TECHNICAL REPORT

WELLNESSTRACK: A PERSONALIZED HEALTH MANAGEMENT APPLICATION

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Abstract

The continuous progress of science and technology has influenced the development of human health awareness, and health management tools have become indispensable tools for humans to pursue a healthy lifestyle. This study introduces the continuous development of WellnessTrack, a mobile application for monitoring users' daily steps, water intake, and sleep time for personalized recommendations. The application uses the sensors of smartphones to record steps and sleep time, but requires users to manually enter water intake. The application will continue to enhance user engagement and cultivate good health habits through functions such as health reminders, goal setting, and data visualization. This study adopts an incremental development model, which continuously changes technology through independent increments. It is combined with lightweight algorithms and basic statistical analysis to process health data more quickly. The system architecture adopts a model-view-controller (MVC) framework design to ensure the scalability of the module. The application uses science and technology based on personalized recommendations to enhance user stickiness and usage of the application and ensure long-term monitoring of users.

Introduction

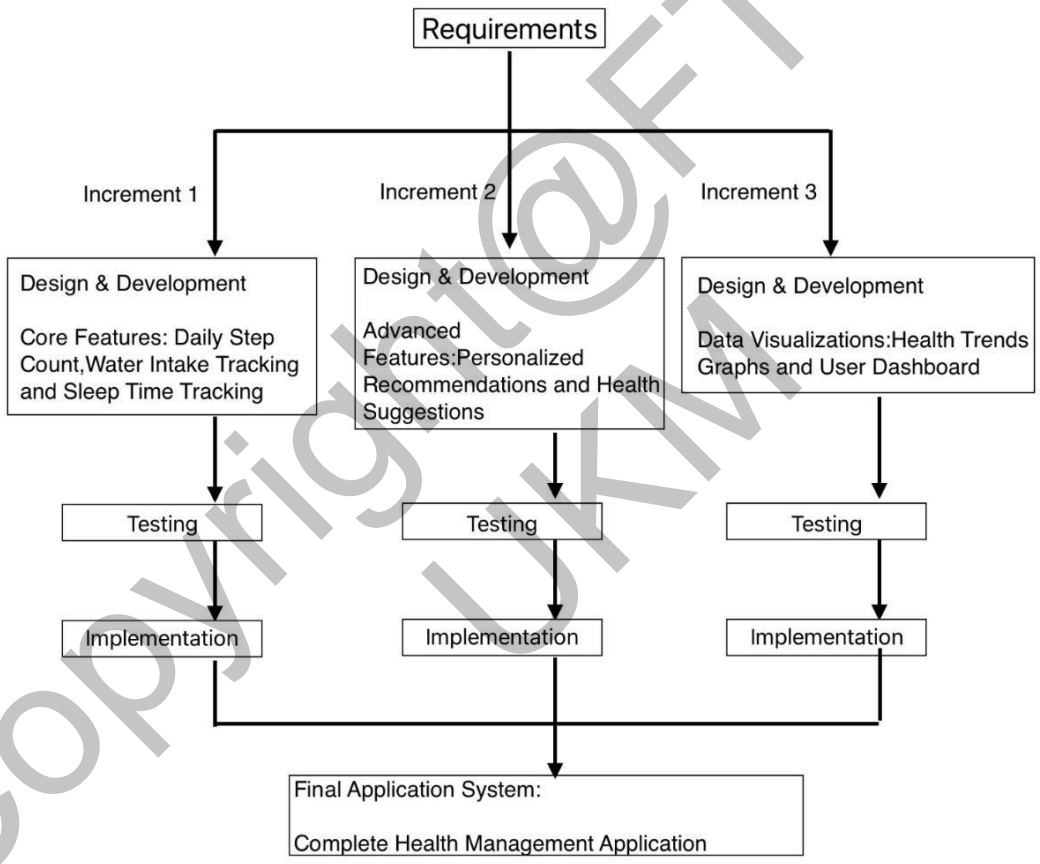
With the improvement of the quality of life, people pay more and more attention to health, especially in the field of health management. More and more people are looking for reliable health monitoring tools, but many people face many challenges in health management, especially in key health factors such as daily steps, water intake, and sleep time. With the advent of the smart era, traditional health management methods have been gradually replaced before they are popularized. Based on this growing health demand, people need a management tool that can detect, record and provide timely feedback on health status anytime and anywhere. The resulting health management software is designed to help users effectively manage their health and protect their health through smart records.

