

Research on the Construction of Smart Campus Platform based on Mobile Terminal

Xiaolu Ye

Sichuan University of Arts and Science, Dazhou Sichuan 635000, China

Abstract

With the in-depth development of information construction in colleges and universities and the rapid popularization of mobile terminals, it is difficult for traditional digital campus-based applications to solve the contradiction between users' real-time access to information and users' mobility. This paper studies and implements a smart campus one-stop service platform based on mobile terminals. Through resource integration, teaching, scientific research, information, employment and other applications will be integrated into a mobile portal to provide teachers and students with one-stop services based on mobile terminals. It provides comprehensive, effective and intelligent innovative management and services for school work, and has important reference significance and practical value for the construction of smart campus.

Keywords

Smart campus; Mobile terminal; One-stop service.

1. Introduction

The construction and development of smart campus is the trend of development and reform in the field of education, which is conducive to promoting the development of educational informationization, forming flexible and diverse teaching and learning methods, cultivating high-quality talents, improving the level of running schools and optimizing school management. The construction and development of smart campus can adapt to the development of network technology in the new era, the needs of society and the needs of school management and teaching reform [1]. The construction of smart campus aims to improve the quality of campus work, study and living environment, and build an intelligent, innovative and open one-stop service platform integrating teaching, scientific research, management and campus services. The foundation of smart campus is campus network infrastructure, followed by intelligent application system platform. With the popularity of mobile terminals such as smart phones and tablet computers in colleges and universities and the coverage of wireless networks, teachers and students are more eager to obtain information anytime and anywhere through mobile terminals. According to the existing foundation of school informatization construction and the overall construction framework of smart campus, this paper studies and implements a one-stop service platform of smart campus based on mobile terminal. Through resource integration, teaching, scientific research, information, employment and other applications will be integrated into a mobile portal to provide teachers and students with one-stop services based on mobile terminals.

2. Construction Goals

The main goal of this construction is to make use of the existing mobile network and mobile terminals, plan and build a complete mobile campus for the school on the basis of the information construction of the original campus, and provide unified one-stop mobile campus services for off-campus visitors, students, teachers, parents, alumni and managers, so as to

provide teachers and students as the center and provide mobile information services with full life cycle, continuous improvement, practical value, convenience and anytime and anywhere. At the same time, improving the management efficiency and management level of supporting services through information means can once again improve the quality of monitoring and optimizing services; More importantly, through the mobile Internet operation, all kinds of users in the school can be smoothly connected with the mobile Internet, resulting in new service models and business models, forming a virtuous circle of campus mobile Internet ecosystem, realizing the real campus internet plus, and becoming the connector and remote controller of Internet demand inside and outside the school.

The overall goal of Super App is to establish a unified App portal, display and manage all the APPs in the school in a unified way, create an open, cooperative and win-win mobile campus ecological environment, optimize mobile application services, provide the best user experience, continuously iterate and innovate, accumulate operational experience, create a mobile campus with university characteristics, embody the informationization value, and enhance the overall image and competitiveness of the school.

3. Overall Framework

The overall architecture of Super APP follows the general design principle of "openness and integration", builds and implements the system and safety standards that follow standards and specifications, integrates business data, applications and services based on business middle station and data middle station, and finally builds a fragmented APP service platform that faces all users, covers all terminals and supports all scenarios. Super APP needs to build a complete and open mobile service platform system, which actually includes the whole life cycle construction process from user standard, support system (supported by middle station), basic service and application service, one cloud and multiple terminals to unified operation and management, and finally presents its business to diversified end users in the form of service. The construction ideas and modes in each stage have a vital impact on the overall information construction.

3.1. Multi-terminal Access base

Build a bearing base based on three-terminal access, including H5, independent native APP, WeChat (small program, enterprise number, subscription number), Alipay (small program) and nail.

3.2. Multi-technology Engine

Support the application engine of WeChat applet and H5 mobile development language, and meet the requirement of expanding mainstream mobile languages in the future.

3.3. Basic Ability API

Open applets, messages, location services, signature package API services to third parties and publish them on the open platform.

3.4. Multi-terminal Unified Management

Unified management of multiterminal access services, supporting multiterminal publishing and access, mainly including: ios client, Android client, WeChat, Nail, Alipay, etc.

3.5. Global Search

Search news, applications, messages, tasks, etc.

3.6. Operation Management

Provide operational management and operational analysis. Operation management includes management collaboration and problem feedback process among developers, business administrators, system administrators and end users. Operation analysis is based on buried log, providing mobile analysis services, and realizing decision-making of operation and maintenance, management collaboration and promotion by counting and analyzing data such as client traffic, performance quality and user behavior.

4. Key Technologies of Smart Campus

4.1. Subject Information Collection and Analysis Technology

The common information crawling strategy is to collect all the webpages on the whole network. If this strategy is applied to intelligent campus information collection, there will be some problems that are difficult to solve. The intelligent campus information collection system has improved the crawler to filter campus topics. In view of the characteristics of campus information sources, diverse forms and large amount of data, multi-source information integration needs to capture data from relevant information service platforms through configuration and Web data automatic acquisition technology, and then transform the information into a data format that is easy to store, query and mine by adopting technologies such as parsing and extraction, data cleaning, data structuring and data indexing. Personalized association rule analysis technology processes the text, and in order to improve the collection efficiency, the design of the system is optimized by Java multithreading technology, which makes full use of the processing capacity of CPU [2].

