

Research on Teaching Resource Platform Based on AliCloud

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Abstract

The construction of teaching resources platform is helpful to improve the quality of professional teaching and remedy the shortcomings of the existing teaching methods. It is immanency to construct teaching resource platform in higher vocation education due to its major professional characteristic and student source level. Based on high-level major at higher vocational education in Jiangsu Province, the teaching resource platform is developed. This platform can serve the major construction, curriculum development, improvement of student ability and enterprise personnel training. The platform is deployed on the AliCloud platform. It takes advantage of elasticity, high reliability, and high scalability of cloud compute technology, and reduces effectively development , operation and maintenance costs.

Keywords

Teaching resource platform, Alicloud, MVC, Spring, MyBatis.

1. Introduction

Now, new information technologies such as cloud computing, big data, Internet of things, mobile computing have a great influence on education [1]. In the big data era, there is no doubt that it is necessary to construct teaching resource for different level education. With the development of information technologies, modern teaching methods are emerging as an endless stream. These new methods include computer-aided teaching, remote education, massive open online courses, mobile Internet learning, flipped classroom teaching and so on [2]. All of these teaching methods should be based on teaching resources.

In this paper, a teaching resource platform is presented. This platform is development by MVC (Model View Controller) model. Integrating Spring, Spring MVC and Mybatis all together as a MVC framework is used in the platform development. By this way, it not only improved the development efficiency, and reduces maintain cost. To improving the reliability, augment ability, this platform is deployed on AliCloud platform

2. Requirement Analysis

The teaching resource platform is the important part of wisdom campus in Jiangsu Maritime Institute and is also an important task of Jiangsu province key vocational college construction. Through the investigation of all parties, the requirement of this teaching platform is defined. This platform is applied in resources collection, integration, editing and storage by variety of ways. This platform is a multimedia network platform which can support higher vocation education and share teaching resource. Social demand is the guidance for this platform construction. According to the major educational objectives and characteristics of higher vocation education, this platform is based on actual work scene, and the school-running mode of oriented actual project.

Users in this platform are divided into four types. The first one is the type of student user, which provides the students' online learning and the function of downloading the related electronic resources. The second one is the type of teacher users, and this type is assigned the curriculum resources and provides management functions. The third one is the type of external uses which provides some resources to download function. The last one is the type of administrator users, and this type of users mainly completes the system maintenance.

3. Designment and Implementation

3.1 Function Designment

The teaching resource platform is mainly composed of two parts: the PC client application and the mobile client application. The PC client application consists of foreground exhibit and background management. Background management includes basic data management, training plan management, resource management, online learning management, web crawler, user management, report statistics query and forum management. The foreground exhibit includes the home page, course inquiry, online learning, homework completion, notice inquiry, online question answer, resource query, and resource download. The structure of this platform is shown in Fig.1.

