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A discussion on data docking of laboratory comprehensive management system from the perspective of smart campus

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Abstract: *From the perspective of the smart campus, this paper introduces the historical background before the construction of the laboratory comprehensive management system of the experimental teaching center of Shandong University of Finance and Economics, analyzes and discusses the problems of data docking in the construction, and puts forward a suggestion that the smart campus should improve its real-time performance according to the data update frequency.*

Keywords: *smart campus, laboratory comprehensive management system, data docking*

1. Introduction

Smart campus is the advanced form of education development, but also the ideal goal of school construction, and information is undoubtedly an effective means to achieve this goal. In recent years, great achievements have been made in the informationize construction of Chinese colleges and universities, and great progress has been made in infrastructure construction and application development. However, problems such as single platform, business-oriented, decentralized system and fragmented data make the goal of smart campus far from being achieved [1,2].

In order to improve the school information environment and adapt to the development of the new generation of information technology, all kinds of schools carry out the construction of smart campus in an orderly manner according to their own development needs. At present, although the hardware platform and corresponding software platform of the smart campus have been built and the system has been put into operation, there is still a big gap compared with the expected effect. The experimental teaching center of Shandong University of Finance and Economics built a laboratory comprehensive management system relied on the smart campus construction (here inafter referred to as laboratory system), integrated the business data of multiple departments and realized fine management and control on laboratory, by this, we discussed the achievements and existing problems of the practical application of the smart campus in this paper.

2. History Background

Since 2005, the experimental teaching center of Shandong University of Finance has adopted the computer room management system (hereinafter referred to as the computer room system) to centrally control 3125 computers in 69 laboratories in shunge and shengjing campuses, which can carry out student identity authentication, teaching reservation, classroom login control and non-teaching plan billing. At the same time, it can also control the running state of the machine room, screen content, user programs, access to the website, external equipment and so on, and discover the changes of hardware states of computers in time through hardware information management, so as to realize the intelligent management of the laboratory and save a lot of manpower.

However, due to the different data formats, limited data information of teaching management system and campus card system, they have not been connected with computer room system. The teaching information of the computer room system needs to be manually imported by the administrator of the experiment center every semester, the administrator needs to manually adjust the teaching information every time in the middle of the semester when teaching management dept adjusts. While the campus card system on students' class information maintenance does not reach the designated position, students turn professional, foreign exchange, such as suspension change causes the class information, slow to adjust in the campus card system, lead to course information according to the class

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to make an appointment to the laboratory, is new student in class due to do not belong to the class in the campus card system can't log in the computer lab.

In 2011, Shandong University of Finance and Shandong University of Economics merged into Shandong University of Finance and Economics. In 2014, the experimental centers of the two universities merged. In 2015, the Network Center of Shandong University of Finance and Economics promoted the construction of smart campus, integrating application systems and data of various departments. According to the current situation of the business system of each department, the network center puts forward the construction scheme of the shared database, pushes the business data of educational administration system, student status system, campus card system, personnel management system, asset management system, book lending system and other business data to the shared database platform, and standardizes the data for use by each department on campus.

In order to achieve the fine management and control of 6,150 computers in 156 laboratories in Shengjing, Shungeng and Yanshan, the experimental Teaching Center completed the construction of the laboratory system in 2019-2020, and achieved the goal of fine management and control by integrating business data from multiple departments.

3. Discussion on data docking

In order to be able to solve the machine room management system management system is not accurate for educational administration information in time, the campus card system, the problem of data information, we use the wisdom campus Shared library system to provide the business data, developed a Shared library interface in the laboratory system, campus card user information was obtained from the Shared library, student information, personnel information, fine control in lab was realized. However, since the data synchronization frequency of the shared database and all departments is once a day, and the teaching administration department sometimes adjusts classes on the same day, in order to timely obtain the latest course information, we independently developed the interface with the teaching administration system to obtain the course information hourly.

3.1 Data fusion effectiveness

The corresponding relationship between student id and class was obtained from the student status information in the shared database, the corresponding relationship between student ID and card number was obtained from the campus card user information, and the permission of access control and card swiping was granted to students in the class lab according to the teaching arrangement. Obtain the course information from the educational administration system, write the reservation data to the computer room system, grant the permission to log in the laboratory computer to the students in class; The initial password of the user is set to the last six digits of the ID number according to the student status and personnel information of the shared database; It realizes the real-time accurate correspondence and control among students, courses, laboratories and machines.

3.2 Card balance synchronization and allow overdraft strategy

When a student logs in, the identity authentication program will contact the campus card system to obtain the balance of the student campus card, so as to avoid overdrawing and using the computer. However, it is found that because the laboratory is distributed in three campuses in different regions, the intercampus network interconnection line is not stable. If the interconnection line failure (or campus card server failure) leads to the failure of identity authentication program to obtain the balance data, students can not log in and use the computer. In order to ensure teaching and optimize user experience, we adopted the strategy of daily synchronization of the card balance to the computer room system, and set the overdraft limit for students' campus cards, which greatly reduced the impact of external faults on students' login and use of computers, and avoided excessive overdraft for students.

4. Summary and outlook

From the construction process of laboratory system, It can be seen that smart campus construction played an important role to promote departments business data integration, and to achieve fine control, however, there are some problems such as real-time data is not enough, so improve real-time performance according to data update frequency and the actual demand of business departments, is the

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improvements smart campus needs to make.

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