

Informatization Technology Helps University Informatization Construction

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Abstract: The information construction of colleges and universities cannot be separated from the development and upgrading of information technology. Firstly, this paper introduces the main application scenarios of various information technologies in the informatization construction of colleges and universities; Then it points out the challenges faced by the current university informatization work; Finally, in view of these challenges, this paper elaborates on the optimization direction from the aspects of online teaching platform, big data development and intelligent operation and maintenance construction, aiming to improve the quality and efficiency of college informatization construction.

Keywords: information technology; Colleges and universities; build

In March 2021, China released the Fourteenth Five Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of the Vision Goals for 2035. According to the outline, the university informatization department should put forward a development plan for the university informatization construction, and comprehensively promote the upgrading of the university informatization construction from the aspects of education, scientific research and educational administration. In this new situation, how to combine the new network facilities and network technology, cloud computing, artificial intelligence, big data and other new information technologies with the education, teaching, talent training, development research, management and services of colleges and universities, and promote the work of colleges and universities to a new level is a problem that college information workers need to consider.

1. Application Scenarios of Informatization Technology in University Informatization Construction

Information technology can be understood as a new technology represented by "artificial intelligence" and "big data". The application of information technology in the informatization of college education has the following scenarios: □ The construction of information infrastructure relies on new network facilities and network technologies (such as 5G, Internet of Things, cloud computing, etc.), network security technology, multimedia technology, and the construction or upgrading of information infrastructure, such as building a safe and high-speed campus network. Build a high-performance laboratory on campus to support scientific research needs. □ Rely on cloud computing, big data analysis, artificial intelligence and other technologies to analyze the operation data of education, scientific research, educational administration, logistics and other operations, and improve the management mode of colleges and universities. □ Build an information-based intelligent platform. Based on cloud computing, digital twins and other technologies, servers and other devices in the campus can be gathered to form a large resource library, and various campus services can be provided to users through the campus network. The main applications are to build a safe and stable intelligent campus management platform, build a safe, stable, high-speed, open online education and teaching platform, and build a safe, stable, user-friendly educational affairs platform.

2. Analysis of the Difficulties Faced by the Informatization Construction of Colleges and Universities

China's higher education is moving from the stage of infrastructure development to the stage of reform and innovation. The informatization construction of colleges and universities has also formed its own characteristics in the development, but under the background of the new era, there are still many problems, mainly reflected in:

2.1 Insufficient power to apply new technologies

The informatization construction of colleges and universities is more inclined to stable technology selection. For new technologies on the market, the use of power is insufficient. In terms of campus network construction, all-in-one card construction, data center construction and other aspects, they tend to use very mature technologies to ensure the stable use of various businesses within the campus. However, the application of emerging technologies is insufficient, and sometimes it is difficult to meet the needs of a small number of teachers and students on new technologies and more intelligent platforms.

2.2 Lack of data centralized management system

A large amount of data will be generated in the daily education and research work, personnel work and educational administration work of colleges and universities, and a large number of data are highly relevant but belong to different departments. However, due to the relatively independent management system, the school lacks a unified centralized management system for these highly relevant data, which leads to the relatively independent data due to the different departments, and there is no channel to share interfaces, To some extent, it has

formed an “information island”, which has led to the waste of school resources. For colleges and universities, formulating relevant rules and regulations, connecting the data of various departments to form a large database, and developing a one-stop campus process platform based on emerging technologies in the market is the content that information related departments need to think about. Such application can simplify the campus business process, open up the data of various departments to facilitate data synchronization, and is conducive to the effective use of the overall resources of colleges and universities.

2.3 Low efficiency of offline process

There are many offline processes in colleges and universities, which require teachers and students to complete relevant businesses offline according to the work process. This situation may lead to low work efficiency, which is the manifestation of insufficient informatization of college business. It is necessary to simplify the work process, form a series of online electronic flows of relevant processes, and teachers and students launch relevant business applications through electronic flows to improve the work efficiency of teachers and students.

