INSPIRE 2024
International Symposium on Global Education, Psychology, and Cultural Synergy

RESEARCH ARTICLE

Research And Design Of Education Management System Based On Cloud Storage

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ABSTRACT

The research and design of education management system based on cloud storage is a process involving the analysis, planning and design of new products or services. Software that helps manage data in cloud storage. It uses asp Net technology, which helps to create an entire application for managing data in cloud storage. The main purpose of this application is to help users store their data, share them with others, and provide them with various functions, such as sharing files, uploading videos, etc. Teaching data is growing exponentially, which brings great storage pressure to traditional data centers. All users share a resource pool, which leads to low efficiency of resource search. Moreover, due to the unclear role and authority of users, teaching resources are safely shared among university users.

***Keywords**: Cloud storage; Education management system; Teaching demand analysis*

INTRODUCTION

Student performance management has always been an important part of school work. The educational management level of colleges and technical secondary schools in China is generally not high. With the expansion of school scale and the increase of enrollment, it is very necessary to establish a performance maintenance system. Ordinary performance management can no longer adapt to the development of the times, because it wastes a lot of human and material resources. In today's information age, this traditional management method must be replaced by the computer-based information management system (Shi, Liu and Huang, 2020). The use of education management and maintenance system can reduce the workload of college teaching staff, reduce expenses, improve work efficiency and accuracy, and save time. Students can also know their exam results as soon as possible, invest in new courses or review the courses that have not been tested this time. The application of education management system also improves the competitiveness of today's private education in the future market.

With the rapid development of modern high technology, the change of people's working habits, especially the popularization of computers, people's pace of life is getting faster and faster. How to improve work efficiency is the first consideration. Education management is a very tedious and complicated work. One reason is that the workload is heavy and difficult to manage. It is very important for a school to manage students' grades well. Therefore, it is very necessary to develop a set of education management system.

On the basis of most score management systems, this system mainly increases the teachers' operation of scores. After the teachers change the test papers, they do not need to submit the scores to the Academic Affairs Office of the college. They can directly upload the scores to the network (Rui, Long, and Deng, 2020) . Students can also easily and quickly query their own scores. After the test, the academic affairs managers do not have to stay in the office of the college. They are not limited by time, location and space, As long as you have access to the Internet, you can complete the entry, update, management, query and deletion of relevant scores at home. Based on this, this paper studies the research and design of education management system based on cloud storage (Li et al., 2020). This system will change the previous situation of manually managing students' grades

and improve work efficiency. I hope it can bring convenience to the work of teachers and schools.

LITERATURE REVIEW

2.1. Cloud storage

In a narrow sense, cloud storage refers to the collection of a large number of storage devices in the network through software through virtualization, distributed technology, cluster application, grid technology, load balancing and other technologies, so as to jointly provide low-cost and highly scalable data storage services.

In a broad sense, cloud storage can be understood as virtual storage resources provided on demand. Like PAAS and LAAS services of cloud computing, it can be called data storage as a service (DAAS), which provides appropriate virtual storage and related data services through the network based on specified service level requests (Zhang, Bai, and Yuan, 2020)

Cloud storage does not refer to a specific device, but refers to an aggregate composed of many storage devices and servers. When users use cloud storage, they do not use a storage device, but a data access service brought by the entire cloud storage system. The core of cloud storage is the combination of application software and storage devices to realize the transformation from storage devices to storage services through application software. Cloud storage is a new solution that puts storage resources on the network for people to access. Users can easily access data at anytime, anywhere and through any device that can be connected to the network.

High scalability: the cloud storage system can support massive data processing, and resources can be expanded on demand;

Low cost: the cloud storage system should have the characteristics of high cost performance. The low cost is reflected in two aspects: lower construction cost and lower operation and maintenance cost;

No access restrictions: compared with traditional storage, cloud storage emphasizes flexible support for user storage, and storage resources in the service domain can be accessed anywhere and at any time (Rafrastara and Deyu, 2020);

Easy to manage: a small number of administrators can handle thousands of nodes and petabytes of storage, more efficiently supporting the rapid deployment of storage resources required by a large number of upper tier applications. The traditional storage architecture is shown in Figure 1 below. The storage, network and host are all in the same data center. Customers can directly access the storage behind the LAN.

