

Design of Online Video Learning System based on Web

Haiqin Ye

School of Computer Science and Technology, Zhoukou Normal University, Zhoukou 466001,
China

Abstract

In the current trend of Internet development, in order not to affect the normal progress of work and life, and in order to save a lot of time spent on the learning road, more and more people choose to use the Internet to learn knowledge. This graduation design is specifically designed for a web-based online video learning system designed by Internet users. The front end of the system uses elementUI components based on the Vue framework to design the interface, and uses Ajax technology to receive and transmit data. The background uses Java technology to operate the database, while using Redis cache technology to improve reading and writing. The ability of data improves user experience. Through this system, users can learn anytime and anywhere through the network, so that the learning of knowledge is no longer limited to a certain place or a certain book, but also makes the spread of knowledge more extensive.

Keywords

Internet; Web-based online video learning system; Vue; Java.

1. Introduction

The rapid development of network times, the advance of the information society, constantly changing the way people obtain knowledge and way, online video learning because it is not restricted by time and space and rich was welcomed by more and more people learned, learning style by the previous teacher teaching actively, slowly into the student active learning, learning also in the change of thinking, teaching resources on the Internet also get continuous integration and system planning, online video learning not only conforms to the trend of The Times, more on students' learning and teaching methods play a positive and effective role in schools.

2. An Overview

2.1. Project Background

Along with the development of The Times and social progress, people with the accelerating pace of life, people thirst for knowledge is far greater than the previous era, through the traditional way to get the speed and efficiency of knowledge has failed to keep pace with the trend of The Times, so changed the way people access to knowledge, under the impetus of the era, online learning through the Internet has become a major way in today's society people to learn knowledge, China's Internet online learning platform is also more and more, many colleges and universities and education institutions also choose to study online and let students learn part of the course, online learning of the size of the market is more and more big, Online learning is in line with modern people's pursuit of knowledge acquisition methods and can meet people's various demands for knowledge without leaving home.

1.2 Purpose and significance of the study

In today's Internet + wave, online learning has changed people's definition of the education industry, from traditional face-to-face learning to the use of the Internet to bring a broader view

of the world. In this process, because the Internet has changed people's cognition, it has also led to changes in the traditional forms of education, learning methods, teaching ideas and teaching concepts. Through the study of traditional education tend to cost a lot of learning resources and learning time, the learning effect is not ideal, e-learning education not only save a lot of manpower material resources, but also convenient for the user can be anywhere at any time to study, make full use of the user's leisure time, the user is not subject to the restriction of space, time, and also makes a more systematic and high-speeding, network learning. So the development of this system is very necessary.

3. Main Technical Overview

3.1. B/S Structure Introduction

The B/S structure is the browser and server structure. Users can access the corresponding content of the server through the browser. It has the advantages of low cost, convenient maintenance, strong distribution and simple development. It can run anywhere without any special software, as long as a computer with a browser and Internet access.

3.2. Java Introduces

Java is an object-oriented language suitable for network programming. It integrates the features and advantages of other languages and avoids their drawbacks. Java is characterized by simplicity, object orientation, platform independence, and portability. From its birth to now has more than 20 years of development history, technical system is very perfect, suitable for Web development, mobile development and so on.

3.3. MySQL Introduction

MySQL is a relatively common relational database. Relational database stores data in different tables according to functions and requirements, rather than storing all data together, which improves the efficiency of query. The SQL language used by MySQL is the most commonly used database language for accessing databases. Because of its small size, fast speed and low cost, MySQL software is generally used in the development of small and medium-sized websites as a website database.

3.4. Introduction to IntelliJ IDEA

IntelliJ Idea is recognized as one of the most useful Java development tools for Java developers. It has very powerful functions, including support for code hints, code refactoring, unit testing, and a large number of plug-in adaptations, etc. It also supports many current technologies and mainstream frameworks, and is good at the development of enterprise applications, mobile applications and Web applications.

3.5. Introduce Redis

Redis is a non-relational database. Its data structure is in the form of key-value, which greatly makes up for the deficiency of the relational database. It supports storage of more value types, including string(string), list(linked list), set(set), zset(ordered set) and hash(hash). These data types add richness to the way Redis operates, and the operations are atomic and safe to operate. Redis data is generally cached in memory, which is different from relational databases, which greatly improves the data access efficiency and helps improve the user experience. Redis is also completely open source and free, which is very friendly to some small and medium-sized systems developers, saving development costs. Redis configuration is very simple, download and install can be used, do not need the locale, save users a lot of time. Redis also supports multiple development languages, making it extremely easy to use.

