CLOUD-BASED CHAT FORUM SYSTEM FOR ANDROID

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ABSTRACT

Chat forums are essential application software for people to communicate, discuss and share, but most of the forum software on the market are not very convenient to use. Some forum software is very troublesome to register, like “Weibo”, some forum software limit level and scope of content/speech, like “BaiduTieba”, and “Little Red Book”. Therefore, in this project, a cloud-based chat forum system, which aims to solve the problems of cumbersome registration, speech restrictions, and content restrictions of existing forum software, is developed. This "Cloud-based Chat Forum System" is a social platform which is user-autonomous, where the content sharing and management are by the users themselves. It integrates real-time data synchronization and follows the Android user interface design principles to achieve an easy-to-use and manage forum platform. Users can access it through their mobile devices to achieve instant sharing and dissemination of information through multimedia forms such as text and pictures.

I. Introduction

"Cloud-based Chat Forum System" is based on cloud storage, and all the functions require data exchange with the cloud. Compared with other forums on the market, "Cloud-based Chat Forum System" is simpler and more convenient, with no high registration threshold, no restrictions on speech registration, no restrictions on speech scope and this application is user self-management.

II. Problem Statement

There are some problems with the existing chat forums. Users may change forums after using the software. Many new users will switch between multiple forum software. Some forum software chose to load many functions on the homepage, resulting in complicated pages, causing visual fatigue. There is also confusion in the content of some forums. Various types of content are loaded on one interface. Users may not be able to find the content they want to know and view in the forum in time. Too confusing posts will make users lose patience. At the same time, in some forums, different user groups sometimes have different posting rights. Before new users get more permissions, their content may be more restricted. In addition, there may be too many similar content recommendations in the forum. If users choose to view posts with tags, it will continue to push the content of the tag to you.

III. Objectives

The core goal of this project is to create an easy-to-use chat forum with a simplified registration process and no unnecessary restrictions:

1. Study existing chat message boards and their shortcomings, and try to identify the problems encountered by users, such as complex registration processes, text restrictions, and low user engagement.

2. Develop an improved chat forum system - a cloud-based chat forum system that eliminates the above limitations by providing a simple, open, and minimally restrictive chat forum platform and real-time interaction system.

3. Measure the effectiveness of the chat forum in terms of user satisfaction, system usability, and the effectiveness of user engagement features in improving user activity and retention.

IV. Methodology

An iterative development model has been adopted to develop the “Cloud-based Chat Forum System” chat forum, mainly to take advantage of its high flexibility and adaptability. The first step is to find the requirement of users, then analysis and design (c.f. Iteration 1 in Figure 1). When finishing design, the testing step is carried out, which is followed by implementation and review steps (c.f. Iteration 2 in Figure 1). The Iteration 3 repeats the Design to Review process, then perfoms the Deployment and Maintenance steps.

At the beginning of the project, I only made a few necessary interfaces based on the initial design of the forum, and there was no jump between each interface. After the interface was completed, I started to add jumps to ensure that each interface could jump to each other. Then I added the project functions. After the first version of the project was completed, I began to review the entire project, so a new round of design and function additions began. After the second round, I entered the final round of improvement. When the project came to an end, I started deployment and user testing. After the test results came out, I started to maintain the project.

By gradually improving the system in each development cycle, I can continuously optimize the functions. Each iteration not only helps to discover and solve problems as early as possible but also adjusts the development direction in real-time according to changes in requirements. Compared with traditional development methods, the iterative model is more suitable for dealing with uncertainties and changes in requirements in the forum. It provides multiple opportunities for review and optimization to ensure timely delivery and accurately meet the needs of end users.

