

The design and implementation of campus dating system based on uni-app framework

Jiahe LIU, Zeke GUO, Yao LU, Xueqian HU, Yongguang ZHANG, Yan LI, Pingchuan ZHANG

School of Information Engineering, Henan Institute of Science and Technology, Henan, CHINA
Corresponding Author: Pingchuan ZHANG

ABSTRACT:

Currently affected by the increasing spread of the global new crown epidemic, to help college students in closed schools to achieve a new way of making friends, this paper carefully analyzes the current needs of students, using uniapp, spring boot and some other mainstream frameworks today to design and develop a simple, pure and convenient campus dating applet application, the front-end page through Vue + element UI according to the system needs The front-end page is realized by Vue+element UI according to the functions that the system needs to achieve, using Navicat to build MySQL database, using IDEA development tools and combining with springboot framework to realize the back-end business code according to the system requirements, using uniapp framework can make the applet page can run to different platforms, convenient for users to use.

Users can use the applet to publish posts to seek help, and when other teachers or students see it, they can chat with it to help them. Users can also post other content such as life, sports, animation, etc. to meet teachers or students from different colleges and majors and to seek new friends. This article introduces this applet with simple operation and concise pages, which is perfect for users.

Key words: Campus dating, Spring boot, Uni-app

Date of Submission: 07-06-2022

Date of Acceptance: 22-06-2022

1. INTRODUCTION

Under the rapid development of network information technology and modern mobile communication technology, mobile terminal products such as cell phones and computers in daily life are rapidly promoted [1]. Throughout the online various social applications are intricate and complex, most of them contain unhealthy information and advertising elements, which brings extremely bad experience to users, in this case, the convenient and ready-to-use WeChat applets provide efficient demand services for people's daily use and life [2]. Under the development trend of gradually mature information technology means and computer technology, with the help of WeChat applets can easily access user information and bring multifaceted service experience to users with its multiple advantages of not taking up user memory and no need to download and delete [3]. On the campus with the epidemic present, students can use the dating program to solve problems or need to study materials and share their lives, which enriches the leisure time of many students, teachers and staff on campus, brings the school closer to teachers and students, and promotes the construction and development of modern campus [4]. The development of higher education schools should be closely related to students' lives, and this project is to enrich students' social life and solve their various problems more conveniently so that they can find like-minded partners on the platform, and also to strengthen the communication and interaction between students from different colleges, and everyone can share their life and learning experiences and other contents to make university life more exciting.

With the development of society, socializing is not only about socializing in the real world but also about new social software, tools, web pages, and platforms researches related to them. Foreign theories on social networking include network structure theory, embeddedness theory and social resource theory, while domestic theories include Fei Xiaotong's differential order pattern and Huang Guoguang's human face [5]. From the form of the market, it can be seen that three major types of SNS sites have changed exceptionally fast and turned into the top power leading the industry. These three types of SNS platforms are successful: social platforms centered on leisure and entertainment, school social platforms centered on application school students, and social

platforms centered on business communication and intercourse [5]. However, with the increasing development of information technology, insecurity factors of social platforms have gradually emerged. Various types of social platform software for different user needs have emerged. However, due to the low entry threshold and poor supervision at the later stage, seemingly normal dynamic posting, online shopping, links, etc. may induce crises and increase the property and security risks of users [6].

This project aims to design and develop a WeChat applet to provide chatting and dating services for college students, including core functions such as posting updates, modifying and deleting updates, and chatting. By completing this graduation design task, we can fully practice the requirement research, system design, coding, testing, software configuration and release of WeChat applets and server-side applications based on the uni-app development framework, accumulate software engineering practice and software system design and development experience, and lay a solid foundation for engaging in application software development after graduation.

2. SYSTEM FUNCTIONAL ANALYSIS AND OVERALL DESIGN

SYSTEM FUNCTION ANALYSIS

- 1) User management functions: registration of user registration accounts, log in and launch functions of registered accounts, modification of basic account information, management of changing account passwords, etc.
- 2) Topic management: users publish dynamic topics, view topics, as well as the author can modify the deletion of dynamic.
- 3) Friend management: you can text and voice chat with other users on the platform.

OVERALL STRUCTURE AND DESIGN IDEAS

The whole dating applet system structure is designed according to the needs of college students. In the dating system, users need to realize daily posts, posts can be classified, viewed and published, and they can chat and send voice texts with their friends in the friend interface. Users can set their basic personal information, avatar, and other basic content on my page. Users need to register first to set nickname, avatar, and occupation type for login.

