The Application of Big Data in the Construction of Smart Campus Information

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ABSTRACT

With the rapid development of information technology, university information construction has entered the era of big data, big data as a new database processing technology in the construction of smart campus has played a crucial role. This paper expounds the importance of the construction of the smart campus in the background of big data, and gives the frame of the smart campus structure under the perspective of big data, hoping to promote the development of the smart campus in big data perspective, through the analysis of the key technologies of smart campus in universities and the present situation and challenges of university information construction. The innovation of informatization construction of university 's smart campus in the view of data.

INTRODUCTION

As an advanced form of informationization, smart campus is a further improvement and perfection of the digital campus. It utilizes new information technology to perceive the physical environment of the campus so as to realize the work, learning and personal characteristics of teachers and students. The digital space and physical space of the school are connected with each other to create a convenient and comfortable educational environment and living environment for teachers and students to realize the interaction between teachers and students, school environment and school resources to realize humanized innovation service.

INTRODUCTION TO KEY TECHNOLOGIES

Big Data

Big data technology is the core value of mass data storage and analysis. Smart campus is through a variety of intelligent terminal equipment, information systems and sensing devices to obtain a large number of activities and status data, and in order to collect data analysis to grasp the law of things, to carry out intelligent applications.

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Cloud Computing
Cloud computing requires a combination of grid computing, parallel computing, distributed computing, powerful integrated computing, only the use of open, integrated, collaborative information architecture and dynamically configurable resources, high scalability, on-demand service cloud computing model, Can provide good infrastructure support.

The Internet Of Things
The Internet of Things integrates sensors, controllers, machines, people, and things in a new way to realize intelligent identification, location, tracking, monitoring, and management through the integration of intelligent sensing, identification technology, wired network and mobile Internet. Wisdom of the campus to provide material basis.

Business Intelligence
Business intelligence utilizes data warehousing and data mining techniques to systematically store and manage user data, analyze user data through various statistical analysis tools, provide analysis reports, provide decision-making information for a variety of university activities, basis.

Knowledge Management
Knowledge management is the key technology of smart campus. It is the most important and the most common activity of knowledgeable person and university. Knowledge management is the planning and management of knowledge, knowledge creation process and knowledge application.

Social Networking
The social network covers all forms of network services with the core of human society. It is a social or social characteristics of the network services. It is an interactive platform that can communicate with each other, communicate with each other and interact with each other, and is therefore the key to achieving a smart campus. In the construction of smart campus, social network has the characteristics of openness and low cost, so that modern college students can better accept and promote its rapid development[1].

Universities Face the New Challenge of Informatization
China's information technology in the early 1980s, more than a decade is the main campus network, CAI courseware and distributed independent management information system. In the 21st century, digital campus construction has been developing rapidly. In the past decade, almost all colleges and universities have gone through one or two rounds of digital campus construction, to improve the overall level of university information. However, the past two years, the digital campus as the core of the management of information technology has encountered many challenges. With the development of new information technologies such as cloud computing, Internet of things, mobile Internet, big data, knowledge
management and social network applications, university information is about to enter a new stage[2].

**Information Technology Challenges**

In recent years, a variety of new information technology to promote the rapid popularization of information technology in the university has created enormous challenges: large-capacity storage, on-demand computing model of cloud computing on the impact of traditional data centers; smart terminals, mobile Internet, Financial network, communication, collaboration and sharing of social network in one, after replacing the campus BBS, but also to the traditional managers as the center of the information system has a huge impact on the construction of the park network, is to reverse the information system construction ideas and direction; Shock, with its large, diverse and fast characterization of big data, has attracted the attention of all parties because of its high added value.

**Business Convergence Challenges**

After many years of information construction, information technology from the simple application of tools gradually deep into the teaching, research, management and service activities, the school teachers and students and managers of information literacy and demand is also getting higher and higher, Has not satisfied with the simple business management and information query, IT-based innovative education teaching model and management models are emerging, more and more attention from all sides. Ministry of Education issued the "Education Information Decade Development Plan (2011-2020)" is also to "promote the deep integration of information technology and higher education, innovative personnel training model" as the main goal of the current university information[3].

**Challenges in Building Operational Models**

With the development of information technology, the university's information system becomes more and more complex, which poses a serious challenge to the construction and operation mode. No IT company can come up with an overall solution for the university's digital campus and implement it satisfactorily. Information construction in a dilemma in the dilemma; colleges and universities own information technology team is increasingly lacking, safe and stable operation of the pressure and risk is growing. What is the mode of scientific and sustainable information construction and operation in colleges and universities? The current stage of the views of quite different, lack of consensus, and even lead to the development of information technology industry direction confusion. Faced with so many challenges, colleges and universities where information to go? To become an important issue before us, strengthen the digital campus, to jump to the wisdom of the campus is a reasonable and realistic choice.

**The Importance of Big Data to the Construction of Smart Campus Information**

Big data on the construction of smart campus, not only increased the use of campus intelligence of information technology, while changing the traditional
campus management model for the wisdom of the campus to provide data reference, the specific content of the following two aspects:

**Big Data Technology Provides Information and Data Convenience for Smart Campuses**

In the process of construction of smart campus information, we should analyze and study the data outside the "structural form" to enrich the wisdom of smart campus management and scientific service management. On this basis, to reduce the data processing time requirements, improve data research and analysis capabilities, so that the more complex data types, the greater the difficulty of access to data resources. Traditional OLAP data analysis can not meet the diverse needs of campus intelligence. The data analysis of big data provides a convenient data analysis for the construction of smart campus information through the analysis of path, picture, time series and what-if[4].