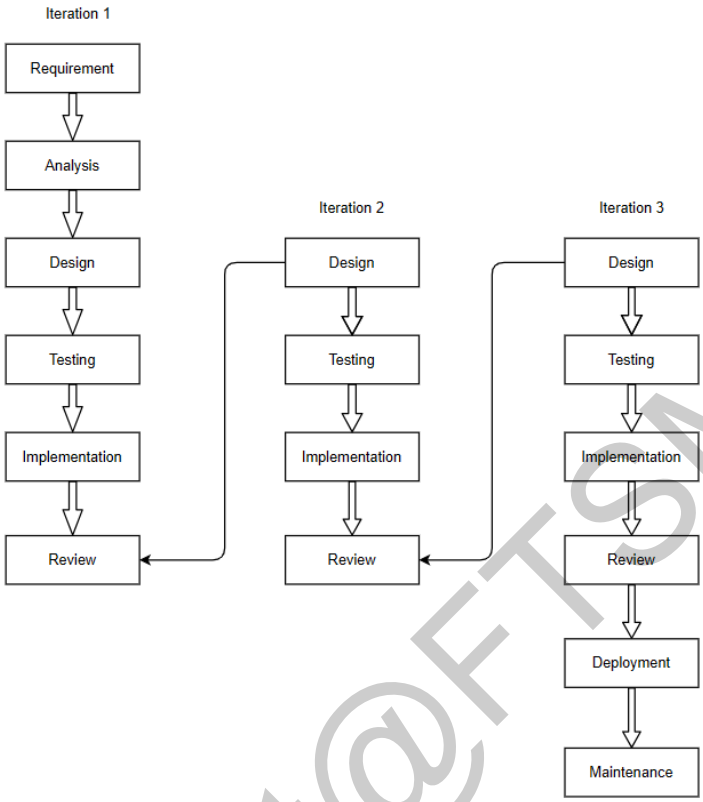

Figure 1 Iterative Development Model

V. Result

This section reports the functions and user interface of the implemented Cloud-based Chat Forum System. There are basic functions for all users. Advanced functions for higher level users.

5.1 Basic Functions

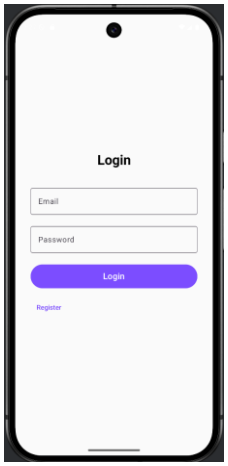

Figure 2 Login page of the system

Figure 2 shows the login page, user can register and login in this page.

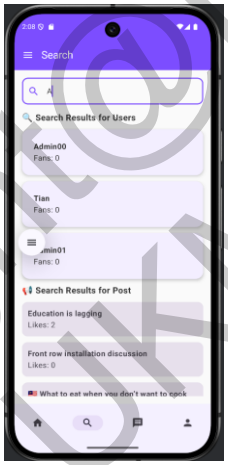

Figure 3 Search page of the system

Figure 3 shows the search function. User can search post or another user.

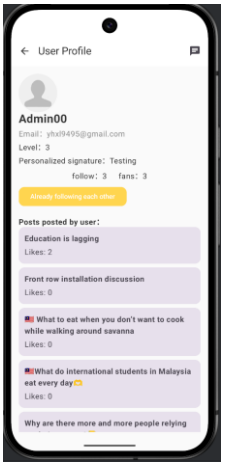

Figure 4 User profile page of the system

Figure 4 shows other user information. User can follow and chat with another user in this page. Meanwhile user also can see the post which is sent by another user.

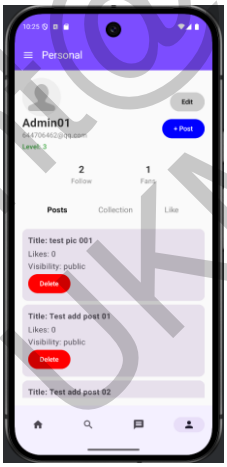

Figure 5 Personal page

Figure 5 shows the user's personal page. The user can create and delete posts on this page. Meanwhile user also can edit their information in this page. In this page, user also can see the post which they have collected and liked.

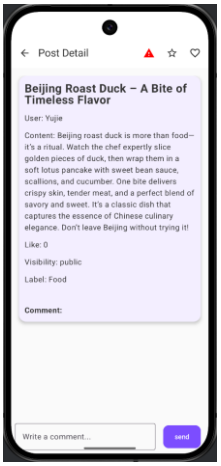

Figure 6 Post page

Figure 6 shows the post. The user can comment, collect, like and report a post in this page.

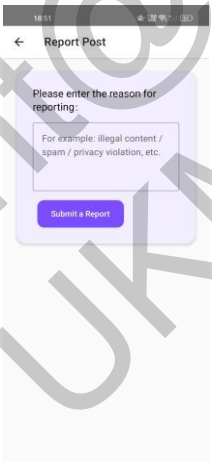

Figure 7 Report post function

Figure 7 shows the report function.

