The Planning and Design of Digital Smart Campus

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Abstract: Under the background of "Digital Liaoning, Smart Province," as the application of a new generation of network information technology in colleges and universities, the digital smart campus is an important part of digital Liaoning education informationization. Combined with the overall actual situation of the university campus, in line with the principle of "People-oriented, Service-oriented, Information Interoperability and Data Sharing," through the idea of "management + service," the traditional application system with management as the core to the service as the core is realized. On the basis of digital information and networks, a new digital smart campus is built based on several information technologies. From the aspects of architecture design, platform and application integration, systematic overall design and scientific and reasonable deployment, to create an efficient one-stop digital intelligent information service platform to fully optimize the use of digital information resources, to provide timely, accurate and efficient campus information services for teachers, students and staff, and to provide cross-departmental business management and convenient information services for the whole school users through the virtual digital means for display and publicity. The overall planning of the campus is carried out step by step, and the campus network, digitalization, virtualization and intelligence are gradually realized. Expand the time and space dimension of the real campus, improve the overall operation efficiency, and then improve the quality of talent training, management level and management efficiency.

Keywords: University; Smart campus; Digitization

1. Introduction

With the arrival of a new round of technological revolution, a new generation of network information technology has been deeply developed and plays an increasingly important role in social life. Under the background of Liaoning Province's construction of "Digital Liaoning, Smart Province," digital smart campus as a new generation of network information technology applications in colleges and universities, ADAPTS to the information requirements of society and higher education. Is an important content of education informationization, but also an important part of digital Liaoning. The construction of a digital smart campus is the inevitable trend of the current social development into the new information age and digital age and is the

organic combination of smart campus and digital campus.

2. The significance of research

The digital smart campus can transform the campus into a virtual digital education environment, and all education and teaching resources are stored and applied in digital form. The main goal of digital campus construction is to realize the digitalization, informationization and networking of campus teaching, scientific research, management and service; deepen the teaching reform, improve the quality and efficiency of running a school [1]; realize the rational planning, rational distribution and rational utilization of information resources and information services; improve the quality, effectiveness and efficiency of the school management process and management system; ensure the reliability, safety and scientificity of resources and services [2]. Wisdom in digital campus environment, students' time and space is no longer confined to previous classroom, business can be extended the traditional campus management and operational efficiency will be greatly ascended. Finally, the comprehensive informatization of the education process can be realized to improve the quality of teaching, management level and office efficiency [3]. At the same time, the construction of a digital smart campus is also an effective way to reflect the comprehensive strength of the school, and improve competitiveness and long-term sustainable development.

This research is to cooperate with Liaoning Weisen Company, combined with the actual situation of the Liaoning Institute of Technology Binhai campus, to carry out the construction of a digital smart campus. Based on digital information and networks, the new generation of network information technology, a kind of collection, processing, integration, storage, transmission and application of teaching, scientific research, management, life service and other campus information is planned and designed for the Binhai campus of Liaoning Institute of Technology. A one-stop information service platform (information portal and work platform) for digital smart campuses to make full use of related resources [4]. Through the realization of digital intelligence from the environment, resources to applications, building a digital space based on the traditional campus, expanding the time and space dimensions of the real campus, building an online service hall for the whole school teachers and students, building a unified working platform, with the help of virtual digital means of display and publicity, providing convenient services, simplifying business processes, and finally realizing the comprehensive digital and intelligent campus [5]. In line with the principle of "People-oriented, Service-oriented, Information Exchange and Data Sharing," the digital smart campus can provide timely, accurate, efficient, anytime and anywhere campus information services, and provide cross-departmental business management and convenient information services for the whole school users.

Through the idea of "management + service," the school realizes the transformation from the traditional application system with management as the core to the service as the core. It can be realized that the integration and configuration optimization of all kinds of resources in the school, improve the management level and work efficiency of the school, and make the digital intelligent application of the campus reach a high level [6]. To achieve the establishment of a new and efficient education system, the quality of school personnel training and management level can be improved, together with management efficiency. The leapfrog development of school informatization can be realized, and fully improve the management and serviceability of the school. As a part of the construction of a smart city, the planning and design of a digital smart campus has certain practical significance for the construction and realization of "Digital Liaoning" [7].

3. Research status at home and abroad

The large-scale informatization construction of Chinese universities started in the 1990s, which was better than that of Western developed countries. After the 1990s, the China Education and Research Computer Network (CERNET) was built and put into use. With the "cross-century education reform education revitalization action plan," a series of engineering projects were drafted, including "211 projects," "modern distance education project" and "985 projects" strongly driven by domestic colleges and universities gradually "digital campus" in the campus network construction scheme [8]. In the subsequent practice process of digital campus construction, the concept of a digital campus has been gradually expanded and improved. Especially in 2002, "the National Key University Digital Campus Construction Seminar" was held, which prompted the formation of the digital campus construction upsurge in China. Early in the more developed city is located in the coastal regions and colleges and universities, the domestic university informatization construction has very swift and violent development, information technology has been widely used in colleges and universities teaching, scientific research and management and other fields has obtained the good effect [9]. Nowadays, based on the development and progress of science and technology, the vigorous development of education in China and the construction of schools has achieved leapforward development. With the arrival of the era of information society, artificial intelligence and big data, the traditional campus management model has gradually failed to keep up with the pace of the era. Campus informatization, digitalization and wisdom have become a trend in contemporary campus planning and design, and campus informatization construction has entered a new era.