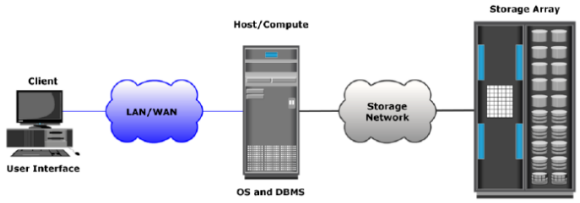

Figure 1. Traditional storage architecture

2.2. Education management system data

Database plays a very important role in an information management system. The design of database structure will directly affect the efficiency of the application system and the effect of implementation. Reasonable database structure design can improve the efficiency of data storage and ensure the integrity and consistency of data.

There are two backup strategies to backup information data with backup system: real-time backup and scheduled backup. The two strategies have their own advantages and disadvantages. In comparison, real-time backup has the advantages of high data integrity and good security. The disadvantage is that for the large storage system such as teaching system, real-time storage consumes too much resources and there is a great waste of resources; At present, scheduled backup is the most widely used. Its advantage is that it can make full use of system resources. Its disadvantage is that when the timing policy is not set properly, it may cause the loss of data information (Gao, 2021).

Cloud storage refers to the collection of a large number of storage devices scattered in different places through software through virtualization,

distributed technology, cluster application, grid technology, load balancing and other technologies. Customers obtain storage resources through public access interfaces, access networks and client programs. Customers do not know where the accessed storage resources are.

METHODS

2.1. Research and design of education management system based on cloud storage

We will establish an education management system and use computers to manage students' grades, so as to further improve the efficiency of running schools and the level of modernization. Help teachers improve their work efficiency and realize the systematization, standardization and automation of the work process of maintaining students' scores (Jia, Li, and Wang, 2020). In order to make the system play a greater role in the management of the college, realize the computerization of the work process, and improve the work efficiency and quality, the following system development objectives are proposed:

(1) The system shall be practical, reliable and applicable, while paying attention to progressiveness.

(2) Dynamically manage all databases to prevent confusion.

(3) Different users have different query and modification permissions to prevent illegal query and modification.

(4) It can classify and summarize query results, and print and download reports.

(5) Facilitate the user's operation and minimize the user's operation.

After the above data items and data structures are obtained, various entities that meet the needs of users and the relationships between them can be designed to lay the foundation for the following logical structure design.

According to_ As described above, the entities of this system include: Huxin daughter-in-law entity, class entity, curriculum entity, class curriculum entity, student table entity, teacher entity and score entity (Zhang, Wang, and Liu, 2022) . After the conceptual structure of the data is designed, the above conceptual structure of the database can now be transformed into the actual data model of a database system, that is, the logical structure of the database. The following figure 2 shows the design process of the education management system.

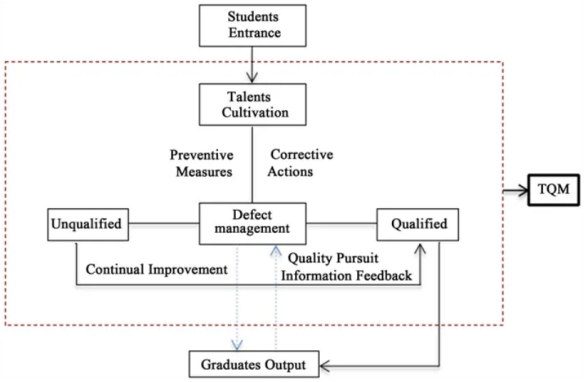

Figure 2. Design process of education management system

RESULTS AND DISCUSSION

After the three-tier architecture is adopted, the user interface layer sends requests to the business layer through a unified interface. The business processes the requests according to its own logical rules and then operates the database. Then, the data returned from the database is encapsulated into classes and returned to the user layer. In this way, the user interface layer may not even know the database structure, as long as it maintains the interface with the business layer (Zhang, Zhang, and Yin, 2020). This method increases the security of the database to a certain extent, and reduces the requirements for the developers of the user interface layer, because it does not need any database operations at all.