The front-end page is realized by Vue+element UI according to the functions that the system needs to achieve, using Navicat to build MySQL database, and using IDEA development tools and spring boot framework to realize the back-end business code according to the system requirements. Specific functions such as the system structure diagram as shown in Fig. 1.

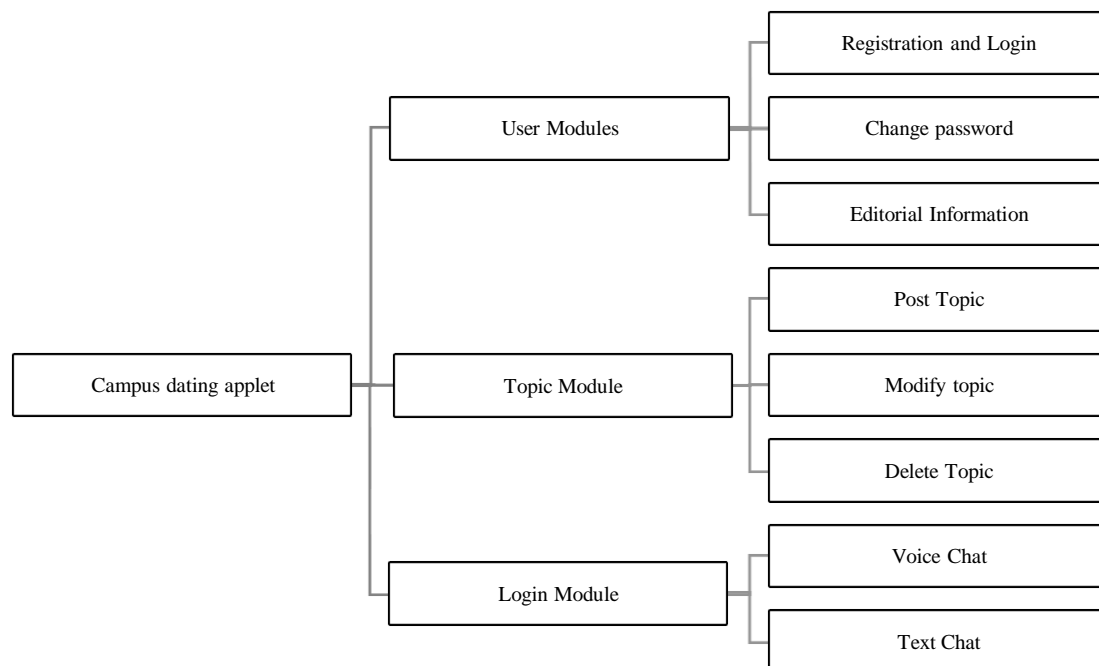


Fig. 1 System Structure Diagram

3. SYSTEM STRUCTURE DIAGRAM

SYSTEM ER DIAGRAM DESIGN

1) User ER Diagram

User ER Diagram is shown as Fig. 2

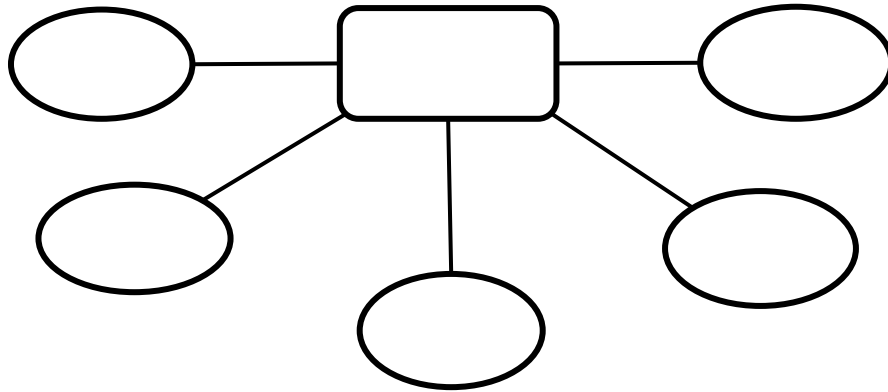


Fig. 2 User ER Diagram

2) Topic ER Chart

The Topic ER Chart is shown as Fig. 3.

