The Construction of Online Assisted Teaching Platform of Film and Television Language Course Based on Javaweb

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Abstract. In order to improve the traditional education mode of film and television language teaching, and strengthen students' creativity and learning autonomy. This paper studies the online assistant teaching platform of film and television language course based on javaweb. The system is an application of J2EE architecture, with Struts2 as the front-end development software, spring as the functional logic design software and hibernate as the ORM framework of the system. The server development language is Java, and the front page design language is css + HTML + JavaScript. The practice shows that the system can achieve the average user request concurrency requirement of 1136 through the optimization of load balancing dynamic algorithm PICK-KX. This system can stimulate students' learning autonomy in film and television language courses, improve students' learning interest and improve teachers' teaching quality. And it has played a positive role in promoting the teaching effect of film and television language courses.

Keywords: Javaweb · Auxiliary teaching platform · SSH framework · Film and television language course

1 Introduction

The language course of film and television is a compulsory course for students majoring in film and television media in higher education. This course needs to help students form film and television thinking, and then improve the language quality of students' film and television works. In the traditional offline classroom teaching, it is necessary to broadcast a unified case of film and television resources through multimedia, which will lead to students' repeated viewing and lack of space for students to discuss and give feedback. And the network resource platform is chaotic, and the quality is difficult to guarantee. So, the author of this paper thinks that we should develop an online assistant teaching platform for film and television language courses. This paper uses javaweb technology to realize the design and development of application system [1].
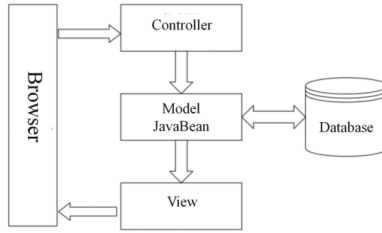
Fig. 1. MVC design pattern structure diagram

2 Key Technologies

2.1 MVC Design Pattern

The back-end framework SSH used in this paper adopts MVC pattern, which plays a convenient role in developing application software because of its clear hierarchical structure. The structure diagram of MVC pattern is shown in Fig. 1. The user client accesses the system through the browser, and sends various instructions to the operation page, and these instructions are requested to be transmitted by the controller for processing. These data will be processed into a data model by the controller controller and further processed by the model layer model. The model layer connects to the database server through javanean, while the VIEW layer View needs the database data provided by the model layer combined with HTML language to realize the functional interaction with the front-end browser [2].

2.2 SSH Framework Technology

The SSH is a popular framework system for back-end development, which is composed of struts2, spring and hibernate. Among them, struts2 is a network programming framework based on JAVA EE technology. It is mainly used for page development between the model layer and the view layer, and is usually used as a controller. Compared with the basic MVC pattern, it also adds the interceptor function.

Then Spring is a lightweight application development tool loaded with bean objects. The Hibernate is a software of ORM object relation mapping mechanism, and developers can ignore data types and adjust data objects by simply operating data tables. SSH framework can greatly improve the development efficiency [3].

2.3 Development Environment

During the development of the online assistant teaching platform for film and television language courses based on javaweb, it is necessary to consider the existing software and hardware conditions of colleges and universities to build the development environment and select the key functional implementation technologies. In terms of software, the operating system of the server is window 10, the database system is MySQL 8.0.29, and the development tool of the system is Visual Studio Code2019. The deployment server of web application adopts Tomcat version 8.0. The development language of the

application is Java, and the corresponding integrated development environment is Intellij IDEA. The development framework is SSH framework of spring + structs + hibernate. Choose Intel Core i7 4600U as the CPU device for hardware. The RAM is 8 GB. Through the above analysis, the author believes that it is technically feasible to build an online auxiliary teaching platform for film and television language courses based on the above technologies [4].

