

Database Design of College Students' Ideological and Political Education Resources Based on Computer Technology

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Abstract

In the ideological and political education of colleges, college students need to learn a lot of knowledge and inquire a lot of historical materials. In order to improve the efficiency of students' learning, so that college students can easily query the knowledge they need in the database, and understand current affairs news from the platform push, this paper builds a B/S structure-based ideological and political education resource database. This database uses a recommendation algorithm and a combined filtering recommendation engine. The system can obtain the user's operation information in the database and recommend interesting content to the user. This platform can improve the efficiency of students' query information and prevent students from acquiring incorrect ideological and political knowledge.

Keywords: Ideological and political; computer technology; database; educational resources

1. INTRODUCTION

With the popularity of the Internet, the field of education is gradually using computer technology as an important tool to improve the effectiveness of education. Nowadays, with the development of technology and changes in the world pattern, online education is gradually developing, and schools have higher and higher requirements for students' self-learning ability. Students need to consult materials independently in the process of learning to supplement the knowledge they did not learn in the classroom [1]. In the process of ideological and political information inquiry, students will find that there is no unified and complete ideological and political information system on the Internet today. When students look up the information, they will find that there are many websites with outdated or incorrect information. The occurrence of this situation will seriously affect the learning effect of students [2]. The ideological and political education resource database constructed in this paper can solve this problem. There are complete ideological and political education materials in this database, and the materials will be improved with the development of the times. There is also a news push function in this database, which allows students to have a channel to

understand the current affairs of the country. This database will mine the user's operation path, and push messages to the user according to the data analysis results to realize personalized resource recommendation. This database is very useful for college students [3].

2. DATABASE DESIGN PRINCIPLES

As a teaching resource library, this database must have some basic functions, such as uploading resources, downloading resources and evaluating resources. As a comprehensive system that needs to have multiple functions, the database must have the current programming framework and network architecture to be able to meet the needs of users. In the process of database design, the most important thing is the reliability of the database. Computer software will encounter abnormal conditions due to many factors in the process of running. As a qualified computer software, it should have the ability to automatically solve common abnormalities and provide users with a smooth running system [4]. The reliability of software determines the user's experience, so the first principle of system design is to have reliability [5].

The database design also needs to have strong applicability, meet the needs of users, solve the practical

problems of users, and improve the efficiency of users. The primary goal of database design is to provide a channel for users to independently query correct and logical ideological and political knowledge. In order to achieve the goal of developing a database, the applicability of the database needs to be focused [6].

In the process of users using the database, different users have different server environments. In order to provide services to all users, the system must have strong portability. The portability of the system is strong, it will not be constrained by the server environment, it can be better promoted and used, and the user experience can be improved.

The database system needs to be constantly improved and updated, and ideological and political knowledge will change with the development of the times. In order to meet the needs of the development of ideology and politics, the system must have strong scalability [7]. The data information in the database will continue to grow over time, so when designing the database, the database capacity should be increased to meet future needs.

For the long-term development of the database, the database must be maintainable. Database managers can maintain the data information, relevant announcements, resource evaluation feedback and other contents in the database system, so as to update the database in time [8].

3. THE OVERALL ARCHITECTURE OF THE DATABASE

This resource data system uses B/S architecture. B/S architecture refers to browser/server architecture [9]. There are three main parts in the B/S architecture, namely Browser side, Web browser and Server side. The application software used by the user is one of the web browsers. In the B/S architecture, the server side is the core part, responsible for the most important centralized coding and unified business functions in the system. In the past, in the system architecture, developers often used the C/S architecture, but with the increase in the amount of data, the C/S architecture gradually failed to keep up with the development of the times. The defects of poor compatibility and high maintenance cost brought by using the C/S architecture make the C/S architecture gradually abandoned by developers. B/S has the advantages of low coupling, simple client program, and low maintenance and update costs [10].

The system uses the B/S architecture, that is, there are three layers in the system, namely the presentation layer, the platform business logic sublayer and the data access layer [11].

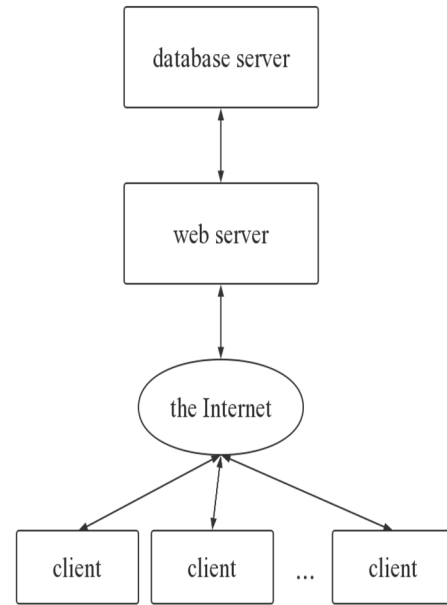


Figure 1: System Architecture

Through the analysis of system requirements, this paper divides the functions of college students' ideological and political education database into five sub-modules, namely resource management module, message module, announcement module, news module and data maintenance module [12].



