

Design and Implementation of Online Education Platform Based on ThinkPHP Abstract

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Abstract: With the increasing progress of the times and the rapid development of the Internet, in order to solve the actual needs of students, this online education platform project has been launched in combination with the teaching characteristics of various disciplines, aiming to improve the flexibility of teachers' teaching, enrich the learning channels of students, so as to use and learn at any time. This platform is based on ThinkPHP framework and MySQL database implementation to achieve the front-end separation.

Keywords: Online Education Platform; Online Course; ThinkPHP; MySQL.

1. Introduction

1.1. Project background

In the 21st century, under the background of the rapid development of electronic information, the way of education is gradually developing from the traditional mode to the direction of information construction, which has become a significant trend. From the perspective of learning the experience of basic education information in developed countries, their basic education information work can be summarized into three stages of development: the first is the hardware construction stage. It is mainly a wide range of modern facilities such as computers, projectors and smart screens in each classroom of the school; the second is the network development stage. The first phase of the deployment of electronic information facilities, especially computer access to the Internet; the third is the popularization stage. Since 1999, developed countries have begun to give full play to the advantages of information technology to classify and integrate curriculum and teaching resources. At present, the research direction of online education in developed countries such as the United States, Britain and Japan is online education platform. More and more teachers and students are getting convenience and efficiency from using the Internet to learn. At present, China's education information construction has made initial progress, on the whole in the second stage of Internet development, many of the first-tier and second-tier cities of the campus network and education metropolitan area network hardware construction has been fully equipped, is gradually entering the third stage of popularization. In addition, the popularity of broadband Internet access for home users in these first and second tier cities is already very impressive.

From a practical point of view, there are many online teaching platforms in the market, such as Xuexitong, Tencent Classroom, CCtalk, Rain Classroom and so on, and they serve teachers and students in the whole society. The education platform is designed to serve the teachers and students of our school to abandon the social commercial nature and customize the situation of our school. During the epidemic, students must download multiple platforms to meet the needs of the classroom at home, and most students complain. This

project aims to integrate teaching resources to provide a more efficient and convenient education and teaching platform for teachers and students in our school. Therefore, the education platform is established as the expansion of school teaching and learning resources. With the increasing progress of the times and the rapid development of the Internet, the importance of online education resources is increasingly highlighted. In order to solve the actual needs of students, this online education platform project is carried out in combination with the teaching characteristics of various disciplines. The Internet has evolved into another learning channel for students, so that they can use and learn anytime and anywhere, and enrich their spare time learning life while ensuring the quality of the classroom.

1.2. Correlation studies

At present, the existing online course platforms in the market have their own advantages, and the teaching focuses are different, the scale is different, and it is impossible to make a very detailed horizontal comparison. What kind of online course platform to choose to study in class, mainly depends on what the students' learning needs are, and how much the acceptable tuition budget is, these need to be understood clearly. Among them, teachers are very important, so it is necessary to find some online course platforms with better classroom conditions for class learning. First of all, this institution has a large reserve of teachers, so there are many teachers to choose from. Then find out what is the way to choose the teacher, whether it is decided by yourself or arranged by the platform.

Finally, in a platform inside the class learning, certified full-time teachers can provide students with better teaching content, and is a long teaching time, accumulated a lot of teaching experience of teachers. No matter how, the price charge should be proportional to the actual teaching, that is to say, it needs to spend so much tuition, and the teaching service provided has so much value. At present, there are few open online course platforms for single college students, and teachers' qualifications are not available. In response to this background, the online education system developed by this project aims at a clear audience of users, and selects high-quality courses from front-line university teachers for students to learn.

