Design and Implementation of the Exchange Information Platform for Foreign Students in Colleges and Universities Based on WeChat Applet

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Abstract. With the wave of comprehensive opening up, the number of students studying abroad in China has increased sharply. In recent years, the international exchange and cooperation model between universities has become increasingly mature and universal, and the number of students studying abroad in Chinese universities has also increased steadily. Therefore, in order to solve the problems of expensive consulting fees of overseas study agencies, false and asymmetric service information of different websites, this paper uses the strategy of "Internet plus" to build an information exchange platform for college students studying abroad based on WeChat applet, so as to facilitate college teachers and students to carry out real-time access to and participation in relevant overseas study information and relevant overseas study activities held by international exchange and cooperation departments of colleges and universities And intelligent recommendation and other core functions of overseas universities. Taking Xi'an Eurasian University as an example, it provides effective, convenient and transparent information services for our teachers and students to study abroad, which has obvious application value.

Keywords: WeChat applet · overseas exchange · web developer tool · MINA

1 Introduction

On December 7, 2020, at the "International Conference on Artificial Intelligence and Education", Chen Baosheng, the Minister of Education of China, said that new technologies such as artificial intelligence showed us the great potential of transforming education. China's education must face the world, open to the outside world, focus on encouraging overseas study, improve overseas study policies and services, and actively introduce high-quality education resources. With education facing the world and adhering to the open policy, China encourages more and more graduates to go abroad for further study and bring high-quality technology and knowledge back to the motherland. In this era, it is required that the domestic service industry for studying abroad must change from extensive service to refined and personalized service for studying abroad. Therefore, in order to better focus on the overseas exchange services of university users

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in China, based on the needs of our university staff and students for overseas exchange and study, this paper is committed to developing and constructing a WeChat applet-based university exchange information service platform for foreign students.

As a front-end software that can be used directly without downloading, WeChat applet brings convenience of "more convenient and better experience" compared with other general apps. The promotion and use of products are not limited by time, space and region. At present, the application of small programs is also very extensive, covering more than 200 industries [1]. According to statistics, the rate of Chinese graduates going abroad for further study in 2021 will be about 3.3%, the market size of Chinese international student service industry will be 255.3 billion yuan in 2020, and the average annual compound growth rate from 2015 to 2019 will be 11%. In 2020, due to the impact of the epidemic, the number of Chinese people studying abroad will decrease significantly, and the market size will also be affected accordingly. It is estimated that the market size will reach about 400 billion yuan in 2021 [2]. Therefore, in order to better serve the international cooperation and exchange affairs of our teachers and students, Through market research, demand analysis, system design, system implementation and other development processes, complete the registration and login of students and teachers at the WeChat applet end, and read the basic information of the school, enrollment requirements, school query, online activity registration, question query, message, my information view and other main functions at the user applet end; The server completes the functions of publishing and maintaining information about overseas schools, publishing and maintaining activity information, authority management, publishing and maintaining common problems, data statistics view and report export. Demand analysis of the information platform for studying abroad in colleges and universities.

1.1 The Functional Requirements of Applet Side

The main functions of the international student exchange widget include four major functional modules: home page, activity, college recommendation, and mine. Among them, the homepage module also contains the basic information display of each international cooperative university (including the video introduction of the university, application time, tuition information, the city where the university is located, the proportion of teachers and students, the proportion of men and women, the information of international students, ranking information, advantageous majors, well-known alumni, and application requirements at each stage), the latest policy (FAQ), and the introduction of professional courses; The activity module includes the display of information related to various overseas study service activities released by the management personnel of the International Exchange and Cooperation Center in the background. Authorized users can view and sign up for activities within the valid time range; The college recommendation module includes the college search bar, which recommends colleges and universities suitable for studying abroad according to user-defined conditions; My module includes functions such as authorized user login, viewing user registration information, viewing user's own registered activities, user's applied colleges, and user's interested colleges. The use case diagram of WeChat applet end is shown in Fig. 1.

