HOOP: A PLATFORM FOR SPORTS ENTHUSIASTS TO SHARE SPORTS SCIENCE AND ACCESS PROFESSIONAL ADVICE

WEI YI

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ABSTRACT

This project revolves around the development of HOOP, an online community tailored for sports enthusiasts, with a primary focus on sports science and health discussions. Key factors include the platform's architecture, user requirements, system specifications, design considerations, and the overarching goal of creating a dedicated space for in-depth conversations in sports science. Addressing limitations in existing platforms, HOOP aims to offer a user-friendly, expert-driven, and goal-oriented environment. Challenges encompass attracting an initial user base, content moderation, and sustaining expert engagement. Proposed solutions involve a well-defined user registration process, personalized user profiles, a robust notification system, and a focused interface design. The methodology involves a layered architecture with a frontend (HTML, CSS, JavaScript) and backend (PHP) combination, utilizing a MySQL database. The outcomes include a detailed design specification, system requirements, and an architectural blueprint. While challenges such as expert engagement and platform competition persist, enhancements envisioned include machine learning-driven recommendations, real-time collaboration features, and gamification elements. Ultimately, HOOP—short for “health objectives of players”—aims to establish itself as a dynamic hub for sports enthusiasts.

With the development of information technology, people's discussion places gradually transition from offline to online, such as online discussion forums, which provide a very convenient platform for people who are eager to communicate.

INTRODUCTION

Existing online discussion platforms can provide users with a channel to solve various problems in life by asking and answering questions. Most of these platforms cover a wide range of topics, which provides a relatively independent discussion space for enthusiasts of different topics. However, due to the large number of topics covered, the platform cannot optimize the discussion space for the needs of users who prefer different topics. Today's online forums cover topics ranging from sports training to health management, but they don't have a separate section dedicated to sports science. Especially for users who want to discuss sports science in depth, the content of existing platforms often struggles to meet their needs for professionalism and depth.

With the passage of time, the improvement of the quality of the people, and the deepening of users' understanding of the topic they prefer, the specialization and refinement of online discussion forums is an inevitable trend.

In recent years, with the rapid development of sports science and people's increasing emphasis on sports and health, the existing platforms have been unable to meet the needs of users. This project was created to fill this gap. Unlike traditional online discussion platforms, HOOP uses a forum style open discussion model where users can conduct extensive and in-depth discussions around different areas of sports science. The core areas of focus of the platform include but are not limited to sports training methods, physiological principles, sports psychology, nutrition and health, sports technology and equipment.

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The wishes of the project is to create a curated community where users can share the latest research results, professional insights, and personal practical experiences. The forum will provide users with a high-quality content interaction environment by subdividing discussion topics, introducing professionals to participate in exchanges, and building an open and equal discussion atmosphere.

The objectives of the project is to bring sports enthusiasts, scholars and practitioners together to form a professional discussion platform and promote the dissemination and exchange of knowledge in the field of sports science. In the future, it can become a platform for in-depth learning, sharing and inspiration, where users can find in-depth content that meets their professional needs, while connecting with like-minded community members to advance sports science.

METHODOLOGY

The system follows an Incremental Development Model, consisting of four key stages:

1. Identification

The Identification phase remains similar in the Incremental Model. It involves understanding and specifying system requirements through continuous communication between the customer and the development team. However, in the Incremental Model, the focus is on identifying the most critical and essential requirements that can be developed and delivered incrementally.

2. Design

The Design phase in the Incremental Model is more focused on designing specific modules or components of the software that are prioritized for development in the current increment. Design activities occur iteratively for each increment, allowing for detailed planning of the features to be implemented in the current iteration.

3. Construct or Build

In the Construct or Build phase of the Incremental Model, the emphasis is on developing individual increments or modules. Each increment represents a portion of the complete

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system functionality. After each increment is built, it is integrated with the existing system, allowing for continuous, step-by-step construction of the entire software.

4. Evaluation and Risk Analysis

Evaluation and Risk Analysis in the Incremental Model occur after each increment is developed. The built increment is tested, evaluated, and validated to ensure it meets the specified requirements. Risk analysis is ongoing, addressing any new risks that may arise during the development of each increment. Customer feedback is crucial after each increment, guiding further development and ensuring alignment with customer expectations.

In the Incremental Model, the development process is broken down into smaller, manageable parts, each of which is developed separately and integrated into the existing system. This approach allows for faster delivery of partial functionality, enabling stakeholders to see tangible progress at regular intervals. Customer feedback and risk management are integral parts of each increment, ensuring that the software evolves in alignment with changing requirements and potential risks.

DESIGN

Web models play a pivotal role in shaping the user experience and functionality of online platforms. In the context of HOOP, the chosen web models are instrumental in defining how users interact with the system, access information, and engage with the sports community. This section delves into the web models employed by HOOP to create immersive and intuitive user experience.

From Figure 3.1 to Figure 3.4 are the HOOP prototypical architecture design.

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Figure 3.1 illustrates the user interaction with system.

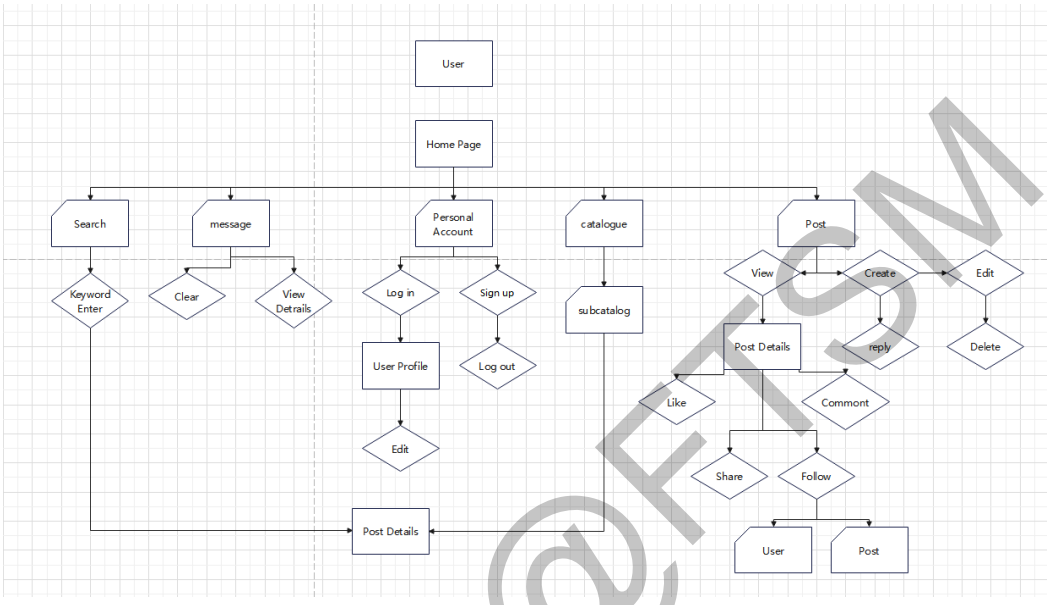

Figure 3.1 Context Diagram

Figure 3.2 illustrates in more detail how the various functions of the user system operate.

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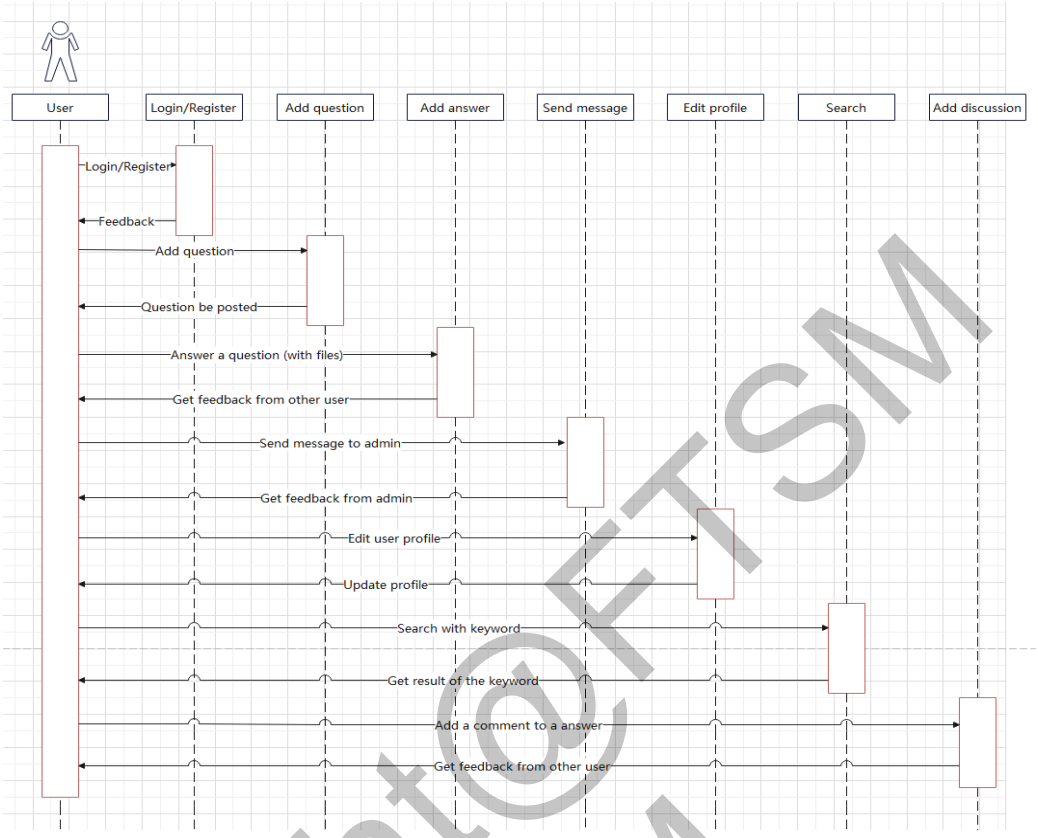

Figure 3.2 Sequence diagram for user

Figure 3.3 illustrates in more detail how the various functions of the admin system operate.

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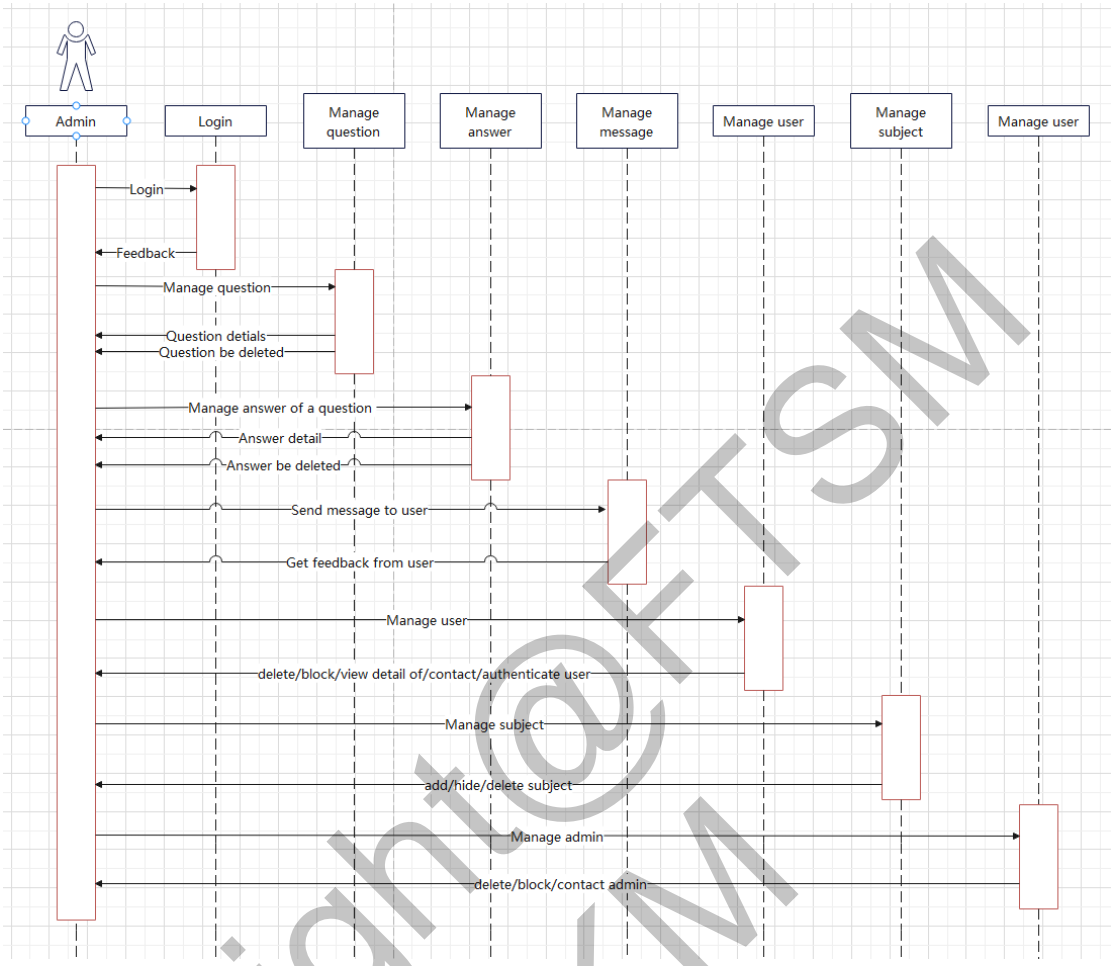

Figure 3.3 Sequence diagram for admin

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Figure 3.4 illustrates the structure of HOOP database.

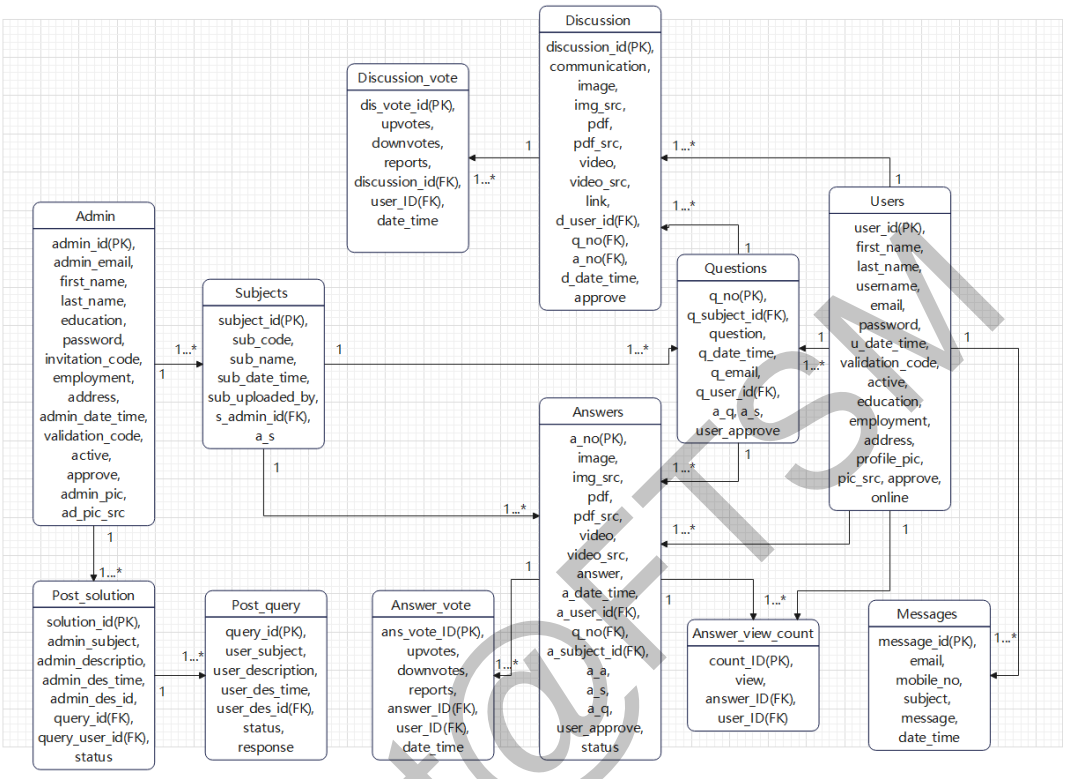

Figure 3.4 Database Diagram

To achieve HOOP web programming, this project will use the classic front-end (HTML, CSS, JavaScript) and back-end (PHP) combination, and use a database (managed by phpMyAdmin) to store data.

Frontend Layer:

HTML will be used for constructing the structure and content of web pages. Then CSS will be Employed for styling and layout design of web pages. This project goanna use JavaScript to Implement for interactive features and dynamic effects.

Backend Layer:

This project will use PHP serving as the server-side scripting language, PHP handles user requests, executes business logic, and interacts with the database. And manage through phpMyAdmin, it stores crucial data such as user information and post content.

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This layered structure offers several advantages. The first is scalability, it breaks the system into different layers, each focusing on specific functionalities, ensures that adding new features doesn't necessitate modifications to existing code. Business logic can be extensively reused, and new layers can be easily inserted to extend the application if required.

The second one is maintainability. The layered architecture encapsulates different functions in distinct layers, significantly reducing coupling between layers. Consequently, when modifying the code of a specific layer, it minimally impacts other layers, enhancing the system's maintainability.

HOOP's web programming follows this layered structure, where frontend and backend components collaborate to deliver a user-friendly interface and robust functionality. The front end manages user interactions and presents an intuitive interface, while the backend handles business logic and data storage. This collaborative approach enables the design and development of the entire HOOP platform.

Figure 4.1 illustrates the components of this project.