1.3. Purpose and significance of the project

With the development of the Internet, the online education platform has achieved unprecedented prosperity and development. Online education is a major change in the education industry. It has the following characteristics: 1. Using the online education platform, on the one hand, students can greatly reduce their own learning pressure and learn in a relaxed and comfortable environment. On the other hand, it saves a lot of time waste. This is to use the advantages of the Internet to fully demonstrate the diversification and diversification of the curriculum, so that students can truly integrate into the classroom and firmly focus on knowledge learning. With the development of the new era, the traditional education model with teachers and teaching materials as the core is gradually eliminated, and replaced by a student-centered, following the educational concept of 'teaching students in accordance with their aptitude'. 3. Break the boundaries of time and space, so that the communication between teachers and students is not constrained by geographical factors, and learning time does not have to conflict with daily work, study and life. The significance of online education platform depends on the equality of educational resources. In the 'classroom', there is no advantage of 'front row students', and teachers are fair to every student. 5. Excellent interaction between teachers and students so that the exchange can be carried out in a timely manner, students can always consult the subject of outstanding teachers on the Internet. 6. Teachers control means and methods are more flexible. Teachers play a role in helping students and urging students in a real sense. Give full play to students' subjective initiative.

2. System requirements analysis

2.1. Feasibility analysis

This online education platform is implemented through ThinkPHP framework and MySQL database development. Both of them are open source software, so as to develop '0' cost from an economic point of view. Developers only need to invest a certain amount of time. At present, the development prospect of education platform has great market value. In terms of labor cost, only one person can complete it, so it can be said that this is a '0 cost' development in a one-person environment. In the later operation and maintenance direction, the ThinkPHP framework adopted by this platform realizes the front-end and back-end separation mode, making the management and maintenance simpler. In summary, the project has indisputable competitiveness in terms of economic feasibility.

2.1.1. Technical feasibility

This system is a small and medium-sized website. The development of such websites is more suitable for the use of PHP and MySQL technology. The development tools of the system are PhpStorm and phpmyadmin. These two tools are very simple to operate. After the continuous understanding and learning of the ThinkPHP framework, the ability to build the website is continuously improved. With a certain technical strength, it also makes the idea open. The software and hardware currently used are sufficient to perfectly support the development of the project. In summary, there is no obstacle in technical feasibility.

2.1.2. Operation feasibility

This platform is designed and developed for student users.

At this stage, most students have been exposed to one or even several online education platforms. The interactive mode of front-end design fully conforms to the current students' habits. The MVC architecture adopted by the ThinkPHP framework is easy to implement modular operations. The logic is simple and easy to understand in code writing, and it is fast and efficient in later maintenance. In summary, the operational feasibility is in line with the habits of developers and users, and there is no additional learning cost.

2.1.3. Social feasibility

The ThinkPHP framework used in the development of online education system and the Centos system used on the server side to build the PHP + MySQL + Apache environment are all open source projects, all follow the international open source agreement, follow and comply with copyright protection regulations and other laws and regulations. The independent secondary development of the system under the open source framework is in line with social interests. The contribution of online education platform to the universal education industry is in line with the core values of socialism and is conducive to the spread of culture and knowledge. In summary, the system is feasible in terms of social feasibility.

2.2. System requirements analysis

2.2.1. Front desk function analysis

The front end of the system is divided into two roles: tourists and student users. Tourists that are not logged in users, can register, browse website information; student users are logged-in users, and student users have the functions of browsing website information, course purchase and viewing.

- 1). User Center: Student users can view their courses here;
- 2). Course information browsing: student users can view the course catalog, course introduction, price, teacher information, the number of students participating in the course, question and answer selection and selected notes;
- 3). Video playback: Student users use Flash playback to play teaching videos through browsers (Chrome, Firefox, EDGE and other mainstream browsers). This video playback method has the advantages of high stability, cross-platform support, and cross-browser hardware decoding.
- 4). Purchasing: Student users can view the purchase price of the course and purchase the course on the course details page.

2.2.2. Background function analysis

The back-end administrator manages and maintains the information of the system after logging in. The management direction includes authority, user, video, directory, news, announcement and website information configuration.

- 1). Background home page : Administrators can visually display popular courses, download times, video viewing times, and total video ;
- 2). Privilege management : Administrators can view the list of administrators and the list of management groups, add administrators or management groups, view the list of permissions or add permissions, and provide different permissions for teachers with different needs and administrators of different levels ;
- 3). User management: Administrators can view user lists and add users;
- 4). Video management: Administrators can add, delete, modify video;
- 5). Cooperation agency management : Administrators can add, delete, modify the information of cooperation agencies, URL links, etc. ;

6). Lecturer management: Administrators can add, delete, modify lecturer information;

7). Other directions: Administrators manage various information of the website, including directory management, news management, advertising management, website information configuration, user feedback, download management and announcement management.

