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Research on Digital Campus Construction of Lyuliang University Based on Luliang Big Data

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Abstract: On the basis of the existing data processing and analysis capabilities of Lyuliang College, the digital campus construction scheme of Lyuliang College is reasonably designed from six aspects: information public support environment, green and energy-saving data center, cloud service platform, big data standard system, big data acquisition system, big data processing and analysis system, so as to provide information services for school teaching, scientific research and management, and promote the optimization of teaching effects. At the same time, promote the deep integration of information technology and education and teaching.

Keywords: Big data; Teaching campus; Scientific research; Administration.

1. Introduction

In recent years, with the concept of "Digital Earth", "Digital China" and "Digital City" was proposed, studied and gradually realized. The method research and system implementation of "digital campus" has become one of the researches focuses of universities [1-3].

As early as the 1970s, the Massachusetts Institute of Technology in the United States put forward the e-campus plan and put it into practice. After years of efforts, a mature digital campus model has been built; France has formulated a policy in the field of education-the Action Program for Realizing Social Informatization, which takes the informatization in the field of education as the key goal of priority development. The United Kingdom has invested a lot of money in education informatization. Since 1989, the British government has implemented CTI projects in colleges and universities nationwide, hoping to achieve a complete transformation of all disciplines in colleges and universities from teaching mode/content to teaching organization through the combination of computer and communication technology. In 1996, under the support of the "211 Project", Tsinghua University focused on the construction of a computer-based public service system under the name of the "Taishan Project". In 2006, Fudan University focused on accelerating the construction of a modern, information-based and civilized campus and implementing the e-campus project. Shanghai Jiaotong University put forward the digital campus in 1999. After three years of construction, it has made great progress in four aspects.

However, the digital campus construction of Chinese universities is still in its infancy [4-5]. There is a big gap between China and developed countries in the field of visual management system on campus, which has aroused great attention from relevant national education and science and technology departments. In China, the first university to study virtual reality technology is Beijing University of Aeronautics and Astronautics. Its visualization and virtual reality new technology research team has successfully designed and implemented a virtual campus roaming engine based on years of experience in virtual reality research; In 1996, Tianjin University successfully designed and developed a digital campus based on the SGI hardware platform according to the VRML international development standard; In 1998, Zhu Yinghao successfully developed a set of 3D visualization management system software for cities based on OpenGL and Visual C++platforms and integrating MapInfo. The virtual building environment roaming management system is a desktop-based 3D GIS system developed by the State Key Laboratory of Computer Design of Zhejiang University. The whole system has achieved a high level of realistic stereo vision and real-time scene interaction; The researchers of Hong Kong Polytechnic University successfully integrated virtual network, electronic map and virtual reality technology into the digital campus system.

Chang Ge successfully developed the "CityView" (digital urban landscape system) in 2001. This system mainly uses the existing data on the OpenGL and C++platforms to model the urban landscape by obtaining the three-dimensional information of the urban landscape. The symposium on the construction of digital campus of Chinese universities was held in Sun Yat sen University in May 2002, which is of symbolic significance to the research of campus digitalization. Among them, domestic universities such as Zhejiang University, Peking University, Tsinghua University, etc. have shared their own experience in the construction of digital campus, which marks that a new round of research on virtual campus management system is about to flourish in China's universities [6].

Tiantu was officially launched in November 2010. This website is the most comprehensive service website of geographic information resources in China. The launch of Tiantu marks a new stage in the research of China's three-dimensional visual management system. Up to now, many domestic colleges and universities such as Lanzhou University, Shanghai Jiaotong University, Hangzhou University, Harbin University of Technology and Southwest Jiaotong University have tried to build a three-dimensional digital campus [7-9]. However, due to the lack of development ability and the incomplete design ideas, the actual functions of the three-dimensional digital campus are single [10]. The main functions are still query and browsing, while the spatial analysis ability is very limited.

At present, many university information management systems mainly aim at non-spatial information (such as educational administration system), and rarely involve spatial

information management. Some scholars or universities try to manage the campus from the perspective of two-dimensional map, but there will be some deficiencies in the visual effect. Based on the above research background, this paper studies the digital campus construction of Lyuliang University under the guidance of Luliang big data.

2. Content of data campus construction led by big data

At present, under the general trend of education informatization, universities have invested a lot of money in campus informatization construction. However, each school pays more attention to construction than application. Functional departments work independently, forming data islands. Data is difficult to circulate. It is in a state of informatization, paper-based management and traditional teaching.