The above JavaBeans return data in the form of return objects. They can specify which data can be accessed and which data is read-only within the class, so as to improve data security again by encapsulating data. Storage layer: a large number of storage devices are distributed in different regions and connected to each other through wide

area network, Internet or fibre channel network. On top of the storage device is a unified storage device management system, which realizes the logical virtualization management, multi-link redundancy management of the storage device, as well as the status monitoring and fault maintenance of the hardware device.

Basic management layer: through cluster, distributed file system, grid computing and other technologies, realize the collaborative work between cloud storage devices, so that multiple storage devices can provide the same service externally, and provide larger, stronger and better data access performance (Zhang, Zhang, and Yin, (2020). Data encryption technology ensures that the data in cloud storage will not be accessed by unauthorized users. Data backup and disaster recovery technology can ensure that the data in cloud storage will not be lost and ensure the security and stability of cloud storage. The system development program is shown in Figure 3 below.

```
public boolean connect(){
try{
Class.forName("com.mysql.jdbc.Driver").newInstance();
String url="jdbc:mysql://localhost:3306/xscj_database";
conn=DriverManager.getConnection(url,"root","111111");
Statement stmt = conn.createStatement();
}catch(Exception ee){
System.out.println("connect db error:"+ee.getMessage());
return false;
}
return true;
```

Figure 2. System development procedure\

CONCLUSION

The research and design of education management system based on cloud storage is to find the best way to store data in the cloud. This type of research is conducted by a team or a person with ideas on the subject. The main purpose of such research is to find out how we store information in the cloud and create an online platform for students and teachers so that they can access their data from anywhere in the world at any time. What are the benefits? There are many advantages to research and design education management system based on cloud storage.

REFERENCE

Shi, W., Liu, T., & Huang, M. (2020). Design of file multi-cloud secure storage system based on Web and erasure code. In *2020 IEEE 11th International Conference on Software Engineering and Service Science (ICSESS)* (pp. 1–6). IEEE.

Rui, L., Long, C., Deng, M., et al. (2020). Design and implementation of river data acquisition and storage system based on cloud platform. *IOP Conference Series: Materials Science and Engineering, 794*(1), 012011.

Li, Q., Hu, X., Yadav, A., et al. (2020). Application of big data fusion based on cloud storage in green transportation: An application of healthcare. *Scientific Programming, 2020*.

Zhang, M., Bai, Y., Yuan, S., et al. (2020). Design and implementation of file multi-cloud storage system based on Android. In *2020 IEEE 11th International Conference on Software Engineering and Service Science (ICSESS)* (pp. 1–6). IEEE.

Rafrastara, F. A., & Deyu, Q. (2020). Revealing the weaknesses of file-sharing systems on cloud storages. *Journal of Cloud Computing Research*, 2020.

Gao, R. (2021). Design and implementation of cloud computer room management system based on cloud computing data center. *Journal of Cloud Computing Research*.

Jia, W., Li, M., & Wang, P. (2020). Design of motor state monitoring system based on cloud. *Journal of Physics Conference Series, 1656*, 012022.

Zhang, Z., Wang, L., Liu, R., et al. (2022). Development of cloud computing platform

based on neural network. *Mathematical Problems in Engineering, 2022*.

Zhang, H., Zhang, J., Yin, X., et al. (2020). Cloud-to-end rendering and storage management for virtual reality in experimental education. *Virtual Reality & Intelligent Hardware*, *2*(4), 368–380.

Zhang, H., Zhang, J., Yin, X., et al. (2020). Cloud-to-end rendering and storage management for virtual reality in experimental education. *Journal of Experimental Education*, *2*(4), 13.