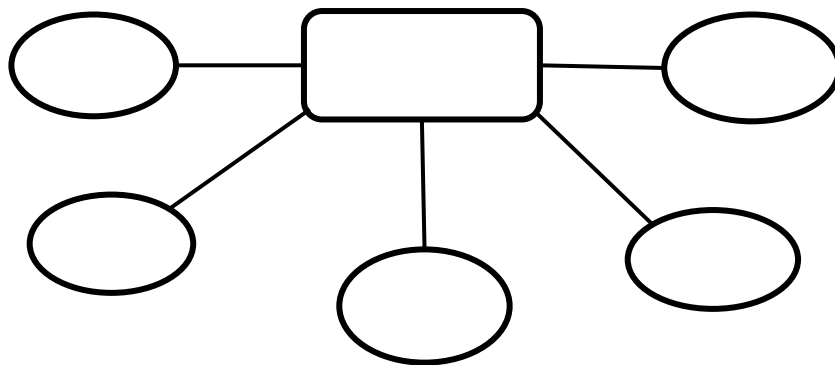


Fig. 3 Topic ER Chart

3) Chat ER Chart

The Chat ER Chart is shown as Fig. 4.

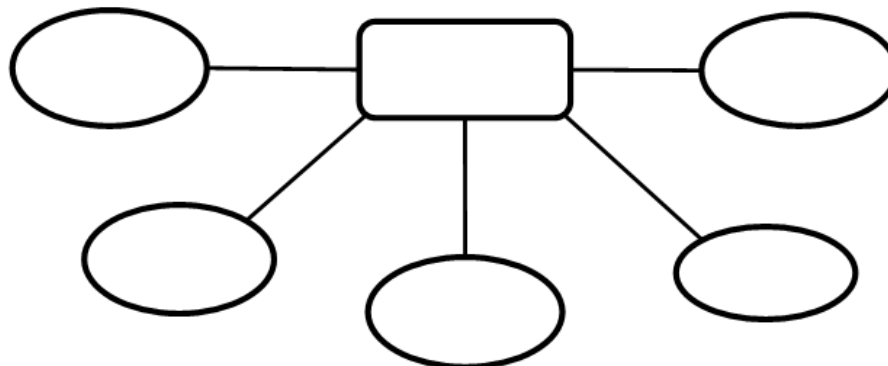


Fig. 4 Chat ER Chart

DATA TABLE DESIGN

According to the relevant design specifications of the database, the corresponding data tables should be designed for specific needs. New relevant indexes can improve the query speed of data tables, and tables with large data volumes can be managed in sub-tables. For the operation of the database, try to make each field non-divisible and not dependent on other fields, and the necessary data have certain type constraints.

1) Chat Table

The main data relationship table of this system lies in the access relationship between users, chats, including sender and receiver ids, chat content and type, etc., as shown in Table (1).

Table (1). Chat Table

Properties	Type	Null value	Data Length	Description
chat_id	int	NOT NULL	11	Primary key, self-incrementing
sender id	int	NOT NULL	11	
recipient id	int	NOT NULL	11	
sending time	datetime	NOT NULL		
content sent	vvarchar	NOT NULL	500	
type	vvarchar	NOT NULL	20	
send_time	bigint	NOT NULL	20	Time taken to send,milliseconds
record_time	int	NOT NULL	11	Recording Length

2) User Table

The user table includes screen name, avatar, type, email, cell phone number, etc., as shown in Table (2).

Table (2). User Table

Properties	Type	Null value	Data Length	Description
user_id	bigint	NOT NULL	20	
dept_id	bigint	DEFAULT NULL	20	Department ID
user_name	vvarchar	NOT NULL	30	User account
nick_name	vvarchar	NOT NULL	30	User nickname
user_type	vvarchar	DEFAULT '00'	2	
e-mail	vvarchar	DEFAULT ''	50	
phonenummer	vvarchar	DEFAULT ''	11	
sex	char	DEFAULT '0'	1	User gender (0 male 1 female 2 unknown)
avatar	vvarchar	DEFAULT ''	100	Avatar Address
password	vvarchar	DEFAULT ''	100	
status	char	DEFAULT '0'	1	Account Status
del_flag	char	DEFAULT '0'	1	Delete flag
login_ip	vvarchar	DEFAULT ''	50	Last login IP
login_date	datetime			Last login time
create_by	vvarchar	DEFAULT ''	64	
create_time	datetime			
update_by	vvarchar	DEFAULT ''	64	
update_time	datetime			
remark	vvarchar	NULL	500	

3) Dynamic Log Table

The dynamic log table includes the type of user posting, operation category, operator, etc., as shown in Table (3).