In today's society, health issues are a hot topic, and health management issues are also extremely important in health issues. People face many challenges in health issues, especially the continuous tracking of issues such as maintaining a certain number of steps, water intake and sleep time every day. Harvard Medical School pointed out that adequate sleep, moderate exercise and sufficient water intake are the three pillars of a healthy lifestyle (Harvard Medical School, 2021). Daily testing is also extremely important. Studies have shown that regular monitoring of health factors (such as steps, water intake and sleep time) can significantly reduce the risk of lifestyle-related diseases (American Heart Association, 2021).

With the advent of the smart era, traditional testing methods are no longer sufficient to meet people's health needs. According to Statista, the global smart health device market is expected to reach $142 billion in 2026 (Statista, 2022), reflecting the high demand for automated health management. Based on this trend, health management applications have emerged, aiming to help users manage their health more effectively and protect their health through intelligent recording and feedback.

Research Methodology

The project adopt an incremental development model. With each increment, the application will update a functional part, and finally all parts will be integrated and tested. This allows the functional parts of the application to be delivered and tested as early as possible, thus achieving true flexibility and continuous improvement through technical evaluation.



Increment 1

Develop the core functions of the health management application, including daily step count, water intake tracking and sleep time, to ensure that the basic functions of the application can be used, laying the foundation for the entire application.

Increment 2

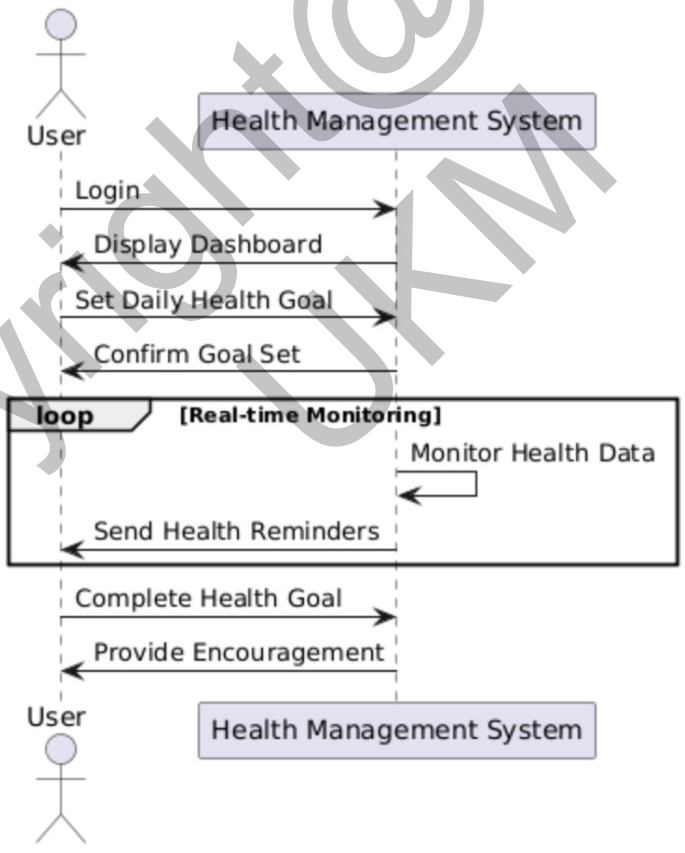
Develop advanced functions in basic functions, analyze users' health data, provide users with more scientific health advice reminders, and set personalized goals, which enhances user experience and application value.

Increment 3

The user's health data will be visualized to help users more intuitively discover changes in their health habits, improve data readability and user engagement.

