Research on the Construction of University Music Teaching Cloud Platform Based on Data Mining Technology

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Abstract

Many colleges and universities still use the traditional recording and broadcasting system to record the course construction and high-quality courseware. For data mining technology. As far as time is concerned, the proportion of music education that colleges and universities can give is very few and scarce. Therefore, it is necessary to supplement and further enhance the cultivation of teenagers' artistic accomplishment, music appreciation and expressive ability in the art education system of universities. With the integration of global social culture and technological progress, music education has increasingly become an interdisciplinary subject integrating musicology, pedagogy, ethics and related technical sciences. At the same time, it also faces the restriction of talent training and teaching mode. The resources and audiences of music education are extremely rich, diverse and extensive. Information based education not only brings convenience to teachers and students, but also stores a lot of information generated by the application platform of teachers and students, which is the biggest feature of information-based teaching itself. At the same time, on the basis of cloud computing, we put forward the research ideas for the model architecture of big data mining platform. Enterprises or operators can use the framework of the model. This paper mainly proposes to build a teaching resource management platform under the cloud computing mode. Using information technology, combined with the knowledge characteristics of music teaching, it constructs the music teaching resource database and its cloud platform.

Keywords*: Data mining, College music, Cloud platform*

Ⅰ. Introduction

Nowadays, the rapid development of information technology and Internet has brought great changes to people's lives. Many colleges and universities still use the traditional recording and broadcasting system to complete the recording work for curriculum construction and high-quality courseware. For data mining technology [1]. As far as time is concerned, the proportion of music education that colleges and universities can give is very few and scarce. The resources and audience of music education are extremely rich, diverse and extensive [2]. Among them, the education cloud platform is the product of the combination of cloud computing and education, and it is a high-speed and high-quality metropolitan area network that can reach every school and class [3]. The platform virtualizes the teaching resources and stores them in the resource library to provide cloud services to teachers and students. Teachers can complete online lesson preparation and release high-quality courseware through courseware library, teaching plan library and video library [4]. Therefore, it is necessary to supplement and further enhance the cultivation of young people's artistic quality, music appreciation and performance ability in the University's art education system. The platform can form a teaching resource service system that is easy to share. It should reflect the characteristics of education informatization and social progress, and adapt to the requirements of the development planning of teaching resource system proposed by the Ministry of Education [5].

With the integration of global social culture and technological progress, music education has increasingly become an interdisciplinary subject integrating musicology, pedagogy, ethics and related technical sciences [6]. At the same time, it also faces the restriction of talent training and teaching mode. The traditional teaching resource management mode can't keep up with the need of the current information technology progress and the synchronization of educational content and teaching methods [7]. As for the most popular cloud computing technology in recent years, it is not entirely a brand-new technology. The resources and audience of music education are extremely rich, diverse

and extensive. Information based education not only brings convenience to teachers and students, but also stores a lot of information generated by the application platform of teachers and students, which is the biggest feature of information-based teaching itself. At the same time, on the basis of cloud computing, we put forward the research ideas for the model architecture of big data mining platform, which is adopted by enterprises or operators [8]. According to their own needs to build internal data mining model, in order to achieve more effective business value [9].

Ⅱ. Data Mining Related Theories

A. The Concept of Data Mining

Data mining is a process of mining hidden knowledge from disordered and interfering data by using computer method, but if the data is really effective, it must have correct and reliable results [10]. Only by parallelizing the common algorithms of data mining can the corresponding optimization be realized, at the same time, the computing model can be used on the platform of cloud computing, and the direct operation of big data mining tasks on the platform can be satisfied [11]. Data integration is to combine and process files in multiple files or databases, solve semantic ambiguity and clean data. One of the important extension of Internet thinking is to provide the classroom form based on the interaction between teachers and students of Internet thinking [12]. Its innovation lies in supporting multi-form teaching classroom, not only the inculcation teaching classroom, the interactive classroom between teachers and students, but also the “reverse classroom” centered on students through the teaching resource management platform under cloud computing mode. In the system architecture design, the entire system is divided into three layers from the bottom up: the basic capability support layer, the service middle layer, and the business application layer. As shown in Figure 1.

