THE ANDROID BASED FITNESS MANAGEMENT SYSTEM

Wang Nan

Faizan Qamar

Faculty of Information Science & Technology, The National University of Malaysia, 43600 UKM Bangi, Selangor, Malaysia

Abstract

In modern society, due to the great pressure of work and the fast pace of life, people's bodies are overwhelmed and various diseases afflict them. Although the development of many diseases is inevitable, we can prevent them by making lifestyle changes. Consistent exercise is the best way to solve this problem. But many people do not have the time and space to do physical exercise. Sales of Android phones have continued to soar in recent years. Android operating system has the advantages of stability, intelligence, moderate price, etc., and maintains a far leading position in the smart phone market. People spend dozens of hours a day on their smartphones. The purpose of this study is to develop a sports and fitness management system with diet guidance function on Android platform. Through this system, users can obtain targeted training video recommendations according to their own situation, and can also easily match fitness meals through the function of diet guidance to obtain better exercise results. It will provide the user with four main modules. Firstly, users can obtain targeted training video recommendations based on their personal body data and movement goals they want to achieve. Secondly, users can use the diet guidance function, and the system will match users with three meals a day according to their sex, age, height, weight, and exercise goals. This system also contains the function of recording the number of steps, the number of steps, the distance, the time, and the calories consumed will be recorded each time. Finally, users can also communicate online through the comment function to share sports experience. I will use Android Studio, Eclipse, and other tools, using the Java language and MySQL database storage technology to achieve this.

Introduction

Venturing into a digital era, where convenience is paramount, healthcare is progressively shifting its paradigm towards online platforms. Amidst this transformation, this study introduces an innovative solution to a pertinent issue within online pharmacies - balancing convenience, medication authenticity, and user data security. Emphasizing a robust Authentication Technology Mechanism, we aim to redefine the integrity and safety of obtaining prescription medications online.

Background: In contemporary society, health and fitness have become an increasingly important concern in people's daily life. With the improvement of living standards and the continuous advancement of technology, people's awareness of health awareness is increasing and they are beginning to pay attention to maintaining an active lifestyle. Physical activity and exercise have been shown to have positive effects on an individual's physical and mental health, including improving energy levels, relieving stress, maintaining a positive mindset, and preventing the onset of chronic disease. In real life, however, many people face various challenges that make regular exercise difficult. Hectic work schedules, family responsibilities, and other life pressures are often the main reasons that prevent people from going to the gym or participating in physical activity on a regular basis. In this case, finding flexible and convenient fitness solutions has become an urgent need.

Objective: This topic aims to create an Android-based fitness management system, including recommending targeted sports videos, recommending targeted healthy recipes, recording steps and sports data, and communicating functions. People who lack time or space for regular exercise are the target users of this project.

Scope: It calculates the body mass index (BMI) value by collecting the user's physical data, and recommends targeted training videos and healthy recipes based on the user's personal exercise goals. This will help users achieve their exercise goals faster.

This project also adds a pedometer function, that is, we will obtain the current number of steps by monitoring the changes in the sensor data of the mobile phone, and calculate the walking distance based on the number of steps, obtain user information and exercise information, calculate calorie consumption, and calculate the number of steps , walking distance, and calories burned are displayed on the interface. The system will also record the duration and frequency of each exercise to help users better manage their fitness plans.

Finally, this system also provides a platform for users to communicate and interact. Users can publish news, share their sports experience with other users, and obtain support and suggestions. Improve users' enthusiasm and sense of accomplishment, and promote the development of users' healthy habits.

Justification and Importance: The development of this project is of great significance. With the enhancement of health awareness and fitness needs in modern society, developing an Android fitness management system has become an urgent task to meet user needs. The app will provide personalized fitness plans and nutritional advice, giving users the flexibility to choose when and where to exercise efficiently. Through the power of technology, this application will promote health management and active lifestyle, and make substantial contributions to the health of individuals and society.

Literature Review: This report attempts to review relevant literature and study related antecedents to explore the importance of fitness for disease prevention and health maintenance. Compare and contrast existing fitness apps for an objective analysis and identify areas for improvement.