Final application system

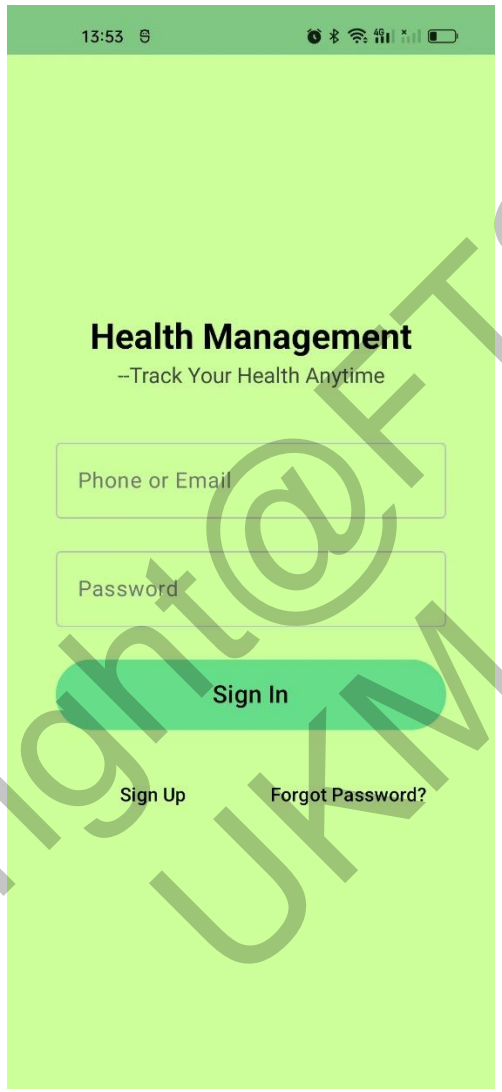
Test and implement each part, launch a complete health management application, and achieve the ultimate goal of the project.



This type of activity mainly shows the interaction between the user and the system. The user first logs in to the system and sets a daily health goal on the system. The system will monitor the user's health data in real time and send reminders. After the user completes the health goal, the system will give encouragement.