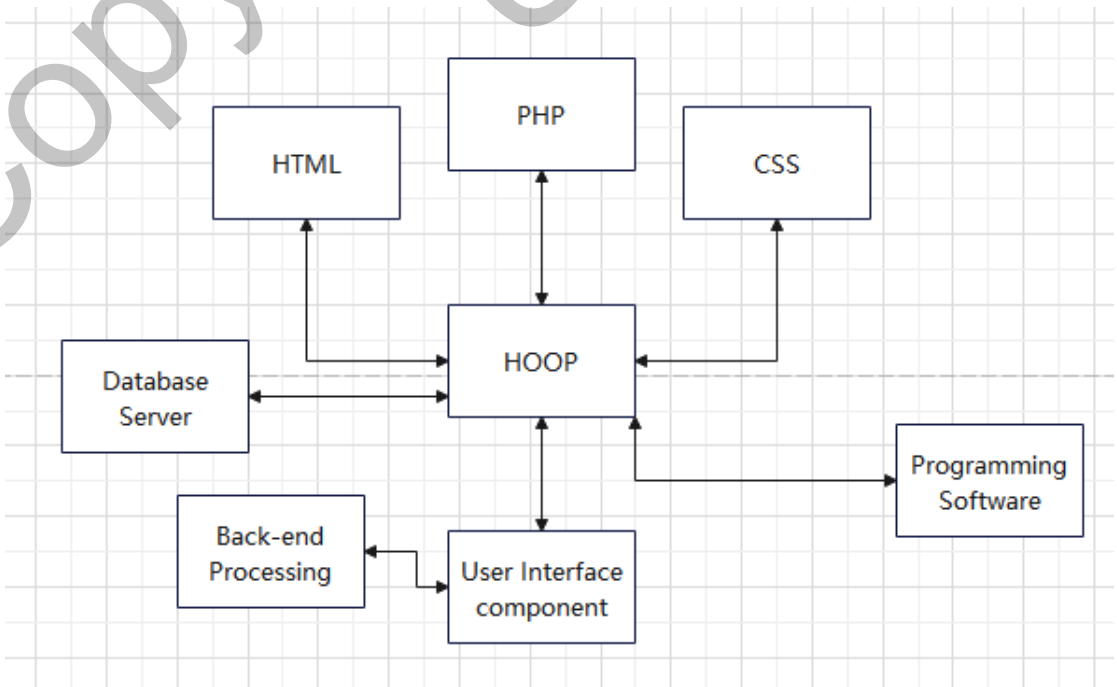

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Figure 4.1 Components Diagram

CODING

This project adopts the incremental development model, the system is developed in stages, and the key parts are developed first. This project is an online community, and user registration, posting, and replying functions are critical, so these functions have been developed with the highest priority. The front-end development of this project uses HTML and CSS to structure and style user pages and uses JavaScript to provide interactive functionality. The back end uses PHP to provide dynamic data support. The data of the project is stored using MySQL digital library.

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INTERFACE DESGIN

Figure 4.9 shows the User Registration Page of HOOP.

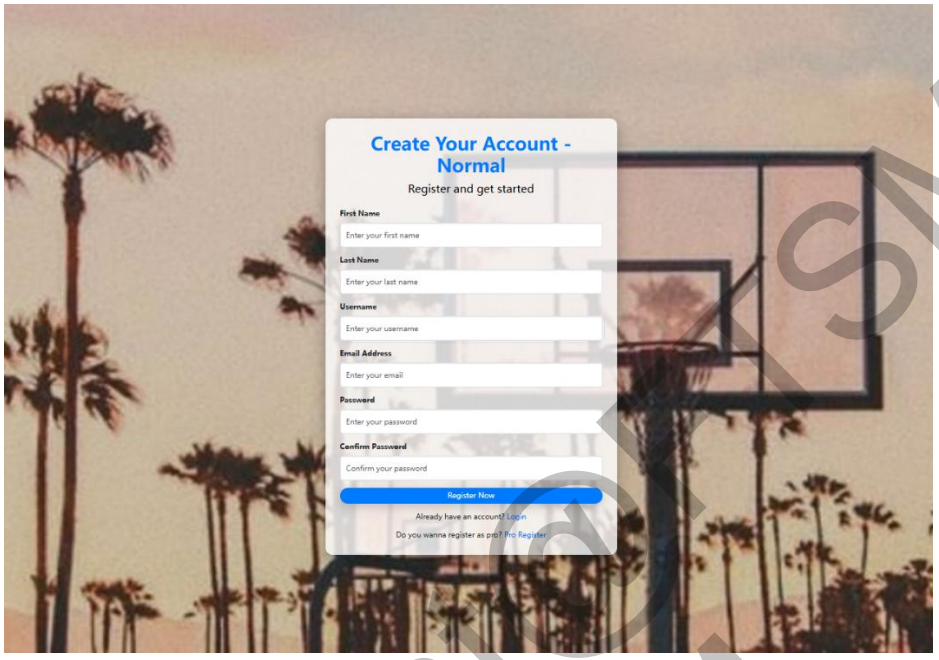

Figure 4.9 User Registration Page

Figure 4.10 shows the User Login Page of HOOP.

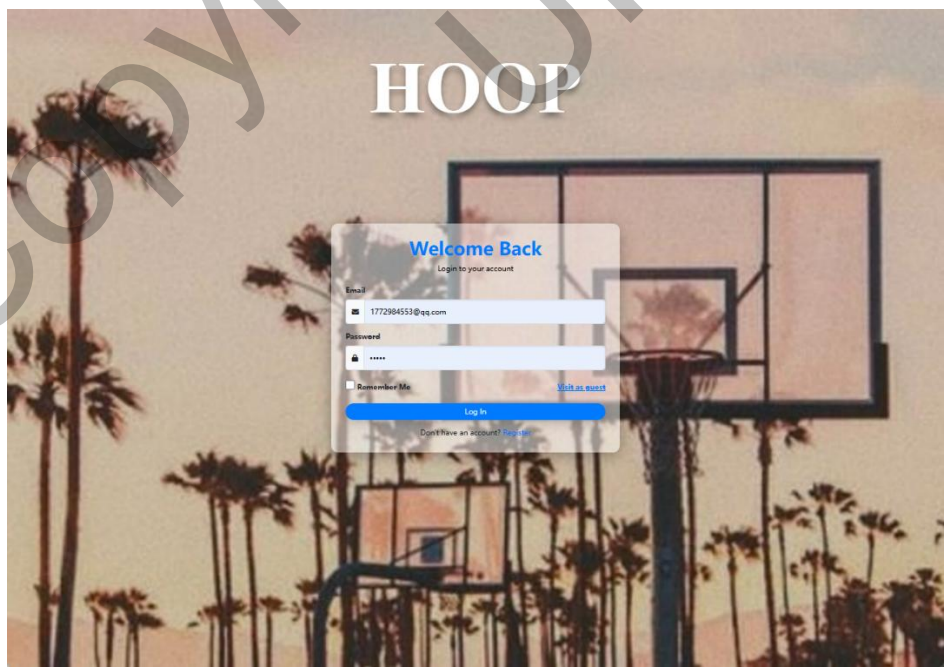

Figure 4.10 User Login Page

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Figure 4.11 shows the User Home Page of HOOP.

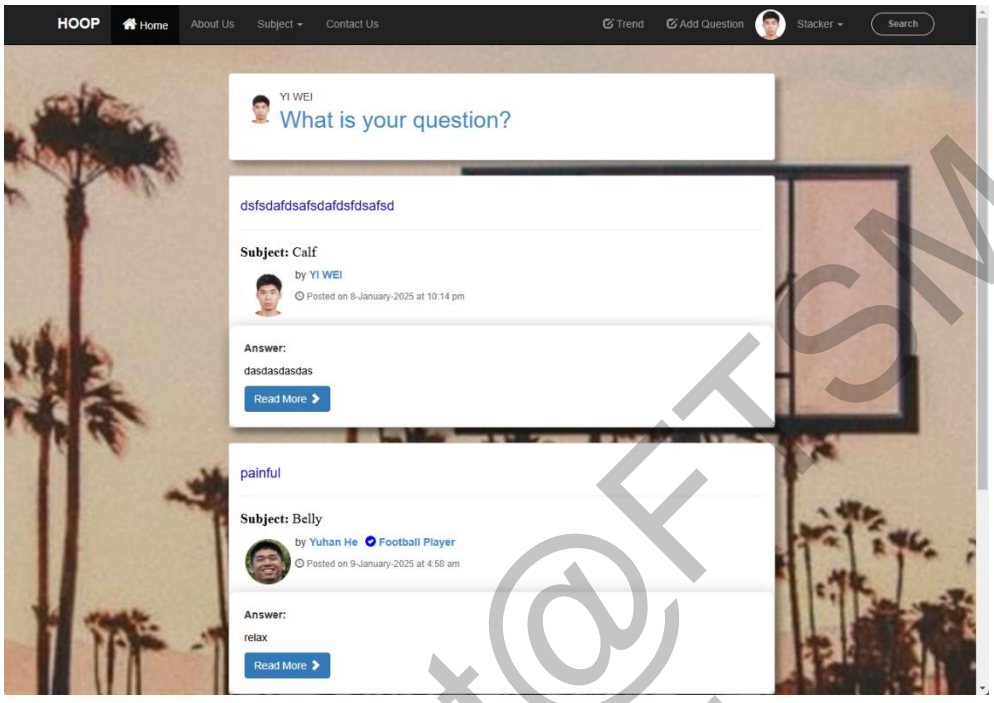

Figure 4.11 User Home Page

Figure 4.12 shows the User Add Question Page of HOOP.

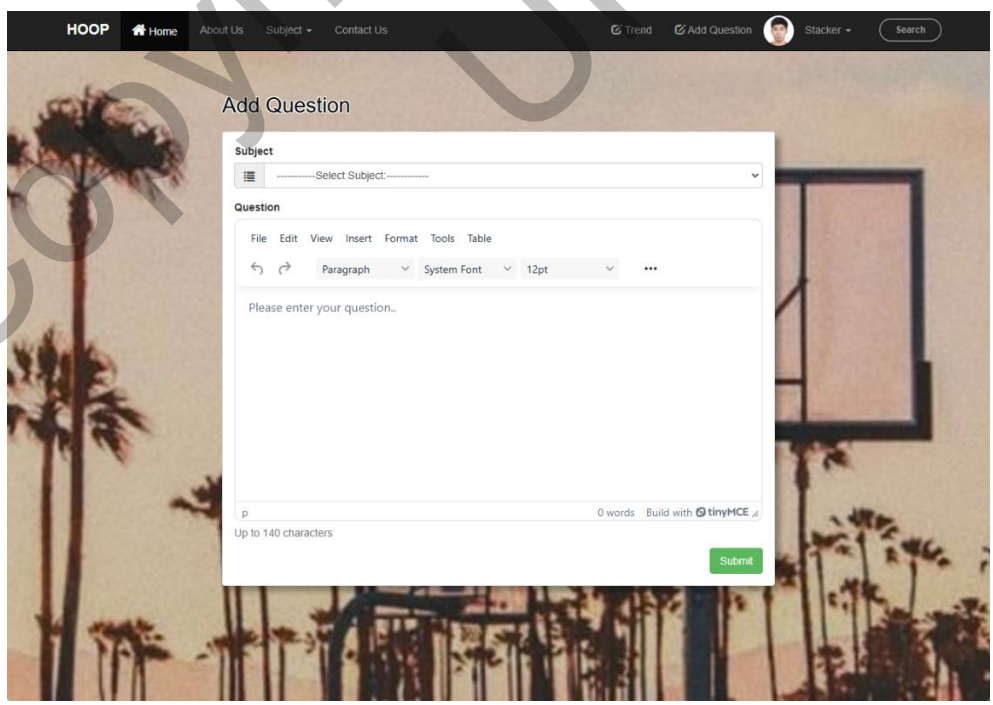

Figure 4.12 User Add Question Page

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Figure 4.13 shows the part of Question Details Page of HOOP.

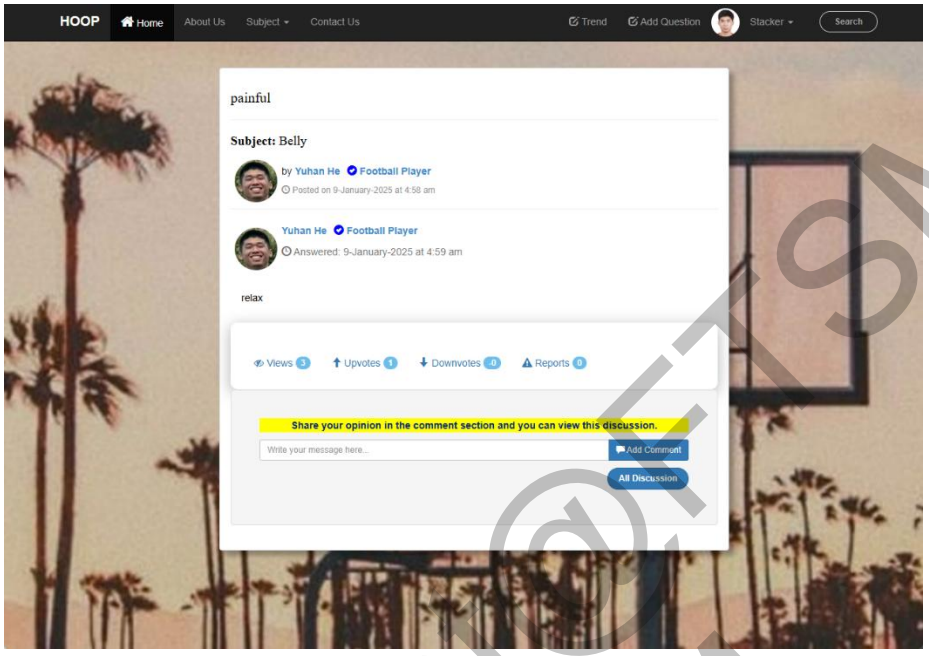

Figure 4.13 Question Details Page1

Figure 4.14 shows the part of Question Details Page of HOOP.

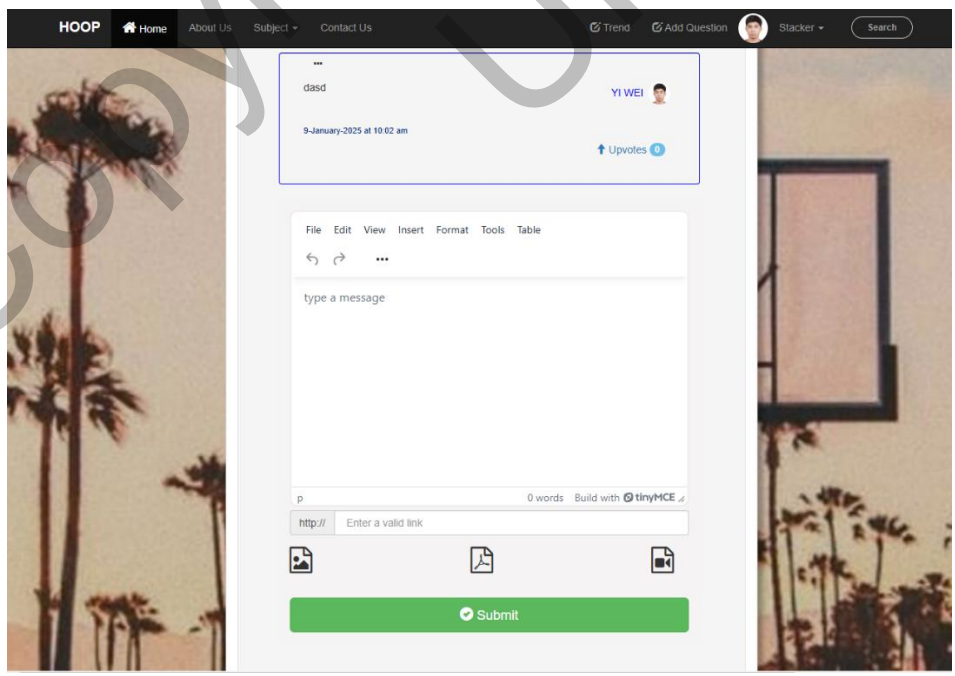

Figure 4.14 Question Details Page2

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Figure 4.15 shows the part of Question Trend Page of HOOP.

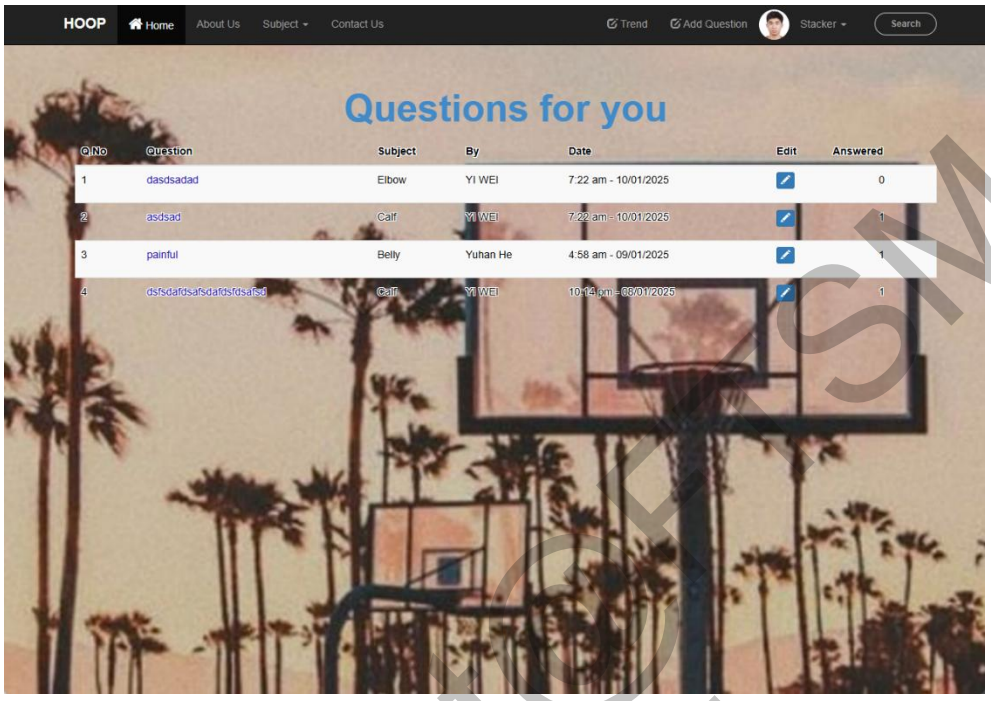

Figure 4.15 Question Trend Page1

Figure 4.16 shows the part of Question Trend Page of HOOP.

