Java Institute for Advanced Technology

Department of Examinations

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Project Document

For

BeFit Mobile and Admin Dashboard: An M-Commerce Solution for Sports Retail

Version 1.0.0

Prepared By: SprinSec Technologies

Acknowledgments

We express our sincere gratitude to everyone who contributed to the development of BeFit Mobile. Special appreciation goes to our mentors, developers, and testers for their invaluable guidance and support throughout the project. Their expertise and dedication played a crucial role in shaping the application into a robust and user-friendly platform.

Abstract

BeFit Mobile is an Android-based M-Commerce application designed to enhance the online shopping experience for fitness and sports enthusiasts. As an extension of the existing BeFit web platform, the mobile application aims to expand the brand's global reach while improving accessibility and usability for customers.

The application provides a seamless and user-friendly interface for users to explore, filter, and purchase sports products effortlessly. Additionally, it offers essential administrative features for managing users, sellers, products, and categories. Sellers can list and manage their products through the mobile app, while administrators can oversee platform activities with limited functionalities.

Developed with modern design principles and efficient data management techniques, BeFit Mobile integrates secure authentication, product categorization, order tracking, and push notifications. The report outlines the motivation, problem statement, system architecture, implementation details, evaluation, and future enhancements for the application.

Table of Contents

List of Tables, Figures, and Abbreviations

Table 1

User Roles and Permissions

User Role	Permissions
Admin	Manage users, sellers, products, categories, and feedback. Send promotional messages.
Seller	Add New Product
User	Browse, search, and purchase products. Manage cart, wishlist, and order history.

Table 1 - User Roles and Permissions
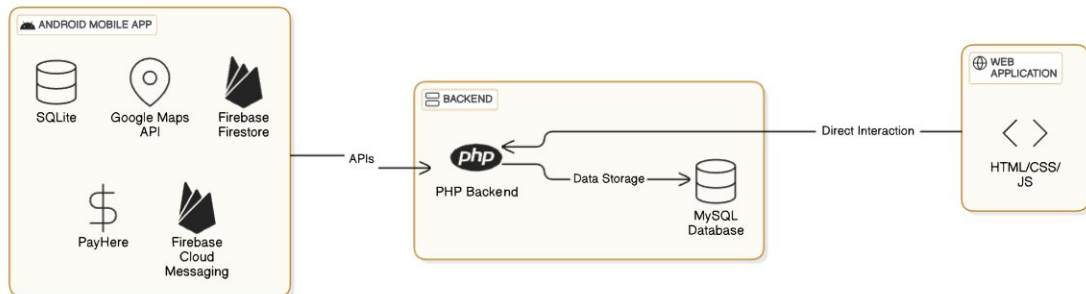
Figure 1

System Architecture of the Application

Figure 1 - System Architecture of the Applicaion

Abbreviations:

- UI – User Interface
- API – Application Programming Interface
- DBMS – Database Management System

Introduction

Motivation

With the increasing demand for online sports equipment shopping, there is a need for a robust and reliable mobile platform. BeFit Mobile aims to bridge this gap by connecting sports retailers with consumers, providing a seamless and efficient shopping experience.

Problem Statement

Many sports retailers lack dedicated mobile commerce applications, resulting in suboptimal customer engagement. BeFit Mobile addresses this gap by offering a mobile-friendly, feature-rich shopping experience tailored to sports enthusiasts.

Background

BeFit is a specialized sports retail business that provides a wide range of high-quality sports equipment, including:
- **Calisthenics Equipment**
- **Swimming Gear**
- **Weightlifting Equipment**
- **Badminton Equipment**
- **Skateboarding Gear**
- **Rubik's Cubes**
- **Other Sports-Related Items**

As the business continues to grow, expanding its market reach and improving the customer shopping experience have become key priorities. While BeFit already operates through a **web-based e-commerce platform**, a **mobile solution** is essential to enhance accessibility and user engagement, particularly for a global audience.