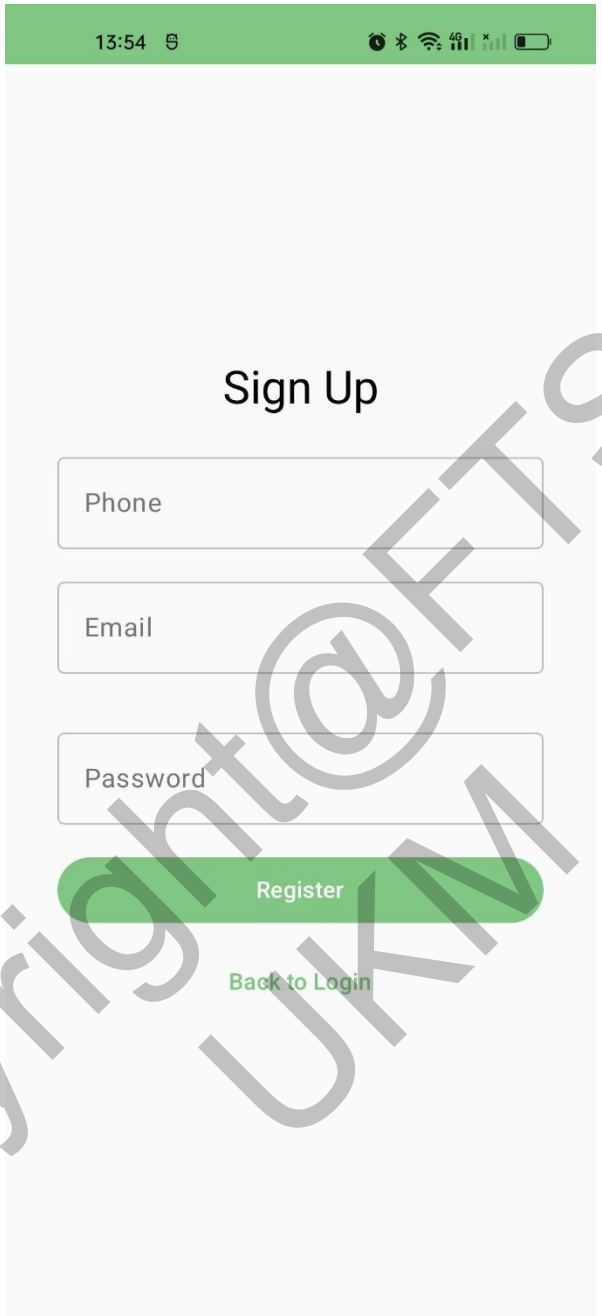
Results and discussion

1. Login Page



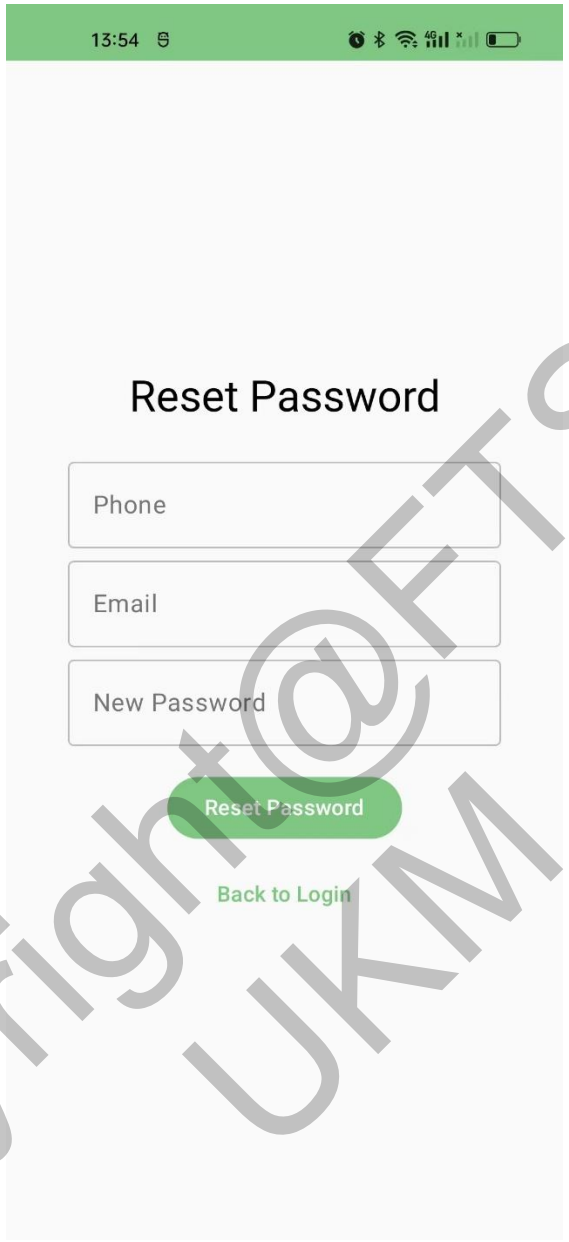
This is the entry page of the system. Users can log in by mobile phone number or email address. Registration requires users to double bind their mobile phone number and email address to set a password. If they forget their password, they can reset their password by double binding their mobile phone number and email address. The page highlights the light green background and main font that match the health theme, which improves visual comfort and user attention.

2. Registration Page



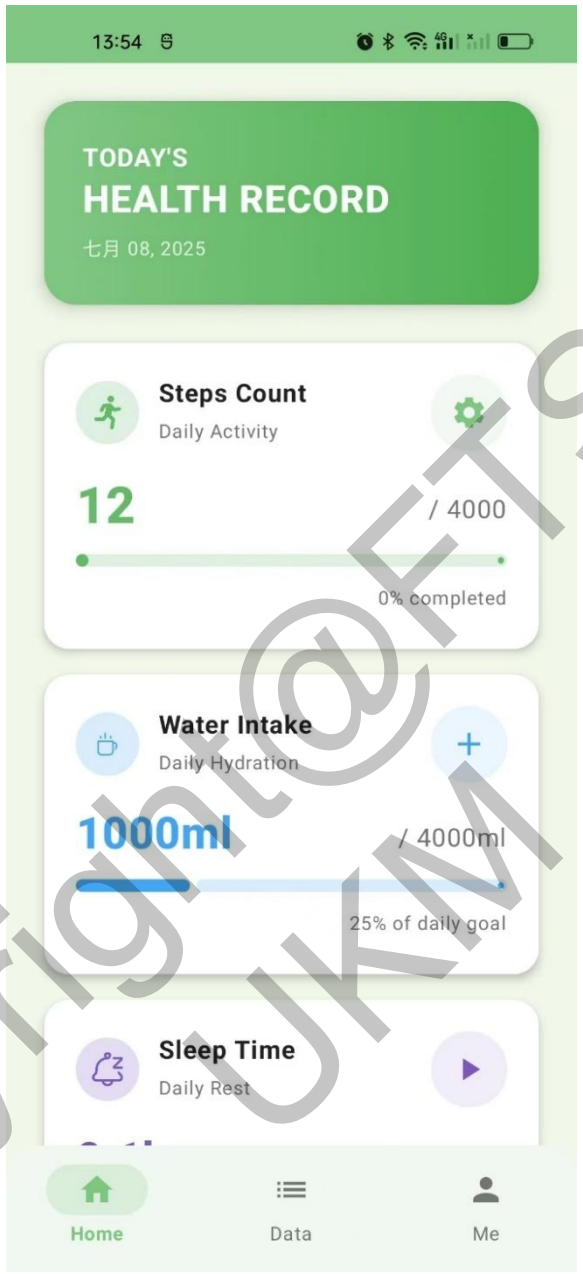
The registration page shows that users need their mobile phone number, email address and password to register and cannot reuse the mobile phone number and email address that have been used for registration for a second time.