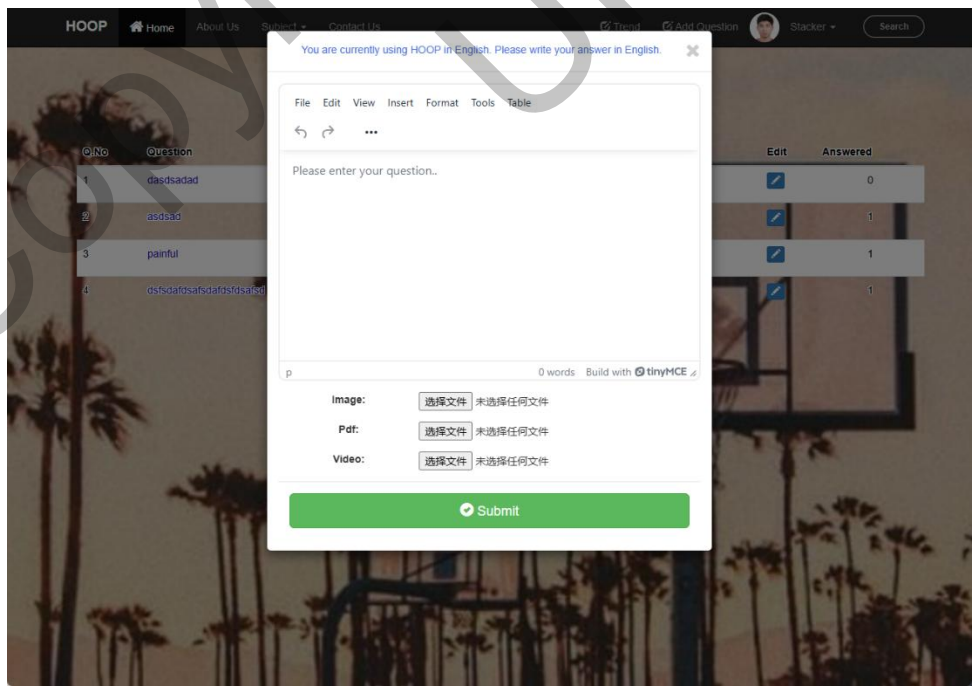

Figure 4.16 Question Trend Page2

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Figure 4.17 shows Welcome Page of HOOP.

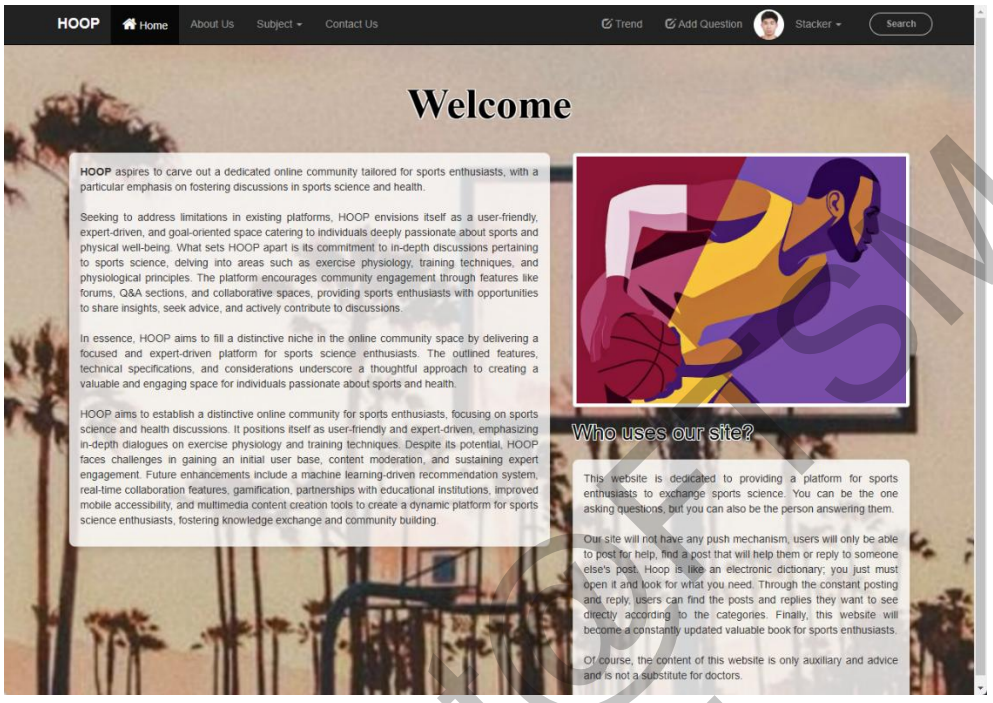

Figure 4.17 Welcome Page

Figure 4.18 shows the User Contact Page of HOOP.

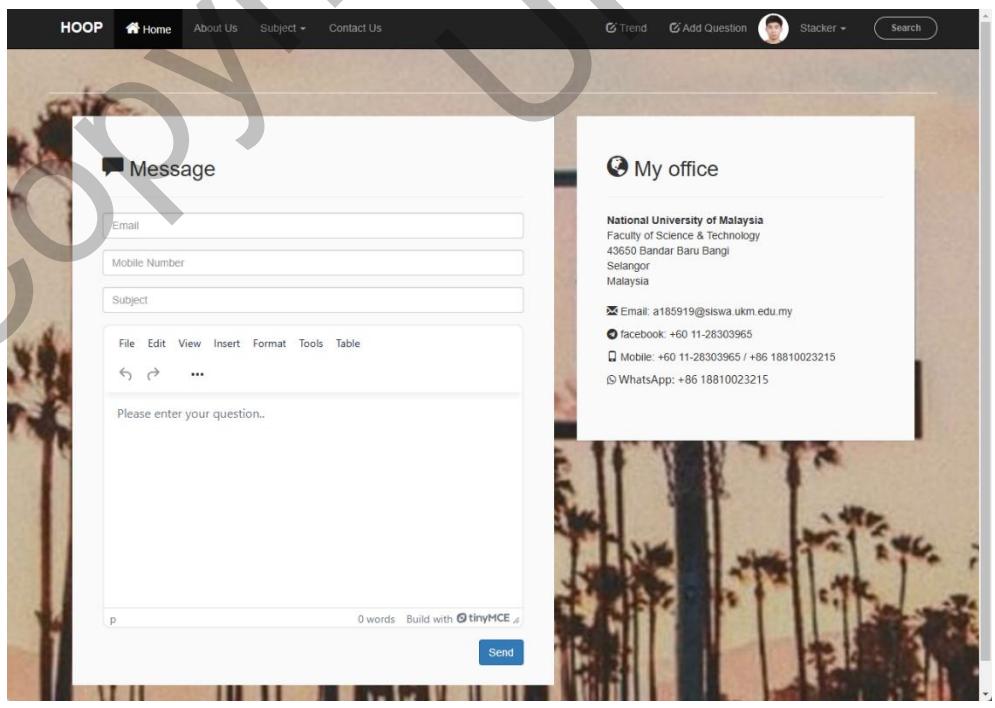

Figure 4.18 User Contact Page

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Figure 4.19 shows Post of Subject “Calf”.

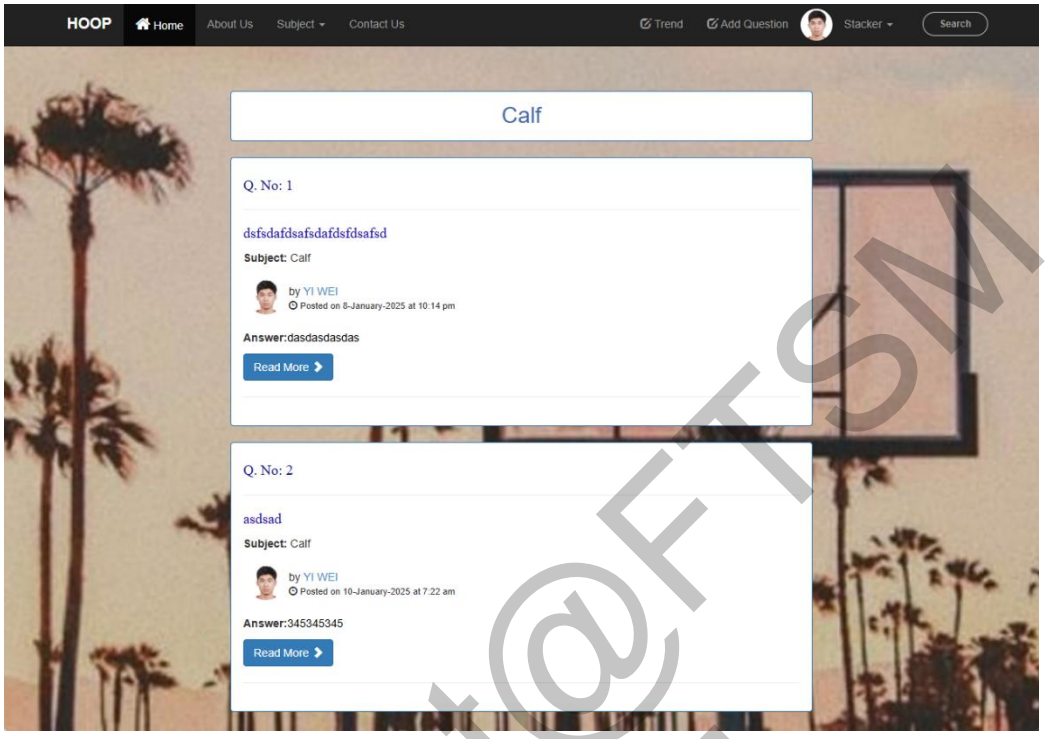

Figure 4.19 Post of Subject “Calf”

Figure 4.20 shows Post of Keyword “painful”.

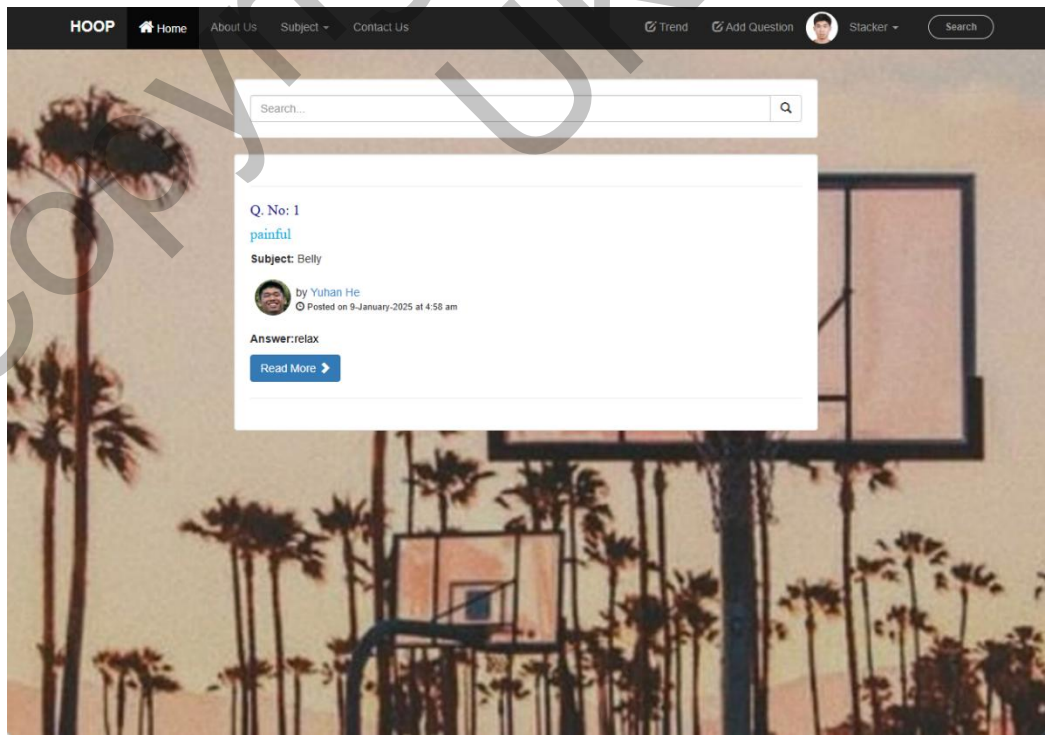

Figure 4.20 Post of Keyword “painful”

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Figure 4.21 shows User Personal Profile Page of HOOP.

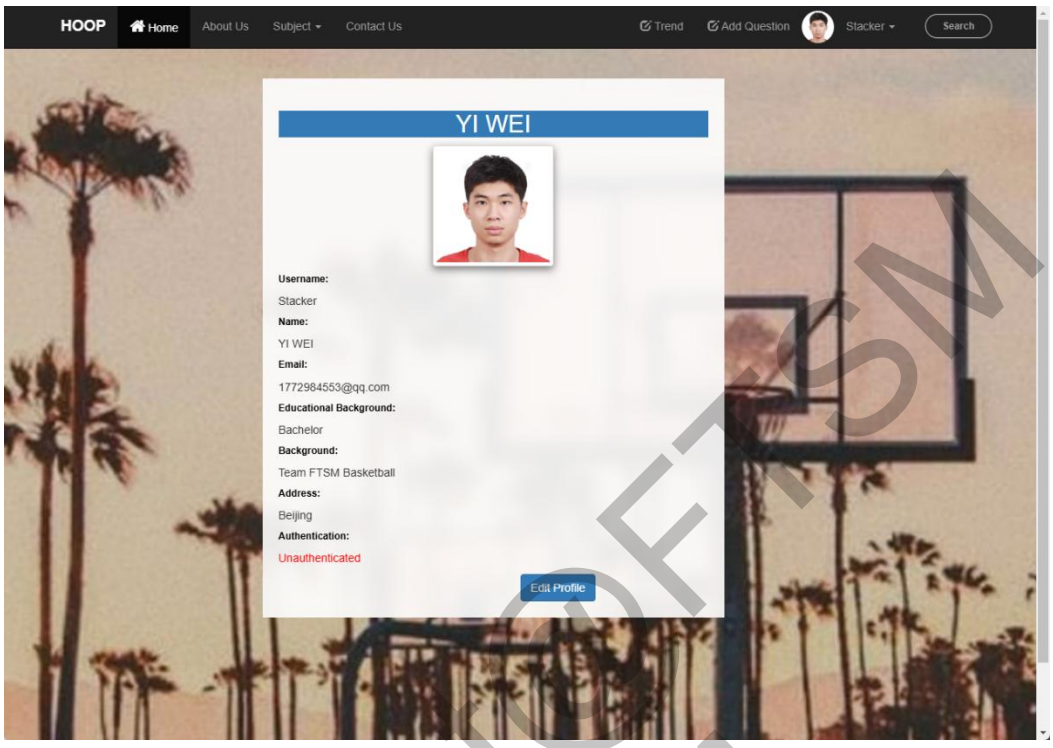

Figure 4.21 User Personal Profile Page

Figure 4.22 shows User Update Profile Page of HOOP.

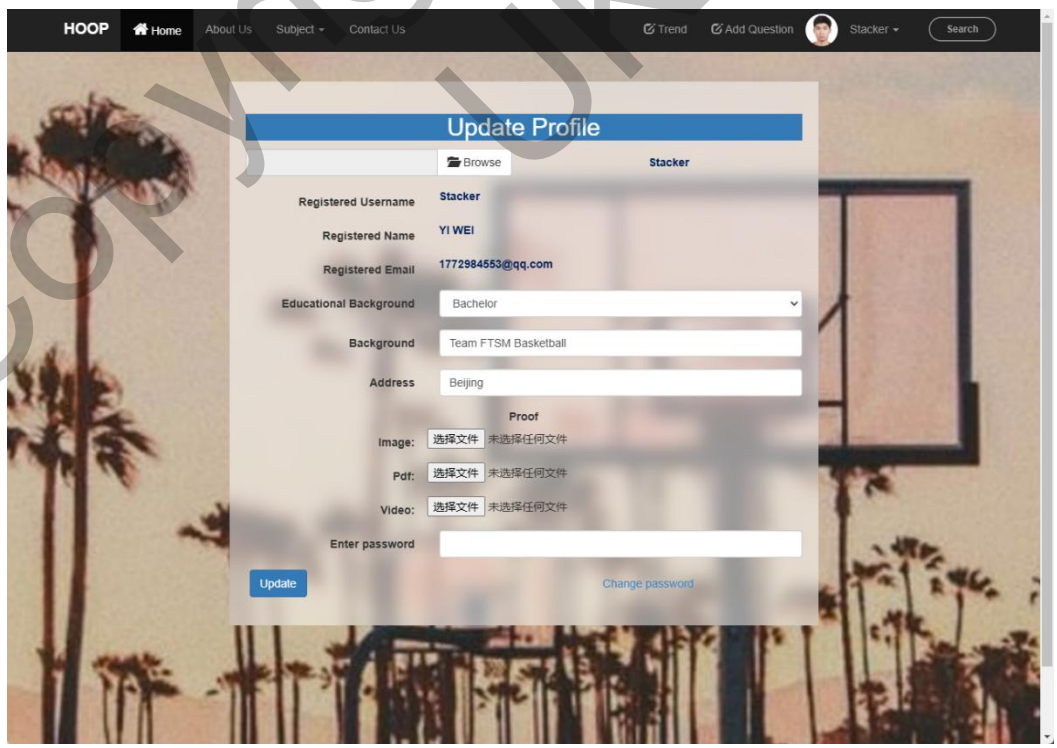

Figure 4.22 User Update Profile Page

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Figure 4.23 shows part of User Blogs Page of HOOP.

