Design of Distributed Student Information Sharing Optimization Platform based on SOA Architecture

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Abstract

In the current case of a large number of students, complex student information categories, and scattered campus, Independent student comprehensive information documents have defects such as not easy to update in real-time, easy to lose leading to hidden security risks, difficult to share in real-time resulting in inefficiency, This has adverse factors to students 'high-quality development, students' personalized guidance and management, This paper proposes an information sharing optimization platform based on student quality development, The SOA architecture makes the system more flexible and flexible, The front-end uses a "layui + jquery" framework, Each microservice at the back end was constructed using the "springboot + mybatisplus" combination.The use results show that the system operation result is good, and the system can not only realize the management information and automation, but also ensure the security and scalability of the system, which greatly improves the efficiency of efficient information management.

Keywords

Information Sharing Optimization; SOA; Layui + Jquery; Springboot + Mybatisplus.

1. Introduction

The software developed by the information sharing optimization platform project based on student quality development is the school student information management system, which is conceived under the background of the automation and precision of student information management given the large number of students and the explosive growth of student information.

2. Architecture Design Scheme

2.1 Distributed Student Information Sharing Optimization of the S O A Architecture

The SOA architecture, is a coarse-grained, open, loose-coupled service structure that requires software products to be developed in accordance with relevant standards or protocols.This layered design or architecture system can make software products more flexible and flexible, and as complementary and compatible with third-party software products as possible to expand rapidly, meet or respond to the diversity and variability of market or customer needs.The SOA framework is shown in Figure 1:
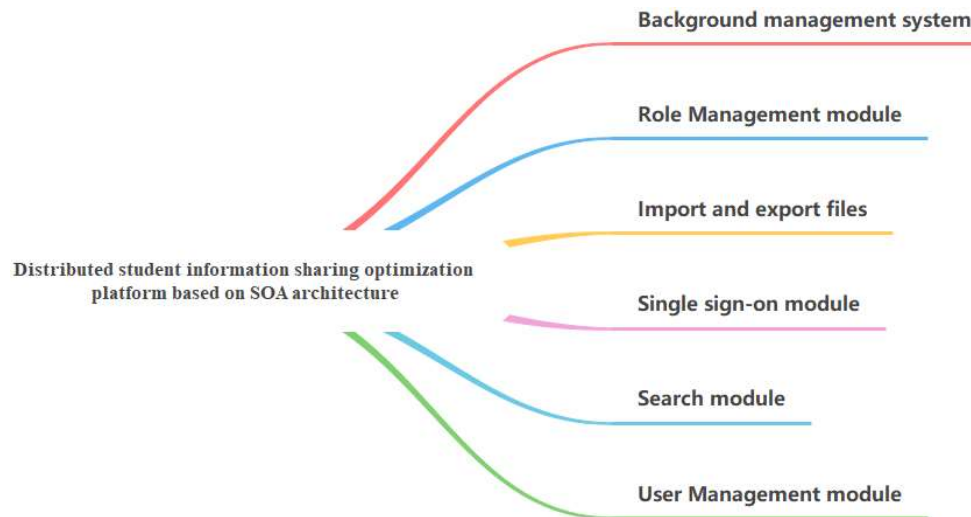
Figure 1. SOA architecture

The functions of each management module are as follows:

(1) Background management system: the management of students' political thoughts, awards, comprehensive quality, users, system statistics, logs, etc.

(2) Role management module: the platform is divided into four roles for students, teachers, super administrator, counselor, and each different role has a different permissions and menu.

(3) Import and export of files: The module information important for each student can be imported and exported.

(4) User management module: manage all users, and can query their professional information, class information, etc.

(5) Single sign-on module: provide a unified certification center for multiple modules, realize the login of a system, the effect of login everywhere, and avoid the frequent login of users for many times.

(6) Search module: each module provides a search module with multiple conditional combination, a high performance search engine implemented by elastic Search, and has word bank and word retrieval to improve the efficiency of search.

3. The Platform Uses the Technology

3.1 Front-end Technology Layui+Jquery Framework

(1) The LayUi framework

The advantages of choosing a layui are as follows:

The layui belongs to the lightweight frame, which is simple and beautiful.Suitable for developing the backend mode, it works very well on the server page.

The layui is the best ui framework for back end developers based on DOM drive as long as it doesn t involve interactive layui.

(2) The Jquery framework

JQuery is a fast, concise JavaScript framework, and it is another excellent JavaScript code base (or JavaScript framework) after Prototype.jQuery designs for "write Less, Do More," which advocates for writing less code and doing more.It encapsulates the functional code commonly used by JavaScript and provides a simple JavaScript design mode that optimizes HTML document operations, event processing, animation design, and Ajax interaction.

3.2 Back-end Technology

(1) Each microservice was constructed using the springboot + mybatisplus combination.

(2) Background role permission separation framework Shiro, assigning different permissions according to different user roles.

The message middleware activeMq decouples the system and eliminates the peaks.

(3) Call between services use Ali's high-performance rpc framework: dubbo.

(4) Cache middleware: redis improves the response speed of the system. redis is a nosql database that stores data in memory, which is not suitable for cache.

(5) Distributed high-performance search engine elasticSearch, has the advanced word segmentation function, can only split out the effective words in a sentence, improve the accuracy of the research.

