Talking About the Idea of Smart Campus Network Construction

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Abstract. In order to realize different service applications for different campus users, it is convenient for students to quickly query on-campus and personal information; to improve the curriculum collaboration of faculty and staff to make teaching better; to facilitate school counselors and teachers to query student information; to give leaders a The basis for intelligent decision-making. Through the integration of business information and campus information sharing system; Then, through the construction of visual data management platform and decision support system, the "visual data display" of supplementary data acquisition of the whole school and auxiliary leadership decision-making is realized; Finally, the data governance system of the whole school is constructed through the intelligent filling system and data verification platform to realize the "data cycle governance" of the digital assets of the whole school. It realizes the smart campus network with one-stop access and use, so that users can obtain the services they need anytime and anywhere.

Keywords: Smart Campus · All-In-One Office · Online Service

1 Introduction

Based on infrastructure construction, a school data warehouse is established for units and departments at all levels of the school to realize the inductive collection, dynamic aggregation, intelligent management, and authorized use of data in the school. Based on business and data standardization work, establish a unified coding system for the education industry with people and institutions as the core, gradually convert educational data into data service capabilities, and establish equivalence between data owners, users and application service providers. Sharing channels, promote the return of data through third-party education digital applications to schools, and fully share education data to support the digital reform of schools [5].

2 Construction Goals

The construction of a new generation of campus software infrastructure platform centered on the one-stop office and one-network unified management infrastructure [1],

its combined applications can comprehensively cover various smart campus application scenarios, truly realize the prosperity of the application ecology of the smart campus, and make full use of the industry's The successful model in the Internet ecology fundamentally solves the problem of informatization construction in the smart campus with diverse needs, frequent changes, and the traditional model cannot effectively cover it, and uses a simple, easy-to-implement and widely verified technology and model to informatize the smart campus. Introduce the track of sustainable development to realize the amplification of Internet ecological value in the field of education informatization.

2.1 Solve the Problem of Information Silos

One of the important features of the one-stop office and one-stop unified management is the high degree of information sharing. Through the informatization of business processes across departments and systems, it serves all students, parents, teachers, administrators, school leaders, and the public. Through a unified process architecture and a comprehensive business process driven by data architecture, it is helpful to connect the existing business and information systems of various departments from the business process, promote information sharing, timely linkage update of information, and improve the consistency of cross-departmental data.

2.2 Improving Data Quality in Smart Campuses

The cross-departmental and cross-system characteristics of the one-stop office and one-network unified management, as well as the ability to quickly adjust and optimize the process, can break the problem that the traditional "sports" data governance is difficult to take effect continuously. Based on the source of data generation, construct A virtuous cycle of long-term, dynamic, and continuously improving data governance [2]. Improve data quality through the standardization of business processes, and improve the overall consistency of data through cross-system docking.

2.3 Improve the Integration of Online and Offline Services

In the information service, the physical exchange, information interaction, consulting services, etc. of the offline service hall cannot be avoided. The construction goal of one-stop service will require the realization of the connection between online and offline business. The content of offline services can be "run at most once", and those who can use self-service equipment should try to achieve 24-h offline service through self-service equipment; and so on. A complete one-stop service platform can more effectively achieve "more data travel, less errands for teachers and students".

2.4 Improve Information Operation and Maintenance Service Capabilities

The construction of one-stop service can provide unified information operation and maintenance service, customer service mechanism, inter-departmental coordination mechanism, etc., and can improve the ability of long-term continuous operation, maintenance and improvement in information construction as a whole.
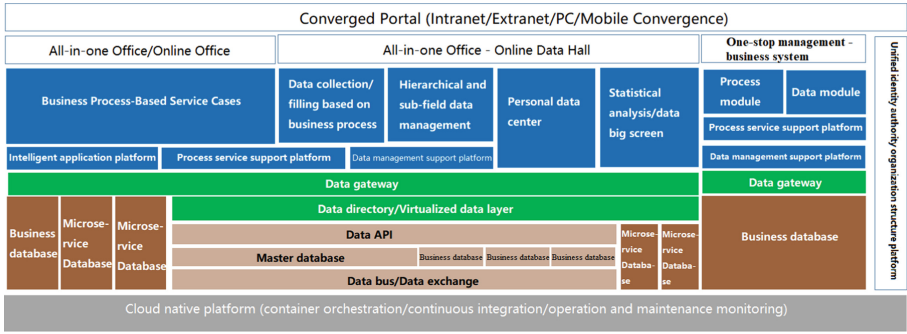
Fig. 1. Overall frame diagram of the smart campus network.

2.5 Driven by the Level of Management Decision-Making

The long-term construction goal of all-in-one office and one-stop unified management is to achieve in-depth information support for school management and services. It provides a credible foundation for further in-depth data analysis, data mining, and decision support in the future.