3. Reset Page



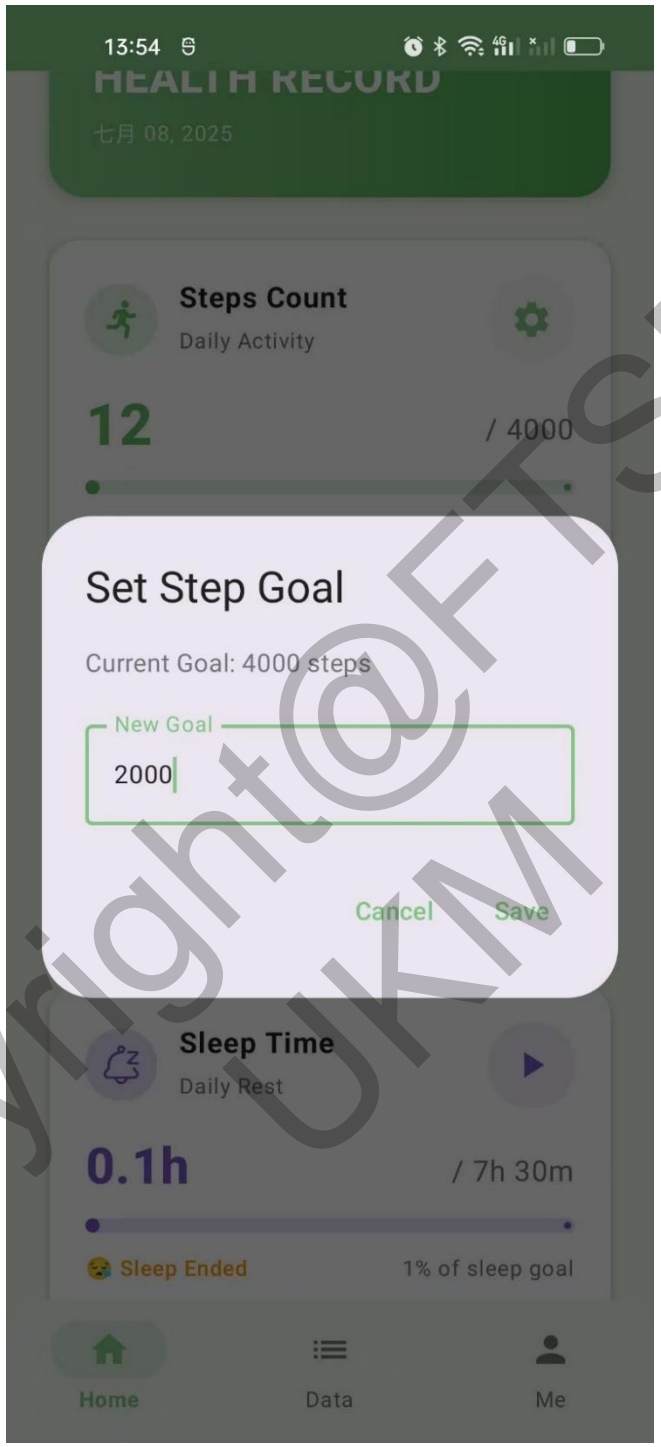
The reset page shows that users can reset their passwords by using their email addresses and mobile phone numbers.