4. Platform Framework

The design adopts layered modular development, and each plate is responsible for the functions of each plate, with clear division of labor, small mutual interference and strong reliability. The platform framework includes display layer, service layer, cache middleware and data persistence layer,as shown in figure 2.
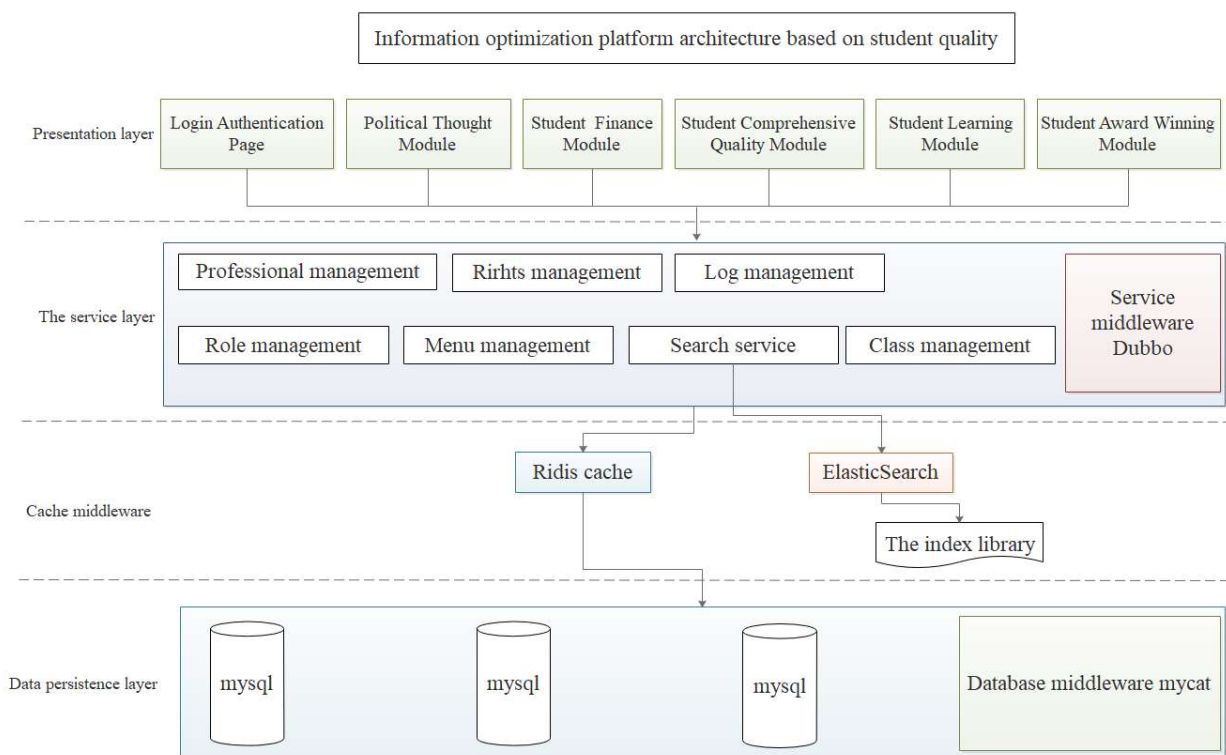

Figure 2. Information optimization platform archetecture based on student quality

5. Implementation Results of the Information Management System

5.1 Display of Student Information Management Function

After students log in the system, click the "Student Information Management" to enter the student information page. The management interface includes 5 parts: basic information, financial aid, quality expansion, award situation and learning situation.

(1) Student quality expansion module

Students, administrators and counselors can check the quality expansion according to different quality project types. Meanwhile, students can add their own quality items online and upload their own certification materials; the students are reviewed by the counselor and the administrator. The

administrator can add, delete, change and check the comprehensive quality modules of all students, and the counselor can increase and check.

(2) Student learning situation management module

Students can check their GPA in recent years, get career-related certificates, and study abroad; the teacher can check the current students, the counselor can check the learning module, the administrator can delete and change all the learning situation, delete and import.

(3) Basic information module of students

Students can check their family information and their majors, classes, colleges and counselors; students can also check their positions and hobbies; counselors and administrators can add and delete their basic information.

(4) Student financial aid management module

Students can check their funding information, such as poverty level and funding amount; teachers can check the funding information of students in their class; counselors and administrators can import and delete student funding information in batches.

(5) The political and thought management module for students

Students can check their time, the league, and their political outlook ;The administrator can add and delete the students 'ideological and political information; the counselor can view, delete and modify the students' political and ideological information; the teacher can only View.

5.2 System Management

It mainly includes menu management, permission management, role management, user management and four sections.

(1) Role management

According to the different roles,it is dividede into different management registration.there are four roles:student super administration counselor and teacher. The super administrator is the first-level administrator, the counselor is the secondary administrator, and the teacher is the ordinary user. Administrators can dynamically add different roles and dynamically assign users to different roles, permissions, and menus. The role management module is only open to team administrators.

(2) User management

The user is students,teachers,counselors, and the module mainly undertakes the allocation of user roles,user increase and editing,user increase and editing,user prohibition and restoration of users,and complete deletion of users.

Acknowledgments

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