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Vocal Teaching Archives Cloud Management System

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Abstract: With the popularization of "Internet plus education" and the extensive use of computers, the traditional paper-based teaching archives can no longer meet the demands of teaching. It has been a required course for every teacher to create and use electronic teaching archives. Especially in the vocal education sector, vocal teaching archives rely more on media files such as audio and video, thus we have to establish a cloud management system for vocal teaching archives based on cloud platform, which is fully functional, easy to access, and easy to operate. Besides, based on the distributed framework, the vocal teaching archives are created. The cloud management system can solve problems such as data shortage, inconsistent file formats, and personalized teaching archives, providing powerful support for the development of vocal education. The vocal teaching archives cloud management system is centered around meeting the management demands of vocal teaching archives. It is built on a distributed framework, with a database storing data base information, distributed objects saving archives and files, full-text search engine supporting big data search, cache memory processing the hot spot data, which fully leverage the advantages of distributed framework and distributed objects storage in the vocal teaching archives management system, and implemented the storage, use, management, and sharing of vocal teaching archives.

Keywords: Vocal teaching, Archive management, Cloud management system

INTRODUCTION

The definition of teaching archives is a practical teaching document for teachers to carry out teaching activities successfully and effectively, which is based on the curriculum standards, teaching syllabus, textbook requirements, the actual situation of students, and teachers specifically design and arrange teaching content, teaching steps, teaching methods, and other aspects in units of class hours or topics (Ji Mucheng et al. 2017).Teaching archives include brief analysis of textbooks, student analysis, teaching objectives, key and difficult points, teaching preparation, teaching process, and exercise design (Xu Xin et al. 2014). In recent years, with the rapid rise of computer technologies such as big data and cloud computing, the forms of archives are also changing with the development of technologies. Teaching archives are gradually transitioning from the paper-based to the electronic and playing an irreplaceable role in teaching activities (Xiong Caihong et al. 2014).

Background

Music teachers in different periods have different understandings and methods of teaching content. According to the studies of music works in the early stages of reform and opening up, there are very few teaching archives available for early Chinese music works at present, and video music works are mostly sung by contemporary singers in recent years, which failed to play a great role in the pre-class preparation and music teaching. In the process of using the archives for teaching, vocal teachers from different periods, experiences, genders, and grades will have completely different understandings of the same song's music teaching, resulting in unique music teaching archives, which has great reference significance for current music teaching. The ability to integrate music teaching archives from different teachers all over the country for access easily not only broadens the teaching ideas of music teachers, but also plays a positive role in promoting the music education industry. Therefore, establishing a shared cloud platform for vocal teaching in universities is of great significance.

Research Problems

At present, the standardization, completeness, and uneven management methods of vocal teaching archives in university archives management systems are inadequate, and there are the following problems:

Low level of systematization. The management of teaching archives in most universities now still adopts traditional manual methods, which mainly include two methods. One is that teachers create the teaching archives before classes and store them locally, the other is a common electronic teaching archive used for a course, which can be simply edited and modified by teachers according to the teaching outline or textbook. However, the data lacks effective collection and processing methods, and most teaching archives or files are not effectively unified and managed in the teaching process. Traditional electronic file transmission methods are only used between teachers and students, and between teachers and teachers, which is only one-way transmission, leading to incomplete information and data loss easily. And there are less data communications among universities in this realm. There is a low degree of systematization in the management of teaching electronic archives, which is inconvenient for data collection and sharing.

Low information exchange rate. In music teaching, teachers should carry out targeted educational and teaching activities for students based

on different factors such as age groups, learning progress and so on. The design of music teaching archives should be in line with the actual situation of students. For example, in instrument teaching, the teaching progress should be determined by the age level, ability to accept knowledge, and learning years of students. In vocal teaching, teaching design should also base on the gender, different vocal conditions, and different singing methods of students, relying on the use of a large number of electronic archives such as audio and video files. Therefore, the traditional electronic teaching archives or paper textbooks alone cannot meet existing teaching demands. We are expected to establish a cloud management platform to store electronic teaching archives to facilitate the use of relevant electronic teaching archives by teachers and students, and to meet the frequent access and use needs of personnel from teachers, students, and multiple departments.

RESEARCH METHODS

The cloud management system for vocal teaching archives will adopt a front-end and back-end separation architecture to improve the scalability and flexibility of the system. (Liu Xiaobin et al. 2002). The back-end system will build three core centers, namely the user center, data resource center, and archive center, to support the basic services and processes of the system.

User Center

The user center will be responsible for managing users' information, including functions such as registration, login, and permission management(Song Jingwei et al. 2021). In addition, the user center will also offer users more flexible login methods such as third-party login and verification code login to improve the convenience. At the same time, the user center will also achieve multi-tenant management, providing basic capabilities for the productization of the system, enabling the system to support the vocal teaching archive management needs of multiple different institutions or schools.