Table 1   Current similar fitness app comparison

	Google Fit	Keep	MyFitnessPal	Alo Moves	Daily Workouts Fitness Trainer App
Problem	1. Fit isn't tracking activities correctly 2. Fit doesn't store data from my fitness app	1. Obvious homogeneity of content 2. Great individual differences in the social plate 3. Lack of accuracy in data recording	1. loads very slowly Update does not start 2. Photos not attaching to a status post when in Landscape	Unstable, the app always fails to open and crashes easily	Daily Workouts Fitness Trainer always crashes
Solution	1. Change Fit's permissions 2. Reset Google Fit connections	1.0 Create personalized content, enhance fun, and incorporate some game elements to allow users to consciously participate in it. 2.0 Sophisticated social sector management. 3.0 Improve technical capabilities	1.Restart smartphone or tablet 2. After taking the photo, turn the device to Portrait before "confirming", or take the photo first and add it from your camera roll	Restart smartphone or tablet	Restart smartphone or tablet
Advantage	1. View real-time statistics for your runs,	1. Among the apps I have experienced so far, it is the only one that allows	1. As a database with more than 11 million food items.	1. There are several options for professional fitness	1. Allows you to construct a workout that is

	walks, and bike rides and receive instant insights when you exercise. 2. Fit will track your speed, pace, route, and other information using the sensors on your Android phone or the Wear OS by Google wearable. 3. View your daily development toward your Heart Points and Steps objective.	users to conduct simple physical tests; 2. Develop personalized fitness plans according to personal physical tests and fitness goals; 3. The most abundant courses, including some star demonstration courses, are suitable for all kinds of fitness groups; 4. The number of users is the largest. In August this year, the number of users has exceeded 100 million. 5. Have a comprehensive fitness diet.	2. keeps track of your food intake and exercise. 3. customizability based on health objectives 4. Logging of restaurant menus is possible.	instructors' workouts. 2. All-levels barre classes with adjustments 3. Weekly new courses 4. Classes can be conducted both with and without equipment. 5. Tracking features may be linked with the Apple Watch	adapted 2.User sharing of body stat tracking is possible. 3. Exercises from an evidence-based library are offered. 4. Through a subscriber-based community, peer help is accessible. 5. presented are post-workout analytics
limitations	1. a few different apps and devices that applications connect to 2. Sleep information cannot be entered into a field. 3. A technique for tracking calories does not exist. 4. Does not calculate the number of calories burned	1. There is no matching warm-up action in the training plan, so you need to choose by yourself; 2. The sparring effect is good, the video picture and text analysis are good, but there are too few reminders in the voice action points; 3. The generated fitness plan is not reasonable. For example, when I	1. To access the full spectrum of services, a fee-based premium package is necessary. 2. Not a provider of training services 3. Some tracking services could be unclear or wrong.	1. With so many coaches available, finding the best-qualified ones can be challenging 2. No live classes offered 3. No cardio classes available	1. No rood tracking or dietary advice 2. Payment is necessary to access all features. 3. Limiting attention to pursuits except weightlifting

		use KEEP, the generated fitness plan does not target at arm training.			

Report Organization: This technical report will be divided into six sections: Introduction, Research Methods, Results and Discussion, Conclusions, Acknowledgments, and References. The introductory section will outline the project background, objectives and significance. The research methods section will detail the strategies and tools for project development. The Results and Discussion section will present project results and in-depth analysis. The conclusion section will summarize the findings and look forward to future developments. The acknowledgments section will thank supporters and contributors. The References section will list all cited sources.

