Study of Wisdom Campus Overall Architecture Model in Vocational Colleges Based on Service Oriented Architecture

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Abstract. Wisdom campus is a high-level stage of digital campus construction and needs to be improved in addressing the issues of information silos and legacy systems. Based on the SERVICE ORIENTED ARCHITECTURE-based vocational schools wisdom campus overall architecture model contains reusable services and well-defined, standards-compliant interface, through services to achieve different platforms, different languages on the exchange between the system can be targeted at vocational colleges to provide business processes, To provide fast and flexible changes. The model of "platform + application + service" proposed by the model and service-oriented thinking can better solve the problem of information silos and legacy systems and provide an effective method for upgrading the Informatization level of vocational colleges.

1. Introduction
With the further development of the Internet and the gradual popularization and application of the Internet technology of a new generation, the international education informationization ushers in new opportunities for development. The traditional campus will gradually move toward the smart campus through the digital campus. After three stages of development, such as networking, digitization and informationization, the education industry in China began to gradually enter the stage of intelligent education. The smart campus is one of the landmark products of the combination of digital campus and wisdom education. It is a hot spot in information construction and reform in education industry in recent years. How to accurately grasp the connotation of "smart campus" and give full consideration to the emerging new technologies and make a far-sighted planning and construction of "smart campus" is a new topic for educators. At present, on the whole, our country has made a major historical breakthrough in the construction of education informationization, but at the same time it faces a series of outstanding problems. First, the information infrastructure is still at a low level, can't effectively meet the development needs of various types of education at all levels; Second, a large number of digital campus system, the system independent of each other, there are isolated islands of information and applications; third is the construction of university information Lack of complete unity, covering a comprehensive, efficient and stable, scalable application framework. [1-3]

Wisdom campus generally refers to the new information technology that integrates school teaching, research, management and other types of campus resources and application system efficiently through the application of new technologies such as the Internet, Internet of Things and social software so as to realize intelligent management and service Campus construction mode. Therefore, the existing basic platform should be combined with new technologies such as cloud computing, big data and Internet of Things to build a complete, unified, comprehensive, efficient, stable and scalable application
framework to solve the problems existing in the informatization of vocational colleges. To "smart campus" become a hot issue of information technology in vocational colleges. [2,4].

The construction of the smart campus in vocational schools is still in its infancy, fulfilling the requirements of a basic digital campus, but far from being intelligent, especially in the field of big data. Mainly reflected in the various departments, the data between the colleges did not achieve sharing, fragmented, resulting in "information island" phenomenon, leading to different data when the leadership decision-making, affecting the effectiveness of decision-making and pertinence. [3] Wisdom Campus "Information Island" and other problems and the solution to the remaining problems [5,6].

2. Enterprise-class SERVICE ORIENTED ARCHITECTURE
Service-Oriented Architecture is an enterprise-class service-oriented architecture, enables the distributed deployment, composition, and use of loosely coupled coarse-grained application components over the network as required. SERVICE ORIENTED ARCHITECTURE, with its loosely coupled nature, allows colleges to add new services or update existing services in a modular fashion to address new business developments that can be served through different channels, with existing or existing Application as a service to protect the existing IT infrastructure investment. SERVICE ORIENTED ARCHITECTURE can respond quickly to business changes, take advantage of investments in existing applications and application infrastructures to address new business needs and present a framework that supports organic business [7]. SERVICE ORIENTED ARCHITECTURE framework for enterprise-class applications provided by the distributed, high reliability, advanced solutions. The Web-based software industry's public standards, independent of the operating system and server-independent "cross-platform," make it "write once, run anywhere" and is the best fit for running on the Internet with powerful "business logic" Application [8].

3. Vocational college wisdom campus model
The vocational school campus structure model from the wisdom of vocational colleges and universities hardware infrastructure, public support platform, intelligent software applications, integrated information services, scientific decision support, security protection, operation and maintenance services management, uniform standards from the bottom up Design, high-performance cloud computing as a data storage, mining, analysis of the core technology, the use of big data as a basis for organizational management decision support, make an overall plan and top-level design, construction and Education, management, service information as one of the key core database of school education information cloud service platform to form an information system suitable for the planning and development goals of the college and form an informationized learning environment and supporting service system for all to enjoy quality educational resources, Promote the teaching of online courses, e-resource sharing of book documents, virtual simulation experiment center and other supporting information construction, and promote the reform of mixed education teaching mode. We will promote the construction of information resources such as digital book resources and digital teaching resources, carry out extensive training in enhancing teachers 'informational instructional capabilities, and continuously improve teachers' information literacy. In the campus network infrastructure, data center infrastructure, information security and other aspects continue to develop, built into the office automation, educational administration, research management, student management, personnel management, enrollment and employment, logistics services, "Palm University" and other information subsystems One-stop online service hall to achieve the universal use of online resources in the teaching and learning process, to provide a solid information protection for the improvement of education and teaching quality, and to create a high-level intelligent campus model framework featuring information collection and resource sharing.
Figure 1 "smart campus" integrated service model

The "smart campus" integrated service model is shown in Figure 1. It mainly includes seven levels: hardware support environment, software support environment, information resource center, application system public support platform, application system layer, user authentication and user layer, information service layer, and all applications strictly follow the relevant technical standards and norms.

The platform adopts the N-level architecture system, and builds the hardware and network layers, information resource center, public support platform, application layer, user authentication and user layer from the bottom up, all layers are based on the services provided by the lower layers. The platform through heterogeneous application integration technology, integration of existing information systems in various departments, through the interface integration and single sign-on technology for the end user to provide a unified interface.

(1) Infrastructure layer: Wisdom campus hardware and software support system, including network resources, hardware servers, storage, support software.

