Development of Archives Management System for University Ideological and Political Practice Activities Based on Computer System

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Abstract

University ideological and political education needs to be based on practical activities. Students are able to translate theoretical knowledge into practical actions in practical activities. In order to be able to supervise and record students' ideological and political activities, this research develops a computer system-based file management system for university ideological and political practice activities. The system uses a distributed database, which improves the reliability and operational efficiency of the system. In order to facilitate teachers to query archive information, this research uses genetic algorithm to solve some data allocation problems in distributed databases. This system can record the data information of students, and record the students' ideological and political practice activities in real time. This system has high use value for university management.

Keywords: Computer system; development; file system; ideology and politics; B/S structure

1 INTRODUCTION

Nowadays, the ideological and political teaching in colleges and universities has requirements for students' practical activities. There are many colleges and universities that require students to complete practical activities in their spare time, and allow teachers to evaluate students' practical activities. Under the premise of such ideological and political teaching, colleges and universities need to record the students' ideological and political practice activities. The system constructed in this study can record the basic information of students and related information of ideological and political practice activities in detail. Due to the large number of students in colleges and universities, the system needs to have a scalable database and efficient response speed. This research formulates an ideological and political practice activity system according to the requirements of colleges and universities. Now many colleges and universities have file management systems, but the architecture used by the system is generally an old C/S architecture, and the system response speed is slow. When multiple teachers query and upload information at the same time, the system may crash. This study improves on this problem.

2 DATA STORAGE TECHNOLOGY

Data integration is to integrate data from different storage environments into the specified storage environment. In this process, the most critical is data storage technology. Since the design of this research is a file management system for ideological and political activities in colleges and universities, it is necessary to pay more attention to data storage technology. Different data generation environments will lead to different data storage technologies and characteristics of stored data. Taking data structuring as a criterion for differentiation, data storage can be divided into structured data storage environments and unstructured data storage environments. Structured data storage technologies include SQL-type databases, and unstructured data storage technologies include NoSQL-type databases. Taking the form of data storage as the standard for distinguishing, the data storage environment can be divided into a disk data storage environment and an in-memory data storage environment. There is CSV data in disk data storage technology. Among the in-memory data storage technologies is the Redis database. With time as the standard of distinction, data storage technologies can

be divided into offline data storage and real-time data storage.

Structured data refers to a type of data that has a highly organized and neat format. Most of the data in this study are structured data. Commonly used structured data storage methods include relational databases MySQL, SQL Server, Oracle, as well as Excel and CSV files stored in file form. There is a strong correlation between the attributes of structured data, so in the process of storing data, each record of the data will be recorded as a whole. Structured data storage can record the relationship between various data, but performance problems will occur when the amount of data is too large, so the structured data storage solution is suitable for applications and mathematics [14].

Unstructured data storage is data other than structured data. The structure of unstructured data does not conform to any predetermined data model. In general, NoSQL is used to query and store unstructured data.

3 SYSTEM REQUIREMENTS ANALYSIS

In order to build a file system of university ideological and political activities that can meet the needs of colleges and universities, we must first analyze the display situation and needs of colleges and universities [10]. Now almost every university has an independent student file management system, but these systems cannot carry out data transmission and data sharing. This has led to poor communication between colleges and universities, and low efficiency and waste of resources in the process of transmitting information. The development of this system should pay attention to this problem, so that the system can communicate and exchange information with other systems [13].

In the traditional college student file management system, the system generally uses a centralized database management mode, and all clients use the same database server for computing when sending requests. Although this method is low-cost and simple to develop, it is not suitable for a large user group. The system developed in this research needs to be able to deal with the situation that multiple users send requests at the same time, improve the system response speed, and provide users with a good experience [8].

The ideological and political practice activity system of the university needs to store the situation and evaluation of the students' practical activities, which contains the basic information of the students, and these data are very important. System development should pay attention to data protection, not all data can be stored in the same database server. The system needs to have good security and reliability to protect the data security of students and teachers [1].

In order to solve the above problems, this research chooses to use a distributed database and management platform to build a university ideological and political practice activity system. Distributed databases are geographically dispersed, but logically unified, meeting the requirements of universities. The distributed database has the ability of local autonomy, which can reduce the network burden caused by data communication [9]. In a distributed database, even if one node fails, the entire system will not be affected. The use of distributed databases in the university ideological and political practice activity system can improve the efficiency of school management and ensure the data security of students and teachers.