Research Methodology

As an important part of the technical report, research methodology is the key to ensure clear direction and effective implementation of project development and research. In this technical report, we will focus on the methodology of this fitness application project, including the development process model, data collection method, data analysis method, and selection of measurement and investigation tools. These methods will guide and interpret our research, ensuring that the goals of the project are met and supported by meaningful data. In the part of methodology, we will explain in detail why iterative model is chosen as the development process model of this project, and explain how well it fits with the project goal. In addition, we explain why we use specific data collection methods to ensure that we collect the necessary data to evaluate the app's functionality and performance. At the same time, we will also introduce the data analysis method adopted and how to obtain valuable insights from the data. Finally, we explain why specific measurement and survey tools were chosen for measuring project outcomes and development effectiveness. A methodology is critical to the successful implementation of a project, providing guidance and explanation for how research is conducted and how data is collected and analyzed. By clearly introducing these methods, we will ensure that the development and research of this fitness application project can be carried out in an orderly manner, and finally achieve the project goals and provide users with valuable fitness solutions.

Development Process Model: The project will be created using an iterative paradigm, as show in Figure 1, breaking the development lifecycle into smaller, more manageable project modules. Requirements, design, implementation and testing steps are then applied to each module to ensure its quality. As each cycle progresses, modules are merged or further improved until the project is complete. Some of the benefits of this approach include: first, priority requirements can be identified first; it enables users to access critical functionality as soon as possible; and finally, users can provide

feedback at any time, helping to prevent risks at the end of the project and making requirements adjustments simple.
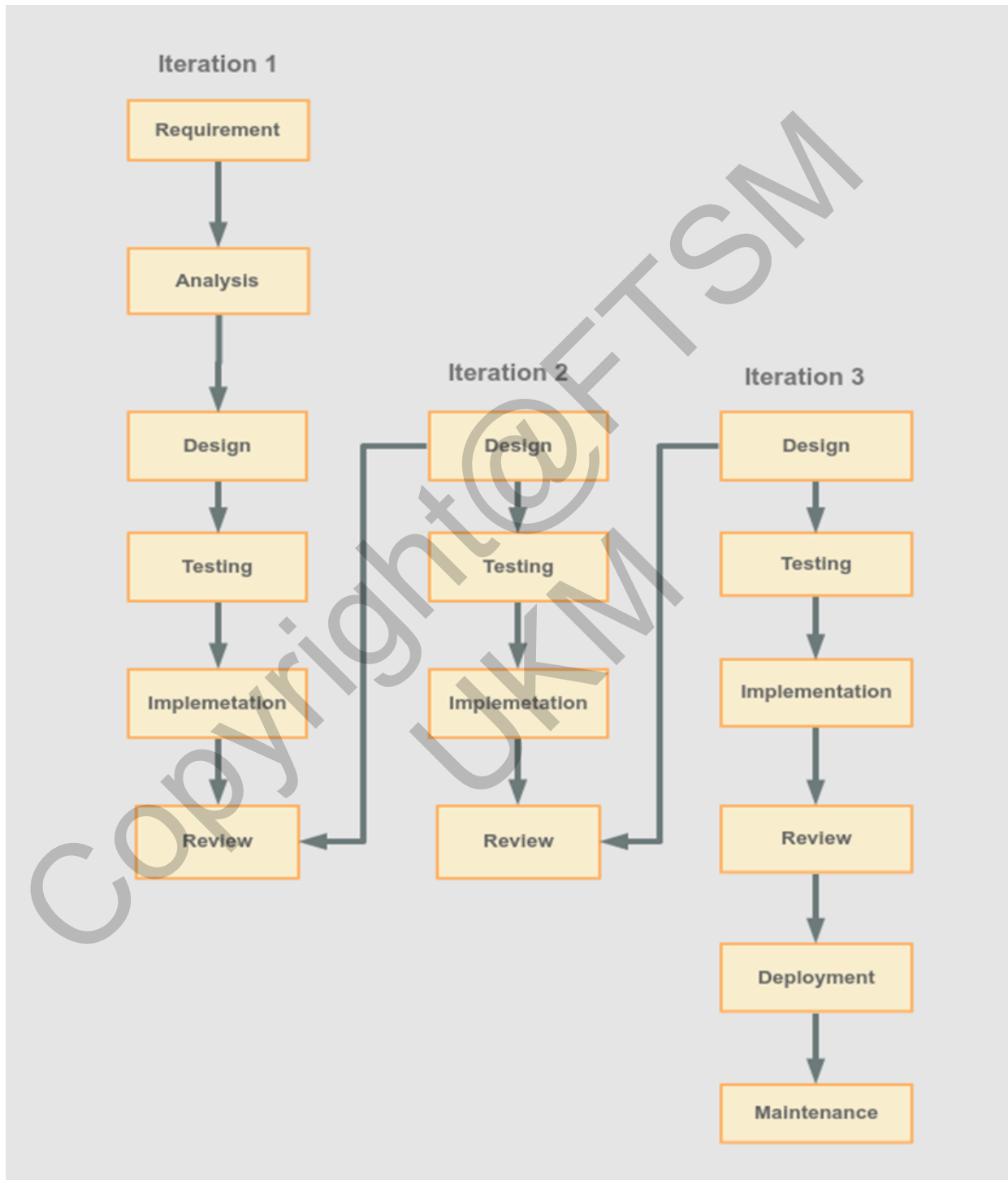