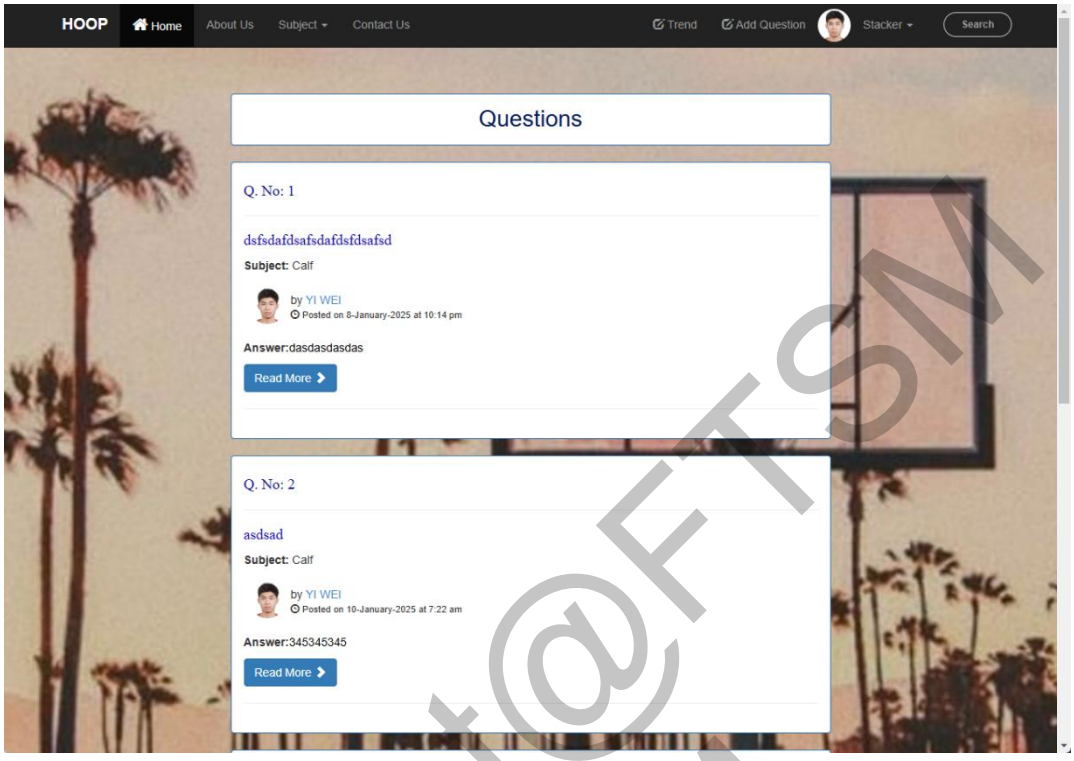

Figure 4.23 User Blogs Page1

Figure 4.24 shows part of the User Blogs Page of HOOP.

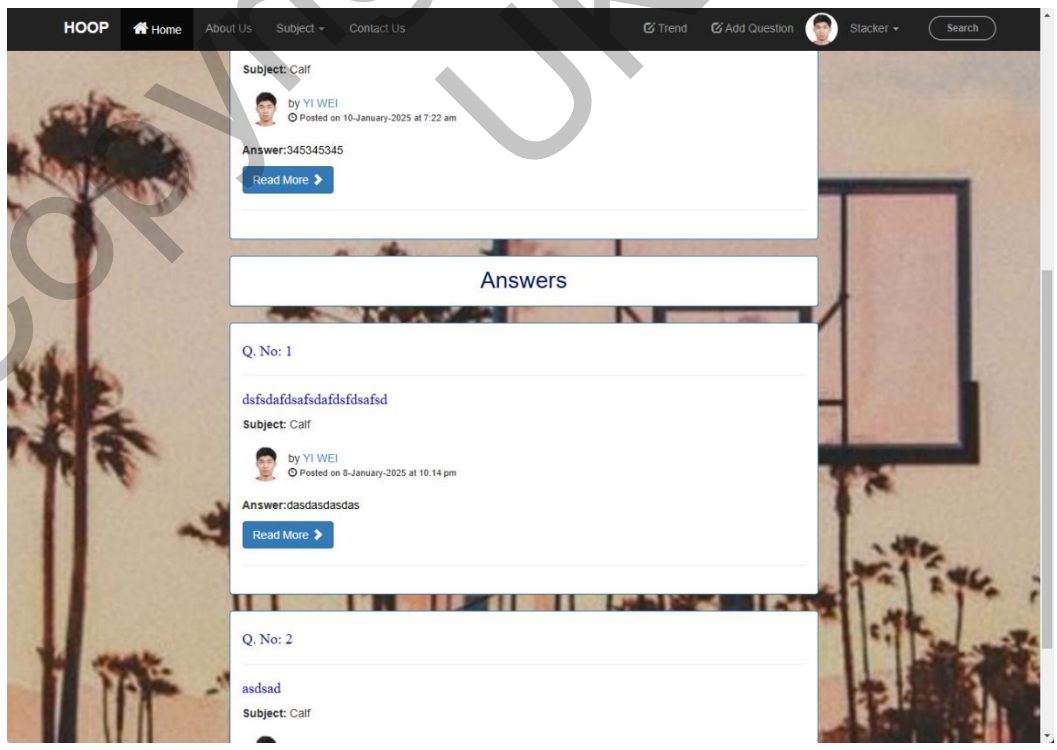

Figure 4.24 User Blogs Page2

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Figure 4.25 shows User Inbox Page of HOOP.

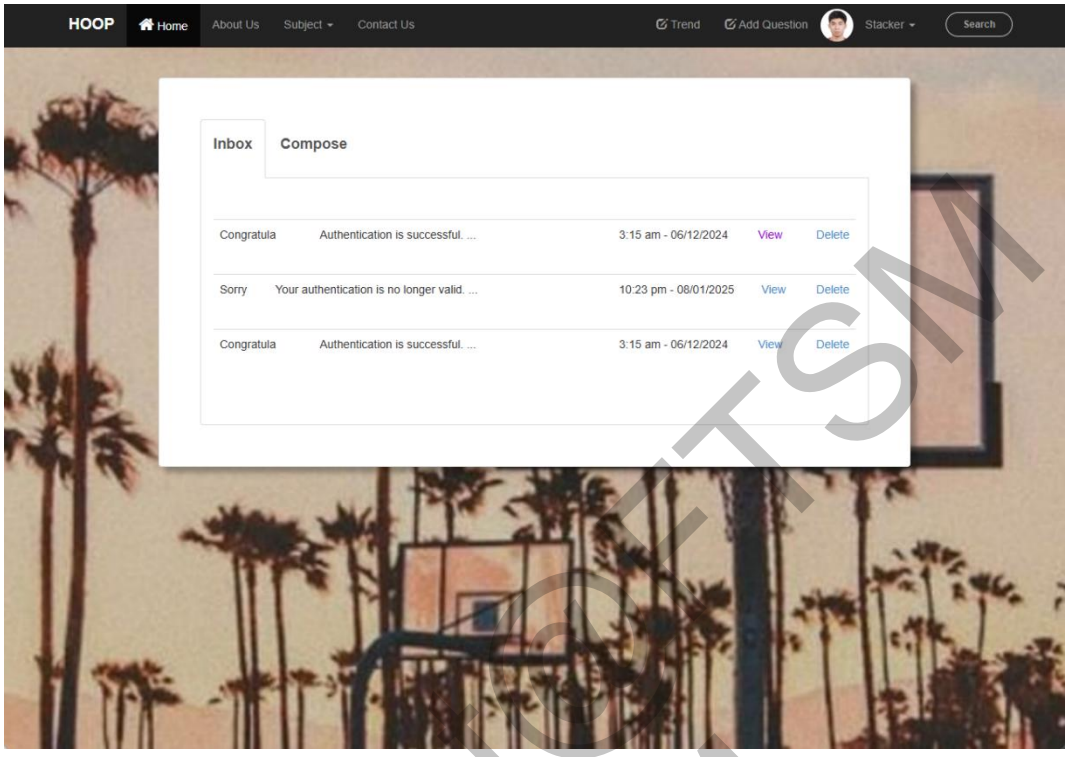

Figure 4.25 User Inbox Page

Figure 4.26 shows User Compose Page of HOOP.

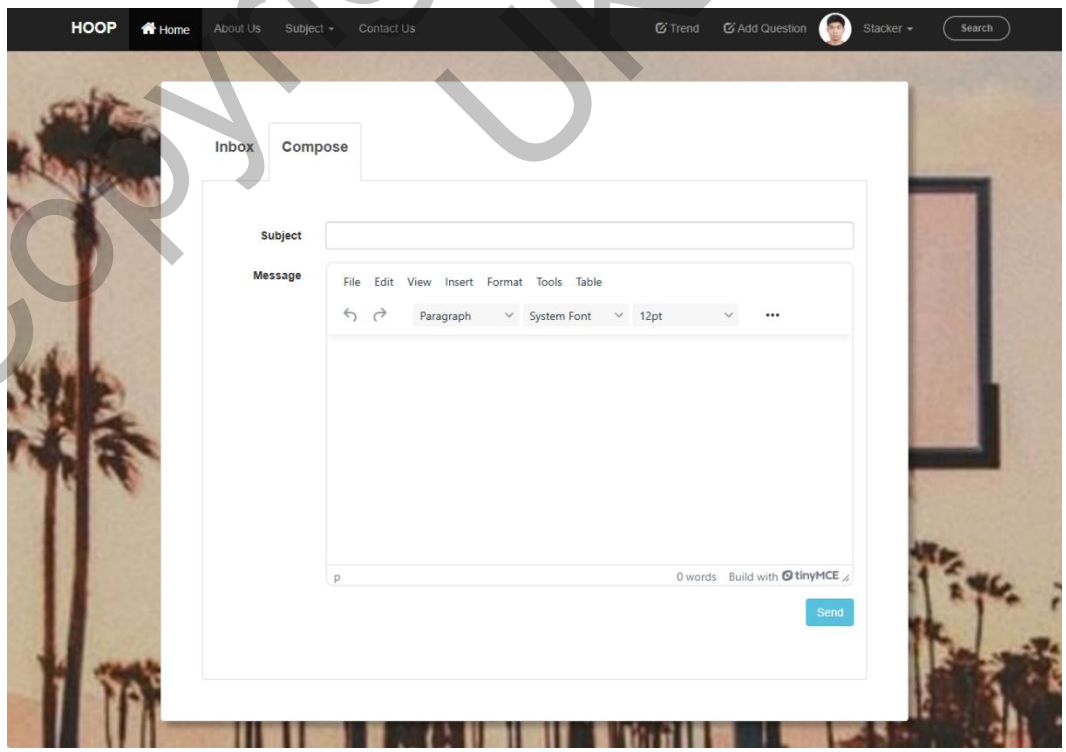

Figure 4.26 User Compose Page

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Figure 4.27 shows the User Profile Page of HOOP.

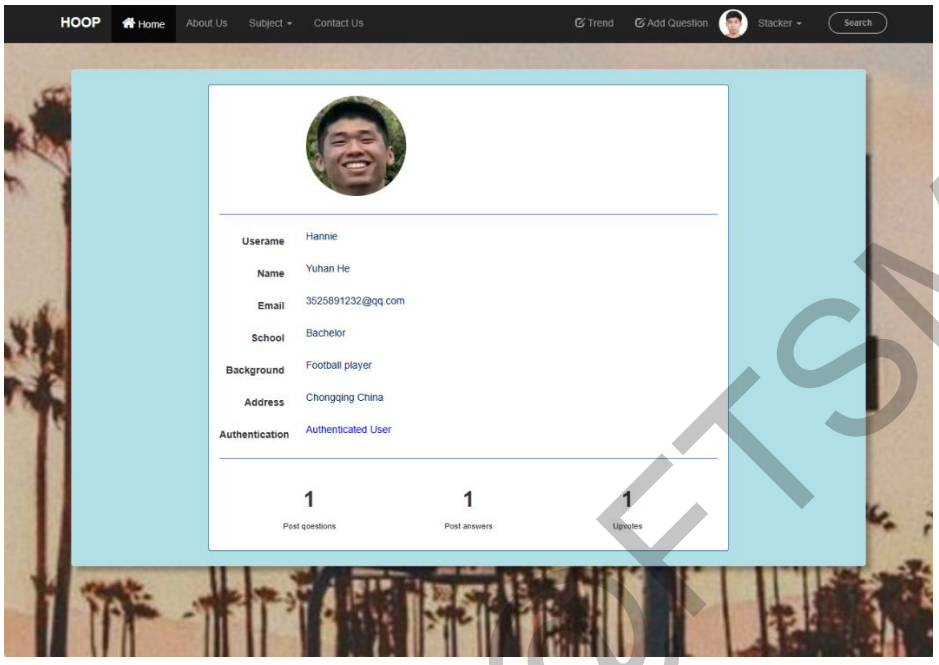

Figure 4.27 User Profile Page

Figure 4.28 shows the Admin Login Page of HOOP.

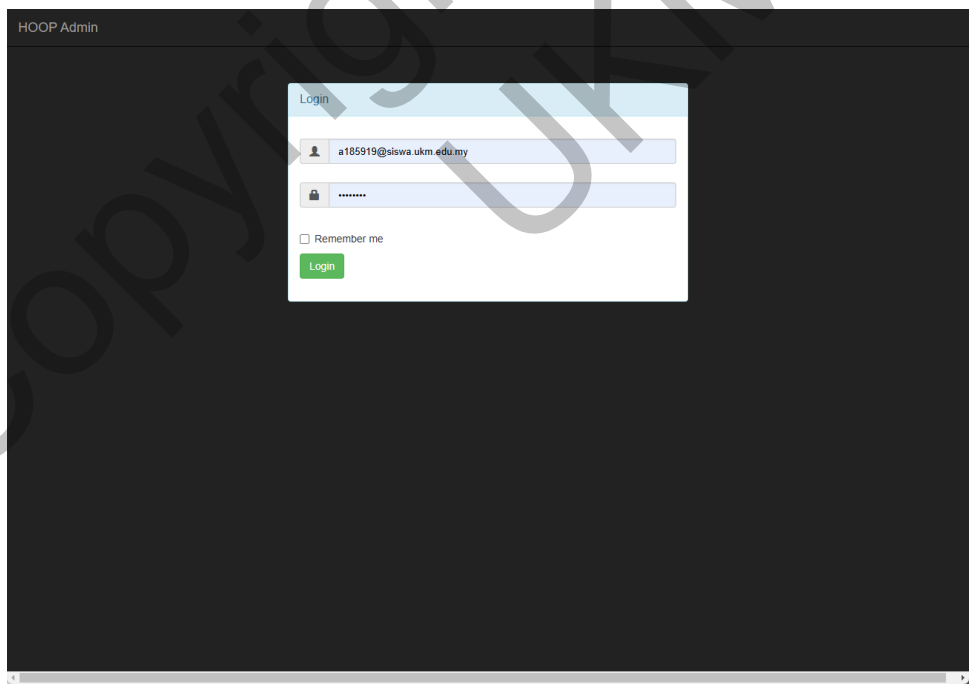

Figure 4.28 Admin Login Page

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Figure 4.29 shows the Admin Home Page of HOOP.

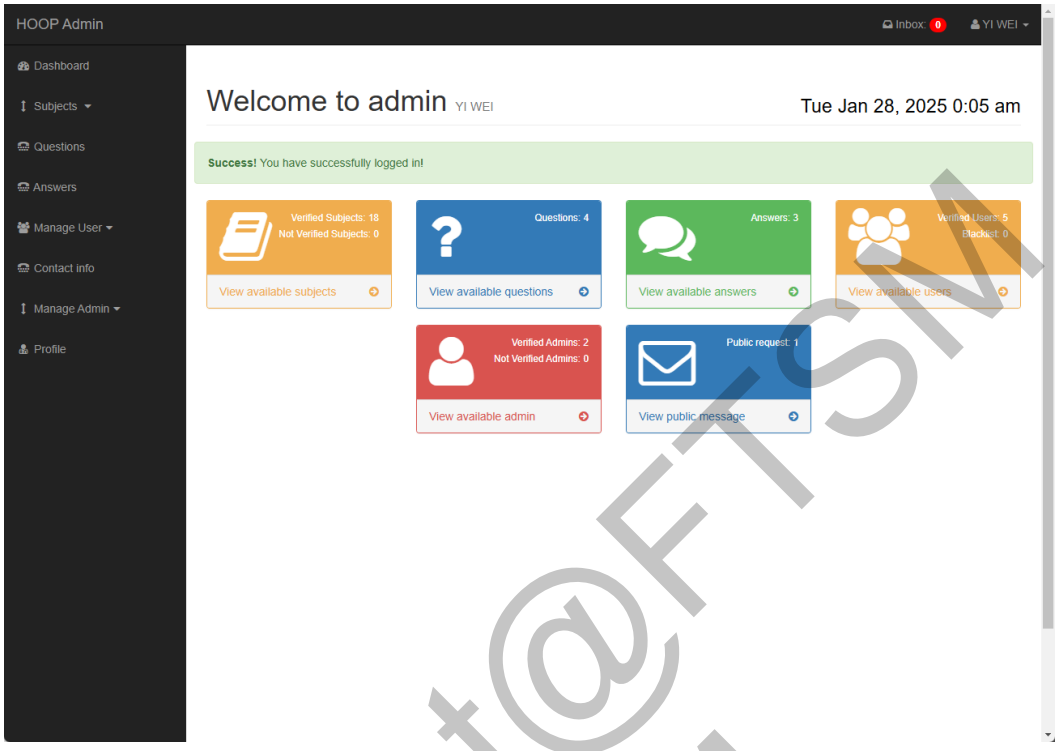

Figure 4.29 Admin Home Page

Figure 4.30 shows the Available Subjects Page of HOOP.

