections and related operations. The data access technology of the excellent course teaching resource database system adopts the connection pool technology. Database connections are treated as objects using connection pooling techniques. These objects are then stored in memory for use. Through connection pooling technology, users' data access technology can be faster and more convenient.
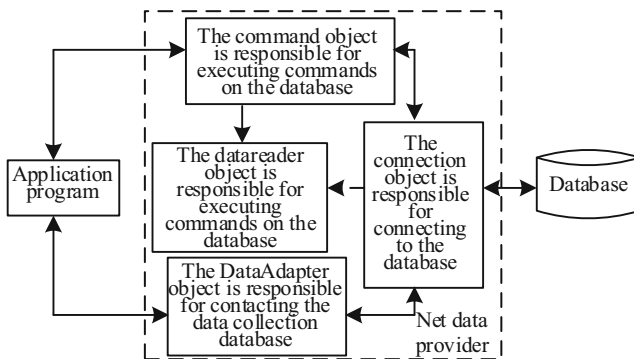
Fig. 3. Optimization of teaching resource database structure of excellent courses

3   Analysis of Experimental Results

In order to ensure the rationality and effectiveness of the experimental detection effect, the experimental environment and parameters are standardized. The experimental environment is intelpentiumiv166mxghz configuration and SVGA graphics card. The database is Microsoft SQL Server 2000. The browser is Internet Explorer 52. The general operation mainly tests the system interface, user login, user registration, etc. During the experiment, the administrator, teacher and student accounts are used to test whether the functions in each functional module can be realized and whether the use permissions of different roles are correctly distinguished. The test of the registration and login module of the multimedia teaching resource sharing service platform system is mainly the test of different user names and passwords (Table 2).

The test of resource management module of multimedia teaching resource sharing service platform system is mainly the test of resource download evaluation (Table 3).

The operation effects of traditional system and online management system of college education based on cloud computing technology are compared and recorded. Compare the test results, and the specific experimental results are shown in the Fig. 4.

It can be seen from the inspection results that, compared with the traditional management system, the inspection curve of the university education online management system based on cloud computing technology proposed in this paper can reach more than 90%, but the highest value of the traditional system can only reach 40%. It is proved that the online management system of college education based on cloud computing technology is obviously superior to the three detection curves of traditional methods, and fully meets the research requirements.
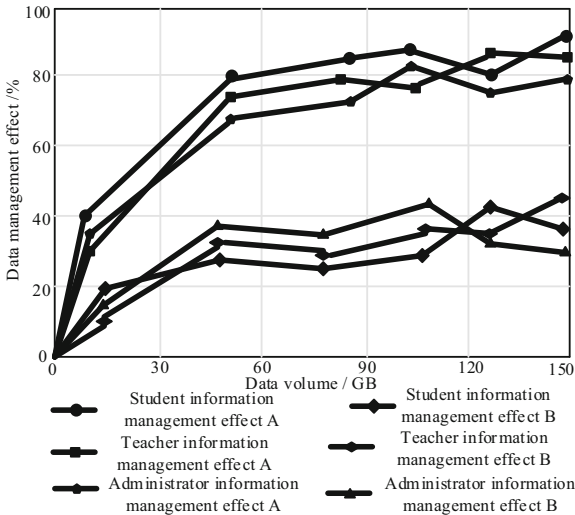

Fig. 4. Analysis of experimental results

4   Conclusion

In order to meet the requirements of educational reform and the development of the times, this paper designs the system framework and network structure, divides the system function modules according to the functional requirements, determines the sub functions in the modules, and finally realizes the corresponding functions to test the system function and performance. In the later research, we need to further understand some aspects, such as: the functions in the function module should be more clear; The rationality of the operation interface and the control of authority in the system should be further optimized.

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