Figure 1 Iterative Model

Data Collection Method: This project employed a variety of data collection methods, including user surveys, usage data, and user feedback. User research will help me understand what users want and expect from a fitness app. The collection of usage data will track the user's fitness behavior and application usage, so as to evaluate the effectiveness and function of the application. At the same time, I will also actively collect feedback from users, so as to keep abreast of changes in user experience and needs. These data collection methods complement each other and will provide me with comprehensive information to fine-tune and optimize app functionality.

Data Analysis Method: In terms of data analysis, we will use a combination of quantitative and qualitative analysis. Quantitative analysis will be used to process usage data to extract key indicators such as user activity, app usage frequency, etc. These metrics will help us assess the performance and appeal of our app. At the same time, we will use qualitative analysis to process user surveys and feedback data to gain an in-depth understanding of user needs and opinions. Qualitative analysis will provide deeper user insight and provide valuable suggestions for us to optimize the application.

Measurement and Measuring Tools: To measure project outcomes and development effectiveness, a variety of tools will be used for measurement and investigation. These include survey tools for collecting user survey data and feedback. In addition, in-app analytics tools will be used to track user usage behavior and app performance. These tools will help me obtain data in a timely manner and evaluate the implementation effect of the project.

Through the above methods, data will be collected and analyzed in a targeted manner to ensure that the project maintains flexibility and efficiency during the development process, and provide fitness applications that meet user needs. A clear definition of the methodology will ensure that the project goals can be achieved in a targeted manner, supported by meaningful data, and provide guidance and explanation for the successful implementation of the project.

Results and Discussions

In the Results and Discussion section, we will comprehensively present the research results of this fitness application project, and provide in-depth analysis and interpretation of these results. This part will include application function effects, usage data analysis, and user feedback. At the same time, we will compare the research results with past research and explore their impact on relevant knowledge or industry fields. In addition, we will provide suggestions for future research to facilitate the further development and exploration of this project. The Results and Discussion section is of great significance in a technical report, it presents the research results of the project and the information obtained, and provides substantive significance and conclusions for the research that has been conducted. By presenting these results and analysis clearly, we will provide readers with comprehensive project results and a deep understanding of the value and advantages of this application in the fitness field.

Analysis of Results: In the results analysis section, we will conduct an in-depth analysis of the research results of this fitness application project to reveal the meaning and significance behind it. The following is an analysis of the main findings of the study:

Through user survey and analysis of feedback data, we found that the fitness app performed well in providing personalized fitness plans and balanced diet recommendations. Users are highly satisfied with the application experience and functions, especially the experience of conveniently performing fitness activities at home has been well evaluated. This shows that the app has achieved positive results in meeting users' fitness needs and improving users' health management capabilities.

Through the analysis of usage data, we have observed that the frequency and duration of exercise of users have increased significantly. The in-app step tracking function has been widely used,

and the user's step count has increased by a certain percentage every day. This shows that the app has achieved good results in encouraging users to be physically active and promoting physical activity.