Therefore, on the basis of the existing school, combined with the data processing and analysis capabilities of big data, the digital campus construction scheme of Luliang College is reasonably designed to provide information services for school teaching, scientific research and management, promote the optimization of teaching effects, and promote the deep integration of information technology and education and teaching.

The content of digital campus construction under the background of big data should mainly include:

(1) Information public support environment

It is mainly a big data transmission basic network with seamless coverage. This network should have the function of connecting all devices together and transmitting data of any type and size. The future digital campus basic network should be a combination of a wired network with fiber to the home and a wireless network with seamless coverage.

(2) Green and energy-saving data center

Green energy conservation is the direction and unattended is the goal. The construction of the data center includes routing, switching, security, storage, application and other equipment, temperature and humidity monitoring and regulation system, security monitoring system, power supply and distribution system, fire protection system, lightning protection system, etc.

(3) Cloud service platform

The cloud service platform can provide services from three levels: IaaS, PaaS, and SaaS. Cloud computing technology can integrate existing equipment, improve its application value, and provide different levels of services for teachers and students through digital campus. Open source software can be used for cloud service platform construction. The benefit of cloud service platform in digital campus is to provide robustness of relevant applications. At the same time, data can be collected at any time.

(4) Big data standard system

At any time, the standard system is not as simple as the document. The construction of a good big data standard system at the institutional level can greatly improve and determine the quality and level of digital campus construction.

(5) Big data acquisition system

The system should include hardware and software, which are controlled and processed by software. Hardware mainly refers to computer room, electronic reading room, language laboratory, digital library, video monitoring, all-in-one card system (consumption, access control, energy-saving platform, etc.), unified storage (cloud platform, virtual storage, etc.), and software mainly refers to virtualization software, cloud platform software An application platform based on SOA architecture with unified interface and certification (including educational administration management, scientific research management, asset management, electronic curriculum construction management platform, etc.).

(6) Big data processing and analysis system

The ability of analysis and prediction is the core of big data construction: (1) Big data analysis results are applied to teaching and scientific research to promote the optimization of teaching effects and the deep integration of information technology and education and teaching. (2) The big data analysis results predict that the big data will promote the great development of education informatization and make decisions more scientific.

In the context of big data, the content of digital campus construction is very rich. In addition to the above, it also includes the construction of organizational system, management system, management personnel training, learning organization construction, digital learning resources and digital campus ecological construction.

3. Conclusion

Due to the deepening of the connotation of digital campus construction, new concepts are constantly emerging, and the content of digital campus construction has greatly increased compared with the early days. In the context of big data, in addition to the original infrastructure, we should pay special attention to the construction of software and hardware related to big data, because the digital campus in the age of big data is a major opportunity for traditional education research to move towards scientific demonstration. With this cutting-edge technology, we can increase the collection and storage of big data related to each student individual, and pay more attention to each individual, from macro group to micro individual, it provides basis for individualized education. Through the analysis of this paper, the research on digital campus construction of Lyuliang University based on Luliang big data can effectively solve the following problems.

(1) Digital campus construction can provide accurate information for classes and management in extraordinary times

With the current outbreak of COVID-19 and other infectious diseases, the campus is closed, and remote management and teaching can be realized by using digital campus, which ensures the normal teaching and normal operation of the school in an emergency period.

(2) Digital campus construction can publicize school culture and improve the popularity of the school

The digital campus management system combines the traditional campus management system of Lyuliang University with 3D terrain model and geographic information, and applies virtual reality technology and 3D imaging technology to the system, so as to realize the roaming flight function of the campus.

(3) Digital campus can be used as a basic tool for university management and planning

Use space analysis and campus management functions to solve problems that cannot be solved by traditional campus management systems, so as to improve the application ability of traditional campus management systems, improve the efficiency of management, and finally achieve the goal of improving teaching quality, management and scientific

research level, campus construction and management informatization.

(4) The development and application of digital campus management system can fundamentally change the current unorganized manual management mode

Combining the campus visual management system with other information on the campus can provide users with a three-dimensional visual, rich and colorful browsing and query environment, thus improving the previous dull interface. The distance education of colleges and universities can also use this management system to develop vigorously, thus providing a good platform for the construction of digital colleges and universities.

(5) Digital campus construction can better integrate with Luliang big data system

Lyuliang University is located in the New City Development Zone of Luliang City. The construction of digital campus can provide an opportunity for the planning and development of the new district of Luliang City. The priority of digital campus visualization construction can provide favorable data for the industrial transformation of Luliang City.

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