2.4 Resource sharing in colleges and universities cannot be unified and coordinated

Colleges and universities have a lot of digital resources, which are distributed in libraries, archives, laboratories and museums on campus. However, most of these resources exist in the form of paper resources. Teachers and students need to apply offline for relevant resources for reference. To some extent, this hinders the efficient use of campus resources. Colleges and universities can convert paper resources into electronic resources and put them on the platform in a unified way. Teachers and students on campus can easily access online resources through unified identity authentication, which reduces the threshold for access to resources.

3. Utilize new information technology to optimize college informatization construction

With the development of new information technology, the “new infrastructure” represented by new network facilities and network technologies (such as 5G, Internet of Things, etc.), artificial intelligence, cloud computing, big data, and edge computing will bring new vitality to the informatization construction of colleges and universities. The informatization construction of colleges and universities connects the boundary of campus network and pushes the informatization of colleges and universities from “LAN” to “Internet”; From “fixed” to “mobile”. In the process of informatization construction, on the one hand, we should pay close attention to the current situation of informatization development in colleges and universities at home and abroad, and closely follow the development trend of informatization construction; On the other hand, attention should be paid to the technical points of new network facilities and network technologies (such as 5G, Internet of Things, etc.), artificial intelligence, cloud computing, big data and other related technologies.

Colleges and universities should promote the application of new information technology, upgrade the online education exchange platform, improve the informatization level of college education, and promote the fair, open, high-quality and quantitative construction of college education; Build a safe, stable, efficient and humanized educational administration platform, and promote the development of educational administration to a more efficient, safer and more humanized direction .

3.1 Online teaching in the background of cloud computing

The continuous development of network technology has shortened the physical distance between people, followed by the application of various online teaching platforms. College students can enrich their skills by learning relevant professional knowledge in MOOC and other course platforms to meet the job needs of the growing modern society. College teachers can realize distance teaching through online teaching, which can ensure that teachers and students can take the same course in different places. After analysis, we found that online teaching can enable learners to ignore the restrictions of time and space, and under the appropriate network conditions, they can learn the curriculum resources provided by colleges and universities without restrictions. It improves students’ self-learning ability, increases students’ learning efficiency, promotes the reform of traditional teaching mode, and also promotes the improvement of teaching quality to a certain extent, which has a very favorable impact on teachers, students and colleges. Therefore, the importance of online teaching platform relying on cloud computing technology is self-evident .

The online teaching platform mainly needs several function points, namely:

- a. The system operates stably, and there is no delay or jamming when multiple people are online;
- b. The system has high security and does not disclose personal privacy information;
- c. The system has powerful functions, such as sign in, online communication and document sharing;
- d. The system performs man-machine verification on the personnel entering the course to ensure that the students of the school-based course can access the course in real time;
- e. It provides playback function for teachers and students to facilitate students to review courses.

The application of online teaching also needs to pay attention to several problems: first, the load of online teaching, which mainly tests the performance of the online teaching platform. The online teaching platform should ensure that at least 100 people have concurrent access

to the scene without delay and stuck problems to ensure the course experience; Second, the bandwidth of online teaching. Colleges and universities should require teachers and students who access online teaching platforms to be in an environment with sufficient bandwidth to ensure the quality of courses; the third is the organization and management of the online teaching platform. The online teaching platform needs to have the functions of students' sign in, raising their hands in class, and uploading homework to verify students' learning progress and quality.

The online teaching exchange platform relies on the new network facilities and network technology, cloud computing technology, network security technology, and multimedia technology to simulate the real classroom. Teachers and students can not only complete the normal teaching of the course, but also interact in real time. Moreover, the exploration of online teaching also provides a new development idea for the development of online education in China and the development of education fairness.

3.2 Under the background of big data era, information technology helps the informatization of university educational administration system

With the continuous in-depth development of the education industry in China, universities have made great progress in the scale of running schools, research fields and infrastructure construction, and the rapid development of these fields can not be separated from the construction of the educational affairs information platform. The safe, efficient and humanized educational information platform not only simplifies the business workflow, but also improves the operational efficiency of the business; At the same time, relying on big data technology, we can better optimize business processes and provide a basis for personalized management by analyzing various data accumulated in the educational administration platform.