Figure 2: Overall system structure diagram

The resource management module is mainly responsible for browsing, uploading, deleting, downloading, and searching for resources. The message module is mainly for system users. Users can put forward opinions or ask questions in this module, and the messages in this module will be publicized. The announcement module is mainly responsible for issuing announcements and deleting announcements to all users. In the news module, real-time news will be displayed according to the type of news and the user's preference.

This module also provides search functionality to the user. The data maintenance module is for administrator users, and administrators can delete resources and announcements, or back up and restore data in this module [13].

The most important thing in this system is the management of the database. The system uses the database management system MySQL. When designing the tables in the database, this database mainly follows several principles. The first is that a table in a database has only one object or entity [14]. The entity design is smaller than the current system requires entity granularity. Second, the dynamic changes of system data and the expanded information are not in the same table. Then, a one-to-many or one-to-one relationship is adopted between the tables in the database, and a many-to-many relationship cannot be adopted. Finally, there are strict regulations on the number of data fields in the table, which cannot exceed the rated value.

Table 1: User Information Table

field identification number	type of data	Data length	Notes
Cid	Integer	4	User ID
Cname	Varchar	30	username
Cpwd	Varchar	8	user password
Cadmin	Boolean	1	Is it an administrator
Cmcommt	Varchar	11	telephone number
Cdate	Date	8	Registration time
Cweixin	Varchar	13	We chat number

4. IMPLEMENTATION OF PERSONALIZED RECOMMENDATION FUNCTION

The system will recommend information to students according to the user's downloaded resource information and learning behavior record information in the system, so as to improve the user's experience and reduce the time for users to find materials. The personalized recommendation method used in this system is a combined filtering recommendation method based on collaborative filtering board technology.

Collaborative filtering technology is to recommend the content of the resource and the matching degree with the user according to the user's rating of the resource. The computer will use the Pearson correlation coefficient to calculate the previous similarity of the target user to find neighbors and generate recommendations. The formula for the Pearson correlation coefficient is as follows:

$$\text{sim}(u, v) = \frac{\sum_{i \in I_{uv}} (R_{ui} - \bar{R}_u)(R_{vi} - \bar{R}_v)}{\sqrt{\sum_{i \in I_{uv}} (R_{ui} - \bar{R}_u)^2} \sqrt{\sum_{i \in I_{uv}} (R_{vi} - \bar{R}_v)^2}}$$

In the formula, I_{uv} represents the item that user u and user v have jointly rated, and R_{ui} and R_{vi} refer to the rating of item i by user u and user v . The collaborative filtering board technology will take the top k and users with the highest similarity as the neighbor user set. The system will predict the score and generate recommendation results [15].

The combined filtering recommendation engine used in this system takes collaborative filtering technology as the basis. The combined filtering recommendation engine first analyzes the data information base to form a scoring matrix of users and resources. The system then determines the sparsity of the data and selects the modified collaborative filtering algorithm to use based on the data. Then a threshold is set as the threshold for selecting score prediction or content filtering. When the data sparsity is less than the threshold, the system will select content filtering to correct the collaborative filtering algorithm. Finally, the system will recommend the user [16].

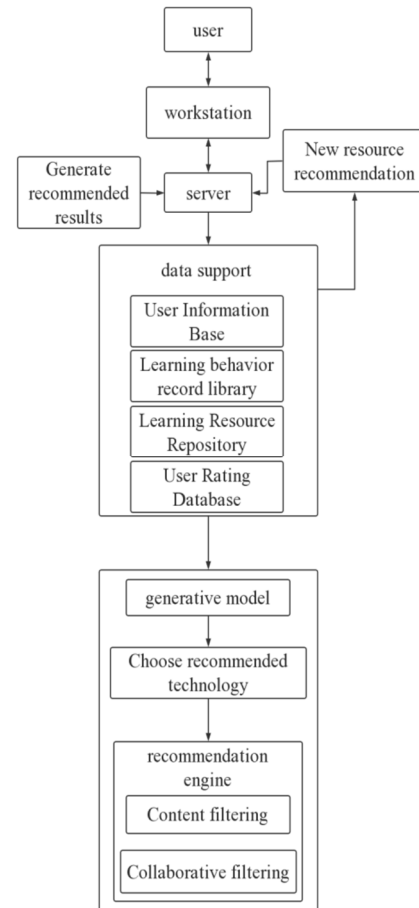


Figure 3: Personalized recommendation model based on combined recommendation technology

5. CONCLUSION

This paper builds a database of college students' ideological and political resources based on B/S structure, users can check the information they need according to the keywords in the database. The system also has a news and resource push function, which analyzes the user's behavior on the website, and uses the combined filtering and recommendation technology to recommend news and learning materials that may be of interest to the user. This system can provide students with real, timely and correct ideological and political resources, and improving students' learning efficiency has high use value for ideological and political learning.

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