Construction and Application of Smart Campus Platform Based on Big Data

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Abstract: The current world is already an era of informationization. With the development and popularity of the Internet, a large number of people go online every day, and the data they generate is very large. Faced with these massive amounts of data, traditional data processing and technology can no longer accommodate this. In the data age, big data technology was born, and it has great application value in the construction of intelligent campus. In this context, this paper puts forward the application research of big data technology in the construction of intelligent campus, briefly introduces the big data technology, introduces the blueprint of intelligent campus construction in detail, and finally introduces the construction and application of big data technology. Big data for smart campuses. Provide some constructive advice for the application of big data technology in smart campuses.

1. Introduction

Since the 21st century, informationization and automation have gradually become the main development trend of college construction in China, bringing a lot of convenience to campus management[1]. However, due to the relatively large information system of colleges and universities, all aspects of campus services have high requirements. There are also many problems in the construction of school campus information. These problems can be solved well through the construction of intelligent campus. Therefore, the research on the construction strategy of college intelligent campus in the context of big data is very practical.

2. Overview of Big Data Technology

Values applied to technical design, scientific research, validation, and decision making are called data and are obtained through scientific experiments, tests, and statistics[2]. Through measurement acquisition, record classification, store these data for preliminary screening, form effective data, build different models through data mining, analyze and explain the acquisition of important and decision-making information, and finally apply and promote (as shown in Figure 1)[3], the process should be completed May be comprehensive, accurate, and systematic. In addition, statistical analysis and testing are needed to make the conclusions more convincing. For these detailed data, record measurement records, and store statistical data, and obtain a large number of information sources, that is, big data, in a large-scale long-term process. School teacher and student information, resource information during campus life, teaching activities and venue information, information generated during the teaching process and teaching process will accumulate a large amount of data. At the same time, the storage, management and analysis of school data is accompanied by some difficulties and faces enormous challenges. Campus information construction must not be rushed to achieve, but to rationally use various data storage and online learning methods, based on ETL data, the extraction and integration of relevant data, to lay the foundation for the construction of smart campus[4].

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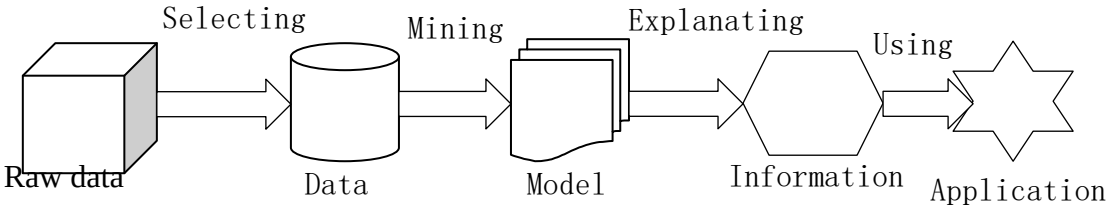

Fig.1. Big data mining and application process

3. College Smart Campus Overview

3.1. Definition of smart campus

A smart campus usually refers to a smart campus environment that integrates teaching, teaching, research, management, learning, and life, and provides services to teachers and students through a variety of application service systems. Virtual education spaces based on next-generation information technologies, such as cloud computing and the Internet of Things. In a smart campus environment, students can use the online learning platform to develop time and space learning, enjoy efficient, intelligent life services, and teachers and administrators can use the network to complete innovative research and transparency. Scientific research management, these are crucial for the development of colleges and universities in the information age[5].

3.2. Characteristics of a smart campus

The Smart Park integrates a variety of emerging information technologies such as cloud computing, big data, the Internet, artificial intelligence and social networking[6]. In essence, it still belongs to a higher level of university informationization. Compared with colleges in the traditional sense, smart campus also has the following characteristics. First, the smart campus can fully understand the physical environment in all corners of the campus, and the implementation of this sensing function is network-based. Therefore, the construction of smart campus must be built on a stable and comprehensive broadband network. Second, the smart campus connects the campus physical space to the digital space through intelligent terminals such as mobile phones. Therefore, smart campus construction relies heavily on a variety of smart sensing technologies, and must also use a large number of digital devices that enable remote control. Third, the integration of smart campuses is reflected in integrated communication systems and comprehensive data sharing. Therefore, in a smart campus environment, whether it is student learning, campus management or teaching and research, more efficient teamwork can be achieved. . Fourth, the smart campus has changed the closed architecture of traditional campus information construction. While collecting and using massive amounts of data, it connects a variety of intelligent services, greatly improving the integrity of the smart campus[7]. Fifth, the intelligent campus has deepened the connection between the school and the society, the international academic community and the education community while improving the campus environment and improving the quality of the campus environment, which has greatly helped the university's decision-making. Staff training and professional settings. This is very beneficial to the long-term development of colleges and universities.