4. Homepage



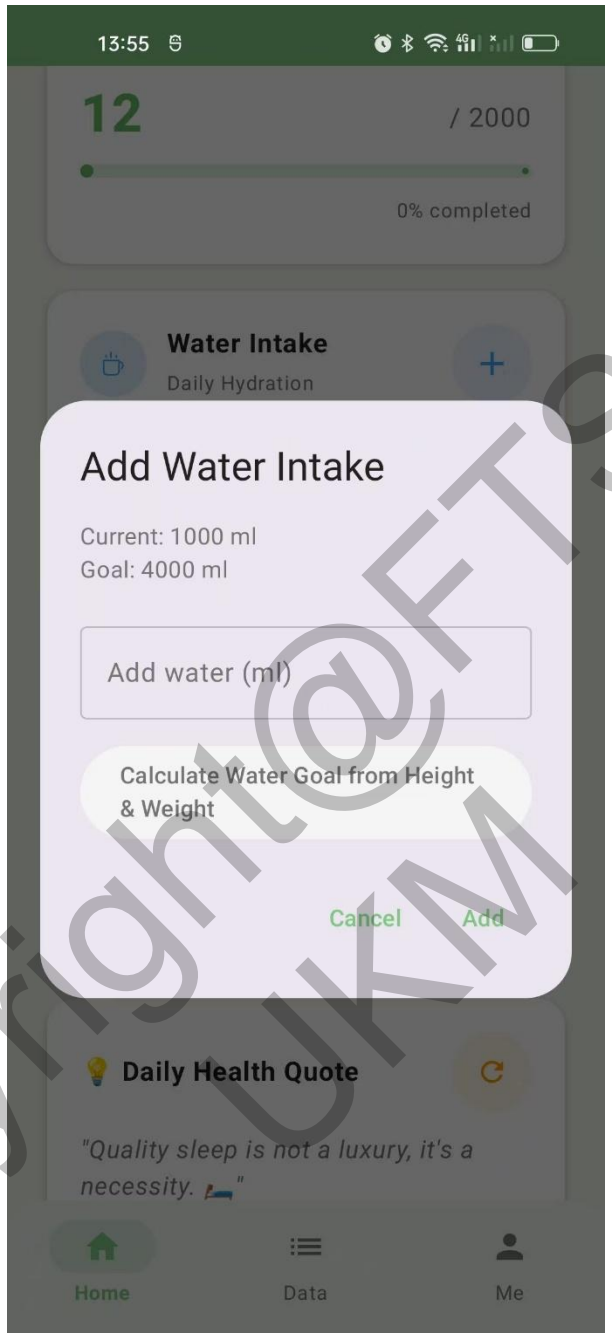
The homepage mainly records the three most important data for human health in the form of cards: daily steps, water intake, and sleep time. Users can set walking goals by clicking on the icon. In terms of water intake, the system will calculate the recommended daily water intake based on the user's height and weight. In terms of sleep, users can set a target sleep time and calculate the time difference between the start and end of sleep to get the sleep time. When the user completes the health goal setting, the system will give encouragement. When the user fails to complete the health record for a long time, the system will send a reminder. The design supports the discoverability of content and supports users to interact in the form of exploration and collection.

