Building an Efficient, Convenient, and Humanized Modern Student Management Platform for Universities: Applications and Challenges of Information Technology

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Abstract: With the rapid development of information technology, university student management is undergoing a transformation from traditional models to modern ones. To achieve this goal, we need to utilize information technology to integrate, analyze, and process data, and rely on modern management platforms to integrate various campus data from universities. By adopting different models for different functions, we will conduct data analysis and requirement analysis for the university student management platform and build a comprehensive architecture that meets the requirements.

Keywords: Information Technology, Modern Education, Platform Management

1. Introduction

Chinese universities have made significant progress in the construction of information technology, with comprehensive student management platforms as the representative management software providing strong support for student cultivation and management. However, current student management platforms face issues such as information silos, information security problems, insufficient application integration, and poor personalized experiences. How to fully realize the modernization of student management is a new challenge faced by universities. This article aims to explore how to use information technology to build an efficient, convenient, and user-friendly modern university student management platform to address the current challenges.

2. The Practical Significance of Building a Modern Student Management Platform

2.1The Trend of the Times - The Need for Information Reform

By constructing a modern student management platform, we can build a more scientific and reasonable student information management system, achieve digital management of student information, and improve

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management efficiency. At the same time, this platform can meet the information sharing needs among various departments of the school, promoting collaboration and communication between departments. Furthermore, the construction of a modern student management platform can also ensure the privacy and security of student information, avoiding the risks of information leakage caused by paper-based file management. The platform can achieve automated organization and intelligent analysis of student information, providing school leaders and teachers with more comprehensive and accurate student information data support, helping them better develop student management strategies and teaching plans.

Building a modern student management platform is an important information technology project with broad application prospects. This platform can not only improve the school's management efficiency and teaching quality but also promote the sharing and collaboration of information among various departments, providing better support and services for the overall development of students. At the same time, the construction of this platform can bring more social and economic benefits to the school, injecting strong impetus into the realization of talent cultivation goals, and thus promoting the sustainable development of the school. For example, by building a new management and review system based on multi-dimensional data such as student basic information, campus card consumption records, payment systems, access control records, academic performance records, and awards and honors, the transition from paper-based office work to electronic office work can be realized.

2.2.Accurate Portrait - The Need for Talent Cultivation

The construction of a student management platform is an important task in the process of talent cultivation in schools. This platform can effectively help schools manage various types of student information on campus, providing one-stop services, including application for scholarships, psychological counseling, living services, and club activities. In addition, the platform has sufficient data analysis and mining capabilities, allowing it to discover students' learning and living patterns and mental health status through the analysis of a large amount of student information. Based on this, the platform can create accurate portraits of students and provide more targeted guidance and counseling.In summary, the construction of a student management platform can not only improve the school's management efficiency but also better meet the personalized needs of students, which is conducive to their overall development.

3. Major Issues in the Information Construction of University Student Management

3.1.Lack of systematic top-level design.

When constructing the student management system, there is no comprehensive planning and design, resulting in a lack of overall and consistency in the system. The issue of lacking top-level design may lead to the phenomenon of information silos, making it difficult for information to be effectively shared and collaborated among different departments. Moreover, due to the absence of unified planning, various departments may use different systems and data formats, further increasing the difficulty and cost of data integration. This issue not only affects the efficiency and accuracy of student management but may also have negative impacts on students' learning and life.

3.2. Lack of effective information sharing.

Due to the absence of a unified system construction plan and data standards, the data organization and management methods of student management administrative departments, psychological counseling centers, and secondary departments vary, resulting in inconsistent data and difficulties in sharing. This often leads to significant difficulties when comprehensively utilizing data for statistical analysis, data mining, and decision support of student information.

3.3.Lack of effective integration of application systems.

Since various application systems have independent data and functions, and there is a lack of unified planning for application access interfaces and integration among different application systems, data sharing is hindered, processes are not smooth, and information is not transparent. This severely affects the efficiency and decision-making capabilities of student management.

4. Principles for Building a Student Management Platform Based on Information Technology

4.1.People-oriented principle.

The design and development of the student management platform should focus on meeting the needs of students, teachers, and administrators, providing convenient, efficient, and user-friendly services. The platform should have a friendly user interface, allowing users to quickly get started and complete tasks efficiently.

4.2.Information security and privacy protection principle.

