

Research on Computer Artificial Intelligence Technology in Remote Network Subject Teaching and Research System

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Abstract: According to the three-layer structure system of IntraWeb technology, the teaching and research system of campus network was designed by comprehensive use of CSCW technology, database technology and Ajax technology. The whole structure of the system is based on the teaching and research work of the college. In terms of hardware, GeForce8 and CA-2A single-chip computers are used to design the system. The data of online education is collected on the software, and the content of online education is generally controlled. It can be seen from the simulation test that the whole functional structure of the system is based on the teaching and research work of the college. It provides convenience for users to communicate, and at the same time, it can give full play to the advantages of information technology in teaching and research activities. This enables advanced techniques of web application development to update traditional systems.

Keywords: Artificial Intelligence; Remote Network Teaching and Research System; IntraWeb; CSCW; Web Applications; Online Teaching; Intelligent System.

1. Introduction

Equality in education is the most popular issue in the current education reform, and students' access to education, especially the opportunity of high-quality education, the level of education and the quality of education, are very different, which is why the public reaction to this issue is so fierce. There are obvious disparities in areas such as regions, urban and rural areas, schools and social groups. In order to improve the unbalanced development of teachers between urban and rural areas, between regions, and between schools, teachers' educational concepts are relatively backward, teaching content and methods are outdated, and primary and secondary school students are overloaded with schoolwork, the research on "Development and application of inter-school collaborative teaching and research network system" is carried out. The basic way to promote the balanced development of compulsory education is the rational allocation of resources, the equality of schools, the sharing of high-quality teachers, and the exchange of teachers and students between regions. In order to maximize the current rapid development of Internet technology, we put forward the topic of inter-school collaborative teaching and research network system development, the purpose is to maximize the current rapid development of Internet technology, so that the teachers of excellent primary schools and weak primary schools, urban primary schools and rural primary schools in the same region can communicate with each other [1]. It enables teachers to share more excellent resources and teaching and research results on this teaching and research platform, thus breaking the boundaries between schools and urban and rural areas, and building a mechanism for the common development of education and research between urban and rural areas and regions. Through cooperation and exchange, it has improved the quality of education in weak schools. The online system of inter-school cooperative

teaching research designed by the author achieves the comprehensiveness and consistency of teaching research content, and sets up the guide columns of "host" and "expert". In this way, the original scattered individual teaching research has become an organized collective behavior to achieve the goal of "online teaching research, inter-school cooperation".

2. Design of Remote Network Teaching and Research System

2.1. System Architecture

Using IntraWEB to develop a complete three-tier web architecture, its three-tier Architecture is shown in Figure 1 (the image is referenced from Streamlined and Practical Information Architecture for Office 365 Corporate Intranet). A client can use a browser to make an HTTP request to a Web server through a specific port. IntraWeb application servers can then access the database system directly via MyApp.exe. IntraWeb, meanwhile, provides users with comprehensive management of Web application details, such as Cookies, sessions, and user authentication management. It helps developers quickly develop and deploy server-side Web applications. IntraWeb9.0 manages individual details more efficiently, reduces storage footprint, and restores users' storage space quickly. IntraWeb is actually a web application interface, just like the NET architecture. VCL, CLX, JDK, etc., are "class frameworks" that provide developers with high-level abstractions that separate them from the underlying operating system apis, IntraWeb's class frameworks are the high-level abstract interfaces, and HTTP, HTML, and JavaScript are the low-level apis. The purpose of the internal network is to prevent developers from accessing HTTP, HTML, and JavaScript, but to access them, if necessary, which increases the flexibility of the internal network and extends the internal network on the client [2]. The version after 9.0 introduced Ajax technology, which made it easy to

adopt asynchronous communication methods in B/S network applications. Compared with ASP or other Web development tools, Web applications developed by Intranet components have greater advantages.

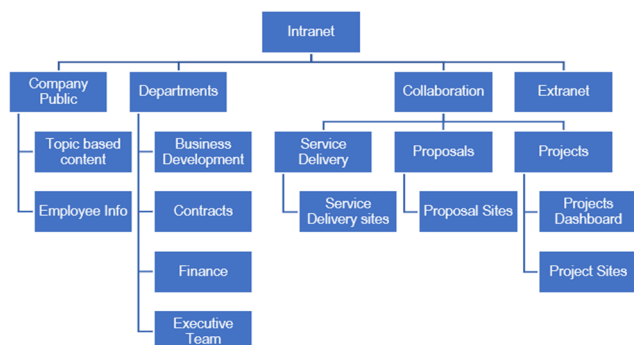


Fig 1. Intranet's architecture

2.2. Software Design

The registration and login in the system include three identities: teacher, student and administrator. After logging in, the teachers' work content will be related to the teaching of the course content, the correction of homework after class, and the discussion of answers in class [3]. After logging in students learn content, complete homework, answer questions, discuss, self-test and so on. After the administrator login, the corresponding user management and system maintenance are two aspects of the content. The System's Teaching plan program flow chart 2 (the picture is quoted in the Design of Electrical Remote Control Teaching System Based on Intelligent Ubiquitous Learning Network) Model).