**The Influence of Big Data on the Smart campus of Universities**

*Analysis of the Construction of Smart campus*

In recent years, with the rapid development of information technology, information technology construction of colleges and universities has experienced several stages of electronic campus, digital campus, smart campus. The smart campus breaks through the physical and digital education environment of the traditional campus physical environment, big data, Internet of things, cloud computing, mobile Internet, intelligent perception technology integration, teaching, research, management, service and so on. Smart campus through information technology to the university physical environment and digital virtual space linked to the wisdom of teachers and students of learning, work characteristics and needs, to provide them with a more intelligent and open education and teaching, more humane learning environment, comfortable and convenient Life service environment[5].

*University Informatization in the Background of Big Data*

Big data technologies include acquisition, mining, storage and processing. Big data technology includes four major parts: big data analysis, cloud database technology, memory, database and data security. Big data technology in the wisdom of the campus in all aspects of the application will make its management services to a higher level. In the course of constructing the smart campus, the university should use the data network and the cloud computing technology to produce the management information, the service information, the teaching management, the teaching resources, the student information and so on in the smart campus construction, the data volume is many, the type is complex, Data collection, analysis, can be transformed into university management and service available resources, the construction of smart campus will play a very important role.
The Construction of University 's Smart Campus Informatization from the Perspective of Big Data

In order to carry out information construction of smart campus in universities and colleges and universities, we must first understand its design concept, and then start with the structural analysis, from the perspective of big data analysis of smart campus information construction.

Smart Campus Design Concept

Smart campus and traditional "digital campus" concept is different, cloud computing and Internet of things technology synthesis. Smart campus design philosophy is through the application of the first generation of information technology, so that administrators, teachers and students through a more sophisticated way and dynamic approach to teaching management. Smart campus through embedded sensors, load it to the campus building, water supply systems, power supply systems and equipment between the various objects, can achieve the integration between campus life and physical systems to achieve the Internet of things and the Internet connection, will Management systems, learning systems and office systems into the "campus cloud", you can achieve real-time capture of large-scale data, more in-depth analysis, so as to provide a more effective basis for decision-making, and ultimately achieve the purpose of service information construction[6].

Smart Campus Information Construction Structural Design

In order to integrate the physical space and the digital space, it is necessary to take the big data as the core, the mobile Internet as the neural network, and the intelligent perception as the nerve endings. Based on the intelligent application, the goal will be fixed in the adaptive and personalized user interaction. Information support platform, to achieve intelligent business applications of the university. Specific architecture shown in Figure 1.

Figure 1. Smart campus system architecture diagram.
Intelligent Perception Layer

Intelligent sensing is an important part of Smart campus. It integrates RFID, ZigBee, IP CAM and other intelligent sensors and near-field communication-related Internet of Things technology, collecting campus environment, resources and activities of real-time data. To achieve a variety of campus facilities and equipment operating conditions, learning and life trajectory of teachers and students, teachers and students learning activities and the interaction between the campus environment, such as comprehensive awareness for the massive data management to provide basic data services to achieve smart campus comprehensive data collection and real-time feedback Control, providing the basis for perceptual support[7].

Network Communication Layer

Integrated use of the campus wired network, WIFI wireless network, 4G mobile network and other communication technology, for the intelligent perception layer to collect various types of environmental and activity data for teachers and students anytime, anywhere using the Internet to provide high coverage transmission services to provide high-speed access services, For all types of smart campus applications to provide highly reliable access services for smart campus applications to provide a stable, high-speed, full-coverage campus network environment[8].

Cloud Computing Layer

Integrated storage technologies such as virtualization, distributed computing, high-performance computing, centralized storage, distributed storage and other storage technologies to achieve efficient, transparent and reliable infrastructure cloud services for big data processing and intelligent applications to provide universal wisdom. The campus's big data processing and intelligent applications provide universal, on-demand computing and storage support.

Big Data Layer

Big data layer is the core of the wisdom of the campus. It is responsible for data storage, data organization and management, data mining and data analysis technology integrated use. The information gathered in the campus environment, activities, business, interaction and other information needs to follow the information standards and standardization, establish the data sharing and exchange mechanism, the database infrastructure theme, the unified data platform application construction, connect in cyberspace and campus Intelligent virtual images, and according to the virtual image of a comprehensive analysis of the physical park to master the laws of operation for the wisdom of all types of campus applications to provide scientific and comprehensive data support.

Intelligent Application Layer

Smart campus needs to integrate the existing application systems, the use of information resources planning theory, to achieve the application system integration. This is the key to smart campus to play its role. Based on the big data
layer, it determines the campus operations management, resource scheduling and business activities. Through intelligent application of campus information teaching, research, life, management, for teachers and students to learn life and campus management to provide comprehensive and appropriate service functions to provide smart campus management integrated, personalized application support, is the focus of the construction of smart campus.

**Intelligent Terminal Layer**

A variety of terminal access technologies, including traditional PCs, smart terminals, self-service devices and wearable devices, provide users with a seamless, adaptive environment, personalized human-computer interaction model for specific application scenarios based on different environments, Enhance the user access to campus information service experience for campus information technology applications to provide integrated, seamless access to support.

**Support Security System**

The support system is the basis for continuous provision of high quality services on the smart campus, including the information security system to ensure campus information security and reliability, and the system operation and maintenance service system to ensure the stable operation of the park infrastructure and application system. Safe, stable and efficient operation to provide practical protection.

**Summary**

The Construction of Smart campus in Colleges and Universities is the Important Stage of the Development of University Informatization. Large-scale data technology plays an indispensable role in the construction of Wisdom University campus, which provides great convenience for the teaching, management and service of colleges and universities. At present, smart campus of some colleges and universities to achieve a big data sharing and exchange, data analysis and decision support, optimize the allocation of university resources for university teachers and students to provide more intelligent teaching, management and services. I believe that big data technology and improve, will make the campus more "smart".

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**REFERENCES**