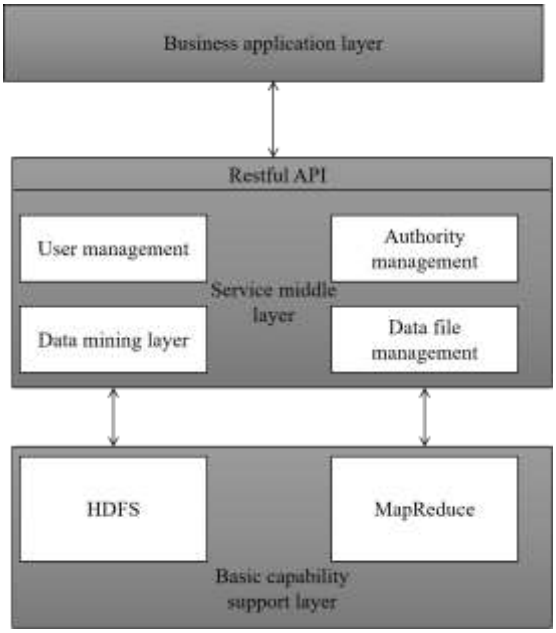

Fig.1 Cloud Computing Data Mining Platform System Architecture

Description is mainly through data mining, to find the general characteristics of data stored in the database. And prediction is data mining based on the existing basic knowledge of data to infer and predict. But the thinking of cloud computing guides the systematic construction of teaching informatization [13]. Taking scattered teaching resources as internet nodes and centering on the backbone of teaching, a sound teaching, learning, management and service system covering different personnel such as teachers, students and managers is formed. Make the teaching and management services work in the form of ecological chain to continuously iterate business and refresh services to meet the requirements of teaching and management services delivered on demand [14]. In the optimization construction of data mining platform, based on cloud computing technology, it is necessary to ensure that the

platform of the system can be monitored in real time, so as to conveniently and timely manage and master the operation of the data mining platform [15]. It is an analysis process to extract non trivial information or patterns from a large number of data, which are hidden in the data set, but have not been found before and have potential value.

B. Characteristics of Data Mining

When the amount of data is small, the law can be found through a simple statistical process. In addition, the results reflected by large sample data are generally more in line with the general characteristics. In the design of this data mining platform, through the use of cloud computing technology, data mining services can be effectively realized, so that accurate and reliable information can be mined. As shown in fig. 2.

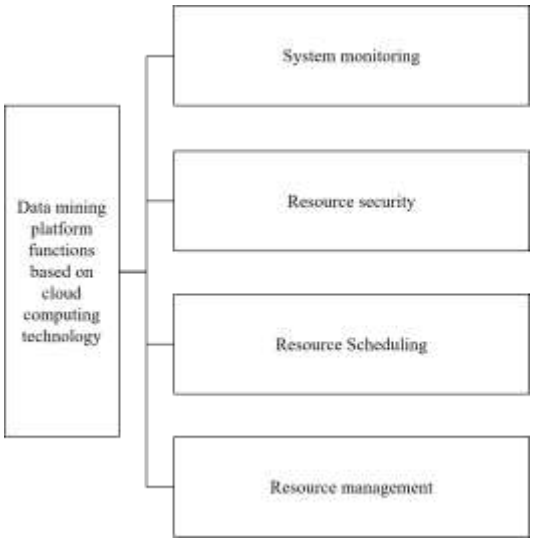

Fig.2 Function Structure Diagram

The key technology in data mining system structure is data mining technology, and its process is mainly composed of data preprocessing, data mining, result analysis and application. Cloud computing technology can also be used to optimize the modeling method of platform data mining model. Build an integrated information programming platform, which can provide consistent, reliable and complete data mining results, and ensure that the designed voucher can meet the needs of users. In this way, students can be classified, their interests can be found, different students can be divided into groups according to the classification results, and an online learning exchange group can be set up to learn more knowledge in the exchange learning.

On the basis of understanding the complex brain neural structure, people have constructed a system which can realize the analysis function-artificial neural network. Sample and select the data, and then build the data mining model according to the data trend and distribution statistics. When learners enter the system next time, the system can provide them with pages that meet their learning needs according to the personalized database. On the one hand, the teaching resource management platform under cloud computing mode conforms to the trend of the rapid development of information technology and meets the business needs of future teaching work. The structure of typical data mining system. As shown in Figure 3.