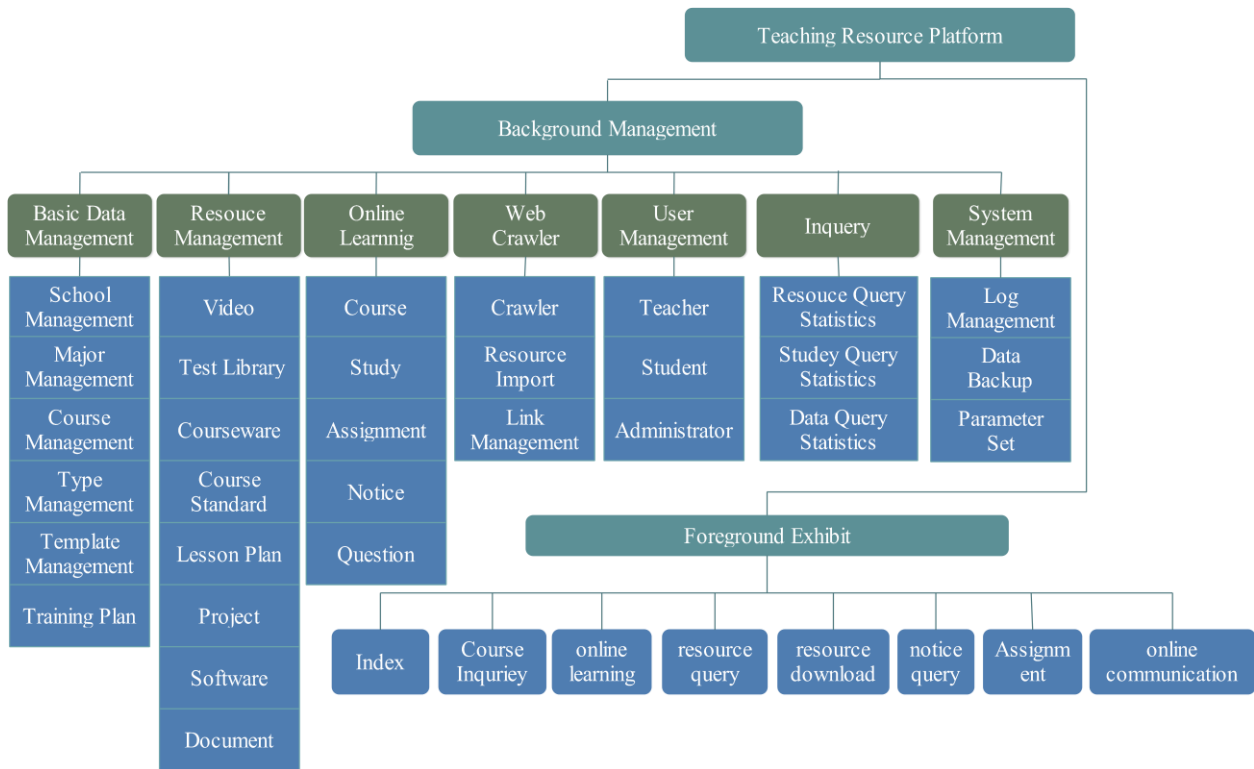


Fig. 1 Functional diagram

3.2 Implementation

The teaching resource platform is implemented by the MVC (Model View Controller) model and based on the SSM (Spring, Spring MVC, Mybatis) framework. The platform architecture is shown in Fig. 2.

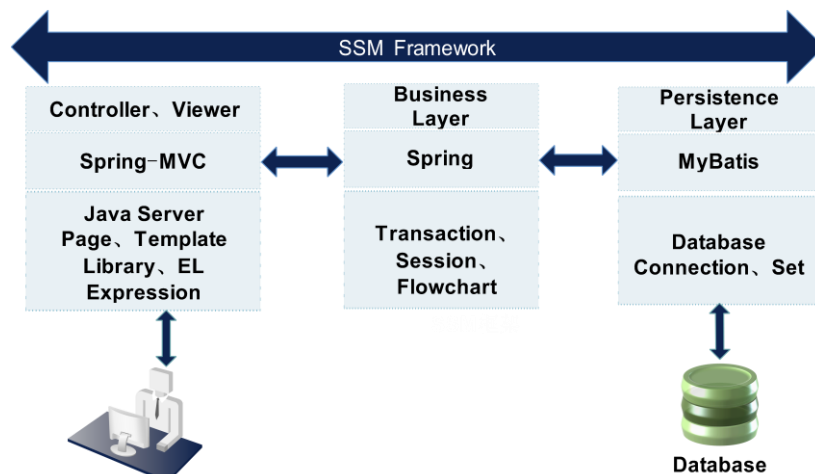


Fig. 2 Development framework

In development process, the control model is implemented by Spring MVC and business control classes. Spring MVC is a powerful and flexible MVC framework provided by Spring [3]. It uses annotation to provide the development of plain ordinary java object, and make the development and test of controller easier. DispatcherServlet is the core of Spring MVC framework, and the controller is called by the framework by relying on the injection function [4]. DispatcherServlet is a centralized access point for client access, and responsible for the distribution of business control. These controller classes can be fused seamlessly with the Spring IoC (Inversion of Control) container.

Business layer mainly realizes business logic and business verification, and it is a bridge between the control layer and persistence layer. It manages the dependency between business level objects and the persistence of transactions. The layer calls the persistence layer, and returns the corresponding view according to the operation results.

The persistence layer implements the operation of the Java language to the database. In the development of this platform, it is implemented by Spring and Mybatis. Spring is a lightweight inversion of controller and an aspect- oriented container framework [5]. MyBatis is an excellent persistence layer framework that supports queries, stored procedures and advanced mappings [6]. MyBatis reduces the handwork of almost all JDBC code and parameters as well as the retrieval of the result set. Spring and Mybatis framework simplifies the operation of the database and improves the development efficiency.