In the age of big data, every piece of data is valuable. Relying on big data technology, these data collected by the educational administration information system can maximize their value. Big data, as its name implies, is a collection of massive data that comes from the behavior data of massive users over and over again. It is characterized by huge data volume, various data types, low value density, high commercial value, and fast and timely processing speed. The strategic significance of big data does not lie in the control of huge data information, but in the professional processing of these meaningful data. Big data technology finds many rules and conclusions through data collection, data storage, data management, data analysis and mining, data display, etc. .

The educational administration system based on informatization can achieve the following:

a. Connect the educational administration and other departments such as colleges and students in the university, integrate and connect the data resources of each department, and open the interface to other departments, so as to form a benign flow of educational administration data;

b. In addition to the standard data interface, the educational administration system needs to reserve some expansion functions in advance to meet the constantly developing teaching needs;

c. As the core system of colleges and universities, the educational administration system needs to operate in a stable and secure environment, deploy the server in the core computer room of the school, and distribute the authority of system users through identity authentication, authority distribution and other ways to ensure the security of the system.

d. Big data analysis can be used to provide decision-making analysis channels for college teachers and students. For example, the analysis of course selection and classes can be used as a reference to a certain extent for the decision-making of next year's courses.

The university educational administration system based on informatization and big data development can provide complete and comprehensive functions for the educational administration personnel, save the time and efficiency of the educational administration personnel, make the educational administration management convenient and efficient, promote the overall teaching reform of university education, and have great significance for the construction of undergraduate courses in universities.

3.3 Intelligent network operation and maintenance in the context of smart campus

The network construction and operation and maintenance work of colleges and universities generally includes network planning, network management, network asset allocation and network equipment access analysis. The operation and maintenance management personnel need to have a very clear understanding of the current topology, network asset allocation and operation management of the campus network. Therefore, the development of an integrated asset allocation management The intelligent operation and maintenance system for network probe analysis and intelligent early warning of network faults is particularly important.

The existing operation and maintenance management platform is not intelligent enough. The existing operation and maintenance platform is only a simple collection of equipment information statistics, export traffic statistics and other related functions. The existing platform cannot register and record the selected IP, switch, port and other related information in a one-stop manner in the scenario where users apply for IP. The existing platform cannot perform one click configuration and rollback operations on the switch configuration, the existing platform is unable to realize the functions of fault early warning and fault processing work order recording .

The intelligent operation and maintenance platform needs to have the following core key functions:

a. Integrated display: the intelligent operation and maintenance platform needs to display the campus network assets and asset status,

export flow status, network topology display, probes and other functions in an integrated way, and focus on the basic functional modules in daily work;

b. Process customization and report export: The intelligent operation and maintenance platform needs to refine the network management related processes and form online processes. The entrance is formed in the process of teachers and students applying for IP, network administrators querying VLANs, switches and AP status, etc., to facilitate users' use. In actual work, the network administrator may need to analyze the report data such as server, switch and IP address usage.

c. Network security protection: the network of colleges and universities may encounter attacks from the outside world, or there may be mining and other non compliant behaviors. The intelligent network platform needs to analyze and process some abnormal IP addresses, prompt and process possible ongoing network attacks, and form a processing report.

Through the analysis of user needs and system design, the intelligent network platform achieves the management and monitoring of network core devices, IP addresses and switches, and provides a powerful processing platform for the construction of university networks. Through the intelligent operation and maintenance platform, it can greatly improve the work efficiency of network managers, effectively simplify business processes, achieve a high degree of integration of existing businesses, and has practical significance for the construction of university networks.

4. Conclusion

With the development of new information technology, the "new infrastructure", represented by new network facilities and network technologies (such as 5G, Internet of Things, etc.), artificial intelligence, cloud computing, big data, and edge computing, will effectively help the construction of university informatization, improve the level of university informatization infrastructure, promote the fair and open development of education, improve the efficient and humanistic development of university business, and comprehensively improve the satisfaction of teachers and students, Improve network security and information construction in an all-round way. There is a certain degree of mismatch between information technology and administrative management process in colleges and universities, which wastes resources to a certain extent. In the face of various difficulties in college information application, online teaching Under the background of big data era, information technology helps to promote the development of university information construction in the direction of informatization of university educational administration system and intelligent network operation and maintenance under the background of smart campus. All colleges and universities should put forward the goal and development plan of their own informatization construction based on the current situation of their own informatization construction, so as to improve the informatization level of our colleges and universities.

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