4 SYSTEM ARCHITECTURE

In order to reduce the burden on the server and improve the operating efficiency of the system, the system uses a four-tier architecture, the specific structure is as follows.
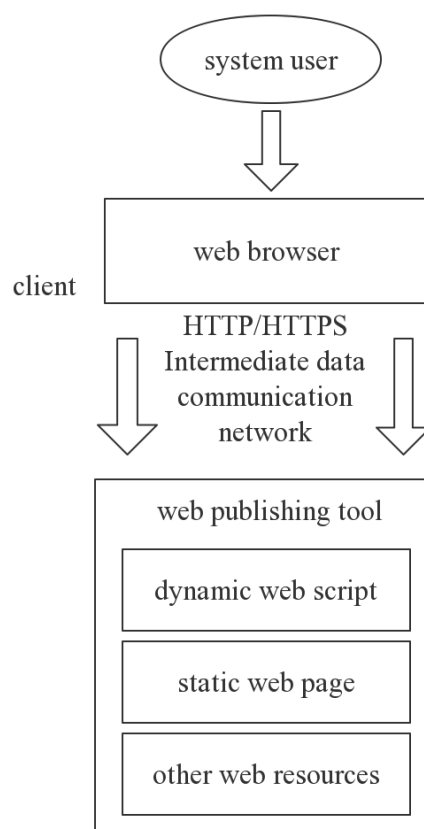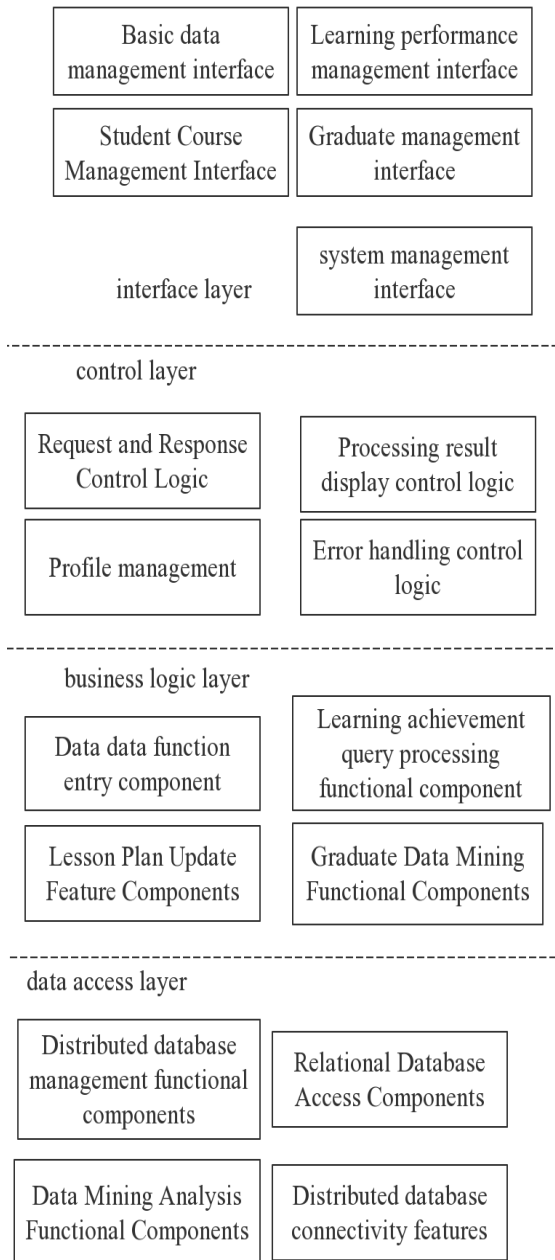

Figure 1: System technology framework

Basic data management interface	Learning performance management interface
Student Course Management Interface	Graduate management interface

	system management interface
interface layer	

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control layer

Request and Response Control Logic	Processing result display control logic
Profile management	Error handling control logic

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business logic layer

Data data function entry component	Learning achievement query processing functional component
Lesson Plan Update Feature Components	Graduate Data Mining Functional Components

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data access layer

| Distributed database management functional components	Relational Database Access Components
Data Mining Analysis Functional Components	Distributed database connectivity features

Figure 2: System Logical Architecture

In the system, the top layer is the interface layer, which is mainly responsible for receiving the data entered by the user and the instructions issued by the user, and displaying the results processed by the system to the user [6]. The Structs open source architecture is used in the interface layer, which implements the MVC pattern, and cooperates with the controller to associate the interface request with the actual processing logic construction [11].