3.6. Introduction to VUE and ElementUI

Vue is a currently popular front frame, unlike other traditional front-end framework, Vue is a kind of MVVM framework, that is to say, the Vue can realize two-way binding view and model, which is when the data is changed, the page will automatically refresh, will change after the data displayed, when changing data by page, the data will also be changed accordingly.

ElementUI is a set of Web components developed based on VUE. It is very convenient and fast to use. The use of these components can help developers quickly carry out the layout of front-end page development, simplify the difficulty of front-end development and make the page developed more aesthetic.

4. System Analysis and Design

4.1. System Objective Design

The main goal of the project topic is the online video learning system based on Web, in today's age of the Internet, more and more people choose to learn the knowledge through the network, there are more and more education and online education schools select network to undertake to the student, the system can help users via the Internet for online video system site visit learning, help teachers to learn the course of management, help platform administrator to manage all the user information, realize the modernization development of the Internet + education. The specific objectives mainly include:

4.2. System Performance Analysis

The system is designed by students and teachers as the core of the system, so it is convenient for learners to register, log in for video learning and teachers to manage the course convenient and simple, the system needs to be reliable, safe, open, and easy to maintain and easy to operate.

4.3. System Functional Module Design

The functional modules of online video learning system are divided into five parts after analysis: login and registration, course search, course information management, course media resources management and user information management. Login registration module: users can choose the role of student or teacher through registration, and then log in, different role login has different functions, students can search for the course, the course watch, on the basis of the teacher added the course information management, course media management and other functions. Course search module: users can conduct classified search through the search engine, or directly search the information related to the course. Course information management module: teachers can add, query, modify and delete course information, add and query the course plan, select the corresponding course video, and publish and preview the course details page. Course media resource management module: Course media resource management can realize the upload processing of course videos. User information management: the administrator can realize the user basic information query and delete.

5. Overall Design and Implementation

5.1. Database Design

According to the careful analysis and design of the system, the database information of the system is designed. In order to more intuitively display the system functions and users' information and the relationship between them, E-R diagrams are generally adopted to realize the conceptual design of the system, such as the relationship between users and roles, and the connection between courses and course plans.

5.2. Design and Implementation of Main Functions

5.2.1 Realization of registration and login function

In the registration and login function, there are three pages involved, which are the registration interface, the login interface and the main interface. Click the login or registration link on the home page, and you will be redirected to the login and registration interface.

Login registration screen produced by using elementUI framework, the background to create user login or register interface, registration is at the front desk by JS judgment user input format is correct, the user name password and confirmation password are consistent, use encapsulated axios technology users write content into the backend AuthController register () method, registered in the business layer of function in the code to determine the user information, and to ensure data security, the user password is encrypted, and according to different types of users to give users of different roles, The user information is then stored in the database. Login passes the content into the login() method. If and else are used to determine whether the user name and password exist and are correct. If so, the user information is written to the cookie so that other functions of the system can call the user information. When the user logs in successfully, the main interface will see and use the corresponding functions according to the user's role.

The main interface is a nested format, consisting of a large frame and content. Big frame is the top and bottom of the composition, use the basic frame to make, add click event, enter the corresponding page. The content is: the round broadcast map, course information, teacher information and so on. After the content design is complete, the content is embedded into the larger frame.

5.2.2 Realization of course search function

Course search function is to prevent too many courses, it is not convenient for users to find courses, it can search courses by keywords, you can also click the category to view the course information searched by category.

The course search interface design mainly uses the search box and classification information. When conducting course search or classification search, the encapsulated Axios technology will be used to connect the background, and the background will conduct course search through Elasticsearch through the list() method of Ecoursecontroller, and then encapsulate the searched contents into objects and return them to the foreground and display them on the interface through JS.

5.2.3 Realization of course information management function

The course information management function requires a user with a teacher role to enter and perform functional operations. The course information management is divided into the course basic information management, the course plan information management, and the media resources management.

