Research on an optimized platform for information sharing based on student quality development

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Abstract

Based on the actual needs of College Students' information sharing and optimization management, this paper studies and designs the college students' information sharing management system. The system is based on the three-tier architecture mode of display layer, service layer and data persistence layer. The front end combines LayUi and jQuery framework, and each micro service at the back end is constructed by springboot + mybatisplus, Using redis as cache middleware realizes the efficient management and sharing of College Students' information, which not only greatly promotes the effective guidance of students and the all-round development of students, but also provides a favorable reference for educational institutions.

Keywords

Information management, sharing, optimization.

1. Introduction

In the current situation of a large number of students, complex types of student information and scattered campuses, independent student comprehensive information documents have some defects, such as difficult to update in real time, easy to lose, leading to security risks, difficult to share in real time, leading to low efficiency, which has adverse factors for students' high-quality development and students' personalized counseling and management, Therefore, we need an efficient information sharing platform to effectively manage these student information.

2. Demand analysis of information sharing Optimization Platform

2.1. Functional requirements analysis of student information management system

The establishment of student information management system needs to have main modules such as students' basic personal information module, political and ideological module, learning situation module, funding situation module, recreational and sports activities module, innovation and entrepreneurship module and comprehensive quality integral module, covering all aspects of students.

Functional requirements: firstly, the system is real-time. Due to the large number of college students, student information management has brought certain pressure to the allocation of school educational resources. The system is mainly to update and dynamically collect the student information system and student management system in time. Secondly, according to the authority, the system divides all groups of colleges and universities into different roles (students, teachers, counselors and super administrators) according to different functions. After different roles in the management system log in, they enter di
Different operation interfaces to realize their work. Different roles restrict their access to the corresponding business according to their authorization rules to ensure the security of system information. Another is the sharing of the platform. The platform establishes a "database middleware" to collect, sort out, save records, share and transmit data information of different departments, realize real-time summary and timely exchange of information, and master comprehensive and complete information. It enables the rapid interaction of information, realizes communication and sharing, and effectively solves the problem of "information island".

Non-functional requirements: mainly for system functionality. First, ensure the maintainability of the system. For most students and teachers, the computer level is relatively low, and the platform is more convenient and easy to understand for the daily maintenance of student information management system. Secondly, the practicability of the system. When building the student information sharing optimization platform, we need to ensure the practicability of the teaching system. The platform is related to the management functions of students' personal information, funding and learning. Therefore, to ensure the practicability of the system can improve the efficiency of student information management.

3. The Main architecture of system development

The entire system uses the SOA framework. SOA is the abbreviation of Service-Oriented Architecture and is a service-oriented architecture. It can divide the service commands and is connected by interfaces and protocols previously defined between services. It can be regarded as components of a modular system, in which each module can complete its own work, and each combination of modules can provide different services, and the interface connection standards between modules are also united. The interfaces are defined in an objectively neutral way, which allows for low-cost reconfiguration and reorganization and makes the information management system much more flexible. With the SOA technology architecture, the university is able to integrate the numerous information system resources that were previously disorganized into an orderly working system, thus increasing the flexibility of the university's information system in the information quality management process and thereby achieving high information system resource utilization.

In addition, each service can be deployed on multiple servers in the future when conditions allow for load balancing to improve the efficiency of the entire system. This can effectively guarantee the high concurrency tolerance of the system and enhance the robustness of the system.

Figure 1 shows the SOA architecture reference diagram.

Figure 1 SOA Architecture Reference Diagram

Service Information Centre: The Service Information Centre is similar to an information base. The service publisher keeps information about its own service interfaces in the information
base and provides the service users with the ability to search for information so that they can query the information content of the required service business in the information center.

Service Publishers: The service publishers publish information about its own services and interfaces to the service information centre so that others can consult and use the information. They are able to receive requests from service users as well as to complete services for requester at a remote location.

Service Users: The service users are the party that uses the service application. They are able to look up the services in the information center, find the services that meet their needs, learn the interface description of the services, execute the services after binding with the services.

4. System module framework

According to the actual situation of major universities and the requirements of student information quality management, combined with SOA thinking, the system structure of the information optimization sharing platform is designed as showed in Figure 2. The solution is made up of five layers, and the functions of each layer are as follows.

The first layer: Exhibition layer. This layer contains all the application modules of the self-defined structure, as well as the original object-based system implementation and business intelligence application modules, such as the system login identification page, the political ideology module and student financial aid module. The second layer: Service Layer. This layer is the core support layer of the information optimization platform. The middleware is used to build the services required for different functions, such as professional administration, menu administration and permission administration, and to build various administrative services in the administrative system through various encapsulated services. The third layer: Cache Layer. This layer uses redis as the caching middleware and adds ElasticSearch as the index library to improve the response speed of the system. The fourth layer: data lasting layer. This layer

![System structure of the sharing platform](image-url)

Figure 2 System structure of the sharing platform
provides a unified big data operation capability. It provides effective and accurate data support for modern school management through a centralized application of data analysis techniques.

The fifth layer: Message Queue Layer. It will serve as the main general source of messages for the unified platform of campus informatization in China, providing users with information and services corresponding to their identities.

5. Related Technologies

According to the five-layer system structure model of the information optimization platform, the front-end of the platform combines the use of LayUi and jQuery frameworks, and each micro-service on the back-end is built using a combination of springboot + mybatisplus, using redis as caching middleware. The relevant technologies are detailed below.

5.1. LayUi framework

LayUi is a very handy leading end frame. It has its own model, using a lightweight organization and is a lightweight framework, simple and beautiful. At the same time, LayUi also provides a large number of built-in modules which can be added on demand using a modular format and follow the native HTML/CSS/JS design approach. This helps us carry out paging on the front end, date formatting, and dynamic chart creation on the front end.

5.2. JQuery framework

jQuery is based on the Javascript language, and the resulting program architecture has a high degree of relativity and consistency in design principles. Similarly, the unique advantages of jQuery are also reflected in the following main aspects: for example, the architecture is extraordinary simple, yet integrates with a great deal of browsers, allowing for a large number of design with little code, the structure is modern and logical. And it is able to achieve the separation of function and structure, that is, a layered structure. In summary, jQuery provides a simple way to separate scripts from web pages, making the web code very flexible, strong and clear.

5.3. The back-end technology stack

Each micro-service is composed of a combination of springboot + mybatisplus. In the SpringBoot framework, there are two quite key design strategies: out-of-the-box and convention over allocation. MyBatis-Plus, referred to as MP, is a MyBatis enhancement tool with non-intrusive, low-consumption, powerful CRUD functionality, manual dispatching in the form of Lambda, and the ability to automate primary key production and other features.

The background role permission separation uses the Shiro framework to assign different permissions according to user roles, the messaging middleware activeMq to decouple and eliminates peaks from the system, and calls using Ali’s high-performance rpc framework dubbo between services.

Project Source

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References