The control layer is the buffer between the interface layer and the business layer, so that the interface layer and the business layer maintain a loosely coupled relationship. The control layer can make the software construction of the upper and lower layers relatively

independent, which is convenient for the later update and maintenance of the system [3].

The business logic layer is responsible for completing relatively large-scale tasks in the system. The business logic layer is relatively independent, which ensures the reusability of the business logic layer. The same functional build can be used in different modules in the same software system or in different systems [12].

The database access layer is responsible for completing the data requests made by users, such as storing data, querying data, and so on. The components of the database access layer establish contact with the database and provide the calling interface for the logic layer. Using the Hibernate framework at this level enables object-oriented data manipulation [2].
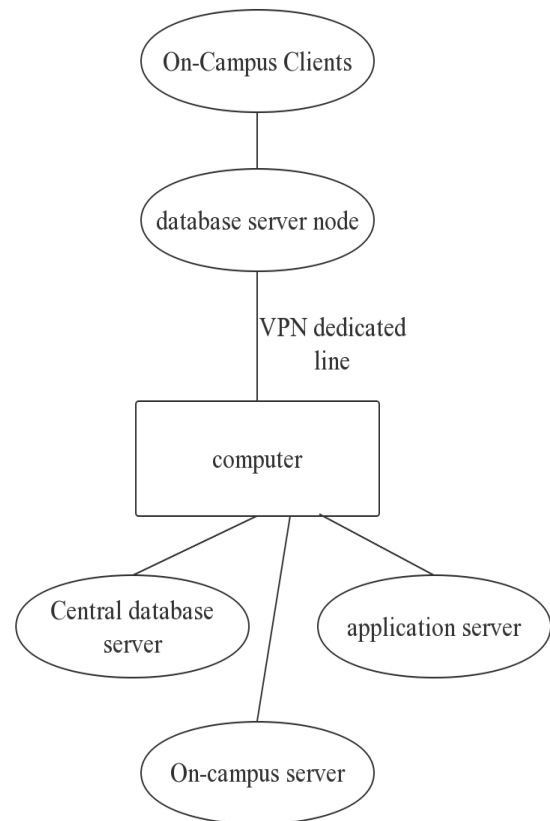
Figure 3: Physical Architecture of the System

According to the needs of college students, teachers and administrators, the system has designed the functional modules of the system [7].
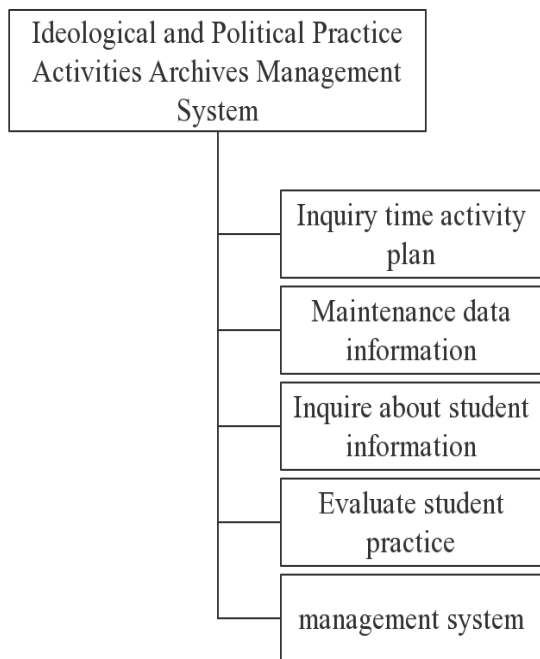
Figure 4: System function module structure