2.3. Requirements model

2.3.1. User use case analysis

Visitors that are not logged in users, can register, log in, browse website information, after registration can log in to become student users; student users are logged-in users, and student users have the functions of course learning and viewing course information. System user use case diagram is shown in the figure.

2.3.2. Administrator Use Case Analysis

Background administrator login background page can manage and maintain the content of the system, including directory, video type, video, video permissions, lecturers, users, news, advertising, announcements, user feedback, website information and cooperation institutions. The administrator use case diagram is shown.

Solid model analysis: The entity object is mainly some data entities in the system. The main entity classes of the system are the front-end functional modules and the back-end management modules. Through the above use case analysis, all the entity classes and their encapsulated information are listed. The system class diagram is shown in Figure 1.

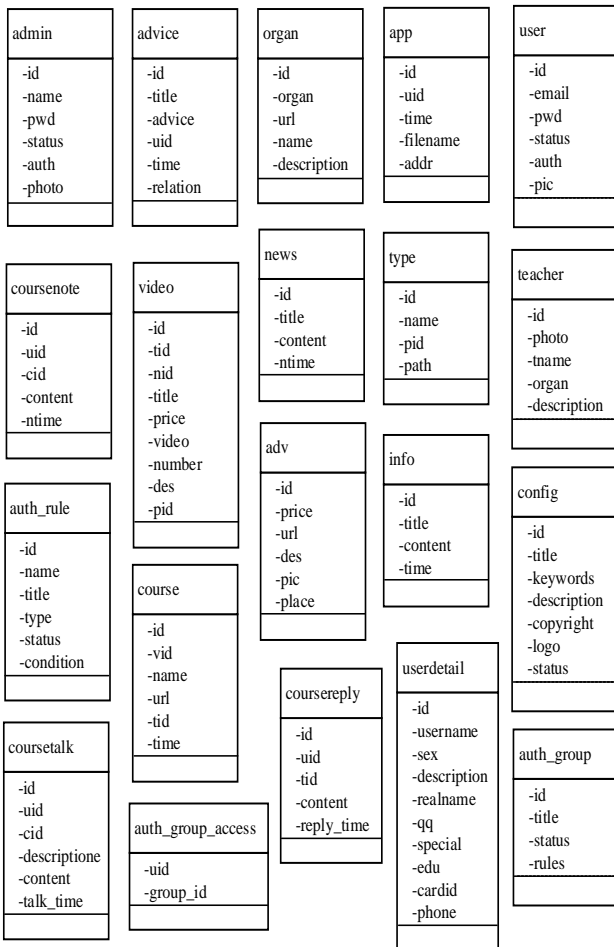


Figure 1. System Class Diagram

3. Overall System Design

A. Development platform configuration

- (1) Operating system: CentOS 7.3
- (2) Development tool: PhpStorm
- (3) Database: MySQL
- (4) Development language: PHP
- (5) Development framework: ThinkPHP
- (6) Development environment: Apache 2.4.46, php7.3

B. Stratification and components of software structure

The system uses ThinkPHP framework, using MVC design pattern development, divided into data layer, logic layer, service layer. (1) Data layer: Model / UserModel, used to define data-related automatic verification, automatic completion and data access. (2) Logic layer: Logic / UserLogic, used to define system-related business logic. (3) Service layer: Service / UserService, which is used to define system-related service interfaces, etc. .

4. Summary

Software testing is mainly to find software errors, effectively define and implement the assembly process of software components from low level to high level, verify whether the software meets the technical requirements specified in the task book and system definition documents, and provide the basis for the establishment of software quality model. The testing process is generally divided into five parts: unit testing, integration testing, validation testing, system testing. From the perspective of whether or not to care about the internal structure of the software and the specific implementation, the test methods are mainly white box testing and black box testing.

After the above tests, the function of the system is normal and the operation result is ideal. The functions of the system are running normally, and the test data are accurate and reliable in line with the operation specifications. However, it is still not enough to prove that the system has a very high degree of integrity, because even if the strict test data will inevitably lead to unforeseen vulnerabilities. At this stage, it is necessary to constantly find and solve problems, so as to gradually improve the system.

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