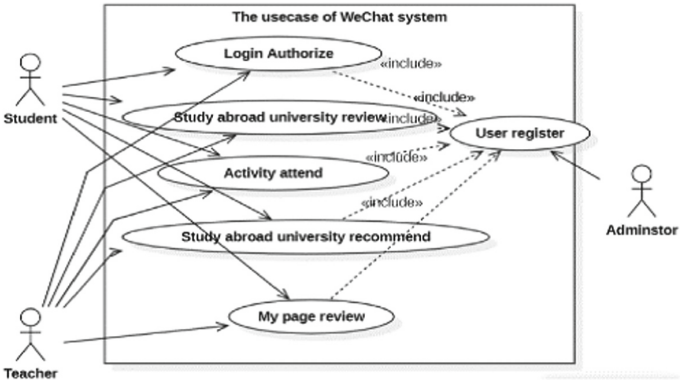

Fig. 1. WeChat system use-case.

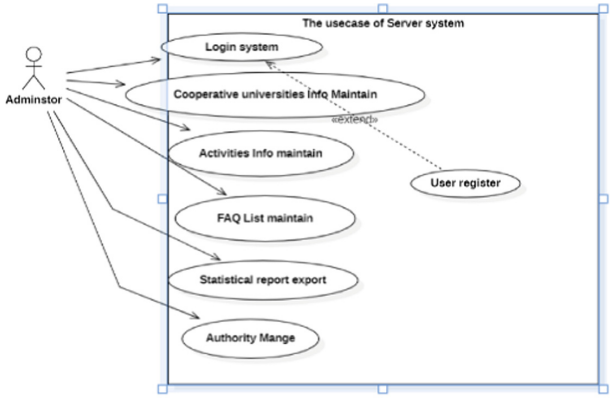

Fig. 2. Serve side platform use-case

1.2 The Functions of Server-Side

The server-side function is mainly about the release and maintenance of the information of overseas students (including the basic information of the school, the professional course information, the latest policies, and the evaluation data), the release and maintenance of the activity information, the user rights management, the release and maintenance of the user's common problems, the statistical view of the activity registration data, and the export of the statistical report. Use case diagram is shown in Fig. 2.

2 Design of Information Service Platform for Studying Abroad in Colleges and Universities

2.1 System Architecture

The overall technical architecture of the university study abroad information service platform is shown in Fig. 3. The platform is mainly composed of the following three layers: the presentation layer is mainly used to deal with user-side transactions. It is used

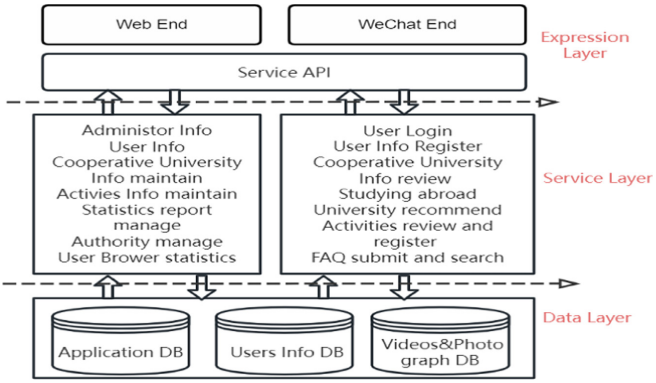

Fig. 3. The System technical architecture diagram.

by the PC-side browser and the mobile-side We-chat applet to make business requests to the server, display functional modules and data information, receive user input requests, and render the server response data. The service interface handles the communication of various application business data between the user and the background server, and the code requires low coupling; The bottom layer is the data storage layer, which realizes the data persistence layer with the help of the basic database. It is the basic layer of the system, abstracts the entity types, and provides data storage services for the system. This paper stores business data separately from the perspective of user privacy data protection, which can realize the design of separating data and behavior. The more detail of system technical architecture diagram is shown on following Fig. 3.

2.2 The Design of System Communication

Users can send HTTPS requests to the server through WeChat applet and browser. The server will access the database on the same cloud platform after receiving the request. The database will return the processed data results to the server, and the server will return them to the user page in JSON format for rendering. The communication is completed. Such a complete event is completed by the user. The server is mainly used for function interface access and response requests, and the database is mainly used for data management and collection.

