

Design and Implementation of University Club Management System based on WeChat Applet

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Abstract: To solve the problems of delayed work processes and redundant content in the management of university clubs, digital means are used to improve the efficiency of club management. We have designed and implemented a WeChat mini program for the university club management system. The mini program uses the Java Script framework and cloud database to facilitate participation in club activities, manage information, and register for activities. Through practical application, this mini program not only simplifies the club management process, but also enhances the interactivity and social attributes of the club. Effectively solving key issues in club management, it provides strong support for the digital transformation of university clubs and the convenience of student life.

Keywords: Club management; WeChat mini program; Management system; Java Script.

1. The Research Background

club activities are an indispensable part of college students' life. How to operate and manage the club efficiently is the focus of the club work. At present, there are problems in the management of university club that are difficult to be solved systematically. In the digital age, people's lives are more convenient and efficient because of the network. WeChat applet is an application that can be used without downloading and installing, and can reach users at the lowest cost [1]. In the case that the APP market is close to saturation, customers prefer to use WeChat applets that can be searched and used through keywords without downloading. WeChat applets are simple to operate and save manpower and time. The WeChat applet for college club management endeavors to offer a convenient platform for coordinating club activities and disseminating information. Its objective is to enhance the efficiency of college club administration, foster interactive exchanges within student communities, enrich campus culture, and ignite students' innovative potential.

2. The Demand Analysis

Through the investigation and analysis of college club users, the related functions needed by the applet are obtained, which mainly include club information management, activity management, member management, background statistics and other functions. At the same time, the WeChat applet cloud database tool is used to reasonably design the system database to ensure the storage and access of various multimedia data, which can realize the function of exporting members' work data to manage the members of the club. The functional requirements of different personnel are shown in Table 1.

The club's personnel responsible for publishing activities are required to complete fields such as the activity name, introduction, and scheduled time before submission. Subsequently, the management team conducts a thorough review. Upon approval, the activity details are made public. In the event of disapproval, the submitter revises the deficient aspects on the activity information page prior to resubmission for review. Refer to Figure 1 for a visual representation of the

club's activity publishing process.

Table .1 Functional Requirement Table

User	Function requirement
club administrator	1. Managing the basic information of the club
	2. Publishing, editing and deleting activity information.
	3. Managing the information of club members, including adding, deleting and modifying members.
	4. Issuing a notice announcement
	5. Checking the club data analysis report
club member	1. Checking the club activity information
	2. Signing up for club activities
	3. Viewing and modifying personal information
	4. Checking the club information
System administrator	1. Maintaining the normal operation of the system and ensure data security.
	2. Managing the rights of club administrators.
	3. Backing up system data regularly to prevent data loss.

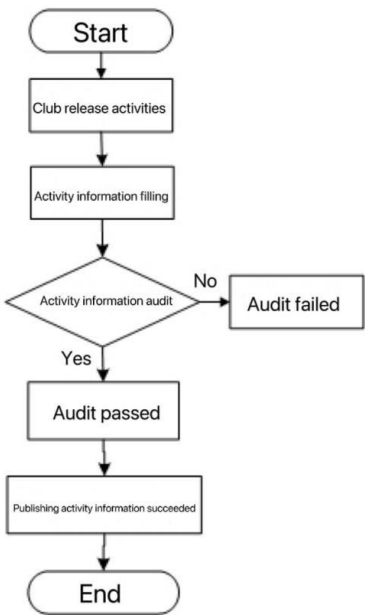


Figure 1. Flow chart of club publishing activities

New users who participate in the activity first enter the new user registration stage, fill in personal information and authenticate campus identity. After the administrator determines that the new user is a student of the school, the new user gets the right to sign up for activities. If the administration fails, the new user will return to the registration stage, as shown in Figure 2, which is the flow chart of the new user participating in club activities.