Table (3). Dynamic Log Table

Properties	Type	Null value	Data Length	Description
oper_id	bigint	NOT NULL AUTO_INCREMENT	20	Log primary key
title	varchar	DEFAULT "	50	Module Title
business_type	int	DEFAULT 0	2	Business Type (0 Other 1 New 2 Modify 3 Delete)
method	Varchar	DEFAULT "	100	
request_method	varchar	DEFAULT "	10	
operator_type	int	DEFAULT 0	1	
oper_name	Varchar	DEFAULT "	50	
dept_name	Varchar	DEFAULT "	50	Department Name
oper_url	Varchar	DEFAULT "	255	Request URL
oper_ip	Varchar	DEFAULT "	50	Host Address
oper_location	Varchar	DEFAULT "	255	
oper_param	Varchar	DEFAULT "	2000	Request Parameters
json_result	Varchar	DEFAULT "	2000	Return parameters
status	int	DEFAULT 0	1	Operation status (0 normal 1 abnormal)
error_msg	Varchar	DEFAULT "	2000	Error message
oper_time	bigint		20	Operation time

4. SYSTEM FUNCTIONAL MODULE DESIGN

USER MODULE DESIGN

Registration and Login Module

Once the user enters the login screen of the program, there are two options.

The first one is to choose the account that has been registered to directly enter the account number and password and then click login, and after successful login, it will jump to the home page. If you forget your password, you can click Forget Password and then go to Change Password, and then you will be redirected to the login page after successful login.

The second is that the user has not registered an account, which requires the user to register an account first, and will authenticate the student information when registering an account.

After the user enters the login screen, enters his account number and password, and clicks the login button, it will trigger the client to send a login post request to the server. This Post request will carry the username and password to the server-side interface login, because the login interface does not need to carry the token when it is called again.

After receiving the parameters, the server will call the login method of the SysloginService interface and pass in the parameter's username and password, then it will call the loadUserByUsername method to find out the user's information according to the username, if not found, it will return the user does not exist. If the user exists, it will determine whether the password is correct, if the password is correct, it will generate a token, the generated token will be placed in redis, the validity of the default is 30 minutes, if the password is incorrect, it will return the password is incorrect. When the client receives the token returned by the server, the token will be saved in the client's storage. To send subsequent requests to the backend without being intercepted. The token is saved successfully and then the token is used to call the getInfo interface to obtain personal information. The client will save the personal information userInfo to storage, and then record a login status loginStatus to storage. The login flow chart is shown in Fig. 5.