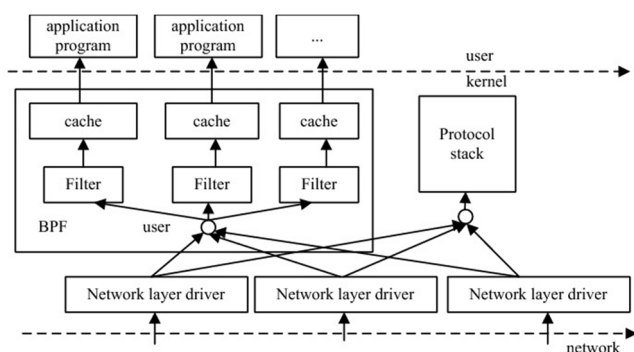


Fig 2. System teaching software flow

According to the teaching function of the teaching management module, collect teachers' teaching materials, after-class reading materials, classroom teaching materials and so on. Collect students' learning materials, homework completion and answer questions simultaneously [4]. Finally, the management and maintenance statistics of the administrator are carried out. Aiming at the uncertain factors in the process of teacher-student interaction in the classroom, artificial intelligence technology is used to collect the process of teacher-student interaction in the classroom in real time. Then all the acquired measurement results are input into the system memory, and then the CA-2A digital processor is used to process all the acquired measurement results. Ensure that the data collected and stored are legal.

2.3. System Hardware Design

The system uses the current mainstream PHP development language, and uses the MySQL database, realizes the parallelization of multiple platforms, and reduces the system

configuration overhead. It can effectively reduce the hardware requirements for network teaching, and is suitable for popularization in primary and secondary schools, which is consistent with the research purpose of this subject. The system uses Smarty template technology, which improves the speed of access to the platform and websites within the platform, facilitating secondary development. In addition, system administrators and teachers can quickly switch between the platform template and each teaching and research topic learning template within the platform, facilitating regional deployment and sharing [5]. This system can be applied in different levels of schools. The system uses database and programming technology to realize the division of network teaching and research platforms in different deployment areas, and realize the integration of network teaching and research platforms in different deployment areas. Administrators can directly add, delete, or modify columns and their modules, and the process and operation of portal content management are visual.

2.4. System Function Design

2.4.1. Logging in to a Subsystem

Its function is to register users and authenticate users. The registration of users is a real-name system, and all those who want to register in this system must give their real names to the system administrator and let him enter their real names into the database of this name. The implementation of real-name registration is conducive to purifying the Internet space and preventing the spread of bad news and malicious spread. And make this world a real world [6]. The login process is divided into three steps: teacher login, student login and administrator login.

2.4.2. Teacher Module Subsystem

This module can complete 4 tasks: subject resource construction, course teaching preparation, team research assignment, teaching and research activities of the teaching and research office. There are professional exchanges between teachers and teachers. Teachers in the same school can carry out academic exchanges and set up scientific research teams to carry out academic exchange activities. In CSCW, teachers and students can realize real-time and non-real-time communication and learning through synchronous and asynchronous communication of CSCW.

2.4.3. Student Module Component System

This module completes 3 tasks for the students: thematic tasks and difficult help, classroom activities, cooperative learning. Students can communicate with each other with the help of the teacher. Through CSCW communication, you can communicate and learn with teachers and students in real time or non-real time at any time to solve problems.

2.4.4. Administrator Module Subsystem

Conduct comprehensive management of all plant data. In this system, all users publish a shared resource or information, and other users can only share this information without any right to delete it. In addition to the publisher, you need an administrator to delete the material. One of the most important tasks is to maintain the entire system. It has maximum access in the background [7]. The overall architecture of the software and the function allocation of each module are shown in Figure 3 (image cited in Enhancing Distance Learning Platforms with Social Media Analytics).