To address these needs, this project focuses on developing:

1. **BeFit Mobile** – A dedicated Android application to provide a seamless and user-friendly shopping experience.
2. **Web Admin Dashboard** – A robust management platform for administrators to oversee users, sellers, products, and transactions efficiently.

By implementing these solutions, **BeFit** aims to extend its services across **South Asian countries**, including Sri Lanka, India, Bangladesh, Bhutan, Afghanistan, Nepal, Maldives, and Pakistan, while streamlining operations through a centralized administrative system.

Specifications

BeFit Mobile is designed with the following key functionalities:

1. **User Authentication and Authorization**
    *   Secure sign-up and login for customers, sellers, and administrators.
    *   Admin verification process.

2. **Customer Features**
    *   **Product Browsing and Search:** Explore sports-related products with search and filtering options by category, price, and condition.
    *   **Wishlist and Cart Management:** Add and remove products from the watchlist and shopping cart.
    *   **Order Placement and Order Status Viewing:** Place orders, order statuses, and view purchase history.
    *   **Product Feedback and Ratings:** Provide reviews and ratings for purchased products.
    *   **Profile Management:** Update personal details and view order details.
    *   **Customer Support:** Contact sellers or customer service.
    *   **BeFit Store Locator:** Locate physical BeFit stores.

3. **Seller Features**
    *   **Product Management:** Add, view products.
    *   **Order Handling:** View customer order statuses and manage selling history.

4. **Admin Dashboard Features (Web and Limited Mobile Access)**
    *   **User Management:** Search, view, and block/unblock users and sellers.
    *   **Product and Seller Management:** Search, view, and manage product listings and seller accounts.
    *   **Category Management:** Add and manage product categories.
    *   **Feedback Management:** Search, filter, and delete product feedback.

- **Promotional Messaging:** Send targeted promotional messages and notifications.
- **Admin Settings:** Configure admin preferences.
- **Report generating:** Generate the report that contains monthly income ,user registration percentage ,most selling category etc details.

5. **Payment and Delivery Integration**
   - **Secure Payment Processing:** Integration with PayHere for seamless transactions.
   - **Third-Party Delivery Service Integration:** Customers pay delivery charges upon product arrival.

6. **Notification and Communication System**
   - **Push Notifications:** Send promotional offers and order updates via Firebase Cloud Messaging.

7. **Offline Support for Mobile Application**
   - **Local Storage:** Use SQLite for offline data access to explore product,cart and watchlist.

Design

The system follows a modular architecture comprising:

- **Mobile Client:** Built with Android SDK and Material3 for an enhanced UI/UX.
- **Mobile Application Backend:** RESTful APIs developed using PHP .
- **Web Application:** Developed with HTML, JavaScript, CSS, and Tailwind CSS, PHP .
- **Database:**
- MySQL as the primary database
- SQLite for offline data storage in the mobile app
- Firebase Firestore for storing admin promotions and offer messages
- **Payment Gateway:** PayHere integration

System interactions and architecture are illustrated through UML diagrams, Entity-Relationship diagrams, and UI designs.