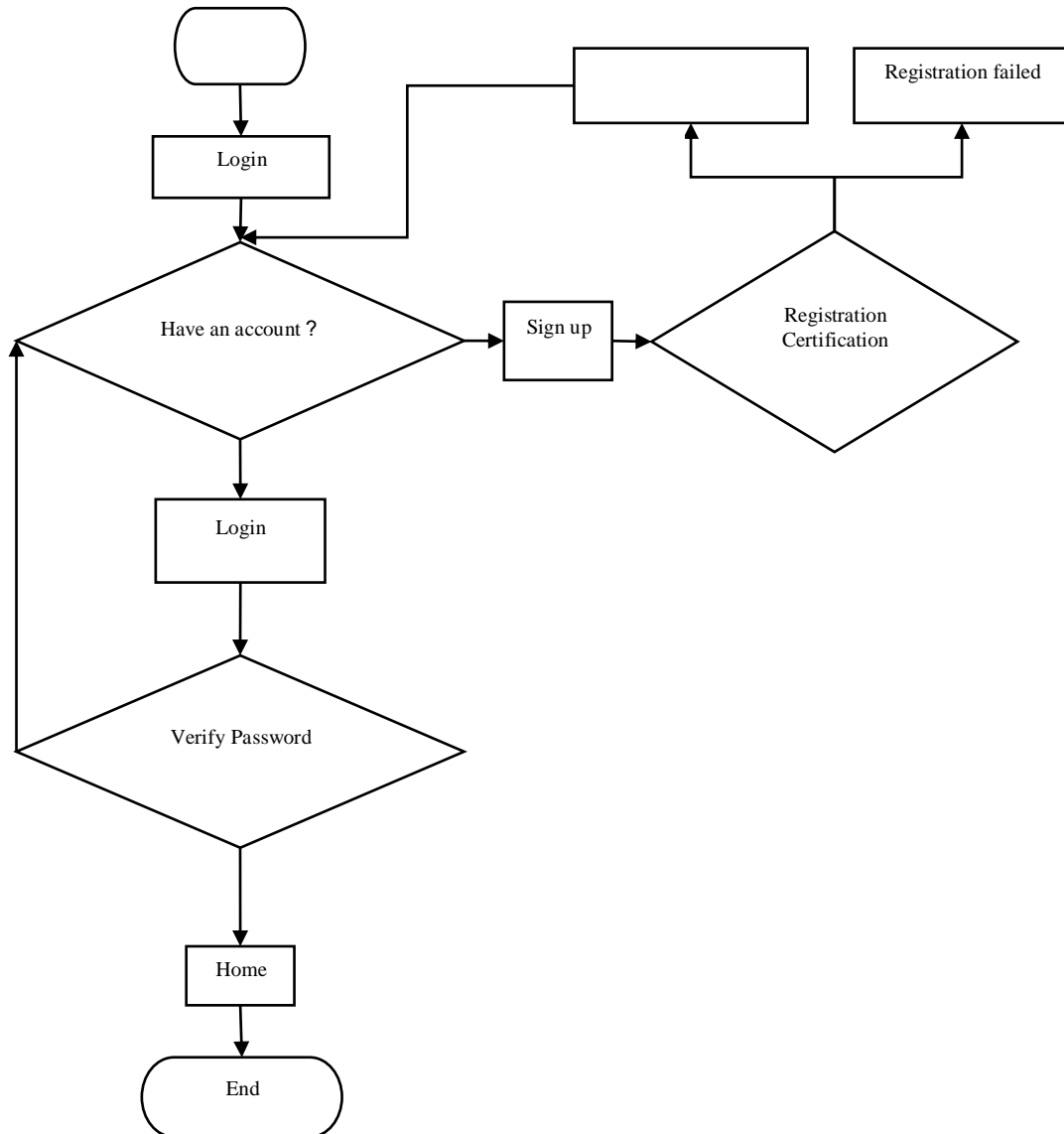


Fig. 5 Login flow chart

User Information Modification Module

When you enter the settings page, you will see the operations of account security, set email, profile edit, clear cache, and about us. When you click Account Security, you will enter the password change page. To change the password, you need to enter the old password, then enter the new password on both sides. After clicking submit, the server receives the parameters, it will first use token to take out the current account information, then use the old password to compare with the password taken out of the account, if equal, it means the old password is correct and the authentication is successful, the new password will be saved to the database by encrypting and replacing the old password. The reason for password encryption is to prevent the database from being attacked, although the hacker knows the user's account information, but the user's password is still encrypted, or can play a certain protective role.

TOPIC MODULE DESIGN

Topic Addition Module

After clicking the publish small icon on the home page will enter the topic add page, in the added page instance life cycle of the created stage will set the article category data categories are stored in the corresponding empty array, and data rendering.

When adding pictures in the topic, the pictures will be uploaded by calling the upload interface of the

background first, and when the upload is successful, a link address of the picture will be returned, and when the topic is written, all the information will be submitted to the background together by clicking on the release. If you cancel the release, the background will delete the image. After the topic is published, it will automatically jump to the home page, and then the home page will be refreshed to get the latest information about the topic. The topics on the home page are sorted in descending order of time, which means the newly added topics will be put on the top.

The top of the home page shows the category of the topic, you can search the topic according to the category of the topic, and you can also use the input box below to fuzzy search the topic.

CHAT MODULE DESIGN

WebSocket is a new protocol under HTML5, which enables full-duplex communication between browser and server, saving server resources and bandwidth and achieving real-time communication. Websocket protocol is a persistent protocol. It is a complete full-duplex approach, where the client and server are completely equal after establishing a connection and can initiate requests from each other, and after the first request establishes a TCP connection, all the data exchanged afterward can be exchanged without sending HTTP header, which is obviously different from the original HTTP protocol, so it needs to be upgraded for both the server and the client to achieve this. This is obviously different from the original HTTP protocol, so it requires an upgrade of both the server and the client to achieve it [18].

User On-line Module

After clicking chat in the buddy list, it will jump to the chat page, and in the chat page, it will call the connectSocket method in uni-app to send a message to the websocket service on the server-side, and the onOpen method in the websocket service on the back end will receive the message, and while receiving the message, we can do some processing to save the obtained We can save the session and record the number of online people, then return a session socketTaskId to the front-end, and also carry a connectSocket:ok to indicate that the channel is established successfully, then the front-end changes the status of the current user's channel to the connected state this.IsOpen= true. method to send a message to the websocket server, which contains the ids of both sides of the chat, and an action category bind, which means that the method is binding the information of both sides of the chat, and then calls getData to query all the chat records and place the chat information according to whether the current user is the sender or the receiver, which will put the other side on the left and the current user on the right. If the difference between the messages is more than 300s, the time will be displayed on the page, the chat list will be initialized, the previous chats will be fetched, and then rendered to the page.