Under the above construction goals, a long-term smart campus application construction logic based on cloud native technology will be formed through the construction of the basic platform for all-in-one office and one-stop management. The overall framework of the smart campus network is shown in Fig. 1.

3   Construction Plan

Make full use of the existing school information software and hardware, and based on infrastructure construction, for units and departments at all levels of the school, establish a unified basic database of the school, and realize the non-inductive collection, dynamic aggregation, intelligent management, and authorized use of data in the school. Based on business and data standardization work, establish a unified coding system for the education industry with people and institutions as the core, and establish a peer-to-peer sharing channel between data owners, users and application service providers to achieve "unified school-wide information standards", "centralize the authoritative data of the whole school", "improve data quality" and "regulate the whole school data service" four goals.

Promote the continuous sharing of data between school departments and break the "information silos". Drive business innovation, service innovation, and management innovation. Provide high-quality data support for data application services such as the one-stop service hall on the upper level, the "one form" intelligent reporting platform, and big data analysis applications. According to the basic information maintained by each teacher and student, a "one sheet" containing personal basic information, teaching, scientific research, social services, academic performance and other data is generated. According to the requirements of each college (department) and department, the system It can extract the corresponding content from "a form" and automatically fill in the
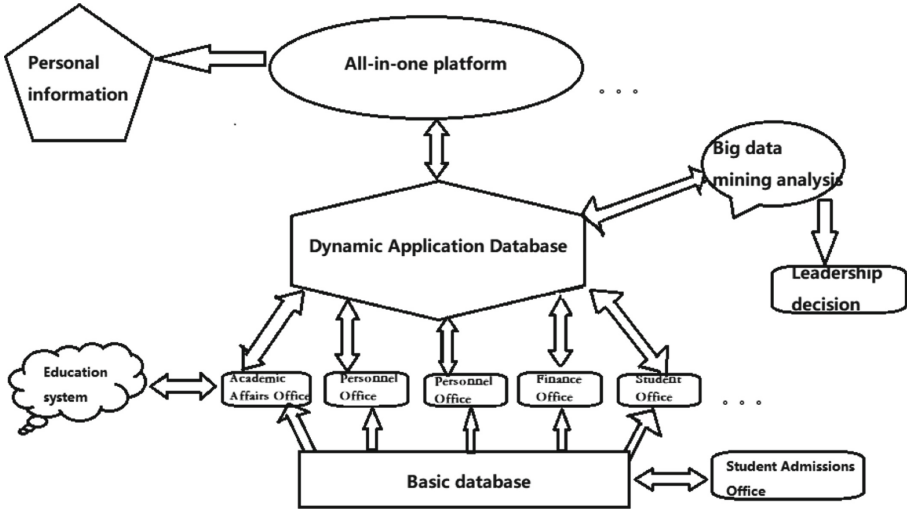
Fig. 2. Topological diagram of smart campus network construction scheme. (Photo credit: Original)

form, and truly realize "one-time filling, multiple reuses, supplementary filling, and confirmation first".

Data governance will be carried out in an all-round way, and the school's data model, data structure, data quality, data security, data life cycle and other aspects will be comprehensively sorted out and constructed from multiple dimensions such as organizational structure, management system, and operational norms. The quality of school data is maintained at a high level to better serve informatization.

Establish an intelligent decision support system, provide data statistics tools, and provide schools with comprehensive and accurate massive data analysis functions and decision support through big data mining and analysis services such as performance management, daily safety warning, and educational data statistics over the years. Conduct analysis based on accumulated business data to provide a basis for school decision-making. The topology of the construction plan is shown in Fig. 2.

4   Construction of a Unified Data Management Platform

4.1   Data Standard

Determining school data standards is the first step in the implementation of data governance. It must be highly valued and cooperated to the greatest extent by all departments of the school. Once the standards are determined, the follow-up work will be based on evidence. According to the situation of the school's informatization construction And conditions, choose the data standard construction that is suitable for the actual situation of the school.

Through the promotion of data standard sorting services, new "Data Standard Maintenance and Process Specifications", "Data Standard Responsibilities of Each Unit" and

"All Unit Process Standard Responsibilities" have been formulated, so that data and process standards can be implemented in all parts. Get up, and standardize the data exchange work of the whole school.

4.2 Data Portal

After passing the data verification, the relevant data inspection results will be displayed, and the display content should not be less than: department data quality ranking, department data verification ranking, department form ranking, department data exchange ranking, and data verification five dimensions comparison display content.

4.3 Governance Center

Based on the data produced by the school's existing business systems, formulate data governance specifications, implement multi-dimensional data governance methods, and ensure high data reuse [4].