(2) Wisdom campus application system based platform: including educational information hub platform, unified identity authentication platform, public data center platform.

(3) Application system layer: It is for all kinds of information management system and various types of information service system for teachers and students in school departments. It can be divided into management center, resource center and service center.
4) Information service layer: for all levels of leadership, administrators, teachers, students provide a variety of personal business operations services, queries, reports, statistical analysis, decision-making.

5) Information Security System: In the platform construction process, give full consideration to the various levels of security measures and security technology, through hardware and software technology and security management tools to ensure the system in a safe and stable environment to run. Through the computer room management, internal and external network isolation, data encryption, access control and other security mechanisms to achieve legal access to data and information.

6) Information Standards / Management / Security System: In the platform construction process, full reference to various national technical specifications and industry standards. The standard specification system is an important guarantee for the normal operation of the system and contains two meanings: data standardization and management standardization. Data standardization refers to the establishment of a standardization system for spatial data and related business data. Management standardization refers to the formulation of work standards and assessment standards for all relevant responsible parties so as to improve the daily work system.

4. SERVICE ORIENTED ARCHITECTURE-based vocational schools wisdom campus architecture model

SERVICE ORIENTED ARCHITECTURE framework for enterprise-class applications provided by the distributed, high reliability, advanced solutions. The Web-based software industry's public standards, independent of the operating system and server-independent "cross-platform," make it "write once, run anywhere" and is the best fit for running on the Internet with powerful "business logic" application. Based on the SERVICE ORIENTED ARCHITECTURE architecture system of intelligent campus and its application system should follow the following SERVICE ORIENTED ARCHITECTURE is shown in Figure.2 technologies, including service component architecture related technologies and service data objects related technologies and so on.

Figure. 2 SERVICE ORIENTED ARCHITECTURE

(1) object-oriented component technology
Object-oriented component technology is a completely hardware and operating system-independent development environment that focuses on developing reusable components that make up the business "business object" of an application that enables the smooth setup of distributed applications.

The application platform module is relatively independent and the interface is clear. The internal business process upgrade and transformation are independent of other modules. All modules are designed based on the pluggable interface of components and provide data support for the secondary development and analysis of the college in the future.

(2) application server cluster

According to the college's situation, put forward the use of load balancing and Session High Availability program: User front-end with hardware load balancing; backend, deploying multiple Application Servers and enabling Application Server clustering.

(3) performance indicators

The main factors affecting system performance include: network environment (campus network and Internet access), hardware configuration (server and client), system software (operating system, database management system and WEB service system), system architecture design, data structure design, Core algorithm design, deployment design and so on. Fully consider the scientific design of the overall system architecture, the rationality of the data structure design, the advanced design of the core algorithm, the flexibility of deployment design to ensure that the overall system performance is superior and fully meet the design requirements.

5. Application experiment

Based on the above research model, based on the vocational college wisdom campus application platform for SERVICE ORIENTED ARCHITECTURE vocational school campus intelligent campus model for application experiments.

5.1. application experiment

(1) example for one-stop comprehensive service hall is shown in Figure.3

To achieve the core business system interoperability, convergence and integration, built a large-capacity high-performance storage as a support, access convenient, stable and reliable high-speed, to meet the teaching, teaching, research, office workers, enrollment, employment, party, real estate, Operation and maintenance and other application subsystems digital campus unified service platform. For the integrated office, teaching, library management, personnel management, asset management, scientific research management, real estate management, card and other systems do a good job of data interface to achieve the sharing of campus information resources for the "Palm University", integrated school intelligence analysis and other campus applications Provide basic data services for the majority of teachers and students to provide school calendar, class tables, leading schedule, payroll, duty watch, phone book, book search, multimedia management, rules and regulations and other convenient one-stop comprehensive services.
5.2. Experimental Conclusion
The vocational school wisdom campus data center extracts, merges and screens the business data in the operation of the business system, forms a complete and independent thematic database for cross-departmental business and personal comprehensive business, and provides data encapsulation and application service interface. To solve the problem of "information silos" caused by the isolation of isolated business systems, unified data standards, application of standard interface standards, reduction of data exchange costs, inventory of school data assets, statistical inquiry and data mining, exploration of big data analysis The application in school provides a scientific basis for school development decision. It can be seen from the application effect that it can promote the development of informationization of vocational colleges with high precision and fast speed, so it is better suited to solve the "information silos" and the legacy problems in vocational colleges.

6. Conclusion
Service-Oriented Wisdom The overall architecture of the campus system integrates resources, data, information and application processes into service-based smart campus construction through service-oriented integration through information service so that they are related to each other and data are shared. It also helps to reorganize the organization and business processes and effectively coordinate personnel and resources so as to improve the overall efficiency in teaching, research, management, office and learning. In order to achieve the IT and business integration, to meet individual needs, and its rapid response ability to respond flexibly to changes in demand, support for education reform and innovation [9].

The application of SERVICE ORIENTED ARCHITECTURE-based intelligent campus overall structure model in vocational colleges makes it possible to greatly improve the sharing of information resources inside and outside the school. The unified management service platform for high-performance education information cloud and a sound data system can make educational administration, teaching and research, Office, academic, enrollment, employment, party affairs, real estate, operation and maintenance and other application subsystems digital campus education and management information level significantly increased. It can be believed that the overall campus intelligent campus model based on SERVICE ORIENTED ARCHITECTURE forms the rationality of the smart campus with SERVICE ORIENTED ARCHITECTURE architecture and application architecture, which provides a unique reference model for the construction of a smart campus in a vocational college. It will certainly be implemented in a wider area Get more widely used.

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