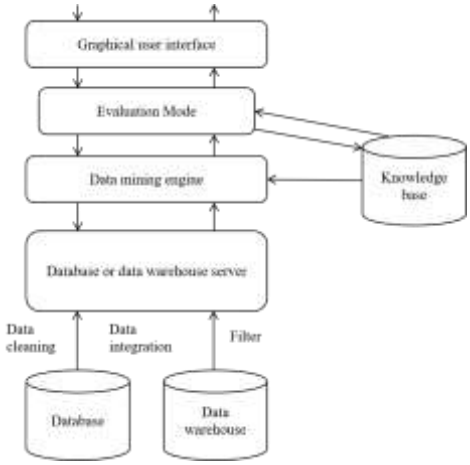

Fig.3 The Structure of a Typical Data Mining System

Database, data warehouse or other information base: This is one or a group of databases, data warehouses, spreadsheets or other types of databases. Before calculating the similarity, we must first analyze the data, and generate a popularity value for each item to represent the popularity of the item. The weight factor calculation formula is as follows:

$$Weight_i = \frac{1}{\alpha + \log\left(1 + \left|N(i)\right|\right)} (1)$$

Among them, $N(i)$ represents the popularity of project I. α represents the harmonic parameter. If the popularity of the project is smaller or equal than the average popularity of the whole data set, the weight factor should not have an impact on the project. If it exceeds the average popularity threshold, the project is a popular project. T represents the average prevalence, and the formula for harmonic parameter α is as follows:

$$\alpha = 1 - \log(1 + T) (2)$$

The improved similarity calculation formula based on users is as follows:

$$t(x, y) = \frac{\sum(x_i y_i \ w_i)}{\sqrt{\sum X_i^{\ 2}} \sqrt{\sum y_i^{\ 2}}} (3)$$

w_i is the weight factor of item i.

Therefore, before mining, we must have a clear goal, and then combine with the function of data mining, using appropriate methods to get valuable and new information.

Ⅲ. The Current Status of Music Theory Teaching in Colleges and Universities

A. Control of the Classroom Atmosphere

In the present music colleges and universities, according to the national regulations, “the Party's educational policy is fully implemented, and the educational requirements are to improve and adjust the overall system of courses, teaching methods and teaching contents, and form a new educational curriculum system”. At the level of teachers, the first concern is whether they have classes or not, and whether class hours can meet the requirements of basic teaching workload. And pay less attention to how to construct the educational function of art education in the

existing educational system. How to make music education courses and teaching links become a scientific teaching system with clear objectives, reasonable structure, in line with the overall goal of the school and meet the requirements of all students' all-round development. And through the way of acquaintance recommendation, the user's personalized component is greater, and the effect is often better. Therefore, how to automatically complete the recommendation algorithm has become a hot topic. Among them, there are not only first-class colleges and universities which are in the forefront, with sufficient resources and broad platform, but also colleges and universities which are relatively lack of resources and slow development.

Through our repeated perception of external things, we can leave a deep impression on things in our minds. Students master music knowledge from the perception of music works. In music teaching, only when students perceive music works more fully and comprehensively, can they form clearer appearances and concepts and lay a foundation for learning and understanding music works in the next stage. This is the fundamental reason for the overall inefficiency and various problems of art education, including music education. On the other hand, students are eager to take art and music courses, regardless of their actual needs of really liking music, or for the utilitarian purposes of lower standard, less difficulty in examination, easy access to required credits and high scores in examinations compared with traditional professional courses. In this case, in the mature period of educational software, music resources in China can be recorded through Internet information and computer technology. Establish the database of music teaching resources, put it on the cloud server, and integrate it in the way of sharing. However, due to the students' psychological activities, age and hobby characteristics can not do a detailed analysis, leading to the teacher in order to pursue the classroom atmosphere and wrong lesson preparation teaching. Not only can not make students really into music learning, but also because of the psychological characteristics do not match will cause psychological resistance, contrary to the original intention of education and learning music.

