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Web-Based Video Learning System Development Using Modern Technologies

Yi Sun

New Jersey Institute of Technology, New Jersey, USA

Sunyiss@gmail.com

Abstract: In light of the ongoing advancements in Internet technology, there is a growing trend among individuals to utilize online resources for learning. This approach aims to minimize disruptions to their daily work and personal lives, as well as to reduce the time invested in traditional educational paths. This graduation project focuses on the development of a web-based online video learning platform specifically tailored for Internet users. The system's front end is designed using ElementUI components within the Vue framework, enabling an efficient and user-friendly interface. Data reception and transmission are handled via Ajax technology. The backend leverages Java to manage database operations and employs Redis caching technology to enhance data read/write performance, thereby improving the overall user experience. This platform allows users to engage in learning activities from any location and at any time, thus transcending the limitations of traditional, location-bound, and book-based learning, and promoting a broader dissemination of knowledge.

Keywords: Internet; web-based online video learning system; 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.

1.1. Subject 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, which can satisfy people's various demands for knowledge without leaving home.

1.2. Purpose and Significance of the Research

In today's Internet plus wave, online learning has changed people's definition of the education

industry, from traditional face-to-face learning to using the Internet to bring a broader world view. In this process, because the Internet has changed people's cognition, traditional forms of education, learning methods, teaching ideas, teaching concepts and so on will be changed. 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 the system is very necessary.

2. Main Technical Overview

2.1. Introduction to B/S Structure

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

2.2. Introduction to Java

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

2.3. Introduction to MySQL

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

2.4. Introduction to IntelliJ IDEA

IntelliJ IDEA is one of the best Java development tools available to Java developers. It supports code hinting, code refactoring, unit testing, and a wide range of plug-in adaptations. It also supports many of the current technologies and mainstream frameworks for enterprise, mobile, and Web applications.

2.5. Introduction to 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 relational database. It supports the storage of more value types, including string(string), list(linked list), set(set), zset(ordered set) and hash (hash type). These data types enrich redis operations, which are atomic and safe to operate. Redis data is generally cached in memory, which is different from relational database. It greatly improves data access efficiency and helps improve user experience. Redis is also completely open source and free, which is very friendly to developers of some small and medium sized systems and saves development costs. Redis configuration is very simple, download and install can be used, no language environment, save users a lot of time. Redis also supports multiple development languages and is extremely easy to use.

2.6. 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 suite of Web components developed based on a Vue. It is extremely convenient and fast to use. Using these components can help developers quickly develop the layout of front-end pages,

which simplifies the difficulty of front-end development and makes the pages developed more aesthetically pleasing.

3. System Analysis and Design

3.1. System Objective Design

The main goal of the project topic is the online video learning system based on Web, in today'sage 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.

3.2. System Performance Analysis

The system is designed with students and teachers as the core. Therefore, in order to make it convenient for learners to register and log in for video learning and teacher management courses, the system needs to be reliable, safe, open, easy to maintain and easy to operate.

3.3. System Function Module Design

The function modules of the online video learning system are divided into five parts after analysis: login registration, course search, course information management, course media resource management and user information management.

4. Overall Design and Implementation

4.1. Database Design

According to the careful analysis and design of the system, design system database information, in order to more intuitive display system functions and user information and the relationship between the general use of e-r diagram to achieve the conceptual design of the system, such as the user and the role of the relationship between the curriculum and the curriculum plan.

4.2. Design and Implementation of Main Functions

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 is to pass the content into the login method, and use if and else to judge whether the user name and password exist and are correct. If they exist and are correct, the user information will be written into the cookie to facilitate other functions of the system to call the user information. After successfully logging in, the user enters the main interface and sees and USES the corresponding functions according to the user's role

Click on 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 to trigger the method

findCourseList, obtain the course information of the current teacher user from the corresponding table of the database and return to the front-end page, which is displayed through JS technology. Click add course to enter the interface for adding events. After completing the basic course information, the encapsulated axios technology can be triggered by clicking the submit button to send the filled content to the background through the addCourse method, and the background can be added by storing the content into the corresponding database table. 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.

5. Develop Tests

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.

6. Conclusion

This paper mainly involves the design and implementation of web-based online video learning system. The main functions of online video learning system are course searching, course adding,video uploading and user information management. In the implementation process, 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 to receive and transmit data. In the background, ElasticSearch is used as a 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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