4. The research content of the digital smart campus

Combined with the overall actual situation of the Binhai campus of the Liaoning University of Technology, in line with the principle of "People-oriented, Service-oriented, Information Exchange and Data Sharing," the school realized the transformation from the traditional application system with management as the core to the service as the core through the idea of "management + service." From the aspects of architecture design, platform and application integration, the systematic overall design and scientific and reasonable deployment are carried out to build a one-stop information service platform, which provides timely, accurate, efficient, anytime and anywhere campus information services for teachers, students and staff, and provides cross-department business management and convenient information services for all users of the university. The overall planning of the Binhai campus was carried out step by step, and the network, digitalization, virtualization and intellectualization of the campus were gradually realized [10]. Build first-class digital network environment, teaching resources, teaching and learning environment, management means and working environment, realize digital intelligent learning, teaching, scientific research, management, life and service, create digital virtual space, establish multi-level, innovative and open colleges and universities, realize education informatization and modernization [11].

The main body of the planning and design of the digital smart campus of Liaoning Institute of Technology Binhai campus includes three parts: (1) Infrastructure platform; (2) Foundation support platform and (3) Business application system. The intelligent business application subsystem can include an integrated cabling system, network monitoring system and security protection system, integrated pipe network system, video monitoring system, intrusion alarm system, vehicle management system, information guidance and release system, access control management system, comprehensive maintenance and repair management system,

campus card system, student management system, office OA system, educational management system, cloud classroom platform system, teaching resources, source management system, learning situation analysis system, internal control management system, library management system, online payment system, virtual display system, etc.

The construction of the smart campus is mainly based on the infrastructure platform, the construction of the digital campus "information standards and security operation and maintenance system," to complete the construction of an intelligent application system [12]. Through the data integration of "business application," the sharing and exchange of digital campus information resources can be realized, and the application integration and development based on the support of digital campus information integration can be realized, such as WEB, mobile client and other digital campus information "comprehensive service display."

5. Specific research implementation and proposed to solve the problem

The specific implementation and steps of digital smart campus planning and design include: building the overall framework of digital smart campus planning and design in the Binhai campus to determine the technical architecture, the system adheres to the design concept of "large integration and small application" in the technical implementation planning, relies on the integration platform with the ESB bus as the core, breaks up the application system set of each level in the application planning, and the subsystem modules are integrated horizontally on the data bus to realize interconnection. Planning and designing the infrastructure platform, foundation support platform planning and design, intelligent business application system planning and design, including business applications and integrated services [13].

The key issues to be solved in the planning and design of a digital smart campus include the planning and design of a digital smart campus in Binhai campus tailored for Liaoning University of Technology, which can help the school realize the unified management of digital smart campus construction and realize the comprehensive informatization of the education process [14]. Campus construction of a one-stop information service platform, to build the campus Internet service hall, people-oriented, service-oriented, information exchange and data sharing, to provide timely, accurate, efficient and campus information services anytime and anywhere, provided meet across departments of business management, for all the user's convenient information service, simplify the process, realize the unified management, improve work efficiency, give full consideration to security and scalability. The idea of "management + service" helps schools realize the transition from the traditional application system with management as the core to the front end with service as the core. It realizes the integration and configuration optimization of all kinds of resources in schools, improves the management level and school efficiency, and makes the application of school informatization reach a high level. With the help of intelligent business applications of the campus platform, it realizes dynamic monitoring of campus status, visual data presentation, multi-dimensional timeline data management, fault research and real-time alarm, etc., and realizes global data visual, manageable and controllable.

6. The role and application prospect of digital smart campus planning and design

Digital campus by integrating the wisdom of digital teaching resources, building the online teaching platform, etc., to promote the depth of the integration of information technology and education, make more flexible and varied teaching methods, and teaching content more rich diversity, to improve the quality of the education

teaching. Digital smart campus uses Internet of Things technology, big data analysis, and other means to realize the intelligent monitoring and management of campus facilities, personnel, resources, etc., which helps to improve the efficiency of campus operation, reduce resource waste, and realize the refinement and scientific of campus management [15]. It greatly improves the convenience of students' life and service experience. The use of video surveillance, intelligent access control and other technical means to improve the security of the campus, real-time monitoring of the security situation of each area of the campus, and timely detection and disposal of potential security risks. The digital smart campus provides a large amount of data resources, which can be used for academic research and innovation. Through data analysis and mining, colleges and universities can better understand students' learning behavior and campus resource utilization, and provide more reference for scientific research. The digital smart campus provides more cooperation possibilities for universities and enterprises. Through the functions of a digital recruitment platform and internship information management, it is easier for students to communicate and cooperate with enterprises, which promotes the in-depth development of industry-university-research cooperation.

7. Conclusion

In summary, the planning and design of a digital smart campus play a significant role in improving the quality of education and teaching, optimizing the efficiency of campus management, improving the service experience of students, strengthening campus security management, promoting academic research innovation and strengthening school-enterprise cooperation, and its application prospect is very broad under the promotion of cloud computing, Internet of things and other technologies.

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