In order to make the teaching resource platform adapt to the different mobile platform, this mobile platform is developed by the Cordova framework [7], and hybrid APP is implemented. This development uses HTML, CSS, and JavaScript. It can support a variety of operating system, such as IOS, Android, and Window Phone. The mobile client development uses HTML 5 and JQuery mobile framework. JQuery Mobile is the front-end development framework for creating mobile web applications [8]. This framework uses HTML5 CSS3 minimum script to layout web. The development framework is shown in Fig. 3

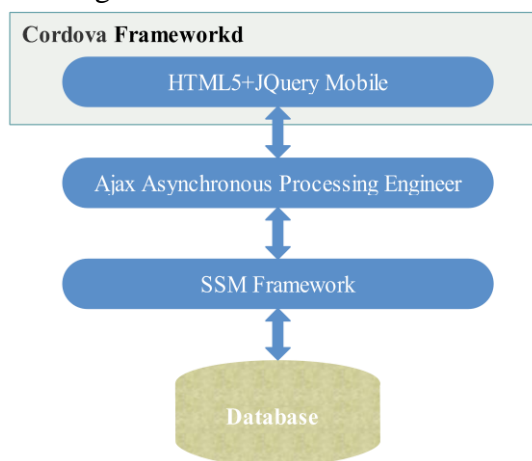


Fig. 3 Mobile development framework

4. Deployment

Based on Alicloud platform, teaching resources platform can take advantage of cloud computing technology, flexible, and scalable services to effectively reduce the cost of operation and maintenance [9-10]. The platform architecture consists of elastic compute server (ECS), server load balancer (SLB), relational database (RDS), and object storage server (OSS). The resource platform is deployed on the ECS, and the operation system is Center OS. The database is deployed on the RDS server and the database management system is MySQL. OSS servers store video, documents, software and other resource files. ECS, SLB, and RDS servers are in the same available area. The access between the ECS server and the RDS server is through the Alicloud LAN. The platform deployment architecture is shown in Fig. 4.

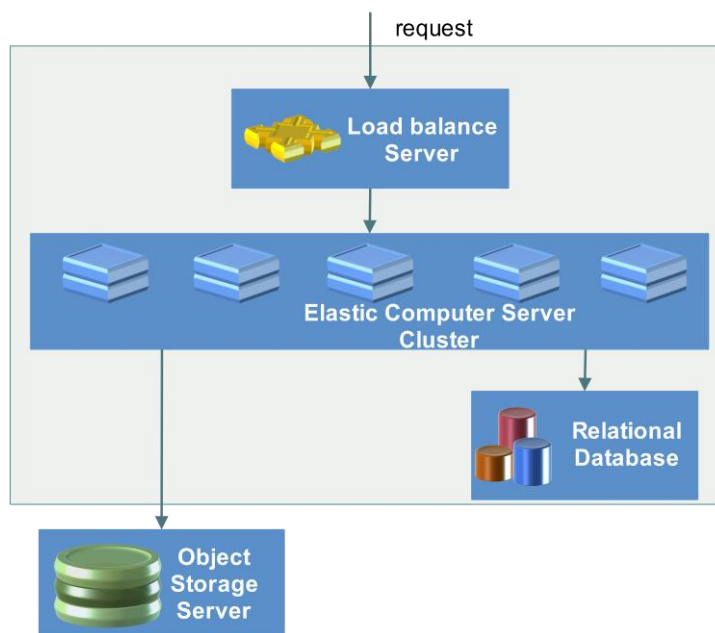


Fig. 4 Platform deployment diagram

5. Conclusion

The teaching resource platform has been tested in many aspects, such as function, reliability, security, compatibility and performance in the cloud platform environment. The test results show that the platform achieves the desired effect. The platform adopts the current popular SSM framework and deployed on cloud platform, and the open source database MySQL is used in the background. The function of this platform function basically meets the learning needs of students in higher vocation institutes. This platform takes full consideration of security, and different people have different rights. Every can only see the content which is permitted to access to, and the security of data is guaranteed.

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