5. Steps Page



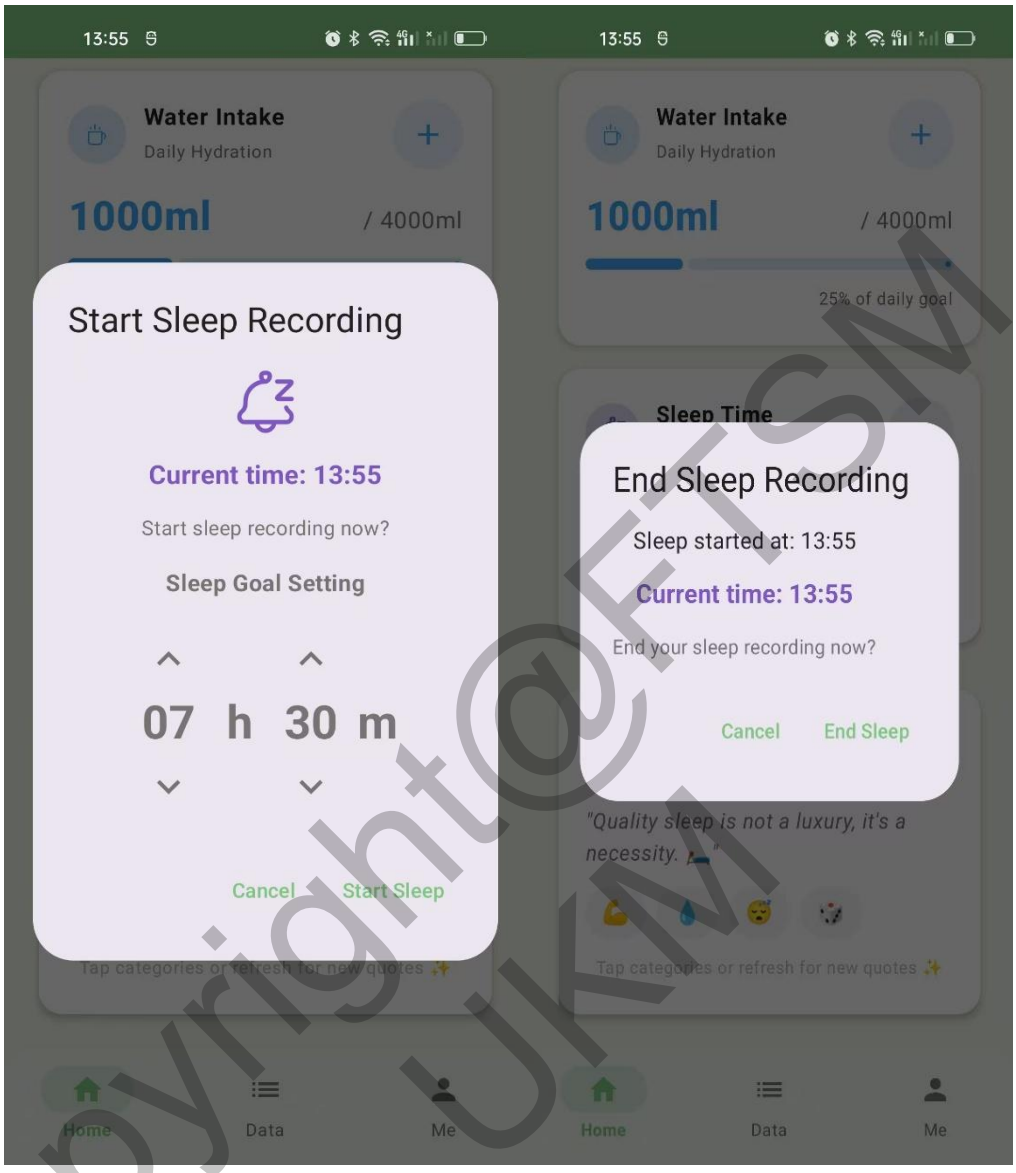
The step page shows that when the user clicks the icon to set a goal, the user can add his or her ideal number of steps, and the phone will perform target detection and step counting in the background.

6. Water Intake Page



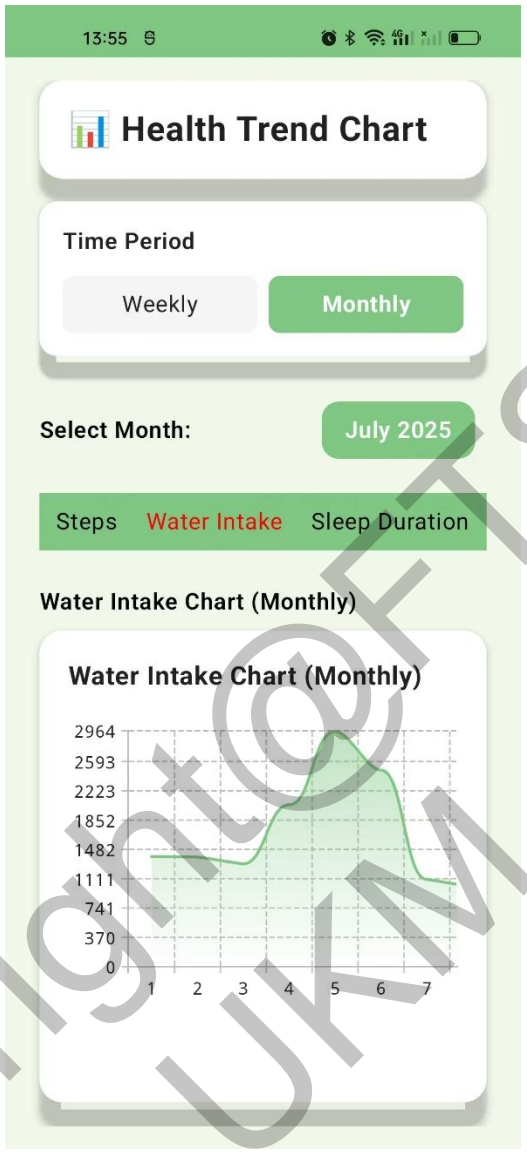
The water intake page shows that when the user clicks the icon to set a water drinking goal, the user can add his or her height and weight to calculate his or her daily water intake, and then add it reasonably to complete the goal.

