Design and Implementation of Music Teaching based on Streaming Media Technology

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Keywords: Streaming media technology, Music teaching system, Digital music, direct seeding technology; MVC framework

Abstract: With the development of multimedia technology and network communication, multimedia teaching is based on its rich information resources, friendly interaction and openness, and gradually mature. With its rich content and institutions of higher learning the advantages of fast and accurate positioning to promote the application of the traditional education of network video teaching resources, combining learning and real-time communication of cyber source, provides a vivid and real scene video information for students learning network. Online music broadcasting, while supporting the rapid spread of streaming media technology, has also brought about tremendous changes in people's lives and education. In the traditional network music teaching system, there are still many problems, such as single function, poor user experience and poor scalability. Based on the analysis of the requirements of network music teaching system, according to the characteristics of streaming media, an online music teaching product model is designed to help solve the problems encountered in music teaching.

1. Introduction

With the development of network information, the diversification of people to obtain knowledge channel change, multimedia technology, network technology and communication technology to the traditional teaching mode in Colleges and universities has brought new changes, real-time transmission requirements, data synchronization, fast response characteristics, so it is very high for video encoding and transmission in the network are required, the current streaming media technology is developing rapidly, provides a feasible solution for online on-demand and interactive system based on streaming media technology. At present, all colleges and universities have established a teaching platform based on the campus network, providing powerful, rich resources of teaching services [1]. There are a large number of music resources on the Internet, which provides great convenience for people to understand the music information [2]. In the news communication, we should pay attention to the sense of social responsibility, emphasize that we must take the social responsibility as the premise, and provide the society with greater freedom of the press. Similarly, online music teaching should also pay attention to social responsibility, strive for in today's society, more and more people to learn music, enjoy music rights, the digital music system schematic diagram shown in Figure 1.

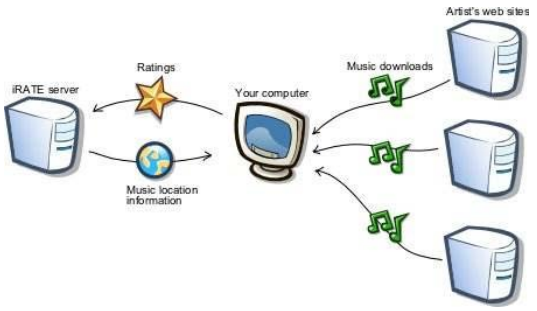

Figure. 1 Schematic diagram of digital music system.

  DOI: 10.25236/iwmecs.2019.067

2. Key technologies involved in the system

2.1 MVC framework introduction

MVC full name is Model View Controller (model) is the model view controller (view) - (controller) abbreviation, a software design model, a business logic and data display interface, tissue isolation method code, business logic will be gathered in a component inside, and improvement in interface and customization user interaction at the same time, do not need to write business logic. MVC is uniquely developed to map the traditional input, processing, and output functions in a logical graphical user interface. MVC is present in desktop applications, M refers to the business model, V refers to the user interface, C controller is used, and the purpose of MVC is to achieve code separation of M and V, so that a program can use different forms of expression.[4]. one change will not affect the other two, so the basis component of this kind of design can lose coupling structure good, MVC frame structure diagram is shown in Figure 2.

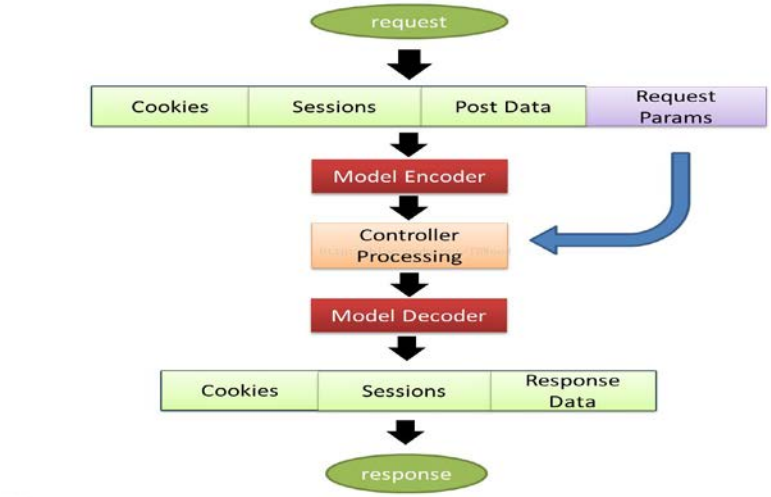

Figure. 2 Schematic diagram of MVC frame structure.

2.2 Streaming media technology

With the development of modern technology, the Internet brings people a variety of information, from the first picture to appear now all kinds of network video and 3D animation in the network, the Internet makes people feel great visual satisfaction. However, before the streaming media technology, people must first download the multimedia content to the local computer, after a long wait (because of the The emergence of streaming media technology, to a certain extent, make the transmission of audio and video difficult to improve the situation of the Internet, streaming media technology structure diagram shown in Figure 3.