2.3 The Design of System Function Module

The university study abroad information service system based on WeChat applet designed in this paper aims to provide our teachers and students with a platform for exchange and information acquisition of study abroad information. Based on the characteristics of "more convenient and better experience" of the applet, it provides teachers and students with the convenience of obtaining study abroad information. The applet end is divided into the applet user end and the applet management end. The applet user end mainly meets the user's various operations and needs. The applet management end can add, delete, and modify the cloud database in the personal center interface when the

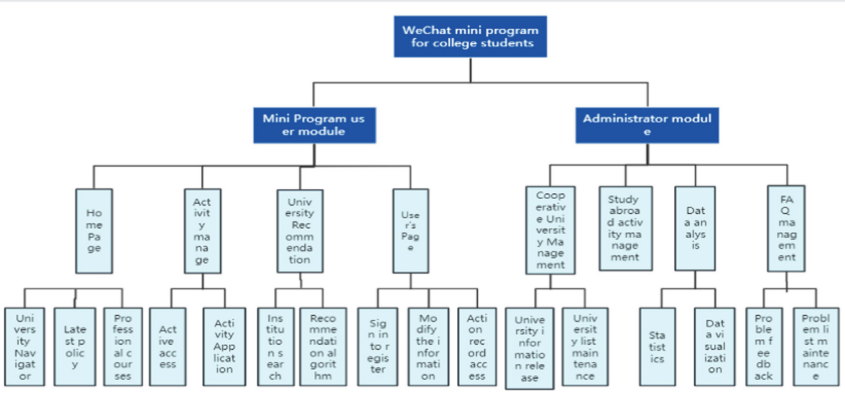

Fig. 4. The system function structure diagram

administrator logs in successfully. The functional structure of the system is shown in Fig. 4.

2.4 The Database of System Design

The database key tables which are used in the system are applet user table, partner universities, Study abroad activity table, School classification table:

(1) Applet user table: user number, permission value, user name, department, telephone number.
(2) Partner universities: university number, profile video, application time, tuition information, city, teacher-student ratio, gender ratio, international student information, well-known alumni, application requirements, latest policies, advantageous majors, click times.
(3) Study abroad activity table: activity ID, start time, end time, activity information, number of likes, number of collections.
(4) School classification table: classification ID, classification name, number of schools, time.

3 The Realization of the Information Program of Studying Abroad in Colleges and Universities

3.1 The Implementation of Functional Modules

According to the implementation idea and demand analysis, the widget end has realized four modules, including home page, activity, college recommendation, and personal center; The web end realizes the core functions of university management, activity management, user management, data analysis, etc. The front end of the applet is developed on the basis of MINA, the native WeChat framework, and the WeChat applet implements page, business logic and interface calls on the framework. The front and back ends are separated from each other on the framework of the small program for studying abroad in

colleges and universities, and the data in JSON format is used for the interaction between the front and back ends. Back-end functions are developed using WeChat applet cloud. API interface is provided based on HTTPS. The front-end applet accesses the database through the API, combines the information of cooperative institutions, activities and other data statistics stored in the relational database, returns the information obtained from the database to the front-end of the WeChat applet in JSON format, and displays it to users using JS, WXML, and WXSS.

3.2 The Functional Modules

(1) User login functional: This module is a prerequisite for all functions normally use. When users enter the WeChat applet, get the authorization via phone number or WeChat number, they can see the contents of the homepage of the applet. If they need to continue to visit the university details page, activities, college recommendation and personal center page, they need to log in with authorization of the WeChat applet, first obtain the user information, and then return to encrypted Data, raw Data, iv, and Singapore; (where encrypted Data is the encrypted data, raw Data is used to calculate the signature, it is the initial vector of the encryption algorithm, and signature is the signature) Then execute WeChat login to obtain the code; Then send the POST request to the background users/wxlogin; Finally, store token and user raw Data locally. The detail flow refers to Fig. 5.