4. The Advantages of Big Data Mining in the Construction of School Smart Campus

4.1. Improve the teaching level and research level of the school

Big data mining technology can provide teachers and students with an information technology platform for learning and research[8]. Teachers and students can find the latest academic trends and related research materials on the platform. The integration of information technology platform and multimedia technology can help teachers and students to easily communicate and communicate with

other scholars. At the same time, they can share the research results of colleges and universities on the Internet in time. Teachers and students can determine the current direction of teaching development on the information technology platform and improve the teaching level and scientific research level of the school.

4.2. Strengthen the management level of institutions

The construction of a school's smart campus will involve a lot of data. For example, teachers and students on the site, forum suggestions and comments[9]. Big data mining technology can analyze and store this information in time, find the most needed information and data in massive data, and help the college improve the management efficiency of finance, teaching and scientific research. At the same time, big data mining technology can also sum up the rules of learning and teaching in a comprehensive and timely manner, and realize the prediction of teaching direction on this basis. This not only strengthens the management level of the institutions, but also provides the impetus for the development of the school.

4.3. Implementing intelligent services

Informatization digital management is more economical than traditional management methods, including manpower, material resources and financial resources. It is of great significance to realize the intelligent service of the school. For example, in the direction of digital information training, students can provide rich text, video and audio; in the direction of resource configuration, the college's IP address can be continuously optimized, and the identity verification technology can be used to ensure the security of the college's internal network.

4.4. Realizing intelligent teaching

With big data mining technology, students can effectively record their behavioral habits and learning attitudes. Information analysis can help students optimize their learning style[10]. At the same time, students can learn independently on the intelligent campus information technology platform to improve their self-directed learning awareness and ability. Students' learning is no longer limited by time and space, and students' learning methods are more diverse. Big data mining technology helps teachers better understand students by analyzing students' learning attitudes. According to the problems that occur during the student's learning process, targeted teaching and correction will be carried out to improve the learning efficiency of the students.

5. The Strategy of Building a Smart Campus Platform in Colleges and Universities under the Background of Big Data

5.1. Smart Campus Technology Application

The construction of intelligent campus involves many fields such as life service, campus management, campus teaching and scientific research, including big data collection analysis and sharing, unified identity management, one-stop campus life service, and full coverage of campus security. Therefore, there is a need to flexibly apply a variety of emerging information technologies, and the role of each information technology is also crucial. In the information age, people generate a lot of data every day in their lives, learning and work. If you can use big data technology to collect and analyze this data and find the rules of things, then you can apply wisdom to massive amounts of data. Achieve better campus services. For example, the student's daily diet information is recorded through the food and beverage system in the cafeteria. Through the analysis of these dietary information, students' eating habits and dietary patterns can be found to adjust the color and taste of the dishes. Cloud computing services are mainly used to manage large and complex intelligent systems. The information systems supported by cloud computing technology are open and collaborative, and can dynamically allocate resources to each subsystem according to the needs of teachers and students. The actual needs of campus services are critical to the management of all types of terminal equipment and technical facilities. Comparing the Internet of Things, mobile Internet and IntelliSense, from the perspective of student learning and teaching, the intelligent campus platform

system also utilizes knowledge management and social network technologies, among which knowledge management technology refers to various digital unified plans. Knowledge resources. Control is usually used for the construction of school intelligent libraries. Social network technology is mainly used for knowledge sharing, problem discussion and communication and cooperation between teachers and students. Students are usually used to build online learning platforms.

5.2. Smart Campus Structure Design

A smart campus can be seen as a combination of campus physical space and network virtual space (see Figure 2)[11]. In general, the architecture of a smart campus can be divided into multiple levels, such as intelligent awareness, network communication, big data, business applications, interactive platforms and security systems. Among them, IntelliSense is the foundation of the entire intelligent campus architecture. The main function is to collect various data such as equipment running status and student activity status, which is an important prerequisite for realizing the functions of the intelligent campus. Network communication is associated with the level of intellisense. It belongs to a network communication system based on campus broadband. The system connects various terminal devices and information management systems and other software tools, which are key to data and signal transmission. The big data layer is at the heart of the entire smart campus. Whether it is the storage analysis of data or the connection between various system modules, it needs to rely on the big data layer to achieve. It is of great significance to the comprehensive service of the intelligent campus. In addition, the interactive platform belongs to each mobile terminal and can be operated to provide optional personalized services directly to teachers and students. The security system layer is an important support for information security, operation and maintenance of the entire smart park, and is the core of the sustainable and stable operation of the smart park. The business application layer is the implementation of various application services, such as research platforms and canteen management systems.