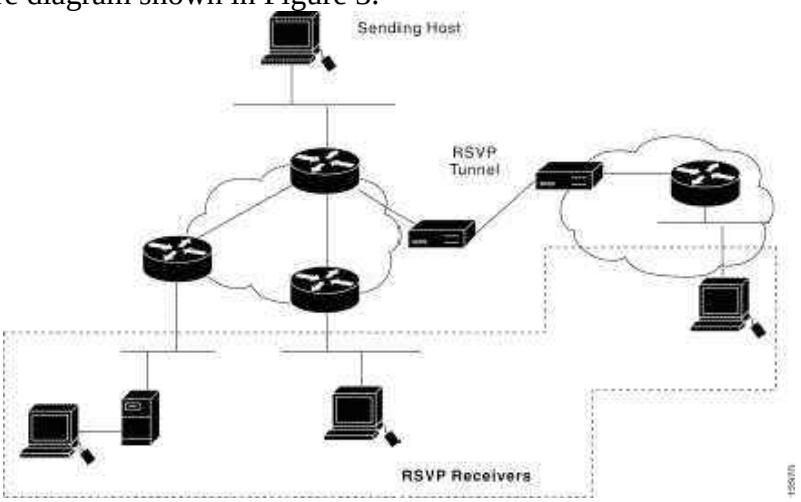

Figure. 3 Schematic diagram of streaming media technology.

2.3 Introduction of video broadcast technology

CDN, The media player is a client player application that is responsible for the information playback that is currently in the IE5.0, and the flow of integrated media players is a standard plug. If the user needs to install a player to receive and broadcast information using other browsers, the live video technology is shown in Figure 4.

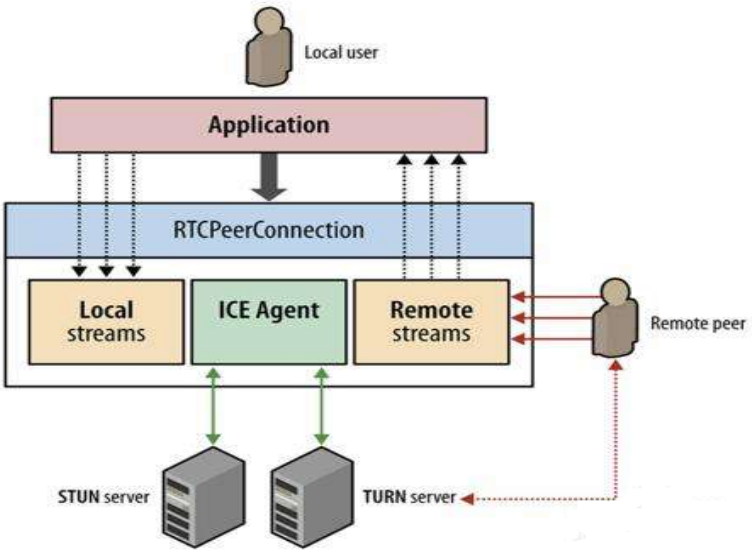

Figure. 4 Schematic diagram of video broadcast technology.

3. System requirements analysis and design

3.1 System requirements analysis

Courseware, teaching materials, materials and other teaching resources prepared or provided by the teacher. Teachers are able to start the course, edit the course description, develop teaching plans and open virtual teachers, recruit students, upload courseware and other functions [8]. The live broadcast classroom is a teaching course which is synchronized to the students in this period. First of all, teachers can apply to the system administrator to live courses, the administrator after the audit arrangements for live time, and notify the relevant students. In the course of the live broadcast, students can watch the teacher's lectures in real time, and can ask questions to the teacher through the text communication platform. As the main service of online music teaching system is to help students successfully pass the music class examination, the level of classroom teaching is an essential function of the system. In this function to provide students with a system of curriculum learning, students can choose the course content. The teaching content in the class is stored in the system in the form of electronic courseware. Management panel is an important function of online music teaching system, the main user oriented teachers and students of two categories. For teachers, the main function of the management panel is the maintenance of the virtual classroom, the maintenance of the course, the maintenance of multimedia music, the management of student applications. For student users, main functions of management panel is for the personal account management, including prepaid cards and personal consumption, teaching management, participation of personal learning history records management, system requirements analysis of use case intention as shown in Figure 5.