Data Resource Center

The data resource center will serve as the data base of the system, providing functions such as dictionary management, menu management, end users (teachers and students) management, and course management. The system can centrally manage and maintain various data resources in the data resource center, ensuring data consistency and accuracy. In addition, the data resource center will also support information management for end users, including registration and information maintenance functions for teachers and students, providing personalized teaching archives management services for teachers and students.

Archive Center

Archive center is the core functional part of this system, which is responsible for recording and changing records of teaching archives and storing files. Based on distributed storage technology, the archive center will construct a distributed storage center to ensure the security and reliability of teaching archives. At the same time, through the archive center, different versions of teaching archives can be managed and change records can be checked, thus ensuring the integrity and traceability of teaching archives.

System administrators have access to system management platform. Through this platform, administrators can manage system data, set rules, examine contents, etc., making sure operation and security of the system. End users (teachers and students) can be accessible to cloud platform for archives management. On this platform, teachers can create and edit teaching files, then they can release and share them. It can be divided into private and public cloud platform. Private cloud system focuses on privacy, which can be used to manage the personal teaching archives of users. The public cloud platform serves as a storage center of sharing and communicating for community, and teaching archive data are open to all users of the platform.

Distributed and Distributed Archive Storage

In terms of distributed archive storage, the cloud management system of vocal teaching archives uses distributed storage structure to store and manage data. Distributed storage means that the data can be stored at many nodes to improve performance of the system, make it more extensible and better its fault tolerance.

Distributed file system is used to store archive data. Through this system, files can be divided into many parts, each of which can be stored at different storage nodes. In doing so, parallel reading and writing and quick access to files can be achieved. At the same time, this system also provides mechanisms of data redundancy backup and auto fault recover to guarantee the security and reliability of data. What is more, in terms of distributed storage, this system is also equipped with object-based storage technology. Object-based storage is a method to store and manage data in the form of objects. Each object has a unique identifier, and they can be stored with metadata. With characteristics of high reliability, scalability and flexibility, the method is suitable for storing unstructured data, such as archive data. The system uses a distributed object-based storage system to store and manage archive data, achieving high availability and high-performance access of data by distributing archive data across multiple storage nodes.

In addition, the system makes full use of the advantage of distributed storage, realizing load balance and parallel computing of data. By

distributing data across multiple nodes, the data access load can be balanced across different nodes, improving the system's concurrent processing capability and response speed. At the same time, the system can also achieve rapid data processing and analysis by parallel computing of archive data.

In summary, by distributed archive system and object-based storage technology, the cloud management system of vocal teaching archives executes a storage scheme with high performance, scalability and fault-tolerant ability through distributed storage and parallel computing of data. This provides a stable and reliable storage foundation for the system, supporting various functions and services of the system.

RESULTS AND DISCUSSION

The significance of cloud system for archive management is that it provides a high-efficient, secure and reliable method to manage and store archive data. It transforms traditional paper-based archives into electronic archives and achieves online storage, access, and management of archives through cloud technology.

The Cloud Archives Management System achieves the digitization and electronic storage of records, transforming paper documents into electronic files, significantly reducing the need for paper and physical storage space in traditional record management. This not only saves resources, but also make archives more accessible and sustainable. Users can access archive data through the network whenever and wherever possible. There are not limitations of time and location, which improves the utilization and efficiency of archives.

Secondly, the cloud archives management system provides secure and reliable archive storage and management. By adopting distributed storage and backup mechanism, archive data is backed up redundantly on multiple storage nodes to ensure data security and reliability. The system is also equipped with access control and auditing functions, ensuring that only authorized personnel can access and modify archive data, improving the security and privacy of archives.

In addition, the cloud system of archive management also has convenient and fast archive retrieval and query functions. Users can conduct full-text searches and advanced queries through keywords, attributes, etc., to quickly find what they require. Users can also preview and edit files with multiple formats online by this system so that it is convenient for users to view and process archive data.

Overall, the significance of cloud system of archive management is that it provides a modern and high-efficient archive management method, which can not only improve the efficiency and security of archive management, but also save resources and reduce costs.(Yuwei Liu1. Biwen Shen2, Shujing Yang1, et al. 2015)

CONCLUSION

The development of distributed storage presents many new opportunities and challenges to the management system of vocal electronic teaching archives. With the lightweight feature of distributed storage, the vocal electronic teaching archives management system can better meet the management needs of vocal teaching archives. In this article, starting with the needs of vocal teaching archives, we build a complete vocal teaching archive management system through basic services, such as cloud database, distributed storage and cache memory. This system not only ensures the security of vocal teaching archive data, but also greatly improves the efficiency of making electronic teaching archives for vocal majors. Through continuous innovation and optimization, we can further improve the efficiency and quality of vocal teaching archive management, making greater contributions to the development of vocal education.

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