4.2. Information Push Technology

Information push technology refers to a new way of information acquisition by the server actively delivering information to users. Smart campus uses the wireless interconnection technology of mobile Internet, which provides information from the server to teachers and students in time, and combines personalized mining technology to effectively improve the accuracy of information. Information push technology can be divided into regular polling mode, short message notification mode and long connection between server and client. Smart campus information push platform realizes information broadcast, personalized push for teachers and students, and provides corresponding Web interface to realize personal achievement push from server to mobile terminal, reminder of book borrowing due, mail arrival notification, and so on.

4.3. Application of Seamless Integration Technology

Application integration can be mainly used for the service integration of campus applications. By means of application integration, the network relationship between existing systems can be effectively improved, which makes the relationship between systems more visible and has stronger management and control ability. Its high performance, high reliability, high scalability and business bring users high control ability, high return on investment, high operational ability, etc. Smart campus application integration builds an open application integration specification and standard API interface based on the unified identity authentication of teachers and students (with unique student number/work number), supports the seamless integration of third-party campus applications, and users can install them selectively according to their needs, thus realizing a "door" access to multifunctional applications.

4.4. Hot Topic Discovery Technology

Topic discovery technology refers to clustering news texts in a period of time, and the clustering results are a series of text sets, so as to identify and discover topics in a certain period of time,

including the main topics, the most concerned topics and specific topics in this period [3]. Based on the smart campus information service platform, this paper studies the campus hot topic discovery technology, processes the campus news texts collected by the information platform, and uses the improved clustering algorithm to study the overall views of teachers and students on campus events, so as to quickly and effectively obtain the views and viewpoints of users on specific topics, reasonably predict the tendency of a topic, and obtain the correct methods and factors to guide public opinion, thus forming the correct public opinion orientation.

5. Overview of Construction



Figure 1. Mobile Smart Campus Platform (Super APP)

5.1. Unify the Display Style and Enhance the User Experience

User-oriented, it is necessary to embody the intuitive, flexible and humanized application mode, and realize the unified display of "humanized" and "service-oriented" services.

Elaborate UI design: the UI of Super APP must be carefully designed and implemented to give users a brand-new revolutionary operating experience and shocking visual effects.

Unified UI/UE:provide UI/UE design specification,which means that users' cross-service experience is consistent.

Provide personalized ability: in addition to the optimal UI, Super APP can also provide personalized ability, and users can select components, adjust layout and subscribe to information by themselves;

With the increasing number of campus mobile applications, Super APP can also initialize the client according to the user's identity, and recommend the applications that users care about.

5.2. Unify Application Management and Promote Sustainable Operation

Mobile campus needs to break the independent and scattered situation of campus applications, provide unified entrance, application search and unified management of campus services,which is conducive to the integration of various applications, improve the homogenization and confusion of applications, and promote the sustainable and healthy development of campus mobile service environment.

5.3. Overall Service Planning and Step-By-Step Construction and Implementation

User-centered, combing mobile service needs, overall planning and design of services, phased construction, promoting use, gathering popularity, precipitating high-quality mobile applications and services, and promoting the prosperity of campus mobile applications.

5.4. Open Service Capacity and Introduce High-Quality Resources

It has access capability to third-party applications, develops interfaces, provides a series of functions such as developer authorization, application review, putting on shelves, recommendation,etc.,lowers the technical threshold of service integration and reconfiguration, helps schools to build a unified, open and local mobile service environment, serves mobile application developers, mobile application providers and school administrators, and enables users to continuously change from "information contributors" to "process participants" and "innovation subjects", thus revitalizing on-campus user resources.To democratize innovation, through online and offline service support, users can participate in every step of innovation in the whole process, quickly iterate and cycle, and create a mobile campus with college characteristics.

5.5. Create An Open,Cooperative and Win-Win Mobile Campus Ecological Environment

The ecological environment of openness, cooperation and win-win is to ensure that the future mobile campus can release great innovation power and generate maximum user value.

The rapid development of mobile Internet has subverted the application form of Internet with web pages as its core.APP has become the dominant form of mobile Internet application services, which has spawned a brand-new application service system and ecological environment, and rebuilt the business model. The main terminals for teachers and students to obtain services are gradually transferred from PC to mobile terminals such as smart phones. Mobile individual developers, entrepreneurial teams and third-party service providers have a strong demand to enter the campus, and they constitute the school's partners.

The future mobile campus is service-driven.Schools should open up the closed business data and service capabilities, face the joint innovation of partners, jointly build a sustainable mobile campus,and realize a 1+1>2 value-added ecological environment.

6. Construction Specifications

6.1. Mobile Standard Specification

In order to support the sustainable development of the mobile terminal, more manufacturers can be connected for joint development based on the super APP framework. And we should provide standard specifications for mobile terminal development, including interactive specifications, component specifications, development specifications, operation specifications, etc.

6.2. Visual Specifications

Promote multi-person cooperation, solve visual inconsistency, reduce marking time and improve front-end development quality.

6.3. Interaction Specification

Different apps have different interaction effects, which need to comply with unified interaction specifications, similar actions, positions, styles and logics.

6.4. Development Specifications

According to different development technologies of mobile micro-applications, different development specifications are formulated.

6.5. Operational Specifications

Provide operation and maintenance collaborative management functions and specifications.

7. Conclusion

Smart campus one-stop service platform can change the access mode of traditional PC terminal digital campus platform. Through modern mobile 4G wireless network, using smart phones, tablets and other access platforms purchased by teachers and students, it can improve the resource utilization and real-time access of smart campus, break the time and space constraints, effectively improve the needs of college teachers and students for learning and living services, greatly enrich the campus life of teachers and students, optimize and innovate the campus management mode, and at the same time, the construction of smart campus platform based on mobile Internet also promotes the informatization construction process.

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