Message Sending Module

When the user sends a text message, after typing directly in the input box, click the send button to call the SendMessage method, in which the Format method will be called first to format the message into a standard format and give the message a category, whether it is a text message text, or send mode, and if the message is sent as a voice message, the Upload method will be called to record the message. If the message sent is a voice message, it will call upload, and the successful upload will return the address of the recording, put the address into the message sent, and calculate the length of the recording, and put the length of the recording into the message. After the message is assembled, we call updateChatDetail to update the message content of the chat page, and finally call the send interface of the backend to send the data to the server, which receives the message and determines whether the person toId is online or not based on the fromId and toId in the message. If it is online, it will call the sendMessage method in the websocket service to send the message. Finally, the messages are stored in the database.

Message Receiving Module

SocketTask.onMessage method will be opened when the receiver is also online. This method will keep listening for messages, receive them if they are sent, and then call the format method to organize the messages, in which different message categories are assembled into different formats, and display the final call to updateChatDetail to render the list of messages.

User Downline Module

When the user leaves the chat page, this.SocketTask.close() method will be called to send a message to the websocket server to disconnect, and the websocket will subtract 1 from the number of people online.

5. SYSTEM TESTING

The testing session is of great importance for the development of the system by conducting a complete test of the existing functions of the applet and observing whether the system works properly.

FUNCTIONAL TESTING

Test users enter the applet to register a new account with the ID: "ceshi" and log in. As shown in Fig. 6.

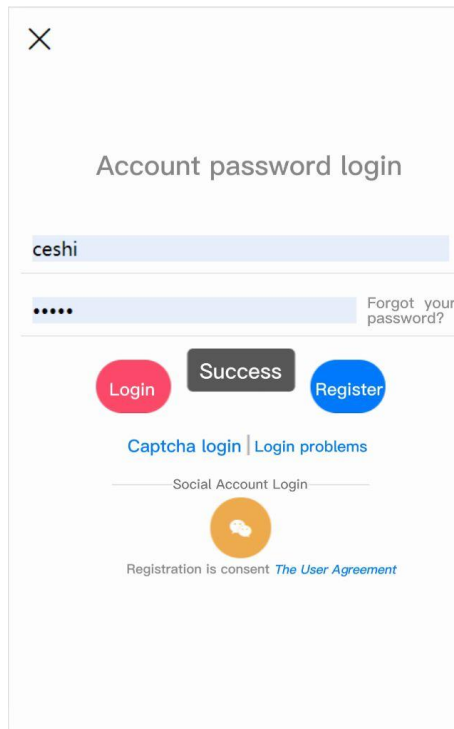


Fig. 6 Test number login

Use the test number to modify the avatar, name and other basic information. As shown in Fig. 7.

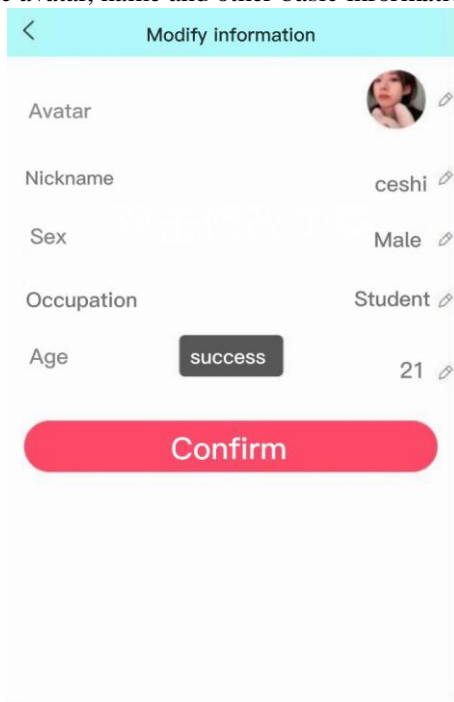


Fig. 7 Test number modification information

Use the test number "ceshi" to publish a post about learning, including any text and pictures. As shown in Fig. 8.