Click My Course, and you can see all the courses of the current teacher user. This is to use the encapsulated Axios technology to connect the background and trigger the FindCourseList () method. The course information of the current teacher user can be obtained from the corresponding table in the database and returned to the front page for display through JS technology. Click "Add Course" to enter the interface of "Add Event". After completing the basic information of the course, click the "Submit" button to trigger the encapsulated Axios technology and transmit the completed content to the background. AddCourse () method will be used in the background to save the corresponding table in the database for adding. Click on management courses, will trigger the encapsulated axios technology, through the background findById () to obtain the basic information of the database that is currently in the course and return to the front by JS technology shows information on the interface, if modify course basic information and can click on the submit button, the modified information by encapsulating

good axios technology to the background, and through updateCourseBase () method updates basic information stored in the database course.

When the user is adding or managing the course, he can set the course plan at the same time. Click the course plan to connect to the background through the encapsulated Axios technology, trigger the FindTeach PlanList query method to get the data and return it to the front end, and display it on the interface through the foreground JS technology. As shown in Figure 7:

Click Add Course Plan to enter the Add Event interface, and click Submit button to trigger the encapsulated Axios technology to connect to the background, which uses the addTeachPlan() method to add the information to the database. Click the modify button, will trigger encapsulated axios technology, through the background findByTeachPlanId () access to the database and returns the current curriculum information, front-end display information through JS technology on the modification of interface, if modify program information and click the submit button, the modified information by encapsulating good axios technology to the background, and through updateByTeachPlanId () method to update the information stored in the database program. Clicking the delete button triggers the wrapped Axios technology, passes the ID of the current lesson plan to the background, executes the removeByTeachPlanID () method, and deletes the information of the current lesson plan from the database. Click "Select Video" to select the corresponding video for the current course chapter. Click "Submit" to trigger the encapsulated Axios technology and transmit the information to the background. SaveMedia () is executed to save the database related to the relationship between the course and the course media assets.

Click Select File, select the video to be uploaded, click Upload File, trigger the packaged Axios technology to connect to the background, and the background performs Register (), CheckChunk (), UploadChunk (), Mergechunks () and other operations to upload the videos in chunks, format processing and other operations, and store the media information of the course in the database. Click My Media Resources, the encapsulated Axios technology will be triggered to connect to the background, and the background will execute the findList() method to query all the media resources information in the database, and return it to the front end, and display it on the interface through JS technology.

5.2.4 User information management function realization

The administrator can enter the background management page of the system, click user management, trigger the encapsulated Axios technology to connect to the background, and the background will view the data through findList() and return all the user information in the database, and the front end will display on the interface using JS technology.

Click "Add" to enter the interface and fill in user information. Click "Submit" to trigger the encapsulated Axios technology to connect to the background, and the background will add user information to the database through "Add ()". , click the edit button will trigger the encapsulated axios technology, through the background of the get () to obtain the database for the current user information back to the front end, with JS technology displayed in the editor interface, if in the edit interface to modify user information, click the submit button, the modified information by encapsulating good axios technology to the background, and through the edit () method to update the user information stored in the database. Clicking the delete button will trigger the wrapped Axios technology, pass the current user's ID to the background, execute the delete() method, and delete the information of the current user in the database.

6. Development and Testing

Test this system adopt the method of black box testing and black box testing is the system as an opaque box, input data and perform the corresponding operation, and then get the test result,

whether by looking at the test results and the expected results, so as to determine whether or not to realize the corresponding function of online video learning design.

7. Conclusion

This paper mainly involves the design and implementation of online video learning system based on Web. The main functions of online video learning system include course searching, course adding, video uploading and user information management. In the process of implementation, the foreground uses VUE front-end framework and ElementUI technology to design the interface, so as to realize and optimize the interface. JavaScript technology is used for logical interaction between interfaces, and Axios technology is used for receiving and transmitting data. The background uses Elasticsearch as the search engine, and connects with the database to add, delete, modify and check the data. In the process of the development of the system, I deeply realize a stable and orderly, clear logic of the development of the system is merely a person's strength is difficult to complete, although I have implemented the function of the system, but still some deficiencies in many ways, such as the layout of the page is beautiful, etc., in the future, I will study hard, improve personal technical ability, make the developed system will be improved.

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