(2) The homepage function mainly uses the scroll-view and image components of the applet to realize the vertical scrolling of the university navigation list. The homepage displays the image information of each university, the logo of the university, the latest policy of the university, professional courses, whether it is collected, and other label information. Using rpx as the size unit in WXSS can realize WeChat applet adaptive screen size.

(3) Activity function: authorized and registered users can view various activities related to studying abroad published by the International Cooperation and Exchange Center, and users can register successfully within the effective time range, and can point praise and collection. The back-end publishes and counts the enrollment data of each online activity, which is exported in the form of a report. The Institution recommendation flow refers to Fig. 6.

(4) The Institution recommendation function is to check the current college classification of the students according to the matching priority rules given by the users of the International Exchange Center, and then call the matching algorithm to give the Institution recommend result. The following Fig. 7 shows Institution recommendation flow.

(5) Personal center functions, including personal registration, modification of basic information, registration and collection of personal activities, likes and collections of interested institutions, contact information of international cooperation departments, etc.

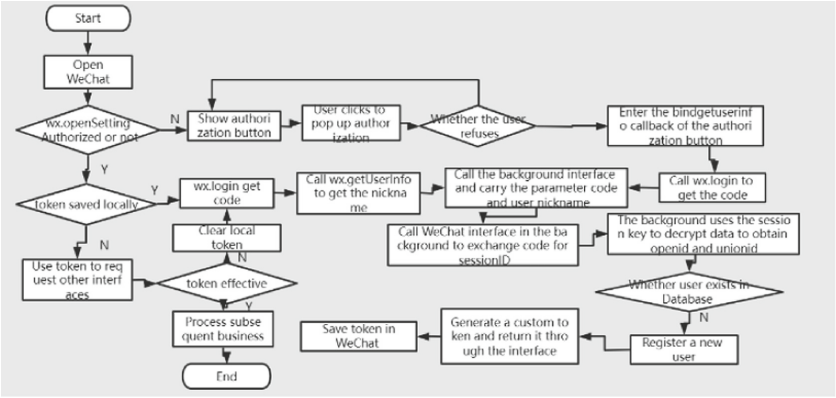

Fig. 5. User authorized login flow

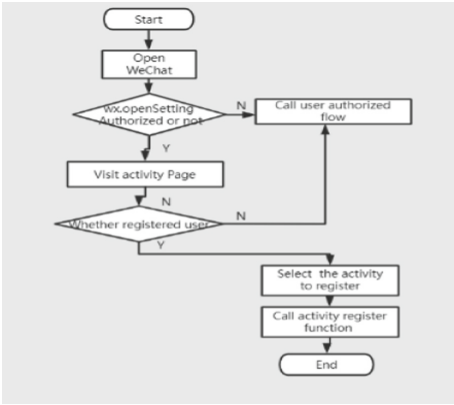

Fig. 6. Activity register flow

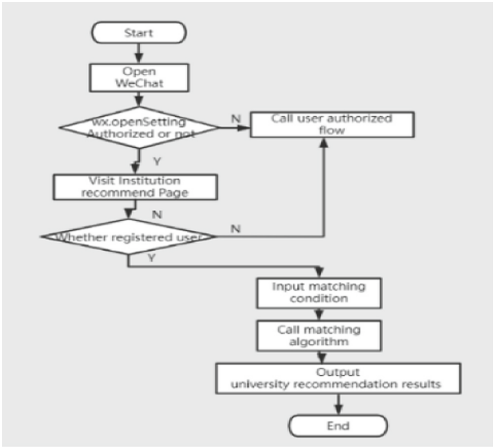

Fig. 7. Institution recommendation flow

4 Conclusion

In order to more conveniently and transparently serve the international exchange work of our teachers and students, this paper uses the thinking mode of "Internet plus" to realize the query of overseas study service information and participation in related activities at anytime and anywhere through mobile terminals based on WeChat applet technology. In the research of future work, in order to further improve the quality and efficiency of our university's international exchange information service platform, in the later stage, with the help of the ability of applet cloud development and the valued data collected by the backend, can make personalized recommendation of overseas study and activities by using data mining technology. So as to improve the accuracy and provide more convenient and effective value for more local teachers and students of similar colleges and universities to study abroad.

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