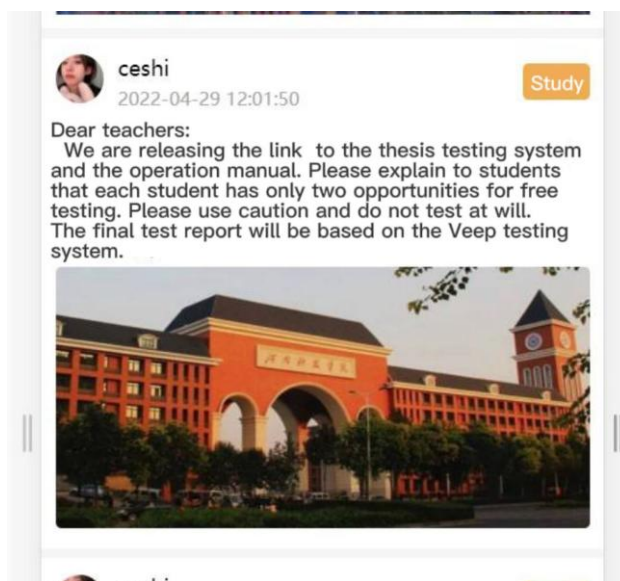


Fig. 8 Release Content Map

Use the function of chatting with other users by logging into the test number "ceshi" and sending messages to the test number "test12", and logging into the test number "test12" to view the messages sent by the test number "ceshi" and reply to them, as shown in Fig. 9.

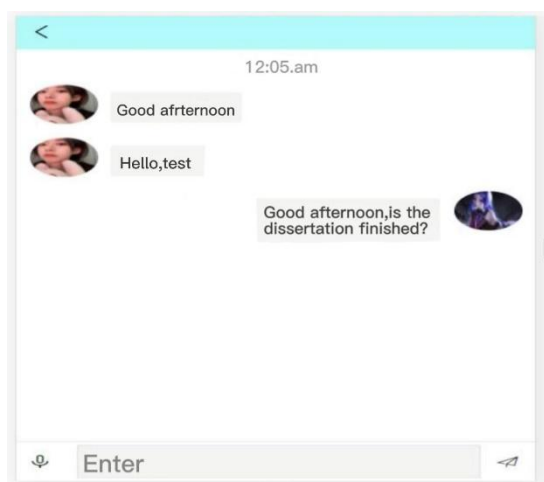


Fig. 9 Test chat function

Users can exit the login function after experiencing the applet, take the test number "ceshi" as an example, click to exit the login page, the user will be prompted to operate successfully. As shown in Fig. 10.

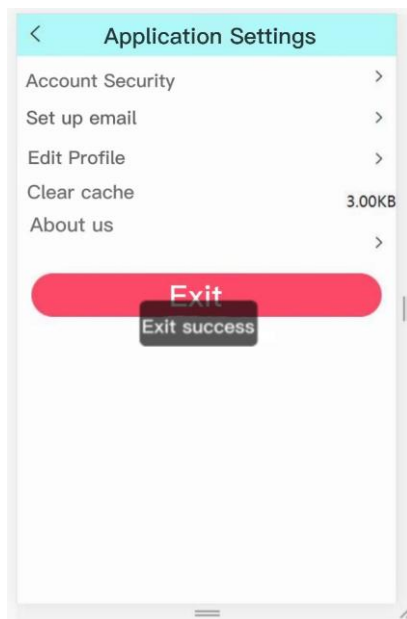


Fig. 10 Logout

Users can set a new password in the Account Security page. During the setting process, you need to enter the new password twice, and the system will prompt the user if the two passwords are inconsistent. As shown in Fig. 11.

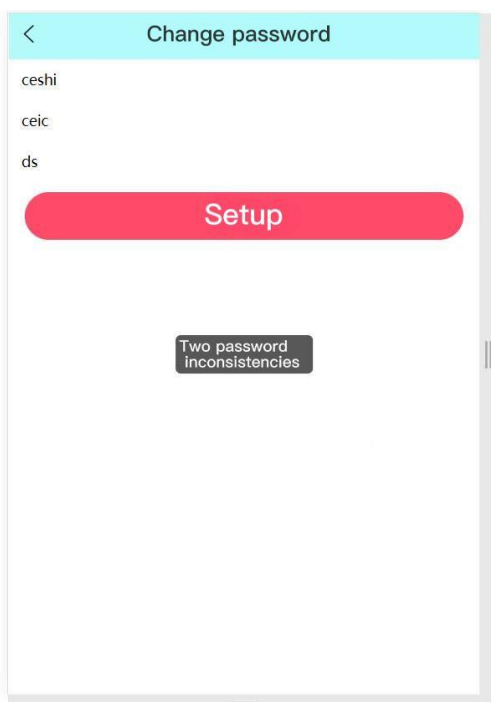


Fig. 11 Change password

7. CONCLUSION

This development is on the WeChat platform with uni-app as the frontend and mysql5.7 as the database management system to manage the backend database. The system implements the user browsing daily and chatting functions in the dating system, and the comfortable page board design also makes the user well able to experience the convenience of the system. It has the following two features.