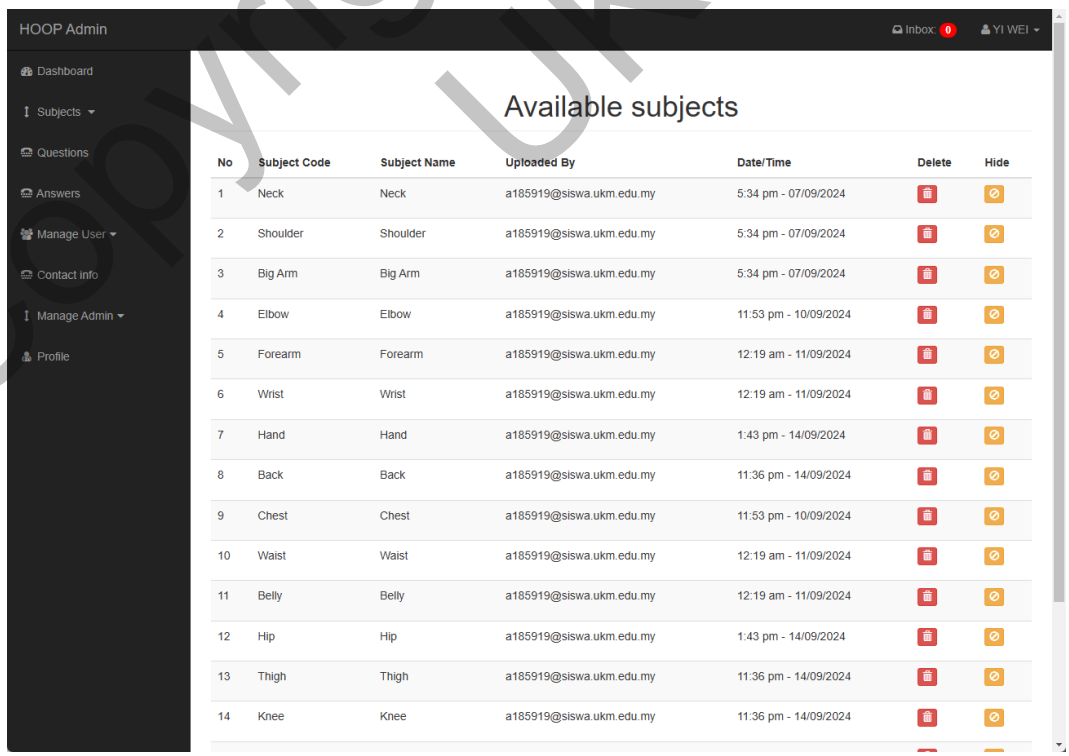

Figure 4.30 Available Subjects Page

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Figure 4.31 shows the Pending Subjects Page of HOOP.

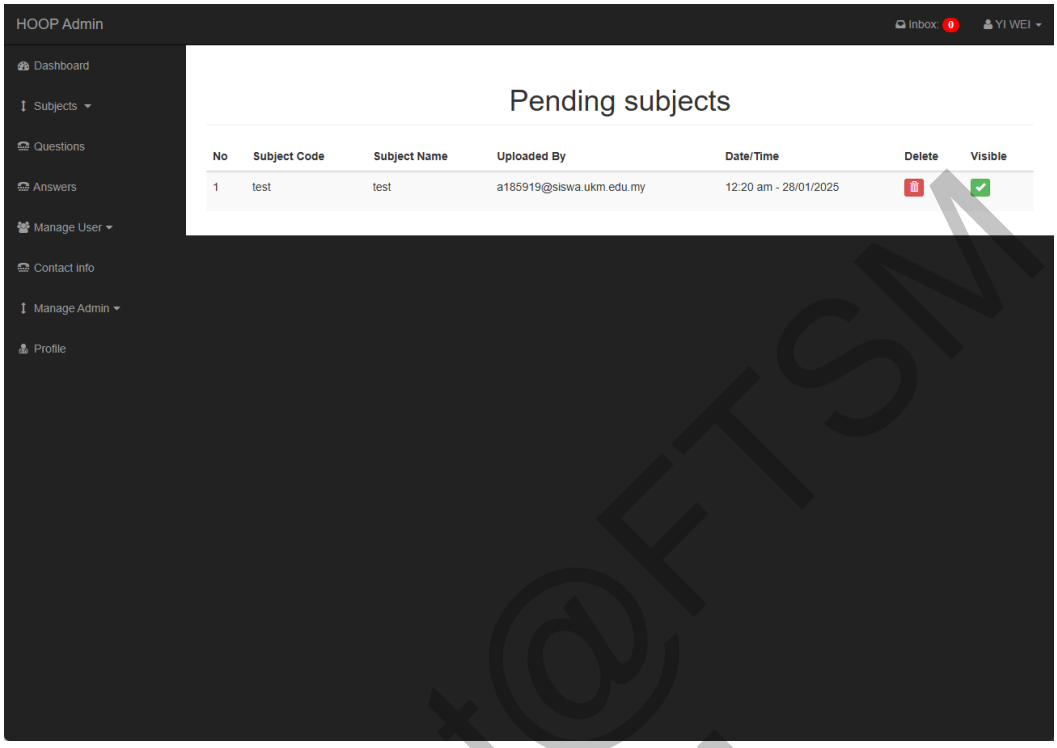

Figure 4.31 Pending Subjects Page

Figure 4.32 shows the Add Subject Page of HOOP.

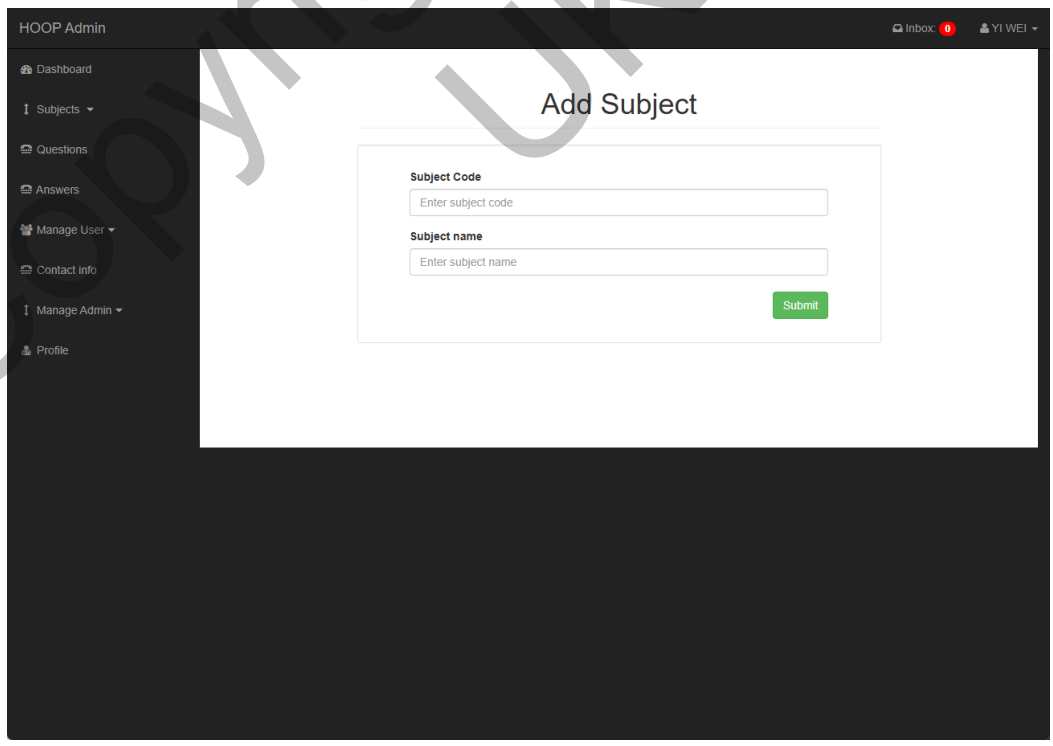

Figure 4.32 Add Subject Page

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Figure 4.33 shows the Questions Management Page of HOOP.

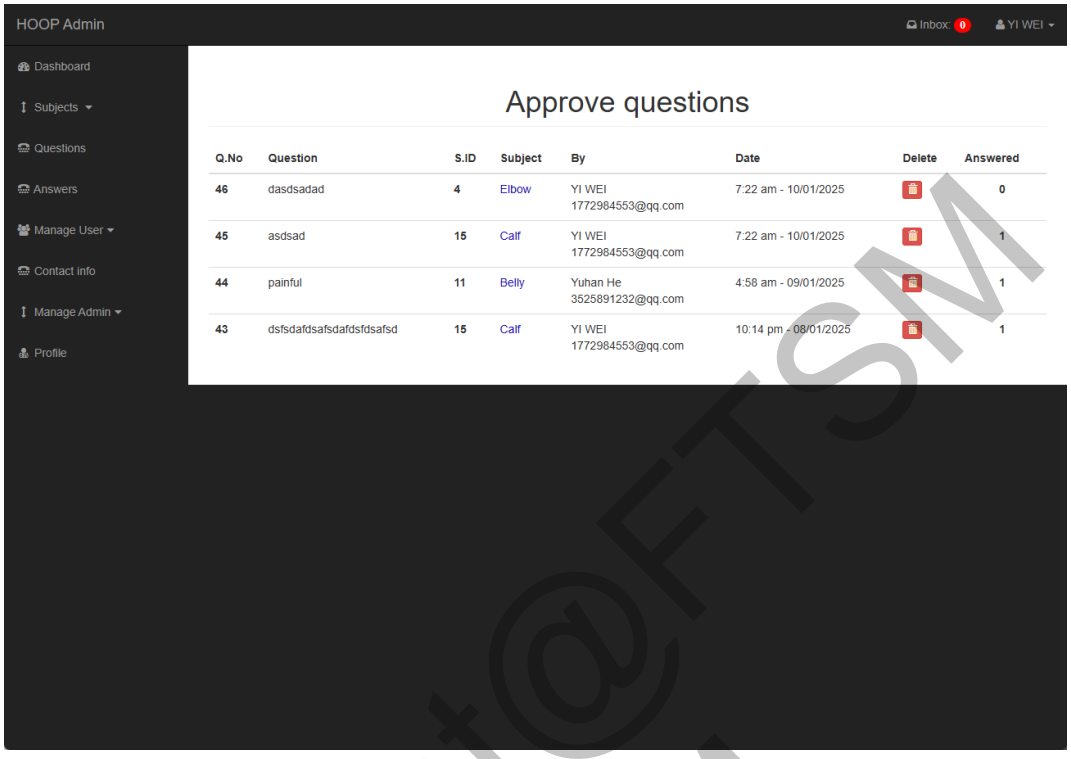

Figure 4.33 Questions Management Page

Figure 4.34 shows the Answers Management Page of HOOP.

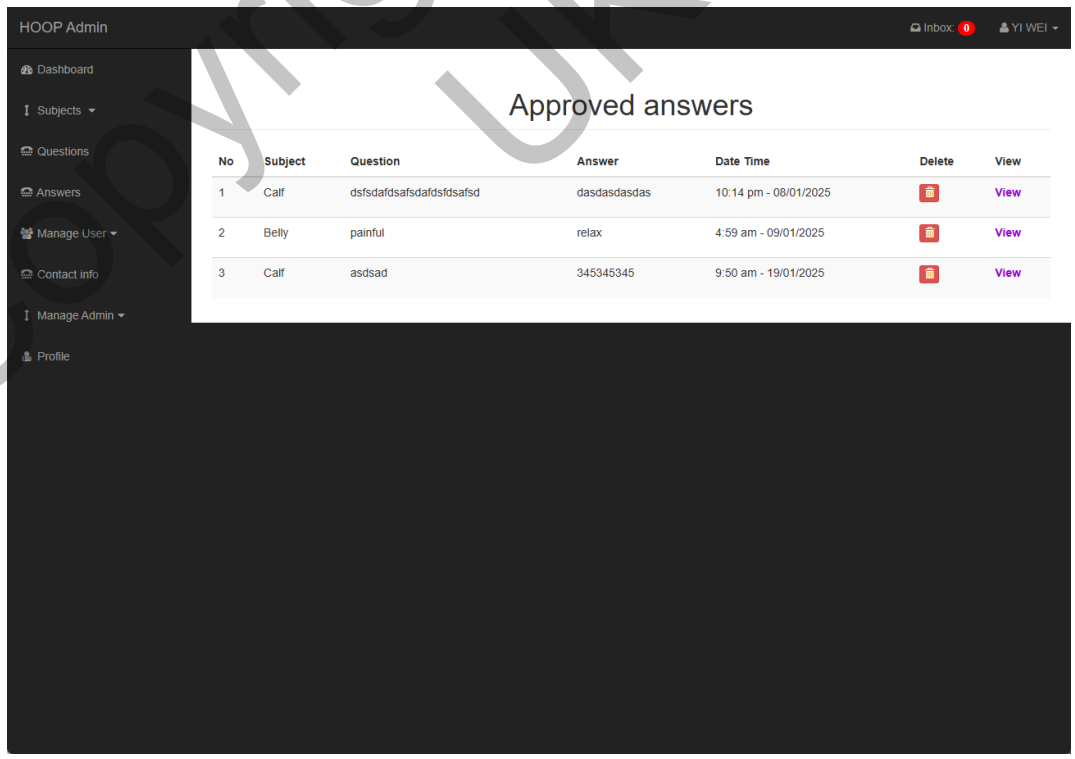

Figure 4.34 Answers Management Page

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Figure 4.35 shows the Answers Details Page of HOOP.

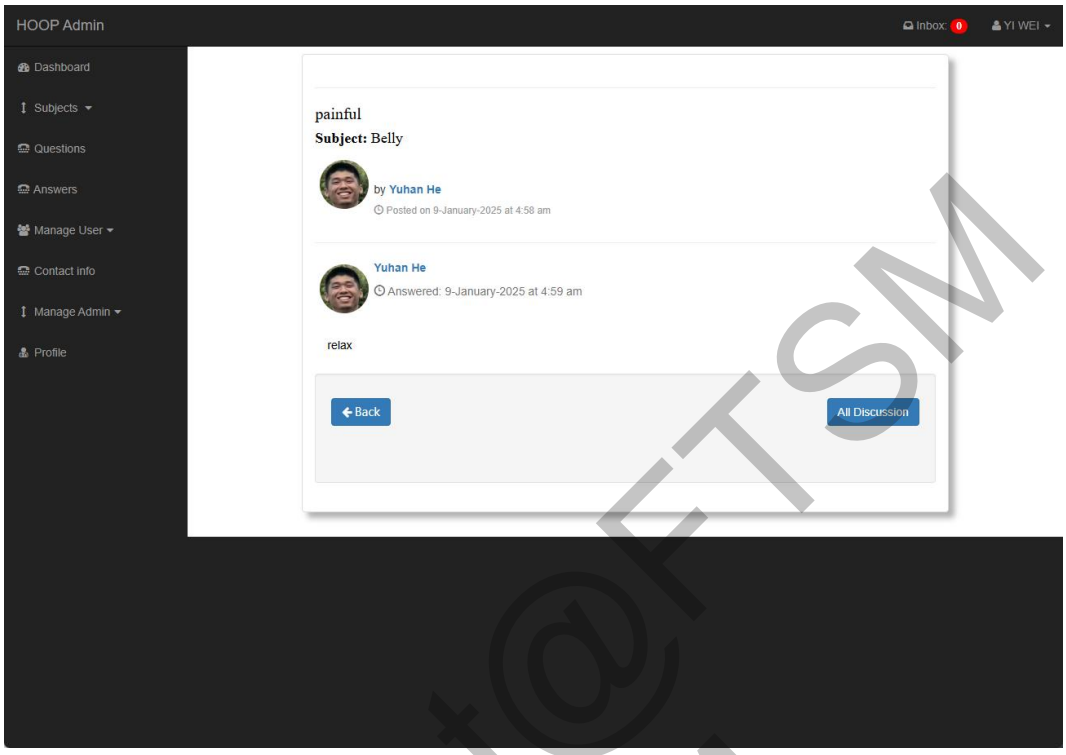

Figure 4.35 Answers Details Page

Figure 4.36 shows the part of Users Management Page of HOOP.