5.2 Level 2 Function

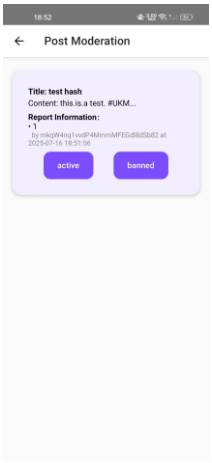

Figure 8 Moderation page

Figure 8 shows the post moderation which is level 2 user function, where the level 2 user can review reported post and choose to remove the post.

5.3 Level 3 Function

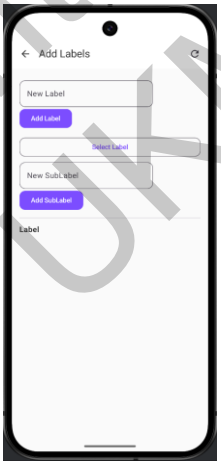

Figure 9 Add labels/sub-labels page

Figure 9 shows the level 3 functions of adding labels and sub-labels.

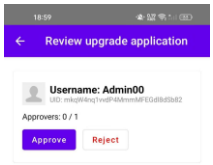

Figure 10 Promotion to level 3 application page

Figure 10 shows the level 3 function, review promotion application from level 2 users. Here, the level 3 user can choose to approve or reject the application.

VI. Testing

6.1 Test Environment

Table 1 Device Introduction

Standard	**Specification**
Brand	OPPO A93s 5G
Processor	Dimensity 700 octa-core
Operating System	Android 12
Memory Capacity	8.00 GB
Solid State Drive	256 G
ColorOS version	V12.1

This system test was conducted on an Android phone to verify the stability and authenticity of the operation and the response test. In Table 1.

During the development process, I used the Android Studio simulator and Android phone for testing, and used the Firebase console to monitor real-time data integrity. This is to ensure that the user's perceived experience is similar to the actual environment.

6.2 Test process and function

Table 2 Test Case Menu

Test ID	Test Function
TC-001 to TC-002	Registration and Login
TC-003 to TC-004	Create Post and Delete
TC-005	Search Function
TC-006 to TC-007	Follow and Private Chat
TC-008 to TC-009	Edit, Collect, Like
TC-010 to TC-011	High Level Power

Table 2 shows the test process and function. All the tests have passed.

6.3 User Test Feedback

Table 3 User Test Feedback

Question	Average Rating	Ratings Distribution	Key Insights
1. Is the system interface clear and easy to understand?	4.80	1: 0, 2: 0, 3: 0, 4: 1, 5: 4	Excellent interface clarity.
2. My main purpose for using the forum is to get information, communicate or be entertained.	5.00	5: 5	All users are satisfied with the purpose of using the forum
3. The registration process is quick and	5.00	5: 5	All users are satisfied with the

easy.			registration process
4. The interface is clean and easy to navigate.	5.00	5: 5	Users find the interface very easy to navigate
5. Core features like posting, commenting, and private messaging work smoothly.	5.00	5: 5	All users are satisfied with the core features
6. I rarely experience lag, crashes, or other technical issues while using the app.	4.80	1: 1, 5: 4	Minor technical issues reported by one user, overall positive response
7. The login reward and user ranking system increases my motivation to use the app.	5.00	5: 5	High motivation driven by the rewards and ranking system
8. I often use the search function to find content that interests me.	4.60	3: 1, 5: 4	Slight dissatisfaction with search feature, but most users satisfied
9. Overall, I'm satisfied with the features and experience of the forum.	4.80	1: 1, 5: 4	Overall positive, but one user less satisfied
10. I would continue using this app and recommend it to others.	4.40	3: 1, 4: 1, 5: 3	Positive but with some room for improvement in user retention and recommendations

Tabel 3 shows the positive user feedback after using the system.

VII. Conclusion

In short, "Cloud-based Chat Forum System" is a project with practical application value. It not only solves some problems in reality, but also lays a solid foundation for my future development practice. I hope that in future optimization, the function and experience of this system can be continuously improved, and it can truly achieve "making users willing to use and comfortable to use".

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