4.3.1 Data Governance Model

- Multidimensional governance: Based on the existing business system data of the school, the scope and standards of data governance are formulated, and the uniqueness, accuracy and validity of the data can be guaranteed.
- Flexible configuration: The established data governance platform can configure the business data tables and data field items that need to be managed through the system interface.

4.3.2 Data Governance Standards

- Data governance responsibility system: sort out the data tables and data fields of each business department, formulate the data responsibility list of each department according to the principle of "who produces, who maintains, who is responsible", and formulates the data business tables and information that each department is responsible for, thereby Carry out targeted governance work;
- Data responsibility system classification: Through the division and determination of the data department responsibility system, the metadata is classified and managed according to the department responsibility matrix, and the data is stored in the way of "business department" - "table name" - "field name", to realize the visual management of department data.

4.4 System Integration

Provide data integration and identity integration services for the school's business system.

First, complete the standardized integration and processing of existing data in the whole school, integrate the data currently scattered in various application systems and

use different standardized codes through a series of tools, and store them centrally in the database of the full data center platform as a school-wide Comprehensive and standardized data sources [3].

User management is centralized on the unified identity authentication platform. The application subsystem does not maintain user information independently. All user information comes from the unified identity authentication service. In principle, the basic user information data in the unified authentication user database is required to be relatively complete., the user basic information data of each subsystem is a subset of the user database of the system; for some already built application systems, the unified identity authentication platform supports the application system to establish its own separate database, and customizes the development of background data replication services, so that the application The system can keep the data consistent with the unified identity authentication platform; for the application system with Web, it can achieve single sign-on.

5 Conclusions

From the perspective of "different users", it sorts out and presents service applications for different roles, and provides one-stop access and use through the service portal. Provide convenient monitoring and management functions to facilitate and simplify the maintenance and management of the system, and improve the manageability and ease of use of the system. Users of different roles can enjoy the most timely, appropriate and personalized service content on the portal at a glance. Users can get the services they need anytime, anywhere.

For students, there are clear guidelines for students' course selection, educational administration system, school mailbox, and book information query. Various notices and announcements of the school can be pushed to the student's own portal, and there is no need to search in each application system. Through systematic guidance, students can find interest groups and participate in club activities according to their own interests. It can realize the management and monitoring of students' own specific learning process and effects. Students can check their own specific situation and find problems. Students can change passive learning into active learning, and actively use the school network resource library to learn what they are interested in or feel insufficient. Weak courses. On the Internet, you can also easily check your own timetable and credits, and you can quickly know the approval status of students applying for scholarships. The whole process is transparent and assured. When leaving school, through the online guide, you can know what procedures you have not completed, and it is clear. The process of stamping and signing by various departments is omitted, which saves time and improves efficiency. After leaving school, I became an alumni of the school. In the alumni system, I could keep abreast of school dynamics and classmate information. I felt that although I graduated, I still had a deep relationship with the school.

All business systems for teachers and staff are interconnected, and the information of each system is updated in real time, making it much easier to query information. The school's notifications can be automatically pushed to my own portal without having to look it up by myself. Important information is also pushed to the phone. In terms of

personnel assessment, professional title assessment, performance, etc., the system can automatically export forms according to the data collected by various departments and according to the needs of the corresponding assessment, and many contents do not need to be filled in repeatedly, eliminating duplication of labor. The assessment process is also disclosed online, the process is simple and the effect is convincing. Teaching is the teacher's own job, and each year's subject knowledge can form a certain accumulation, and also form a guide for the subsequent teaching process. Through course collaboration, students' homework is sent and received, and questions are answered, the interaction with students is strengthened, and the teaching effect is better.

For counselors, they can understand student information in real time: by accessing the one-stop service portal platform, counselors can not only view counselors' personal information, salary information, consumption details of the one-card card, etc., but also provide address books, school calendars, news announcements, Class schedule, student information statistics and other services, you can also query the information of the students under your control, including the student's test information, grades, changes in student status, and students' arrears, rewards and punishments, and awards and loans.

Through the various systems established in the digital campus, leaders can directly obtain accurate statistical information. For example, it is possible to know the situation of scientific research projects every year, and to summarize the laws of past acquisition projects in the form of charts, so as to more accurately predict the situation of teaching and personnel training this year. Analyze the teaching process and effect, analyze the effect and progress of the talent training process, and provide a reference for the continuous improvement of teaching quality and talent training level, which facilitates the allocation and decision-making of school resources. The accumulation of data submitted by each department, through big data mining and analysis, extracts the objective data that leaders want to know, which can give leaders a basis for intelligent decision-making. This module acts as the intelligent brain and intelligent decision-making function of the campus network.

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