Student information involves personal privacy, and the platform construction must ensure information security to prevent data leakage, tampering, and misuse. Strict permission control, data encryption, and backup strategies should be adopted, while complying with relevant laws and regulations to protect user privacy.

4.3.Modularization and scalability principle.

The student management platform should adopt a modular design, which is convenient for function expansion and maintenance. As the school develops and demand changes, the platform should be able to flexibly add new functions and modules to meet the changing needs.

4.4.Resource integration and sharing.

The platform should be able to integrate various types of student information, achieving centralized storage and management of data. At the same time, it should support data sharing to facilitate collaboration among different departments and improve work efficiency.

4.5. Sustainable development principle.

The student management platform should have good sustainability, being able to upgrade and optimize with the development of technology and changes in school needs. During the platform construction process, future development trends should be fully considered to ensure the platform's long-term usability.

5. Construction Ideas for a Modern Student Management Platform

5.1.Functional module design.

The RBAC (Role-Based Access Control) permission management model is a widely used access control strategy in enterprises and organizations. Its core idea is to allocate permissions based on user roles, rather than assigning permissions directly to each user. [1] This model simplifies permission management and improves security and flexibility. The student information management adopts the RBAC permission management model, dividing the platform into six functional modules: user management (student management), department management, teacher management, student management, and parent management, as shown in Figure 1[2]. The user management module includes management of user roles, functions for adding, deleting, modifying, and querying user accounts, as well as precise monitoring. The department management module and teacher management module are responsible for managing the addition, deletion, modification, and querying of information related to colleges, majors, classes, and teachers. Administrators at all levels enter the login interface and input their username and password. By default, the backend administrator user is set as "admin". Teachers, students, and secondary college administrators are assigned usernames by the student management department administrator, or they can register through the registration page. Once the registration is successful, the system will automatically redirect to the login homepage. Among them, the administrator module can only be used by administrators and has functions such as managing users and approving applications.The student information management module mainly constructs student portraits based on students' behavior, academic performance, and consumption habits, and monitors and warns students about potential "three difficulties" (academic, psychological, and economic issues).

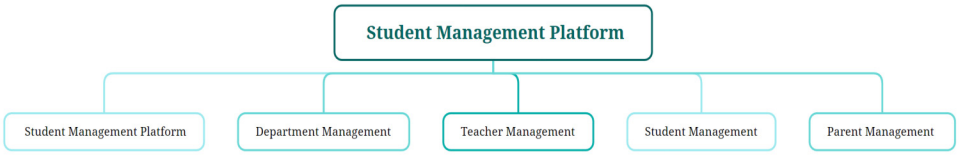

Figure1: Student Management Role Permissions Module[2]

5.2.Adopting the B/S approach

5.2.1 B/S (Browser/Server) architecture

The B/S (Browser/Server) architecture is a model for network applications that divides a software system into two main parts: the Browser and the Server. [3]This architectural pattern is widely used in modern internet applications and web services. In the B/S architecture, users access and operate applications through a browser, while the server is responsible for processing business logic, data storage, and running the application. The main components of the B/S architecture include the front-end presentation layer (user layer), the back-end business logic layer (middle layer), and the database layer (data layer). The front-end presentation layer includes the user interface (UI), which is built using technologies such as HTML, CSS, and JavaScript to interact with users, display data, and receive user input. Front-end frameworks, such as React, Angular, and Vue.js, are used to construct complex user interfaces and improve development efficiency. The back-end business logic layer includes server-side programs: typically written in programming languages like Java, Python, Node.js, Ruby, etc., to handle requests sent from the front end, execute business logic, and interact with the database. Servers, such as Apache, Nginx, etc., are used to handle HTTP requests and forward them to the corresponding applications. The database layer includes database management systems (DBMS): such as MySQL, PostgreSQL, MongoDB, etc., for storing and managing the data of the application. Databases: store the data required by the application, such as user information, transaction records, etc., as shown in the system structure in Figure 2.[4]