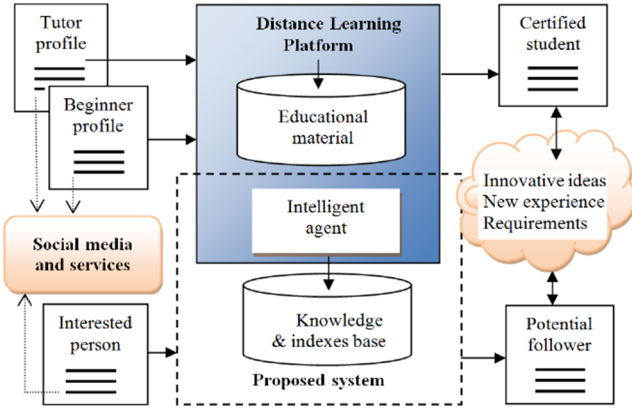


Fig 3. System structure and functional composition

2.5. Database Design

The designed teaching system is a process of teaching based on the teaching content and the actual learning situation of students [8]. In this process, the relevant personnel need to monitor the learning data of students and the teaching data of teachers in real time. The above collection data and processing data are stored in the database, the data type is analyzed, and the login name is taken as the primary key of the database. The database content obtained from this is shown in Table 1.

Table 1. Teaching database

field name	Instructions	Data type	Primary key or not
teac_ID	Login name	Invarchar	Yes
teac_IP	Login address	Varchar	No
teac_cour	Courseware content	Char	No
teac_clas	Teaching data	Varchar	No
teac_auxi	Auxiliary teaching data	Invarchar	No
teac_stud	Learning situation	Varchar	No
teac_ass	Class number	Char	No
teac_dat	Data name	Varchar	No
teac_curr	Course title	Text	No

It can be seen from table 1 that the paper selects courseware teaching content data, in-class teaching data, after-class auxiliary teaching data, student learning data, class number data, data name data and course name data, etc. The corresponding data can be obtained by clicking on the above content, which greatly reduces the time for searching teaching data.

3. System Algorithm Design

If the student team property is set to J , the duplicate data matrix of J is

$$J = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ \vdots & \vdots & \vdots & \vdots \\ r_{j1} & r_{j2} & \cdots & r_{ji} \end{bmatrix} \quad (1)$$

J indicates the team attribute. $r_{11}, r_{12}, r_{1n}, r_{j1}, r_{j2}, r_{ji}$ is the answer data under different team conditions. j, i is a constant. The redundant data is extracted according to the actual requirements of the system, and the calculation formula is

$$D = \frac{\sum_{i=1}^j r_{ij} \cdot J_i}{\sum_{i=1}^j Z} \quad (2)$$

D indicates redundant data. r_{ij} is the j duplicate of the i group attribute. J_i indicates other team data. Z is the total teaching data. According to the artificial intelligence overlay constraint instruction, the repeated knowledge points contained in the course are processed, and the calculation formula is

$$RJ_i = \frac{RD_i}{\sum_{i=1}^i RZ_i} \quad (3)$$

RJ_i is the result of repeated knowledge processing. S is for repeating knowledge points. RD_i is the knowledge point used in teaching. RZ_i are all the teaching knowledge points. When $RJ_i = 1$, the AI overlay constraint instruction constrains the probability of duplicate data occurrence. At this time, the repetition of the paper in the student group test is

$$W_s = \frac{\sum_{i=1}^j c_i}{j} \quad (4)$$

W_r is the duplicate data of the test paper in the group test. c_i is the test paper attribute. When $W_s = 1$, the duplicate data is 0, there is almost no duplicate data, or the duplicate data is negligible. When $W_s = 0$, duplicate data still exists, repeat the above steps until $W_s = 1$.

4. System Inspection

Simulation experiments are carried out to verify the rationality of the design of distance teaching system based on artificial intelligence network. As can be seen from Figure 4, the teaching efficiency of the conventional system is 58.22% and that of the artificial intelligence system is 96.14% at 10 s. In the 20-second experiment, the effect of conventional method and artificial intelligence method was 59.68% and 98.26%, respectively. At first, both systems have a certain time lag, which reduces the efficiency of learning, but it will soon return to the original state.

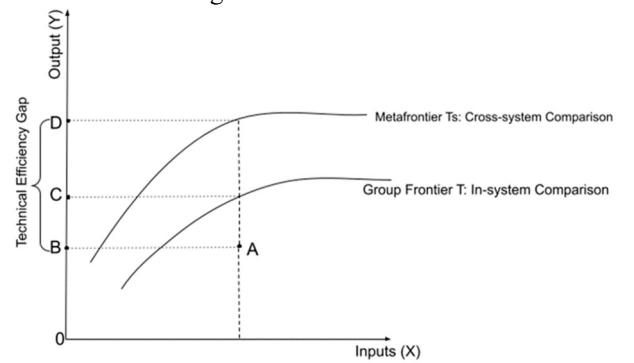


Fig 4. Comparative analysis of teaching efficiency of the two systems

5. Conclusion

The system is easy to operate and has good interactivity. The data transmission of the system is divided into real-time

data transmission and non-real-time data transmission, which is convenient for users to communicate with other users through various ways. All kinds of electronic resources in the campus network can be unified storage management, deployment and use. Users are free to open up their resources and have the right to maintain them.

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