7. Sleep Record Page



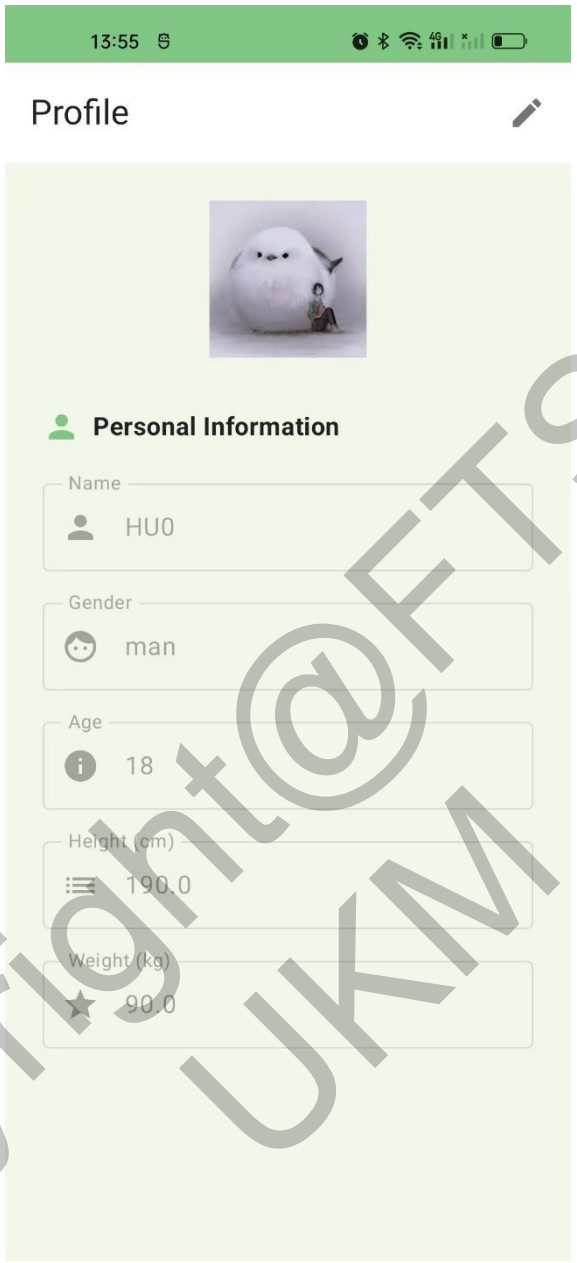
The sleep record page is shown. When the user clicks the icon to start, the user can add his or her sleep goal for the day and then start timing. As shown, when the user finishes, the sleep time is automatically recorded in the statistics.

8. Data Page



As shown, the Data page records the trend of the user's health data in detail in the form of a chart. Users can check their three important health data records every month and every week to ensure their health. The system will make reasonable health suggestions based on the user's data to ensure better execution.

9. User Profile Page



As shown, users can fill in some important personal information to support health records.

Conclusion

This project develops a health tracking app called WellnessTrack, which aims to provide users with an efficient tracking solution for monitoring and managing their daily health activities. Users can track steps, water intake, and sleep patterns, and view detailed health data analysis through clear charts and data visualization. The system provides personalized health goals and smart reminder services to help users maintain a healthy lifestyle through real-time monitoring and timely notifications. The application is built with modern Android development technologies, including Kotlin, Jetpack Compose for the user interface, Firebase for backend services, and Room database for local data storage to ensure system stability, responsiveness, and other advantages.

The advantages of the system include accurate health data tracking, intuitive user interface design, smart reminder mechanism, and comprehensive data visualization capabilities. The app uses device sensors to automatically track user steps for statistics, while providing options for manual input of water intake and sleep monitoring. The Firebase database ensures that data can be synchronized across devices, and background services can continue to monitor even when the app is not active. Data visualization charts better help users understand their health trends and improve the user experience.

As for limitations, the app currently only supports the Android platform and is not accessible to iOS users. The accuracy of step statistics may vary depending on device hardware performance and sensor quality. As user data grows, the system may face performance optimization challenges in data processing and chart rendering. In addition, the reminder system relies on device notifications, which may be affected by system-level battery optimization settings.

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