B. Ignore the Charm of Music

In order to respond to the requirements of the new curriculum standard of the Party, the comprehensive education between textbook content and subject of the new textbook has obviously improved as a whole compared with the boss's textbook. However, due to excessive demands, contemporary college students' demands for music education have changed greatly from quantity to quality. More and more college students need to learn deeper music theory and knowledge, and the traditional music curriculum system cannot meet the multi-level and diversified educational needs. If teachers still use the traditional “teaching learning” way when guiding students to perceive works. The aesthetic experience or the understanding of the works will be directly “instilled” into the students. So, in the process of feeling music, students are passive acceptance, there is no independence of thought to speak of. Music teaching cloud platform is divided into video acquisition module, agent management and system management. As shown in Figure 4.

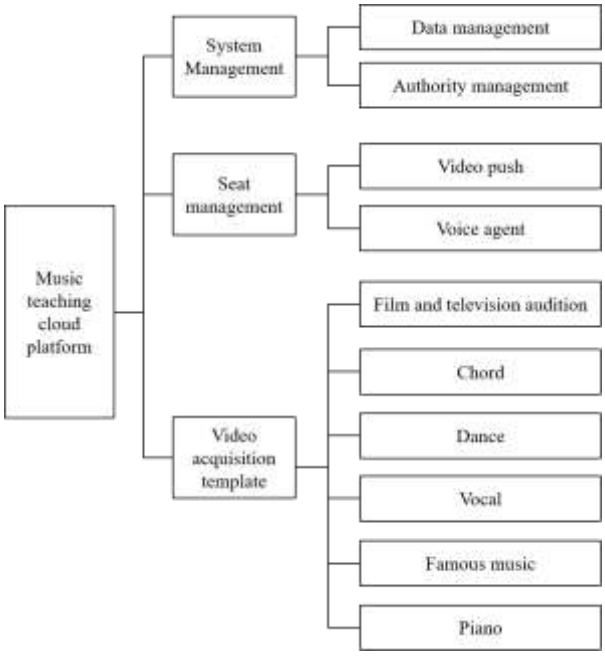

Fig.4 Platform Function Module Diagram

Course videos on the cloud platform are teaching videos specially recorded by teachers for the network crowd, which can take care of different types of learners in terms of content organization and teaching methods, so that the audience is no longer just silent spectators. The time of teaching video should be controlled at about 15 minutes, accompanied by questions and answers, which can make students pay more attention.

Great changes have taken place in the ways and means of knowledge generation, dissemination and acquisition. This brings new challenges and opportunities for the reform and development of all kinds of education, and also brings great innovation power and room for improvement for the development of music education in colleges and universities. Secondly, it is the various needs of the educated, that is, the students and the knowledge base of most people. In addition, it is necessary to combine the characteristics of teachers and the specific environmental conditions of education and teaching in various schools. In addition to sorting out the materials and uploading them to the cloud platform, it is necessary to note some questioning information for learners to consolidate and master. With these auxiliary instructions, each learner can clearly know the key points and knowledge of this lesson. Avoid the deviation of learning direction caused by the failure to master key knowledge in self-study, so as to improve the quality of learning. Users access the music teaching cloud platform through smart phones, and get the required video paragraphs from the music resource library through the selection menu. More importantly, the platform uses mobile phones as the media, so that students can choose convenient time to listen to music at any time, thus turning the fragmented and idle time into effective learning time, which will greatly improve the efficiency and effect of music learning.

Ⅳ. Conclusions

With the development of Internet and information technology, the total amount of information in the world has increased dramatically. Facing the challenge of big data, people hope to find the value behind it by analyzing and processing big data. The data mining technology is applied to the design of modern online teaching websites, and data mining and knowledge acquisition are carried out to better analyze and mine a large amount of online teaching information. To provide a framework model of network teaching system to guide students' learning and teachers' teaching. In view of the data mining system of cloud computing, it has many advantages that data mining system did not have before. Therefore, it can provide a good solution for data mining tasks of enterprise users and individual users. With the investment and promotion of music teaching cloud platform in college music education. We will carry out more in-depth development and Research on the platform functions and knowledge content, so that

students can have a music teaching platform with richer resources and more user-friendly experience. On the basis of auxiliary music teaching, feedback information and platform usage data are collected to help decision-makers formulate music education methods and contents.

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