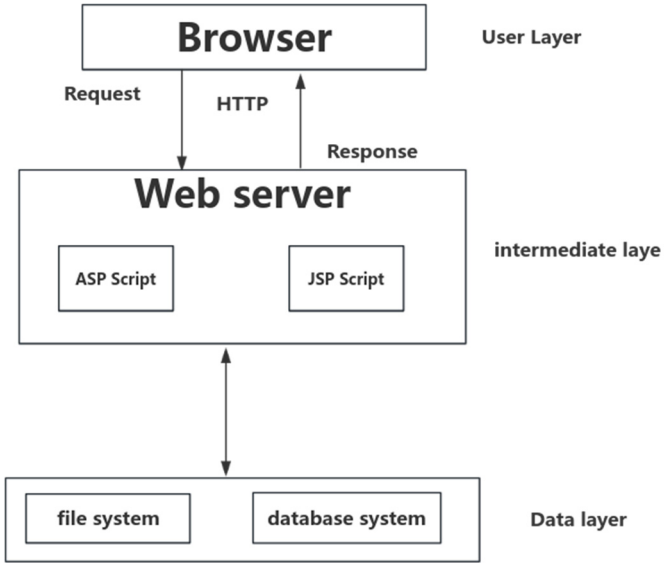

Figure 2: B/S Three-Layer Architecture Diagram[4]

The student management system based on information technology has adopted multiple technologies such as ASP and JSP to transcend the traditional student management paradigm. This system is characterized by its advanced technology, strong interactivity, ease of operation, and high practicality. By utilizing web servers and ASP, JSP as intermediary layers for database operations, the system closely integrates the database structure of the B/S model with web technologies, thereby forming a database system with a three-tier web structure in the B/S model. The working principle involves the front end using browsers like IE to submit operation information from users to the web server IIS, which then processes the request through ASP, JSP, accesses the database, and returns the operation results to the front-end browser.

5.2.2 Application in Student Management Platform

Building a student management platform using the B/S (Browser/Server) architecture is a modern solution that leverages browsers as clients and servers to handle business logic, data storage, and application execution. Based on information technology theory, we can analyze the B/S architecture student management platform from the following six aspects.

5.2.2.1Scalability and maintainability: A significant advantage of the B/S architecture is its scalability and maintainability. Since the client and server sides are separated, upgrading and maintaining the server side does not affect the client side. When it's necessary to upgrade the system or add new features, only the server-side application needs to be updated, without the need for individual upgrades on each client. This greatly reduces maintenance costs and workload.

5.2.2.2Cross-platform compatibility: The B/S architecture student service platform has strong cross-platform compatibility. As the client mainly relies on browsers, users can access the platform through browsers on different operating systems and devices, such as Windows, macOS, Linux, etc. This provides users with great convenience, allowing them to access the student service platform anytime and anywhere.

5.2.2.3Data security: In the B/S architecture, data is stored on the server side, which helps improve data security. The server side can implement strict access control, data encryption, and backup strategies to prevent data leaks, tampering, and misuse. At the same time, the server side can record user operation logs for tracking and auditing purposes.

5.2.2.4Personalized services: Based on information technology theory, the student service platform can utilize big data analysis, artificial intelligence, and other technologies to provide personalized services for users. By mining and analyzing various data such as students' learning, behavior, and consumption, the platform can offer accurate recommendations, tutoring, and guidance to meet students' personalized needs.

5.2.2.5Integration and collaboration: The B/S architecture facilitates the effective integration of various application systems. Through unified interfaces and data standards, different departments and business systems can easily share data and resources, enabling collaborative work. This helps break down information silos and improve collaboration efficiency among school departments.

5.2.2.6User experience: In the B/S architecture student service platform, user experience can be enhanced by optimizing user interface design and providing rich interactive features. A

friendly user interface and efficient interaction design can make it easier for users to get started and complete tasks efficiently.

The student management platform considers the business activities of various student management units, breaks the departmental boundaries, unifies the standardization of business activities, streamlines business functions, shares resources, and shares information, achieving cross-departmental, seamless business connections [5]. The unified student management platform includes six sub-businesses that cover basic student services such as basic enrollment information, on-campus information, academic information, psychological health information, achievements, and post-graduation information, as shown in Figure 3[6].