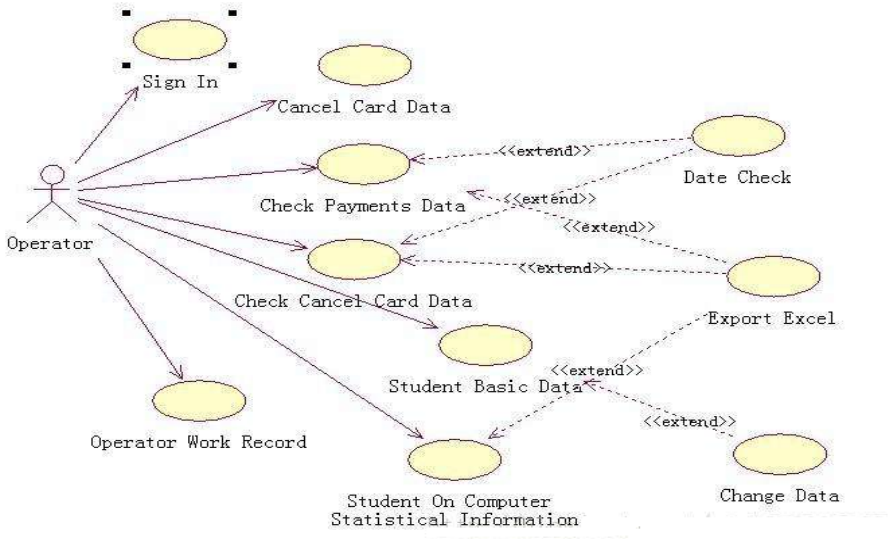

Figure. 5 Schematic diagram of system requirements analysis.

3.2 System function module design

Maintain the music for the system administrator to set up an online music library for the appreciation Watch the live broadcast, for students to watch the teacher's online broadcast program features. After participating in the virtual classroom, students can watch the live video through the consumer card. Watching live broadcast requires students with more than 1M bandwidth can be carried out without delay and the basic process of live service. The content includes the video and audio services from the teacher and the live broadcast.

3.3 The design of music teaching system based on Streaming Media

The design of online music teaching system, in order to avoid the installation and compatibility problems on different systems, will be built on the B/S structure. To this end, the system needs to consider the instability of the network bandwidth, the Internet transmission of unsafe factors, the user's illegal request for shielding, user-friendly interface and other issues. The server is designed and installed in the core computer room of the online music teaching system. Students in the client to enter the virtual classroom in the live broadcast can be watched live courses. At the same time, the video server to create on-demand service, the release path to the video storage server recorded video files for students to review the watch. The system architecture is divided into several layers: the user layer, business logic layer, persistence layer and data layer [11]. The design of performance appreciation is mainly about the maintenance of the music library and the two parts of the music. The maintenance of the system of music database including adding music, editing music, music and music delete playlist, play music online through streaming media player, is used here in the general computer installed Windows Media Player technology, without further design, system logic structure diagram as shown in Figure 6.

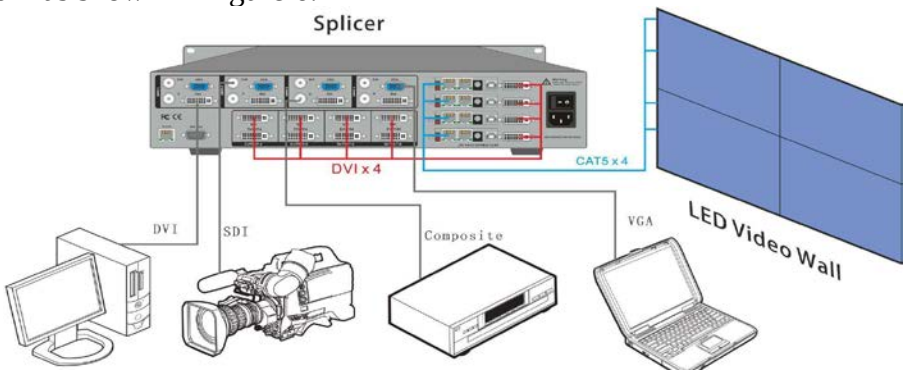

Figure. 6 Schematic diagram of system logic.

4. System design and Implementation

There are two kinds of music in the online digital music, one is to upload the file to the server, and the other is to connect to the network. The library management is only for system administrators. First of all, the system administrator can log in to maintain and update the list. The system administrator edits the music list in the background list editor. The editing of the library includes four categories: classification, adding, editing and deleting. In addition to the music can choose to upload files or link to the network music. When you add, edit, and delete the library, the system administrator clicks the Save button, the system will automatically update and generate a new system library list. The function of the live class is to realize the teaching activities of the teacher to the students through the course. Live streaming classroom based on streaming media technology and Windows Media Service design. First, the system administrator on the server to open a live video service, and then check whether the service is normal. The management of students is mainly to examine the application of students to join the virtual classroom [12].

5. Conclusion

Online music teaching system based on streaming media technology design and implementation, the purpose is to solve the problems encountered in the practical application of online music teaching. In this paper, the concept of "virtual classroom" is put forward, and the design and implementation of the system are also given. The implementation of this system, the rapid development in information technology today, and provided an example for the information construction in various educational institutions, can take this system as the foundation, online teaching system design and development of other types. The design and development of the system, making music teaching resources through the network, can provide better services for the community, to provide more economic benefits for teachers. Aiming at the shortage of traditional C/S mode of online music teaching system, combined with the now popular streaming media technology and broadcast technology, streaming media and broadcast technology combined, applied to the online music teaching system, improved the user experience. At the same time, the system integrates the functions of curriculum management, performance appreciation, card consumption and so on.

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