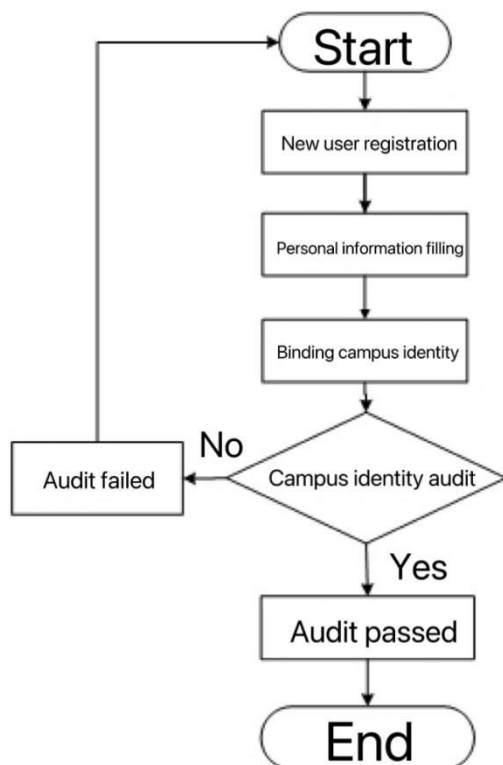


Figure 2. Flow chart of new users participating in club activities

3. System Function Design

According to the functional requirements of the university

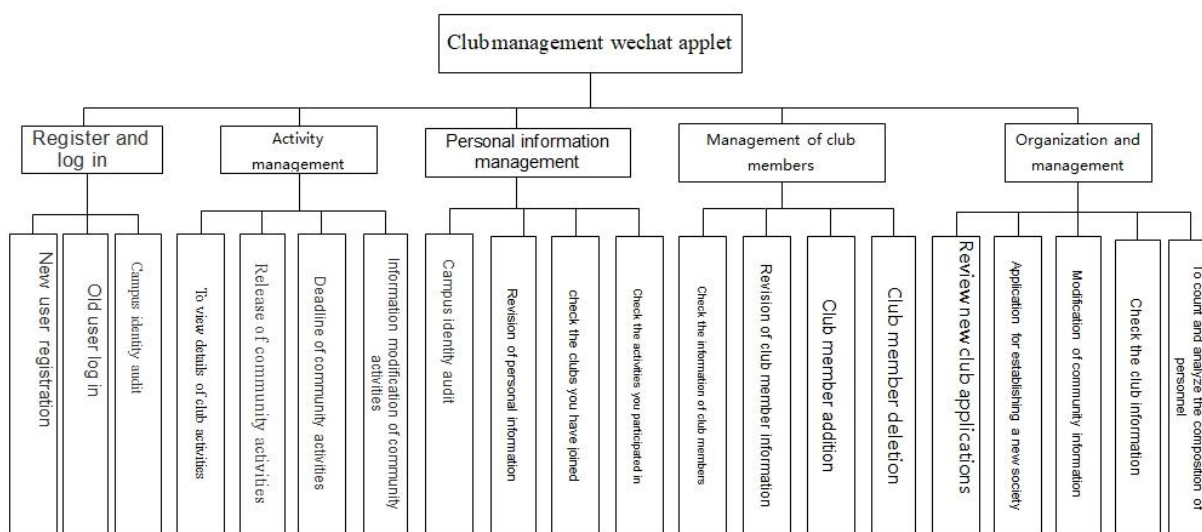


Figure 3. Function module diagram of WeChat applet in university club management

4. System Structure Design

The university club management system is crafted utilizing the WeChat applet, with its backend leveraging applet cloud development technology. WeChat applet, built upon the

club management applet, the applet is divided into five modules: registration, personnel management, activity management, organization management and personal information management. The functional module diagram of the university club management WeChat applet is shown in Figure 3.

3.1. The specific functions of each module

(1) Club member management: Club managers can add or delete club members, view all club member information and modify club member information.

(2) Activity management includes a range of features: the club manager has the ability to publish upcoming activities, cancel or delete activities uploaded in error, amend any incorrect information, and track participation metrics, such as the number of attendees and the gender distribution. Meanwhile, all users have access to view the club's published activity information.

(3) Organization management: the organization management organization can initiate the application for establishing a new association, modify the information of the existing association, and dissolve the information of the association organization; You can count the number of clubs, and show the number and proportion of men and women, the number of colleges and the number of grades through screening.

(4) Personal information management: All users have the ability to update their personal information, review their activity history, and establish recurring reminders for upcoming engagements. Additionally, members of active clubs can access a list of the clubs they've joined, while club managers retain the authority to verify users' campus identities.