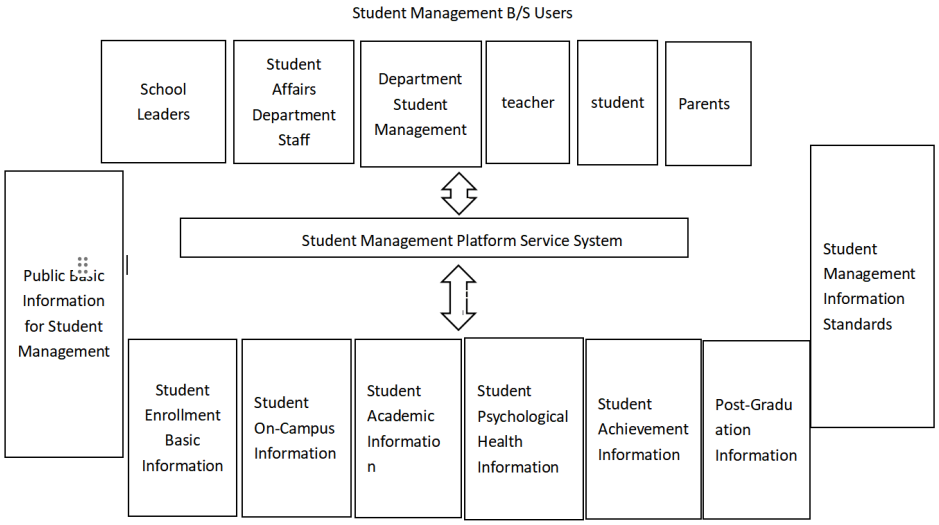

Figure 3: Student Management Platform Architecture[6]

School student affairs administrators, departmental student management personnel, students, teachers, and leaders at all levels can use the B/S approach to perform student management tasks such as collecting enrollment, on-campus, and graduation information, psychological counseling management, and information inquiry.[7] Each business subsystem is relatively independent yet interconnected, working both independently and in collaboration, forming a complex and extensive student management platform.After students enter the school, they fill in basic information. Administrators at all levels, student managers, and substitute teachers can get a preliminary understanding of the students' situation based on their basic information and carry out tasks such as class integration and teacher allocation in a personalized manner. Based on the students' four years (three years for vocational students) of study, their on-campus information is continuously updated, such as achievements in awards, scholarships, and evaluations, as well as social practice experiences, forming a comprehensive "portrait" of the students. Graduating students enter their graduation information, allowing the school to understand the graduates' future plans and conduct follow-up visits on their employment situation.[8] This helps to ensure continuity for future alumni events and other related

matters.In addition, in daily student management, the allocation of roles such as secondary college administrators, counselors, class teachers, and parents can effectively manage students through this system. The access control system in the subsystem can monitor students' return to dormitory at night, while the campus card system can provide insights into students' financial situation. This helps determine eligible students for financial aid and scholarships, offering real data support for decision-making on poverty status and financial assistance distribution.By employing modern information technology and adopting a unified planning, standardized data, unified architecture, role-based, and functional modularization approach, the goal is to build a modern student management platform to address the current situation of information fragmentation, missing information, and disjointed information in university informatization construction.[9] The construction of the school's informatization platform not only liberates student management personnel and teachers from tedious administrative tasks, allowing them to focus more on humanistic care and educational work, but also enables comprehensive understanding of student status through data statistics and analysis, providing personalized services.[7]The above provides a line of thought for the intelligent service of student management work, offering a certain vision for the modern development of schools. In the later practice, continuous improvements and enhancements will be made.[10]

6. Conclusion

This paper proposes a construction plan for a student management platform based on information technology, including functional module design, adoption of B/S architecture, and unified planning and data standards. The platform aims to address the issues of information segmentation, missing information, and fragmented information in the informatization construction of colleges and universities, enabling schools to build a modern student management platform. Through this platform, student management staff and teachers can be freed from tedious routine tasks and devote more energy to humanistic care and educational work. At the same time, by using data statistics and analysis, a comprehensive understanding of students' current situation can be obtained, providing personalized services for students. The construction of this platform provides a line of thought for the intelligent service of student management work and offers a certain concept for schools to achieve modern development. In later practice, the platform will continue to be improved and enhanced.

The experimental results show that the student management platform based on information technology can effectively integrate various types of student information, achieve centralized storage and management of data, support data sharing, facilitate collaborative work between departments, and improve work efficiency. Meanwhile, the platform can meet the information sharing needs of various departments within the school, promote collaboration and communication between departments, and ensure the privacy and security of student information, avoiding the risk of information leakage caused by paper-based file management. The platform enables automated organization and intelligent analysis of student information, providing school leaders and teachers with more comprehensive and accurate student data support, helping them better develop student management strategies and teaching plans.

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