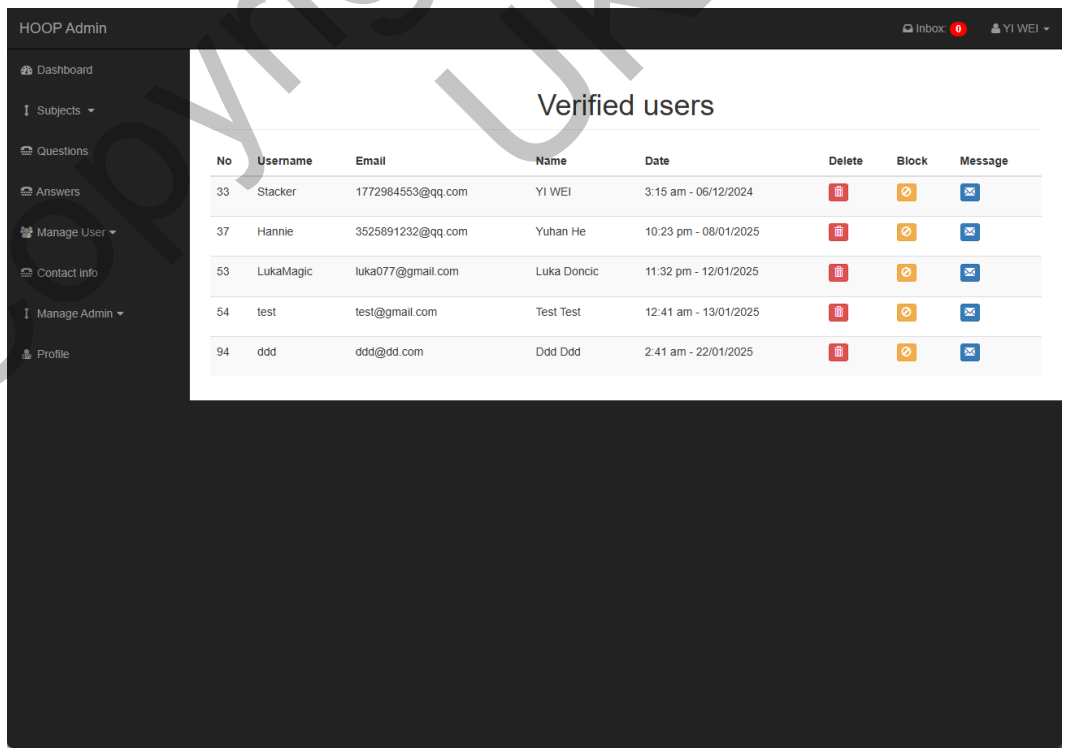

Figure 4.36 Users Management Page1

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Figure 4.37 shows the part of Users Management Page of HOOP.

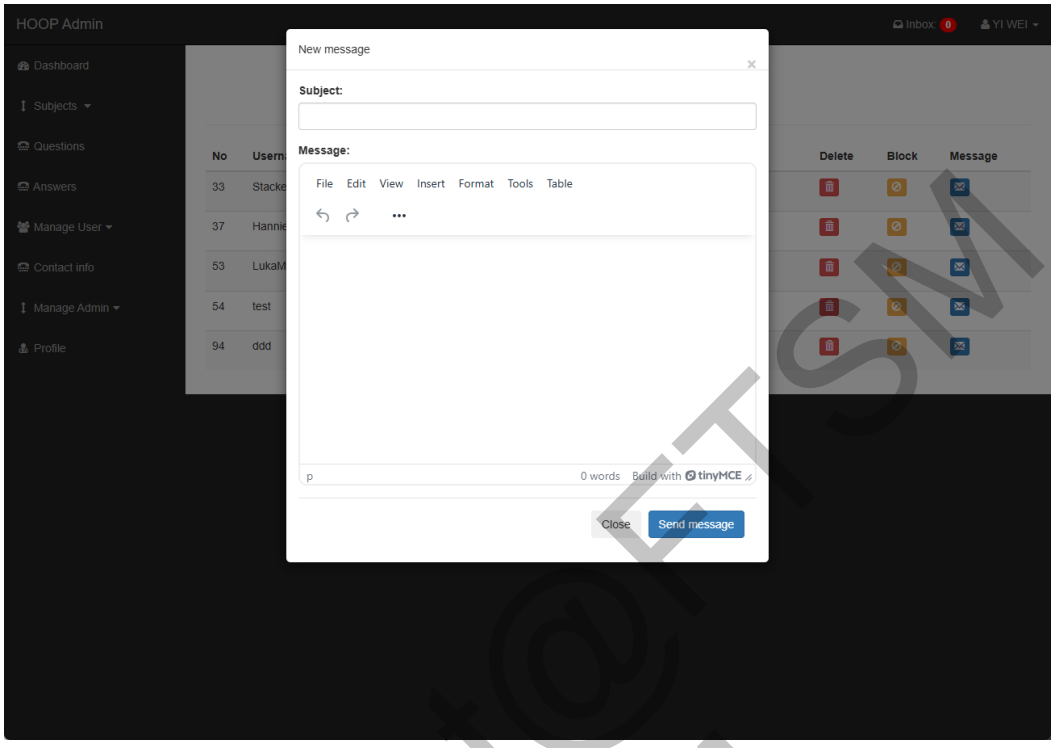

Figure 4.37 Users Management Page2

Figure 4.38 shows the Users Blacklist of HOOP.

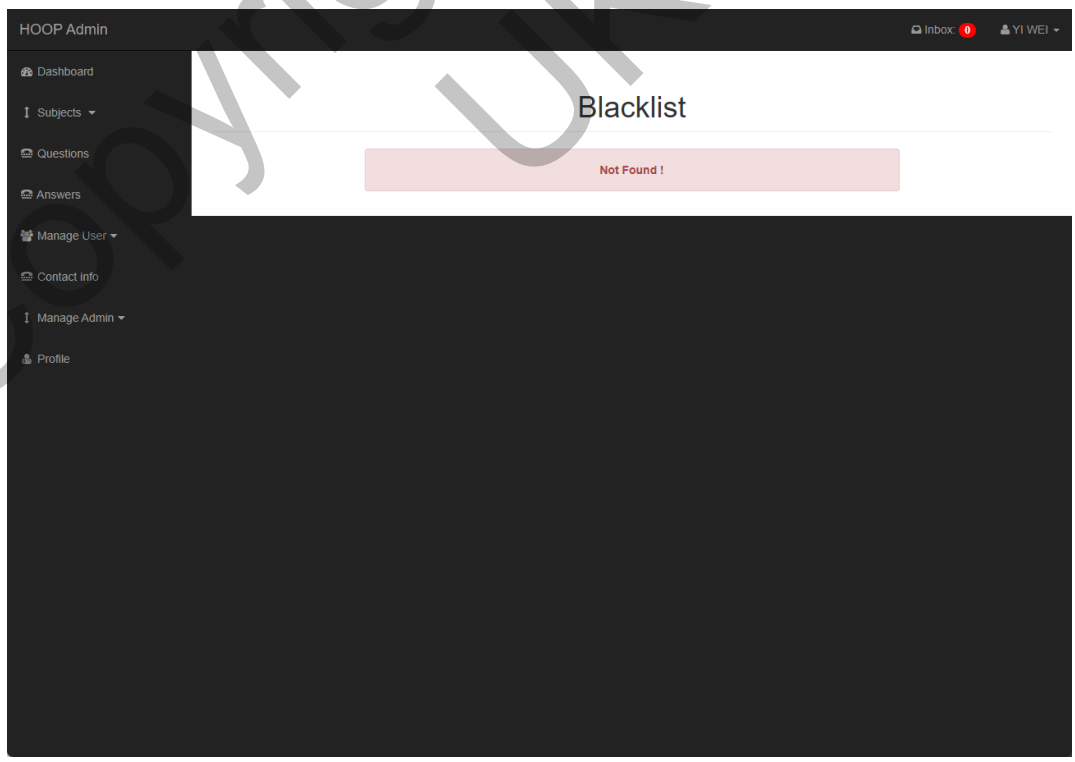

Figure 4.38 Users Blacklist Page

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Figure 4.39 shows the Authenticated Users Page of HOOP.

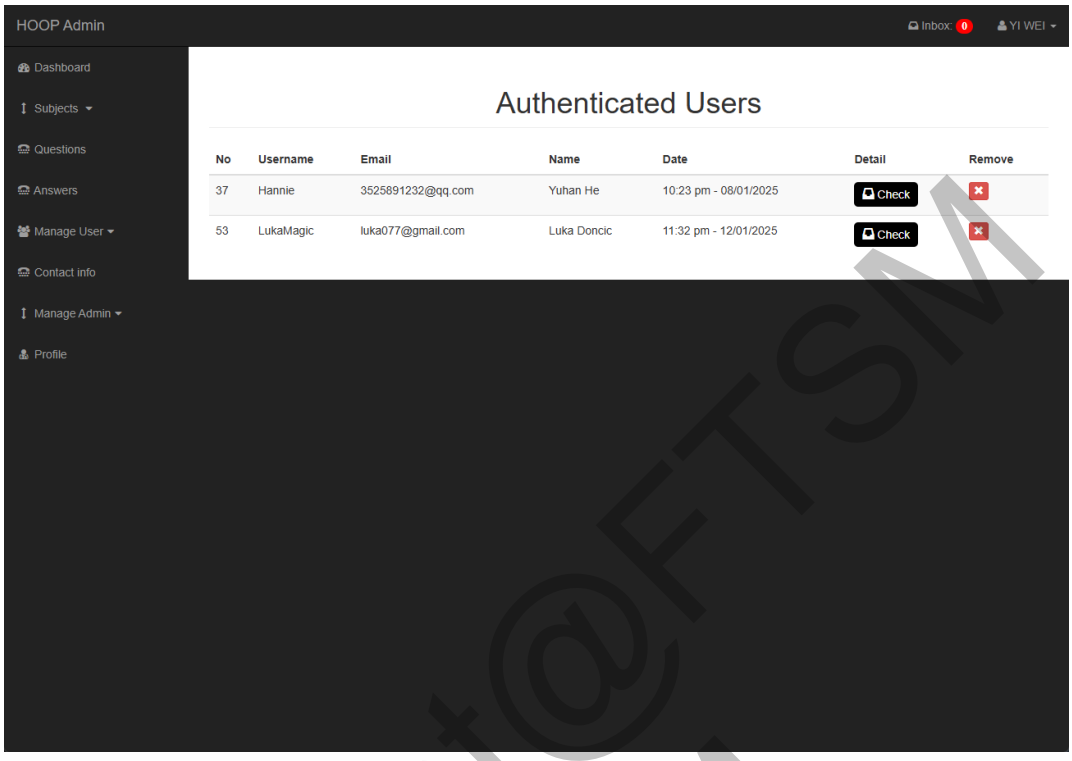

Figure 4.39 Authenticated Users Page

Figure 4.40 shows the Users Authentication Pending Page of HOOP.

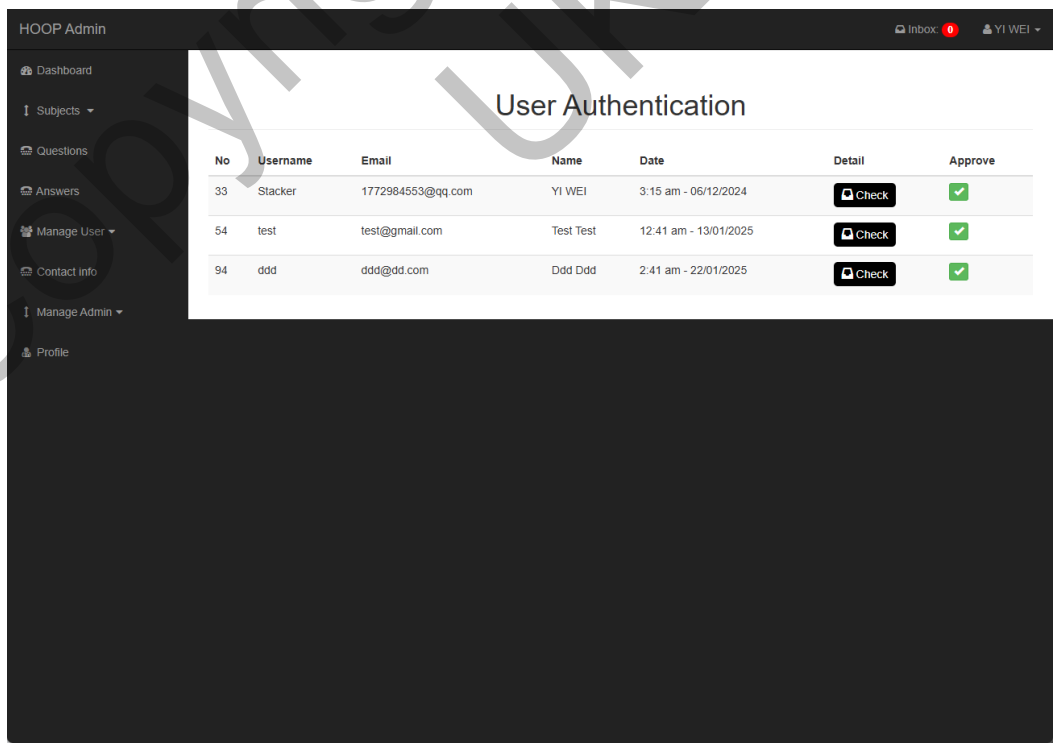

Figure 4.40 Users Authentication Pending Page

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Figure 4.41 shows the part of User Details Page of HOOP.

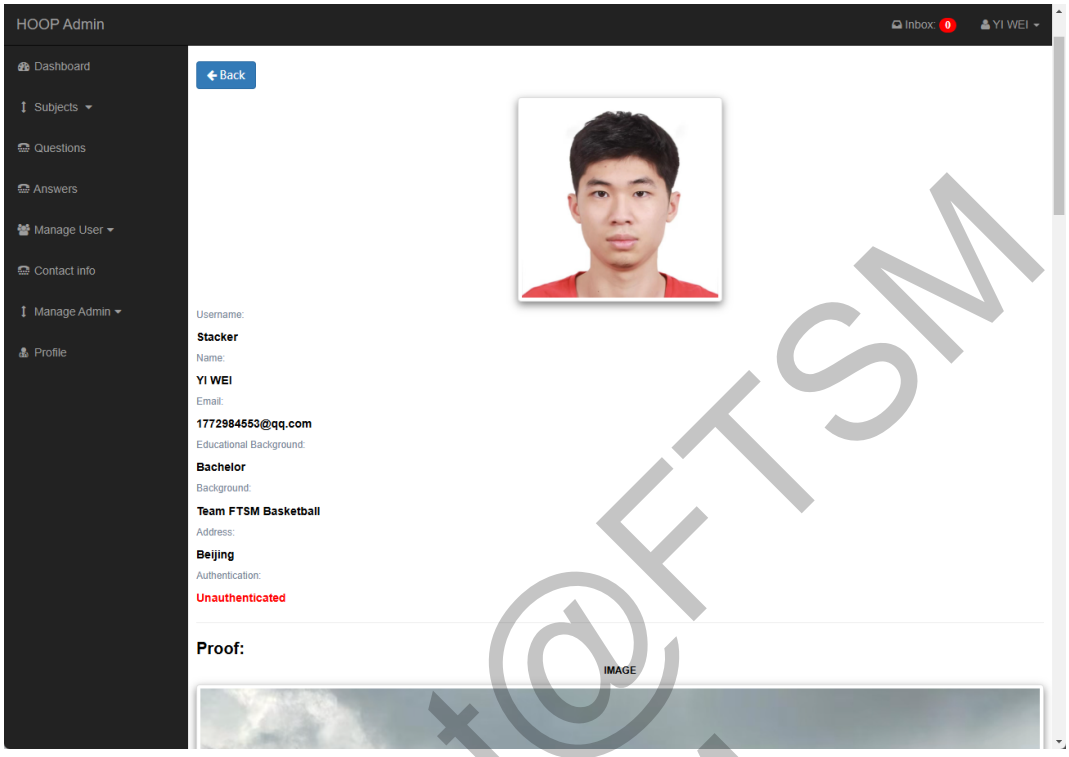

Figure 4.41 User Details Page1

Figure 4.42 shows the part of User Details Page of HOOP.

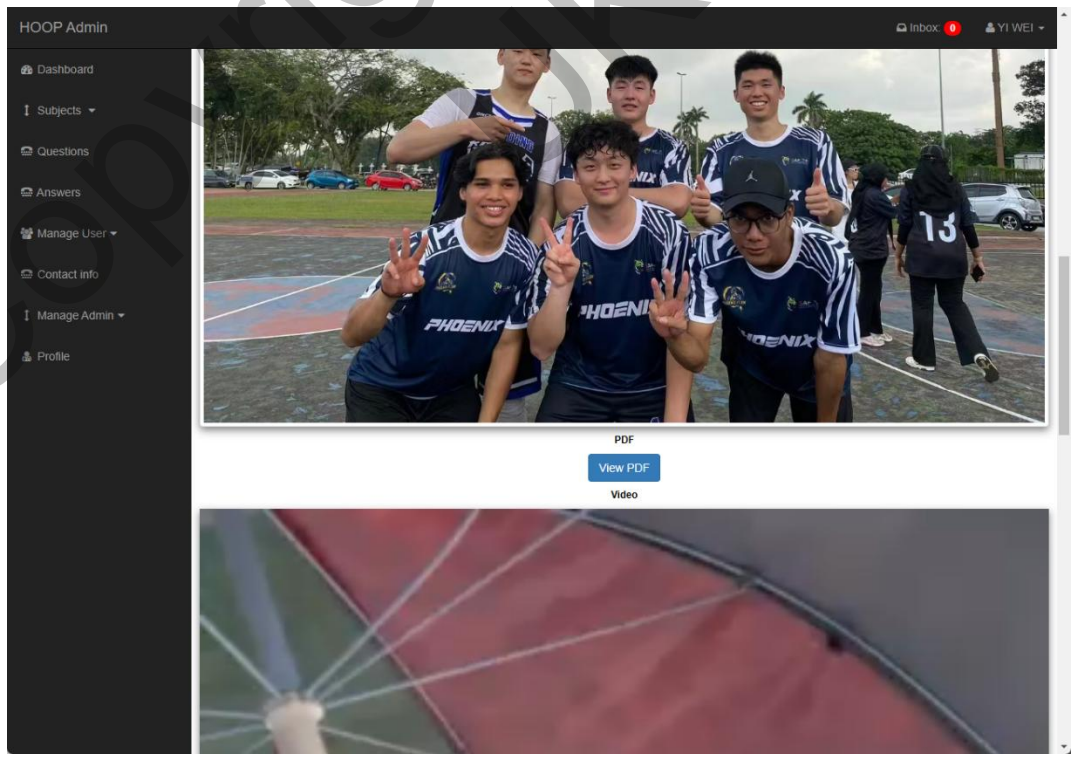

Figure 4.42 User Details Page2

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Figure 4.43 shows the Public Message Page of HOOP.