- 1) Functional integrity: During the initial development process of this design, we investigated a lot of

documentation on campus dating, applet development, online dating platforms, etc., and also consulted and referred to the development process of many other online dating systems and existing online software. After practice and continuous summary, the overall design of the system to achieve the whole system module on the user needs analysis of the division, including three modules: users, topics, chat, in this basic module to achieve the dating system has the function.

2) The web page is simple: after the user logs in to the applet application, according to the role of the tab bar navigation and their own needs to operate, the page is simple and easy to get started, all have text descriptions, which greatly facilitates the operation and use of the user.

References

- [1]. Hu Zuhui. [2021] "Design and implementation of a mobile information service system based on WeChat public platform" *Journal of Nantong University (Natural Science Edition)*, Vol20, issue 3:pp.75-81.
- [2]. Du Yuzhun,Wang Xiaojun,Tian Liqin. [2022] "Design and implementation of an online shopping system based on WeChat applet" *Network Security Technology and Application*,issue 4:pp.60-62.
- [3]. Cheng Yawei, Guo Feiyan. [2022] "Research on real-time monitoring of communication power based on WeChat applet " *Information and Computer (Theory Edition)*,Vol 34,issue 1:pp.116-118.
- [4]. Chen Yanchun,Meng Liqiu,Xu Bo. [2022] "Design of information service platform for college students based on WeChat applets" *Computer programming skills and maintenance*,issue 1:pp.61-64.
- [5]. Yang Ding. [2013] "Design and implementation of a J2EE-based social network platform for college campuses" *Zhongshan University*.
- [6]. Feng Jing, Wang Xuanru, Zeng Qin, Yang Pan. [2018] "Research on the innovation of social application APPs based on the perspective of "Shellless Child CC" " *Economist*,issue 10:pp.212-213+215.
- [7]. Yu Renjie,Wang Fengshuo. [2021] "Design of online book sales system based on Node.js" *Computer Knowledge and Technology*,Vol17,issue34:pp.83-84+92.
- [8]. Zhang Q. [2021] "Research and development of cross-platform digital textbook system based on uni-app" *Beijing Printing Institute*.
- [9]. TonyZhang24.[2021] " (trans) Internet system architecture | front and back-end separation technology system" *Blog.com*.
- [10]. Xiong Yongping. [2019] "Analysis and research of SpringBoot framework-based application development technology" *Computer Knowledge and Technology*,2019,Vol15,issue 36:pp.76-77.
- [11]. Liu Zifan,Guo Yujun. [2021] "Design and implementation of a personal blog system based on SpringBoot+Mybatis" *Modern Information Technology*,Vol5, issue 8:pp.104-107+111.
- [12]. Liu Qiu-lan,Zhang Jing. [2021] "Design and implementation of uni-app-based application software" *Electronic Production*,issue 23:pp.57-59.
- [13]. Li Yaqin. [2021] "The advantages of Java programming language and its application practice" *Internet Weekly*,issue24:pp.60-62.
- [14]. Jiaqiao Xu.Programming [2021] "Features and Technical Analysis of Computer Software Java" *International Core Journal of Engineering*,Vol7,issue8.
- [15]. Cao Hao Gang. [2022] "Research and design of medical technology appointment platform in the era of "Internet+" " *Computer programming skills and maintenance*,issue03:pp.38-39+79.
- [16]. Li Yanjie. [2022] "Design and implementation of a mobile question bank practice system based on JAVA and MySQL database " *Heilongjiang Science*,Vol13,issue 2:pp.56-57.
- [17]. Ding X, Shi JJ, Long DY, Liu Y. [2022]"An applet-based device management system" *China New Communication*,Vol24,issue 3:pp.45-47.
- [18]. Xie Wenyan. [2011] "Design and implementation of a WEB-based information management system for e-commerce shopping malls" *University of Electronic Science and Technology*.
- [19]. Austin Lee.[2018] "Essential Php 6 And Mysql 5 : For Dynamic Web Sites" *Tritech Digital Media*, issue 8.
- [20]. Xiao Rui,Cheng Ning,Tian Chongfeng,Jin Zhixiong,Du Yi.MySQL [2018] "Database Application Technology and Practice" *People's Post and Telecommunications Publishing House*, issue 1:pp.177.
- [21]. Zhao Haoxiang. [2019] "Design and implementation of online shopping mall system based on SSM framework" *Beijing University of Posts and Telecommunications*.
- [22]. Wu Guanxue. [2018] "SpringMVC-based hotel information management system" *Jilin University*.
- [23]. Chen Feng.[2018] "Design and implementation of B2C online shopping mall system based on SSM framework " *Hunan University*.