User feedback data shows that users generally believe that the fitness application provides valuable fitness guidance and advice. Users specifically emphasized the importance of the app's personalization features and the community of communication among users in motivating and maintaining a positive fitness attitude. These feedbacks indicate that the app has a positive impact in meeting users' individual needs and providing social support.

Compared with past studies, we found that the fitness app achieved significant results in promoting a healthy lifestyle and improving users' fitness levels. Compared with traditional fitness methods, the app provides more flexible and personalized fitness solutions, providing users with more convenient and sustainable fitness experience.

In summary, the fitness application project has achieved positive research results. A comprehensive analysis of user surveys, usage data, and user feedback shows that the app has achieved remarkable results in raising users' health awareness, promoting physical activity, and providing personalized fitness support. Compared with past studies, this application has advantages in meeting user needs and improving user health management capabilities. However, we also found some potential room for improvement, such as further optimizing the user experience and enhancing fitness social functions. Future research can further explore the improvement direction of the application and delve into the effect of the application in different user groups.

Implications and Conclusions: In this section, we will explain in detail the impact of the research findings on relevant knowledge or industry fields. Emphasize the significance of this fitness application project to health management and active lifestyle, and highlight the value and advantages it provides to users.

Future Suggestions: Several suggestions were made for future improvements.

Users can add friends, and users can comment and forward friends' dynamics

The pedometer adds more modes, such as brisk walking, running, etc.

Recipe recommendations are more diverse, allowing users to choose collocation options. The system can capture the user's actions in real time and give timely feedback.

By presenting these important elements in the Results and Discussion section, we will present the findings and information obtained from this fitness application project and provide meaningful explanations and conclusions for the studies that have been conducted. At the same time, we will also provide useful suggestions for future research and promote further development and exploration in the field of fitness.

Conclusion

The conclusion section is an important part in the technical report, which provides a comprehensive summary of the whole research and an in-depth understanding of the research results. In this study, the conclusion section contains the following key elements:Objectives: The primary objective of the project was to address the need for a secure and convenient online pharmacy system, which was successfully achieved. The developed system demonstrated robustness and usability across various testing scenarios and user groups.

Summary of findings:

Through a comprehensive summary of the results and discussion sections, we draw the following conclusions: The fitness application project has achieved positive results. User surveys and feedback show that the app is popular with users, especially the personalized fitness program and social communication functions. Usage data indicates an increase in user fitness frequency and motivation. Compared with past studies, the app performed well in increasing users' health awareness and promoting physical activity.

Target:

The goal set in the introductory section is to use the power of technology to help users achieve their goals of healthy living. Through this fitness application, users can easily obtain personalized diet guidance and exercise plans that suit their needs, and can carry out effective physical exercise no matter at home, in the office or when going out. In the conclusion, we were able to confirm that this goal has been achieved, and the app successfully meets the user's personalized fitness needs and improves the user's health management capabilities.

Impact and Implications:

The fitness application project has positively impacted and impacted relevant knowledge or industry fields. By providing personalized fitness support and social communication features, the app promotes active physical activity and improves the user's fitness level. The flexible and convenient fitness solutions it provides bring users a more active and healthy lifestyle, thereby positively promoting the entire field of health management.

Weaknesses and Recommendations:

Despite the positive results of this fitness app project, we also found some potential room for improvement. In the future, we recommend further optimizing user experience and strengthening fitness social functions to further improve user satisfaction and engagement. In addition, the effect of the app in different user groups can be explored to provide more precise fitness support for a wider user group.

Overall Summary:

Overall, the fitness application project has achieved positive research results. It successfully meets the personalized fitness needs of users, improves the health management capabilities of users, and makes positive contributions to promoting a healthy lifestyle. However, we also recognize that the project still has room for improvement in an evolving field and therefore provide suggestions for future research to drive further development of this application. These results and suggestions will provide valuable references for research and practice in related fields.

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Wang Nan (A178725)
Dr. Faizan Qamar
Faculty of Information Science & Technology,
The National University of Malaysia