Figure 4.43 Public Message Page

Figure 4.44 shows the Admins Management Page of HOOP.

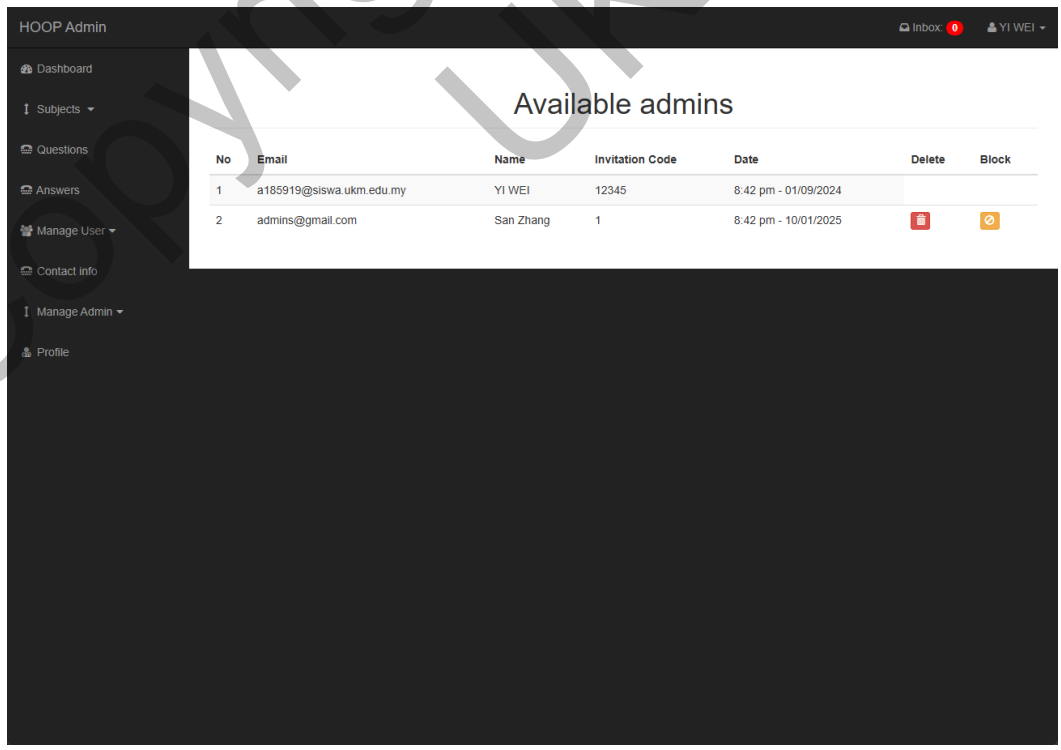

Figure 4.44 Admins Management Page

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Figure 4.45 shows the Pending Admins Page of HOOP.

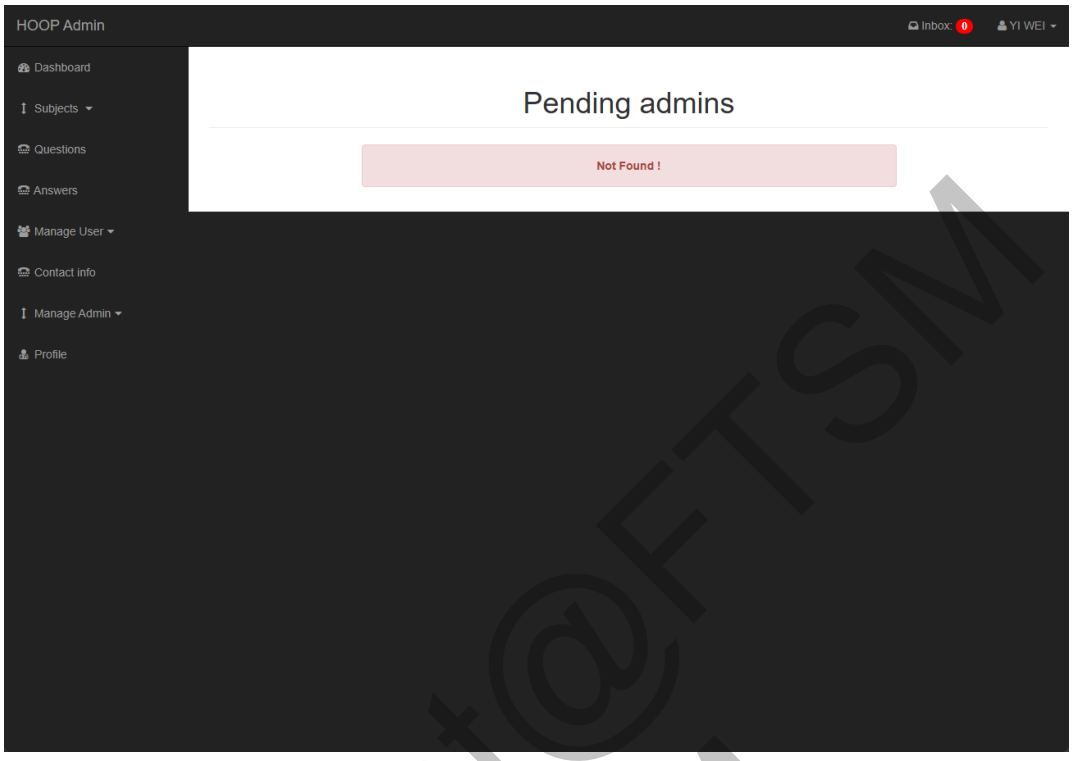

Figure 4.45 Pending Admins Page

Figure 4.46 shows the Admin Personal Profile Page of HOOP.

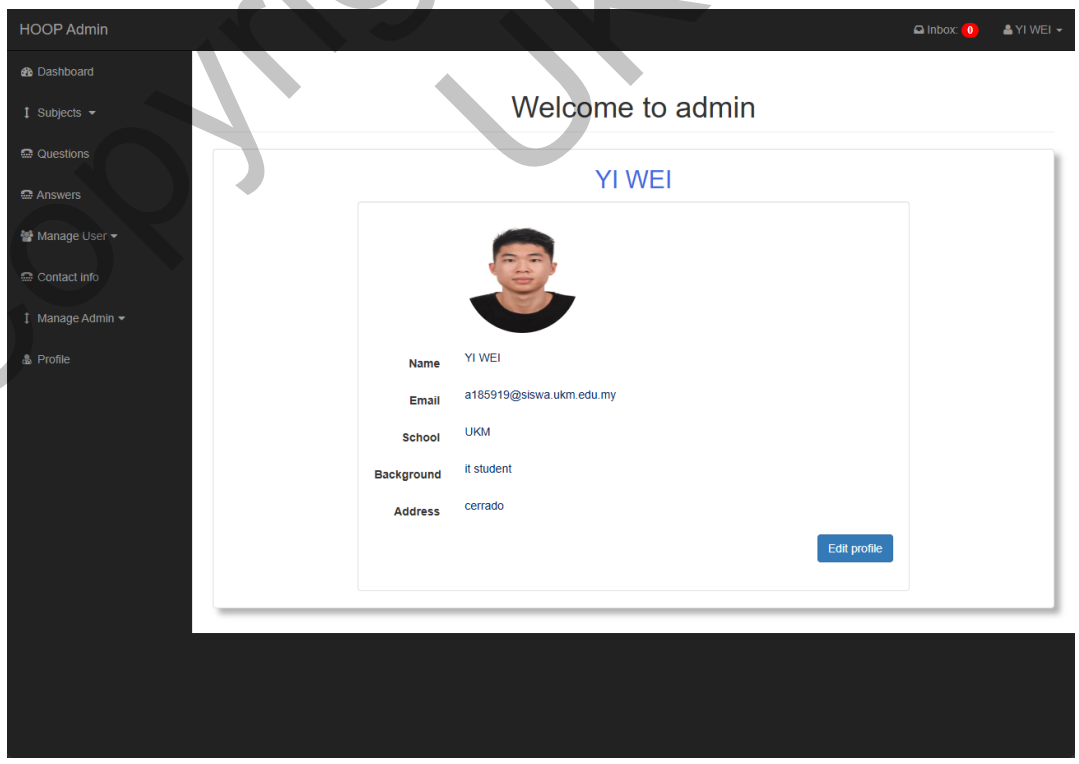

Figure 4.46 Admin Personal Profile Page

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Figure 4.47 shows the Admin Update Profile Page of HOOP.

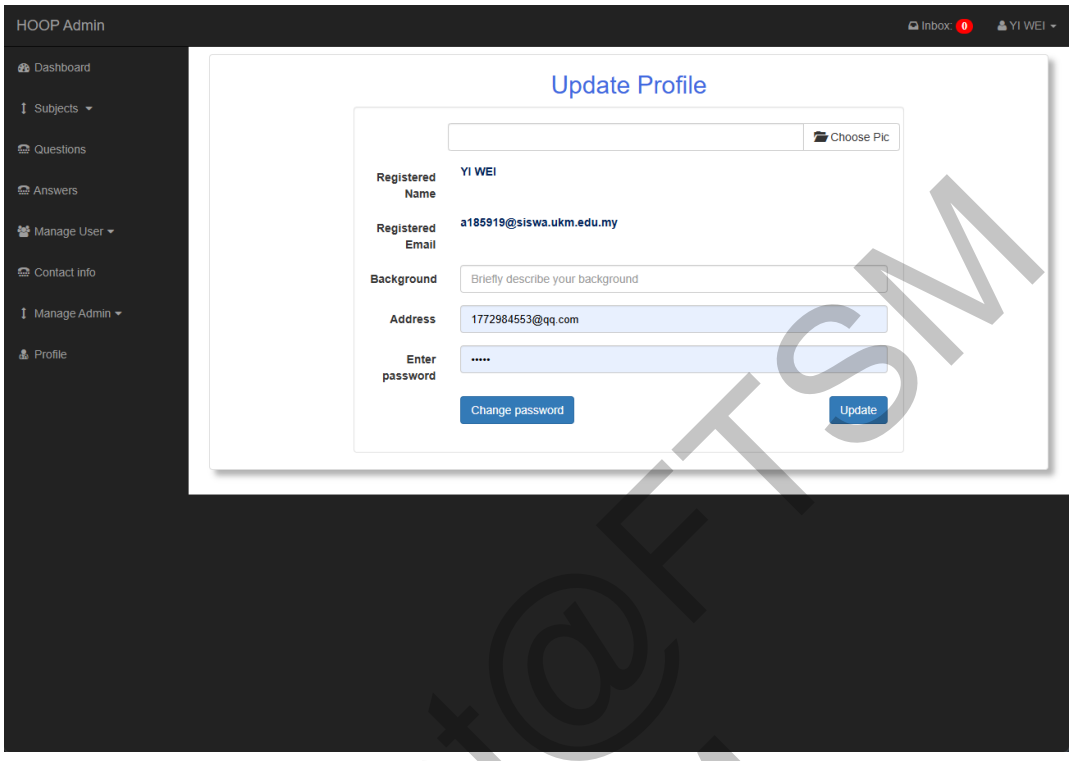

Figure 4.47 Admin Update Profile Page

Figure 4.48 shows User Message Management Page of HOOP.

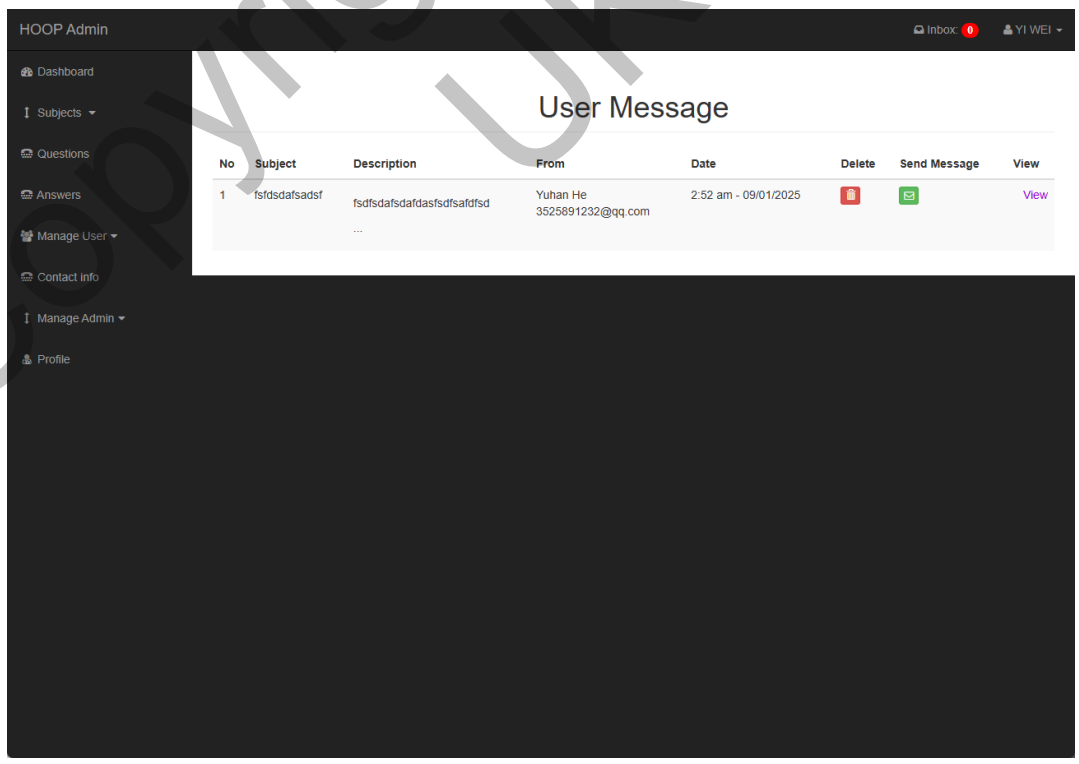

Figure 4.48 User Message Management Page

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Figure 4.49 shows User Message Details Page of HOOP.

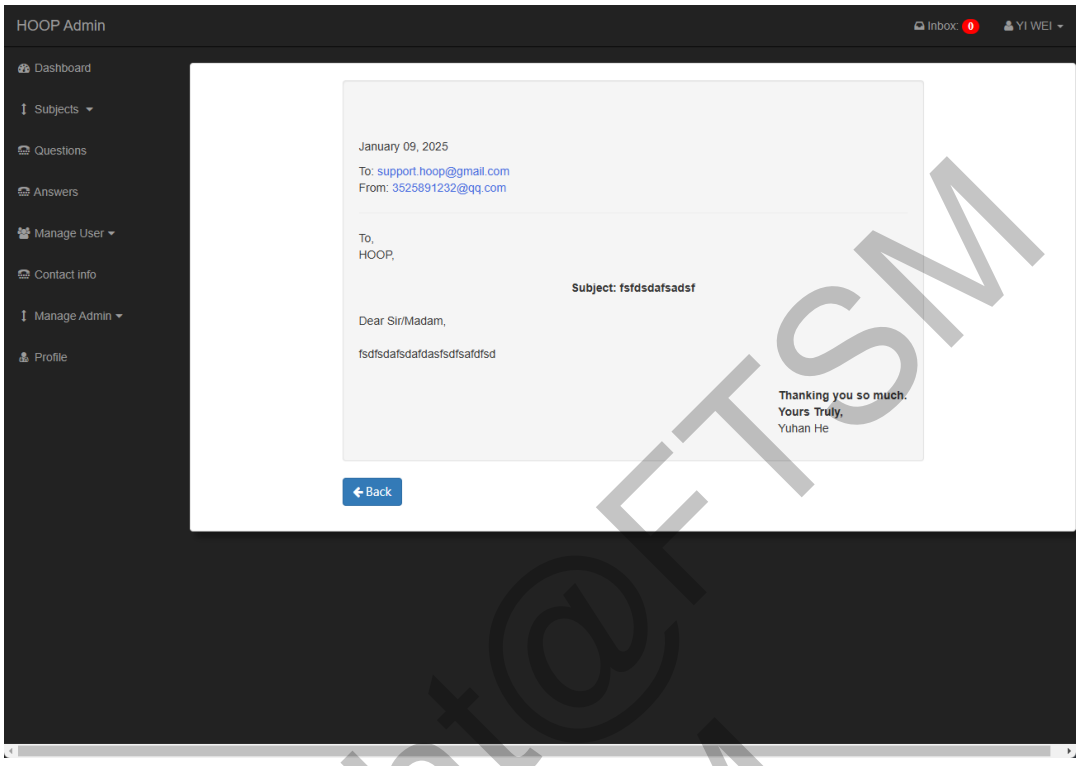

Figure 4.49 User Message Details Page

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TEST RESULT

Table 4.0.3 to Table 4.0.5 are test results for functional and non- functional tests.