(5) Registration and login: new users can register accounts, old users can use existing accounts to log in, and they can bind campus identities.

mobile WeChat platform, embraces the familiar C/S architecture interactive model, enabling seamless operation and efficient data transmission within the applet ecosystem. Cloud development can quickly realize the development of small programs and realize rapid iteration, which eliminates

the tedious steps of server construction and operation and maintenance in the construction of mobile applications. Using the real-time response characteristics of MINA framework, data binding and synchronous response are completed, and the core technologies are Java Script technology, WXML technology and WXSS technology [2]. The whole applet framework system is divided into two parts: the logic layer (App Service) and the View layer (view). The system architecture is shown in Figure 4. App Service can process data and send it to the view layer, and receive event feedback from the view layer. The view layer is written by WXML and WXSS and displayed by components. The view layer reflects the data of the logical layer into a view, and send the events of the view layer to the logical layer.

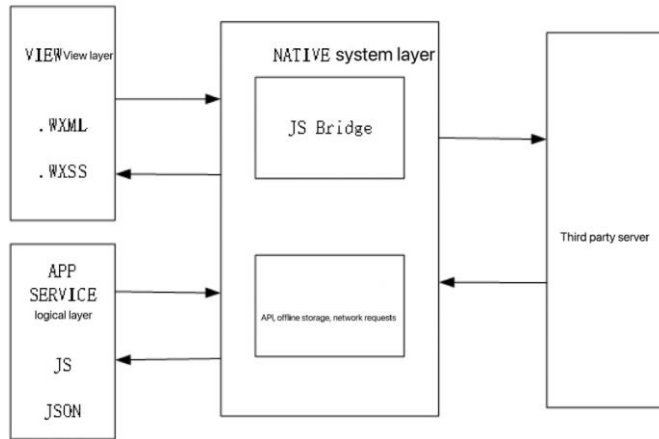


Figure 4. Architecture diagram of social organization management applet

5. Database Design

The cloud database of WeChat developer tool is a JSON database based on MongoDB, which provides high-performance database writing and query services. Developers can read and write on the applet and server without building their own database. Cloud database provides a visual operation interface, which can be easily added, deleted, searched and modified. Use cloud development technology to develop WeChat applets and games, and you can use cloud capabilities without building a server. The main data sets of college club management system include club activities, club members' information and club information. The data structures of the sets are shown in tables 2-6 respectively.

Table 2. Collection of club Activities

Titles for columns	Data type	Whether to allow null values	Remarks
Activity name	String (20)	No	
Activity number	Integer (15)	No	Primary key
Introduction of activities	String (180)	No	
Activity time	Date (50)	No	
Activity reward	String (100)	No	
Activity rule	String (500)	No	

Table 3. Information Collection of club Members

Titles for columns	Data type	Whether to allow null values	Remarks
Name	String (20)	No	
Student number	Integer (10)	No	Primary key
College	String (20)	No	
Professional class	String (50)	No	
club role	String (20)	No	

Table 4. club Information Collection

Titles for columns	data type	Whether to allow null values	Remarks
club name	String (20)	No	Primary key
Association number	Integer (15)	No	
club type	String (50)	No	
Founding time	Date (50)	No	
club purpose	String (100)	No	
Name of person in charge	String (20)	No	
Contact information of the person in charge	String (50)	No	

Table 5. Relationship Table between Members of Associations and Associations

Titles for columns	data type	Whether to allow null values	Remarks
Student number	Integer (10)	No	Combined primary key
Association number	Integer (15)	No	Combined primary key
Rule	Enum (Admin', 'Member')	No	

Table 6. Relationship between Club Members and Activities

Titles for columns	data type	Whether to allow null values	Remarks
Student number	Integer(10)	No	Combined primary key
Activity number	Integer(15)	No	Combined primary key
Registration activity time	Datetime(20)	No	

6. System Implementation

6.1. Tools and technology

The implementation of the system is based on the WeChat developer platform, and the front end uses the J/S basic framework to build the user interface with Java Script language to ensure the fluency of interface interaction and the superiority of user experience. The back-end uses cloud database, and the WeChat developer platform provides rich APIs and component libraries, which greatly simplifies the development process. The cloud function uses login to handle the user's login request, and calls the WeChat login API to obtain the user's code in exchange for Session_key and openid. The GetUserInfo function obtains the basic information of

users through openid and stores it in the database. It realizes the carousel function by using Swiper component. The Navigation Bar component is used to navigate between pages. The List component is used to display data such as club list and activity list.