3 Overall Design

The overall design framework of the online assistant teaching platform for film and television courses is designed according to the B/S system, and it is divided into three layers: presentation layer, business layer and data layer. Firstly, it is the presentation layer, in which all kinds of operation pages of users in the client browser are designed. Users send various operation requests to the system through the pages designed by the presentation layer, and the requests will be sent to the application server for processing. The development of the server lies in the business layer, which is mainly responsible for the business logic design of the main functions of the system, such as registration and login, announcement management, learning materials management, teaching management and homework management. In the business logic layer, the background connects to MySQL database server through SSH framework to call data. The data layer uses MySQL to store all kinds of media materials and homework files needed in teaching courses, and realizes the viewing and downloading interfaces of the files needed by the system [5].

4 Function Realization

When designing the user end of the online auxiliary teaching platform for film and television language courses, this paper considers the different needs of different users, and designs three types of user ports: teacher end, student end and administrator end. The administrator's function is to manage the information data in the system, and it has the highest authority to add, delete, change and check the data [6]. At the same time, administrators need to troubleshoot and maintain the system to ensure the normal operation of the system. The part of the function codes of the administrator for troubleshooting fault data information are shown in Fig. 2. When the administrator is troubleshooting information, the administrator can handle the fault by selecting the troubleshooting time period. This part of the function needs to give the relevant parameter information data to the statisticDate variable, so as to use the date selection data in the variable to call the fault information data in the relational database and return it to the browser [7].

In view of the fact that a large number of students will visit the online auxiliary teaching platform of film and television language course in a certain period of time, the system should have the efficiency of quickly processing requests for reading and calling teaching resources in a short time. Therefore, this paper optimizes the design of the system by adjusting the algorithm of load balancing, so as to reduce the adverse effects of the waste of computing resources caused by service request blocking. This system adopts pick-KX algorithm, a dynamic load balancing algorithm with more outstanding

```
@ResponseBody
@RequestMapping("/station/alarmTypestatistics")
//Fault data information display
public List<Map> alarm TypeStatistics( String statisticDate){
        List<Map> ats - new ArrayList<Map>0,
        Map memberNames = stationInfoService.findMemberNames();
        ats. add(memberNames);
        Map memberAlarmCounts = maintainService.findMemberAlarmCounts( statisticDate),
        ats. add(member AlarmCounts);
        return ats;
}
```

Fig. 2. Realization of troubleshooting data information function

resource allocation ability. The specific formulas of the algorithm are shown in formulas (1)-(3). When the P_j probability is higher, the load on the server is lower. By the value of P_j, the system will dynamically allocate the user's request to the server for different levels of resource call processing [8].

$$P_j = \frac{X_i}{\sum_{i=1}^{i} L_i} \tag{1}$$

$$L_{total} = \sum_{i=1}^{i} L_i \tag{2}$$

$$X_i = \frac{L_{total} - L_i}{L_{total}} \tag{3}$$

Through adjusting the balancing algorithm, it is expected that the average concurrency of this system can reach 1136. Therefore, this paper will test the system performance of more than 100 users. This performance test adopts virtual user test, and uses jmeter software to record the CPU utilization rate of the back-end business logic server to record the test results. The concurrency of the system is tested from 100, and the CPU utilization rate is close to 90% when the number of concurrent requests of the system reaches 1400 [9]. When testing the system, when the user's concurrency reached 1400, 8.5% of the requests were abnormal. However, when the number of concurrent requests in the system reaches 1300, there is no abnormal request response, and the CPU utilization rate is controlled at about 80%. As can be seen, the load balancing adjustment optimized by the pick-KX algorithm can achieve the average concurrency requirement of the system at 1136 [10].

5   Conclusion

With the deepening of informatization in the education industry, the future online teaching of film and television language will have a broader development space. The original traditional classroom is difficult to show more charm of film and television language, so this paper proposes and designs an online assistant teaching platform for film and television language courses. Because it is the initial development version, and the author's ability and time are limited, there are still some shortcomings in the development of

the system function, and it is hoped that the follow-up researchers will improve it. The auxiliary teaching system designed in this paper is aimed at the student users of film and television language courses in a certain university. Therefore, it is difficult to deal with the number of student users of film and television language courses in universities across the country. Therefore, this system can join the big data technology in the follow-up, and manage and improve the massive university students' learning data.

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