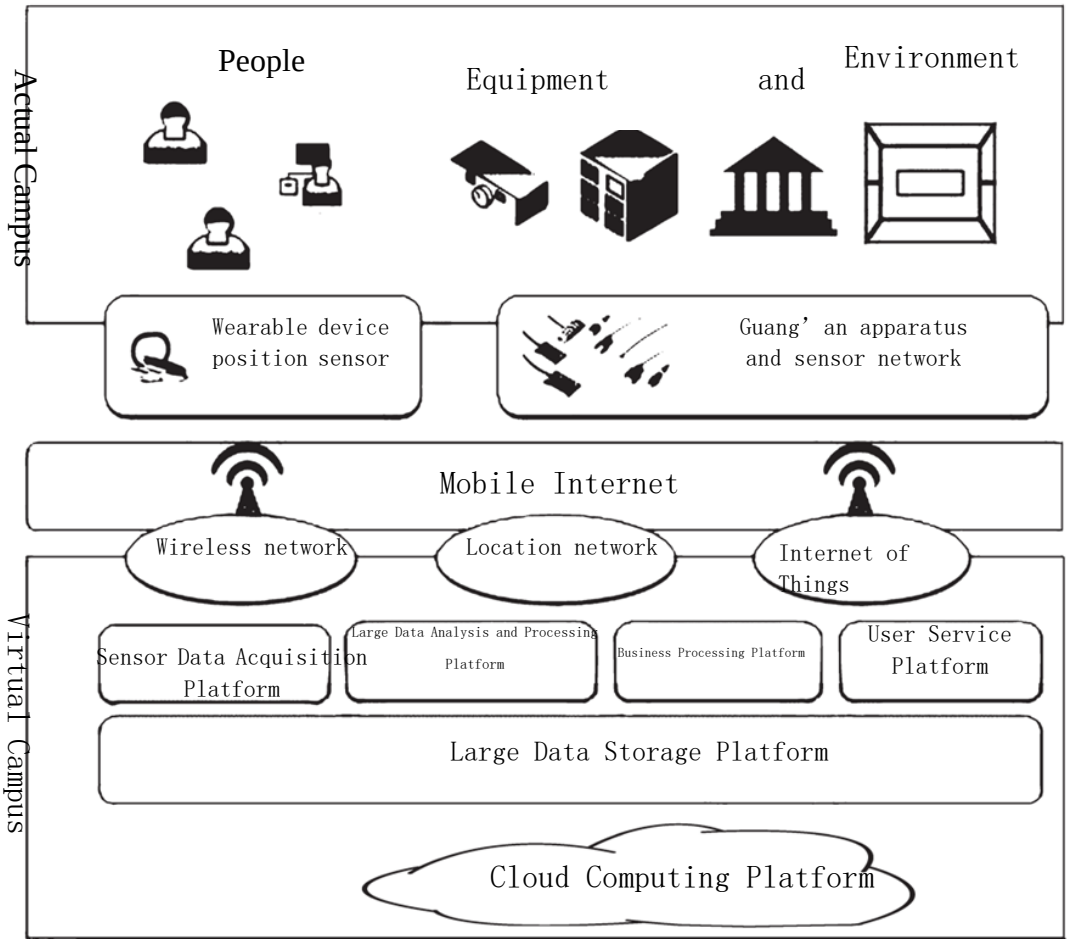

Fig.2. Conceptual map of smart campus under virtual reality integration

5.3. Smart Campus Platform Construction

The functional realization of the smart campus requires the support of various network platforms[12]. Therefore, in the construction of smart campuses, the construction of each platform is also crucial. For example, in order to build a virtual campus space, colleges and universities need to establish a teaching network, research network infrastructure platforms such as networks and resource networks, and connect the platform with cloud computing platforms to achieve an efficient management platform. The collection of campus data requires the establishment of an IoT awareness system that installs sensors, video surveillance systems, QR codes and electronic tags into all areas of the campus.

6. Conclusion

In the era of big data, although smart campuses can be of great help to university campus services, talent development and research, if you want to build a smart campus on a university campus, you need to have a deep understanding of the smart campus. And adopt appropriate strategies in technology applications, platform construction and structural design.

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