5 SYSTEM DATABASE DESIGN

This paper builds a distributed database that can meet the needs of users. The specific structure is shown in Figure 4.
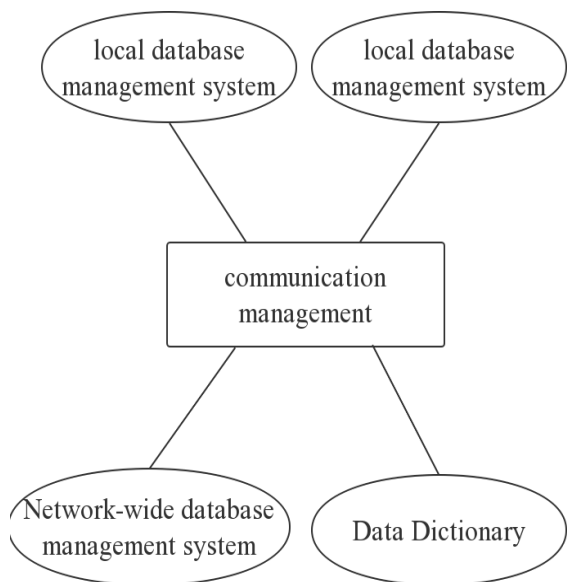
Figure 5: Distributed database structure

This distributed database will deploy a database server in each central computer room of the school. This database server will form a global centralized distributed database structure system with other local database servers in the school. The database server in the central

computer room is responsible for managing all data nodes in this area [15]. A distributed database structure system with global control is used between the central database servers in different regions. This distributed database construction method mixes a centralized approach with global control and a decentralized approach with global control. This can improve the stability and flexibility of the distributed database system.
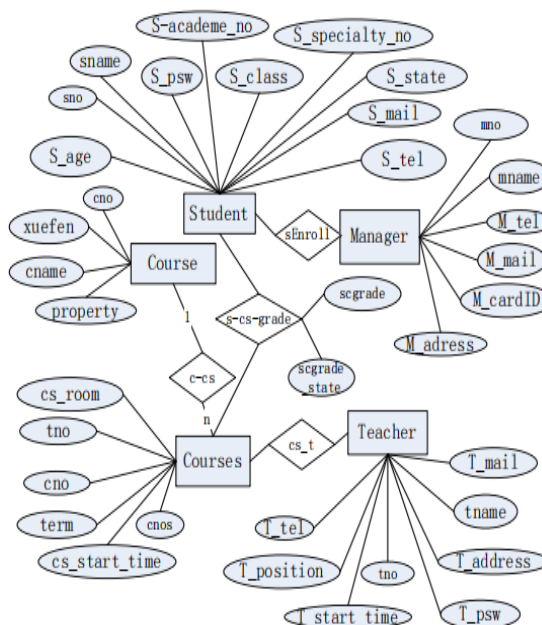
Figure 6: Database E-R Diagram

For the database query algorithm, the system uses the query binary tree. The flow of the algorithm can be represented by a query binary tree p(v,e), where v refers to the relationship of the query, and e represents the edge of the binary tree, which represents the operation of connection [4]. Each leaf node of the tree represents a basic data relationship, while intermediate nodes represent related join operations. Due to the different influencing factors such as connection order and site selection, the query binary tree obtained by constructing the same query statement for the same distributed database is also different. The binary tree algorithm is as follows:

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typedef int data_type_t;

typedef struct binary_tree_node{

    data_type_t data;

    struct binary_tree_node *left;

    struct binary_tree_node
*right;}binary_tree_node_t;
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data is the node key, left and right are the left child pointer and right child pointer, respectively [5].

The algorithm first stores the data and then constructs the binary tree [16]. The algorithm records the clues of the predecessor and successor of the node through the enumeration value, and controls the child pointer. The algorithm then uses preorder to assign values to the binary tree. The algorithm uses global variables to record the node just visited, and uses recursive traversal to point the successor of the node just visited to a node, and hits a new node. The right child pointer points to the head node, and the head node points to the root node. Threaded binary tree is realized through such a process [17].

6 CONCLUSION

According to the requirements of colleges and universities for the records of ideological and political practice activities, this research uses a distributed database to construct a file management system for ideological and political practice activities. The system constructed in this study can process user requests and quickly feedback the calculation results to users. This paper introduces the binary tree query algorithm used in the database in detail, and provides users with a smooth query function. This system is of great practical value for colleges and universities to store and organize student information.

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