Table 4.0.3 Functional Testing Result- User System

Function ID	Tested Functionality	Explanation	Test Result
US-01	Test Registration	Met the expected outcome	Pass
US-02	Test Login	Met the expected outcome	Pass
US-03	Test Add Question	Met the expected outcome	Pass
US-04	Test View Question Details	Met the expected outcome	Pass
US-05	Test Answer Question	Met the expected outcome	Pass
US-06	Test Like/Vote/Dislike/Report Functionality	Met the expected outcome	Pass
US-07	Test View Discussion	Met the expected outcome	Pass

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US -08	Test Add Comment	Met the expected outcome	Pass
US -09	Test File Upload (Photo/Video/PDF)	Met the expected outcome	Pass
US -10	Test Categorization	Met the expected outcome	Pass
US -11	Test Contact Developer	Met the expected outcome	Pass
US -12	Test Edit Personal Information	Met the expected outcome	Pass
US -13	Test Inbox	Met the expected outcome	Pass
US -14	Test Contact Administrator	Met the expected outcome	Pass
US -15	Test Search	Met the expected outcome	Pass
US -16	Test Logout	Met the expected outcome	Pass

Table 4.0.4 Functional Testing Result- Administrator System

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Function ID	Tested Functionality	Explanation	Test Result
AS-01	Test Admin Login	Met the expected outcome	Pass
AS-02	Test Manage Subject	Met the expected outcome	Pass
AS-03	Test Manage Questions	Met the expected outcome	Pass
AS-04	Test Manage Replies	Met the expected outcome	Pass
AS-05	Test Manage Users	Met the expected outcome	Pass
AS-06	Test Manage Developer Contact Messages	Met the expected outcome	Pass
AS-07	Test Manage Administrators	Met the expected outcome	Pass
AS-08	Test Personal Information Management	Met the expected outcome	Pass
AS-09	Test Inbox Management	Met the expected	Pass

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		outcome	
AS-10	Test Admin Logout	Met the expected outcome	Pass

Table 4.0.5 Non-Functional Testing Result

Tested Functionality	**Explanation**	**Test Result**
Performance Test - Page Load Time	Met the expected outcome	Pass
Performance Test - Simulated User Activity	Met the expected outcome	Pass
Compatibility Test - Browser Compatibility	Met the expected outcome	Pass
Compatibility Test - Device Resolution	Only the normal page layout can be displayed on the computer, and the view cannot be correctly displayed on tablets and mobile devices.	Not Pass
Security Test - Input Validation	Met the expected outcome	Pass

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Security Test - Password Encryption	Met the expected outcome	Pass
Recovery Test - Unexpected Shutdown	The data could not be saved automatically, but the stored data was not corrupted.	Not Pass
Recovery Test - Database Connection Loss	The platform cannot display the view correctly after losing the database connection.	Not Pass
Usability Test - Navigation Intuitiveness	Met the expected outcome	Pass
Usability Test - Error Message Clarity	Met the expected outcome	Pass
Usability Test - Keyboard Accessibility	The platform is completely inaccessible by only using the keyboard.	Not Pass

In summary, all core features of the HOOP platform have been successfully implemented.

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These include user registration, login, and logout functionalities, as well as the ability to post questions categorized by tags, view and respond to posts, and use basic engagement features like "likes." In addition, the testing phase confirmed that the HOOP platform is functionally robust and meets its primary objectives. The realization of these features and test results marks a significant achievement in the development of the project and paves the way for subsequent developments.

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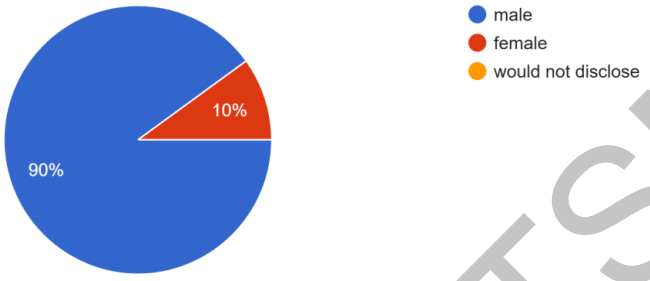
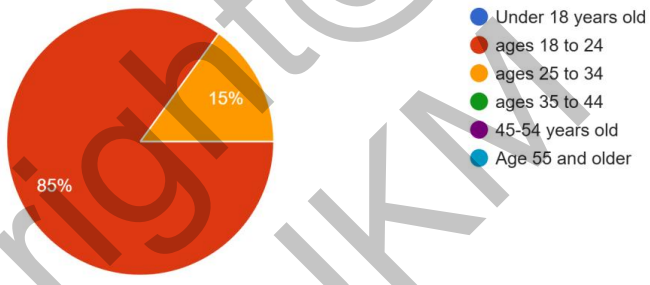
ACCEPTANCE TESTING

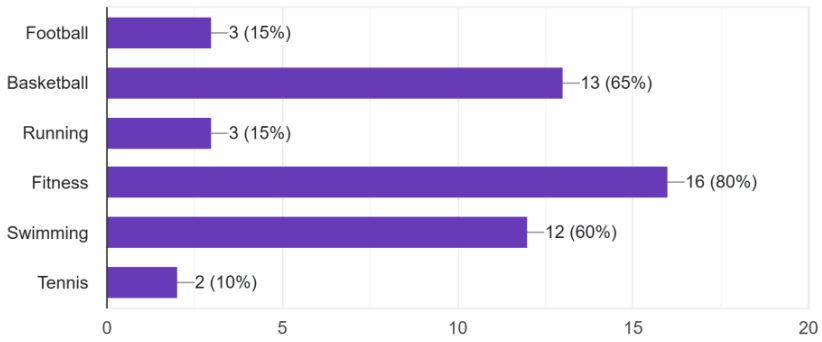
Your gender
20 responses



Your age
20 responses



Your sports hobby
20 responses



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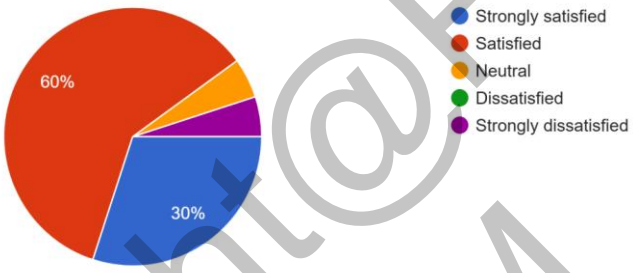
1. Do you think the functions of HOOP platform are simple and practical?

20 responses

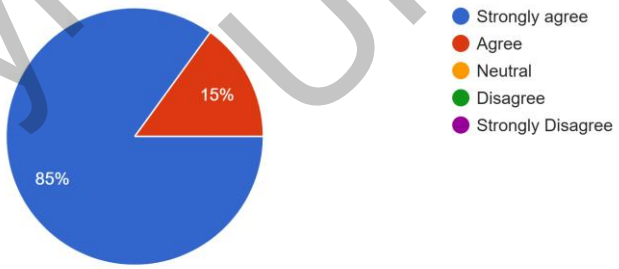
2. Are you satisfied with HOOP's interface design?

20 responses



3. Do you agree that HOOP can provide you with valuable advice?

20 responses



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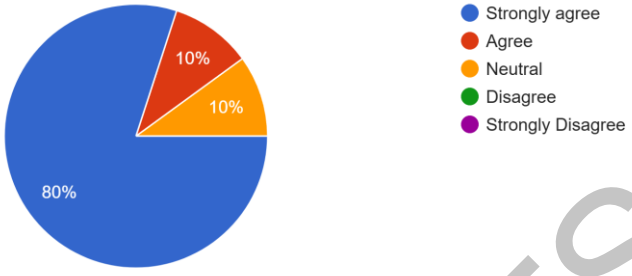
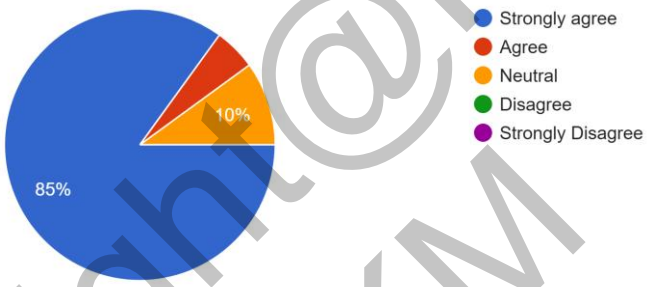
4. Do you agree that using HOOP can improve the efficiency of obtaining valuable sports science information?

20 responses



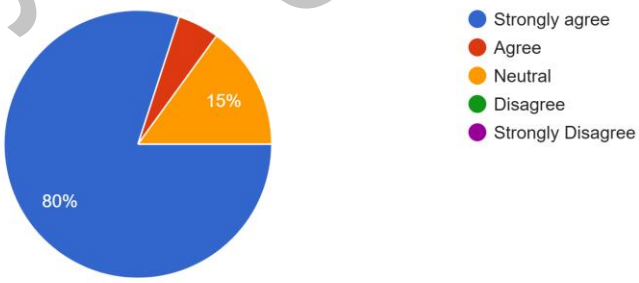
5. Do you agree that it is easier to get professional advice with HOOP?

20 responses



6. Do you agree that the potential risk of using HOOP to obtain misleading information is lower?

20 responses



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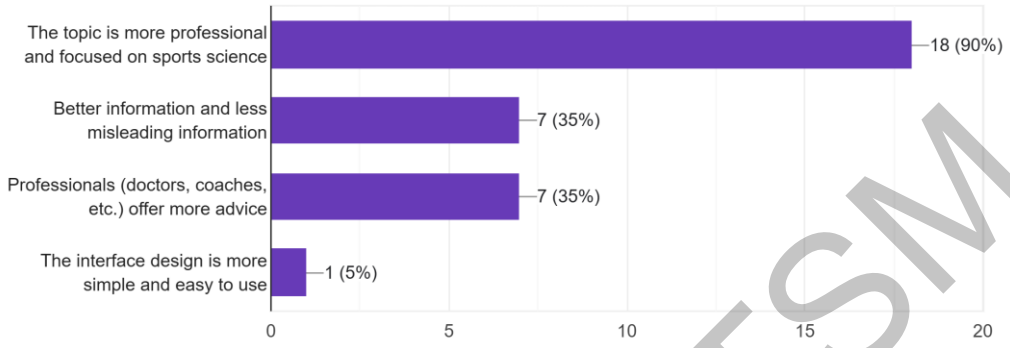
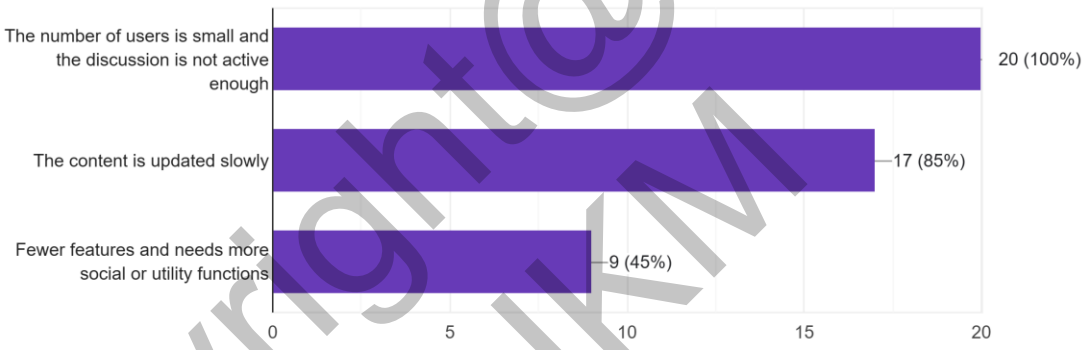
7. What advantages do you think HOOP has over the platforms you have used in the past?

20 responses



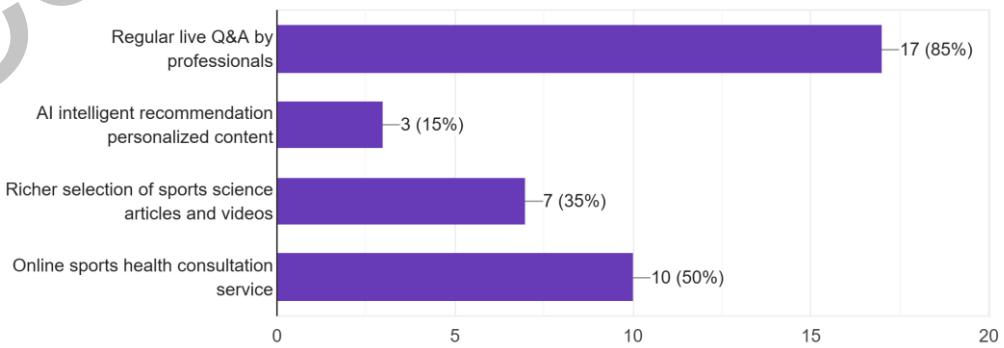
8. What do you think are the disadvantages of HOOP compared to the platforms you have used in the past?

20 responses



9. Which of the following features would you prefer to use if HOOP added them?

20 responses



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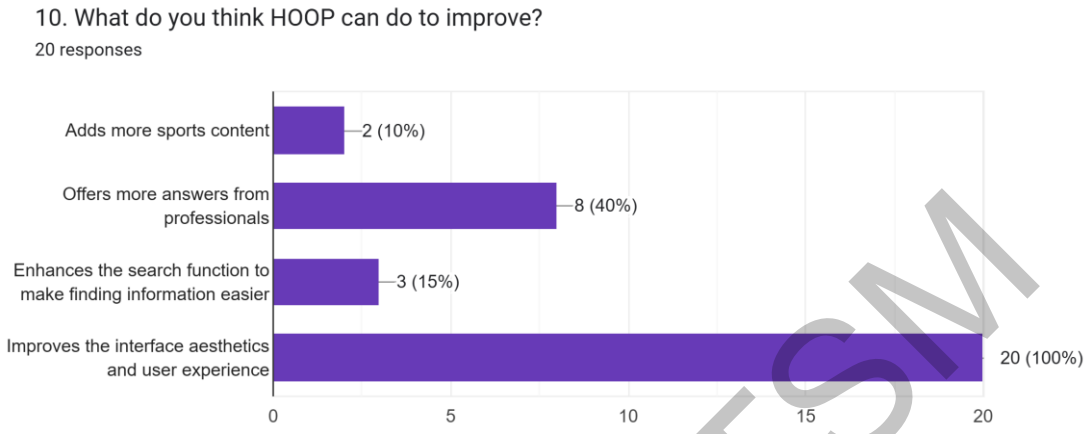

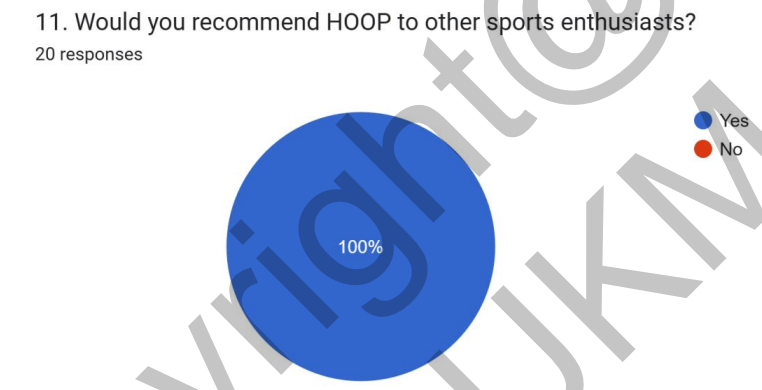

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The project found 20 sports enthusiasts in the gym, swimming pool and basketball court in Cerredo, including 2 women and 18 men. Their age group was 17 from 18 to 24 years old and 3 from 25 to 34 years old. Basketball, swimming

The user acceptance test results for HOOP show positive feedback overall. All users found the platform simple and practical, and 85% strongly agreed it will provide valuable advice and make it easier to get professional guidance. Additionally, 80% believe it will improve efficiency in obtaining sports science information and reduce the risk of misinformation. However, only 30% of users were completely satisfied with the interface design, it indicated potential areas for improvement.

It also presents further insights from the user acceptance test of HOOP. The main advantage of HOOP, as recognized by 90% of users, is its professional focus on sports science. However, the platform has some drawbacks, such as a small user base and slow content updates. Users suggested adding more live Q&A sessions with professionals and online health consultations. The top area for improvement, supported by all users, is enhancing the interface aesthetic and user experience, followed by increasing professional responses and improving search functionality.

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CONCLUSIONS

This project represents a growing interest in sports science and health as science advances. HOOP was built to fill gaps in the existing market and address the limitations of the existing platform. What sets HOOP apart is its commitment to in-depth discussions related to exercise science and its rejection of the online discussion environment that is now flooded with meaningless information. HOOP provides a pure place for in-depth discussion for sports lovers who love sports and pay attention to sports science.

So far, this project can be said to have fully achieved objectives 1 and 2, HOOP on the project through user surveys accurately identified market gaps and then developed a user-friendly platform. For objective 3, HOOP has been well tested by users but still falls short in some areas such as user interface design.

HOOP's goal is to create a pure discussion space for sports enthusiasts, and it focuses on sports science and health discussions. In theory, HOOP shows its advantages, but in the face of the existing mature platform, HOOP's competitiveness is not optimistic. Therefore, in order to attract more target users, more work is still needed, such as more in-depth market research on target users under a larger sample and bridge the gap between the platform and mature platforms. Despite the difficulties, HOOP's positioning captures the gap in the market and sets the course for development according to the needs of target users. Through continuous development and reasonable operation, the platform will be able to show strong competitiveness in the face of target users.

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ACKNOWLEDGEMENT

I acknowledge that this work is my own except for quotations and summaries which I have clearly explained their sources.

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