6.2. Function realization

In terms of functionality, the system effectively manages core operations including information, member, and activity management. Each club is equipped with a dedicated information management page, empowering club administrators or designated individuals to seamlessly edit and update fundamental club details. These details encompass the club's name, profile, instructor information, logo, and more. Such information not only enhances the club's display page but also serves as vital data for future activities and member recruitment initiatives. For the member management function, the system supports the club administrator to add, delete, modify and query members. When adding a member, the administrator needs to input the basic information of the member, such as name, student number, major, contact

information, etc., and set the role of the member such as ordinary member, cadre, administrator. In activity management, the system facilitates the seamless execution of various tasks such as creating, editing, publishing, and cancelling activities. Moreover, it offers comprehensive statistical analysis and visualization of activity outcomes. Club administrators wield the capability to effortlessly disseminate activity details via the system, encompassing the activity's name, schedule, venue, agenda, participant count, and more. Post-activity, administrators can seamlessly upload event photos, enriching the experience for club members and other users alike. Furthermore, the system furnishes robust statistical insights into activity participation, furnishing club managers with a wealth of data to inform decision-making.

6.3. Page display

The operation interface of the applet includes mine, activities and communities, including the activity list page, the club details page and my information page, as shown in Figures 5 to 7.



Figure 5. Activity List



Figure 6. Club details



Figure 7. Personal information

7. Conclusion

By leveraging the club management WeChat applet, we unlock a realm of efficient and convenient club administration. Harnessing the technical prowess of cross-platform compatibility, swift development cycles, and robust data security upheld by the WeChat applet, this system becomes the quintessential management platform for university associations. Continuous refinement of this system promises heightened efficiency in club management and enhanced user experiences, thus catalyzing the dynamic growth of club activities within academic institutions. This fosters the cultivation of talents within clubs and enriches the tapestry of campus life, offering students a vibrant and diverse array of experiences.

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Author Introduction

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References

- [1] Li, J. (2019). Exploration on the Application of WeChat Applet in University Libraries. *Electronics World*, (24), 51-52.
- [2] Chen, Y. (2015, July 16). The Design and Implementation of College Club Management System Based on NET Framework. CNKI. Retrieved August 15, 2015, from https://kns.cnki.net/kcms2/article/abstract?v=BQVG6Ge829bUI8WcHqbjntqHZF4I-FOknx4xkYSn-N51X82GegePjmTzsbF9f-pN8HNeWxrYDCa8cySDi0YxoH6Kw4K7Z_gI9SwUgo5voKV5diKQ_xApBSmwV8jfxgMW0hsRZ-MWT7mI8IP2N3rp9A==&uniplatform=NZKPT&language=CHS
- [3] Cao, G.H. (2020). Design and Implementation of College Club Management System based on Web. *Wireless Internet Technology*, (8), 30-40.
<https://doi.org/CNKI:SUN:WXHK.0.2020-08-016>
- [4] Ma, C., & Jinensi, A. (2022). Design and Implementation of Student Association Management System based on SQLite Database. *Application of IC*, 39(9), 62-68.
<https://doi.org/10.19339/J.ISSN.1674-2583.2022.09.024>
- [5] Zhen, Z., Shi, Y. P., & Zhou, B. Y. (2019). Intelligent Lost and Found Cabinet System. *Digitization User*, 025(049).
- [6] Zhou, Z. (2021, July 28). The Design of Monitoring System for Biogas Engineering based on Small Program Cloud Development. *WANFANG DATA*.
<https://d.wanfangdata.com.cn/thesis/D02290898>
- [7] Wang, C. Y., Xiang, D. D., & Wei, S. (2021). Feasibility Analysis of Idle Resource Sharing Platform for College Students. *Computer Knowledge and Technology*, 017(007), 61-63.