Entity relationship Diagram
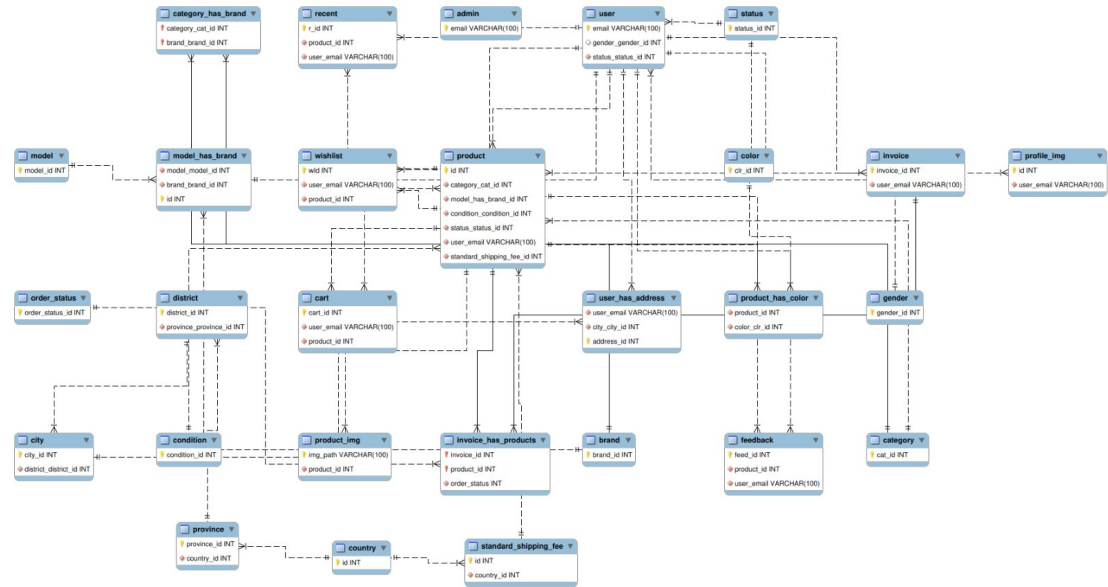
Use Case Diagram
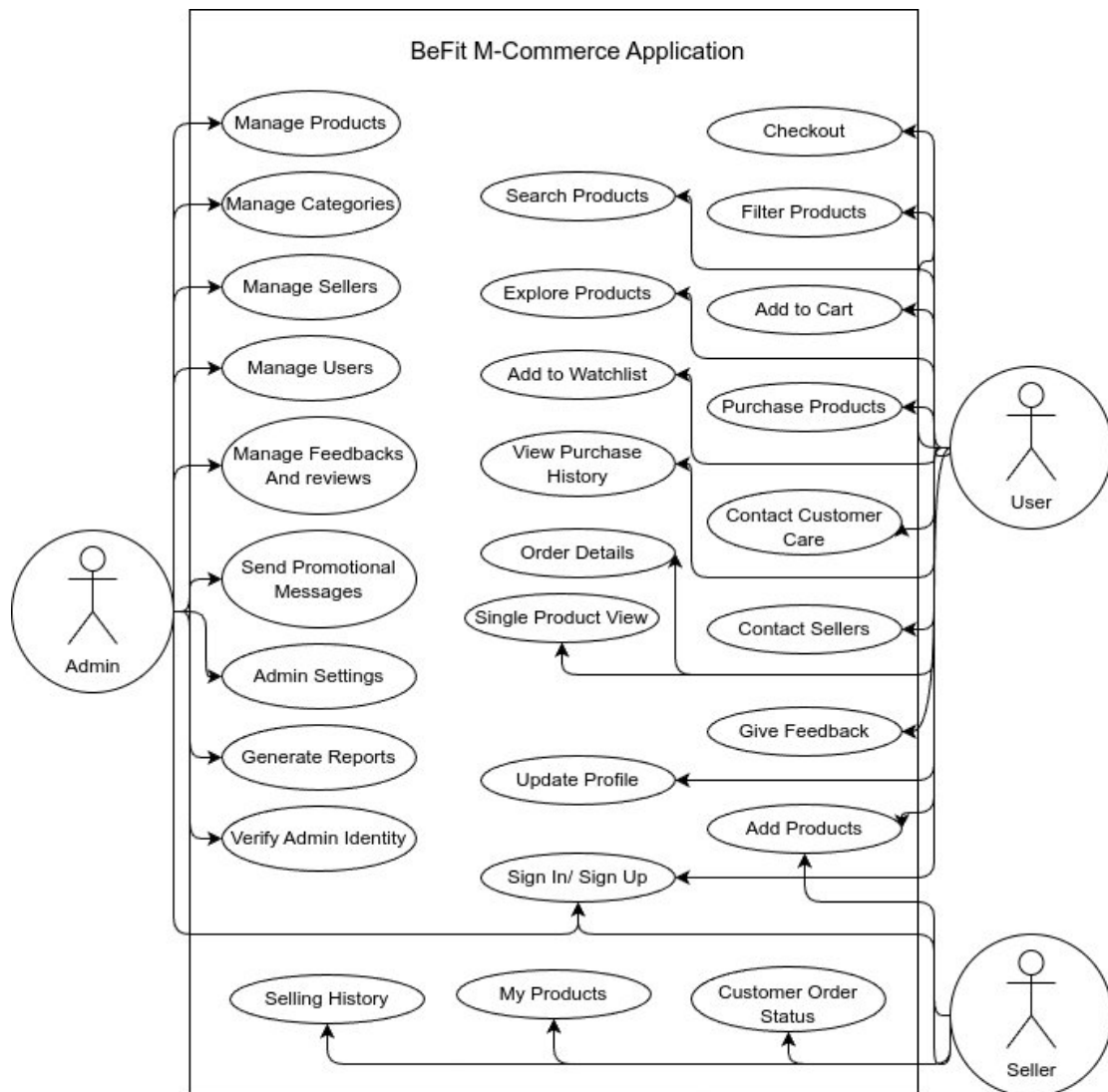
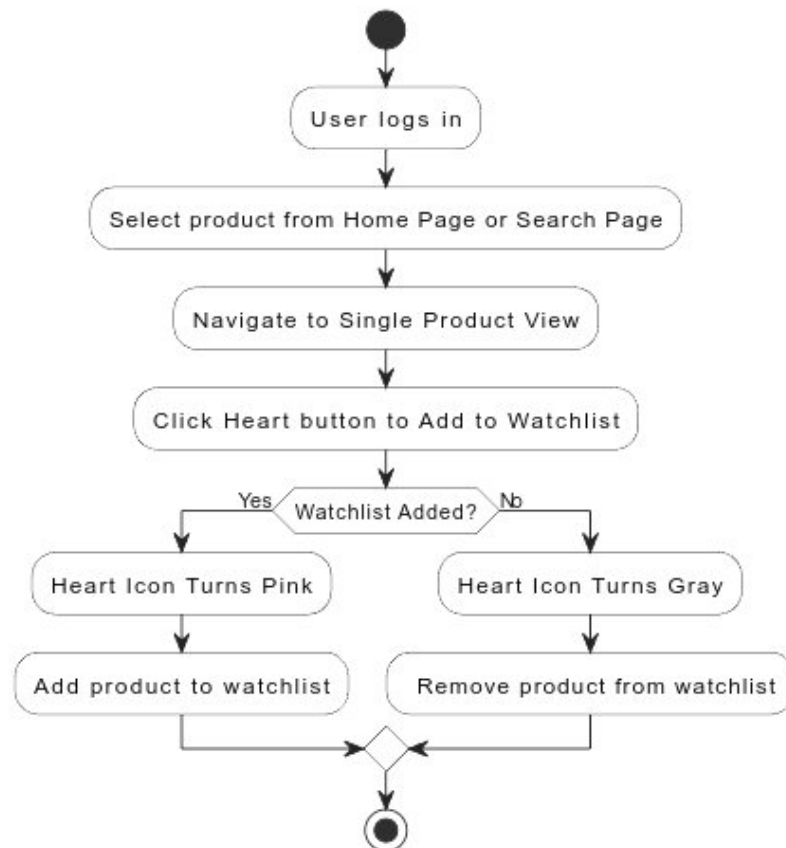## Activity Diagrams

- **User Sign In And Sign Up**

Redirect to Dashboard

Yes

Credentials Valid?

No

Show Error Message

Click Login

Enter Email and Password

User selects Sign-In or Sign-Up?

Yes
Sign-In?
No - Sign-Up

Show Error (Email Already Registered)

Check if Email Already Exists

Yes
Email Exists?
No

Create User Account

Show Success Message

Redirect to Login Page

Enter Email, Password, Retype Password

Yes
Passwords Match?
No

Show Error (Passwords Do Not Match)

- **Purchase Products**

- **Add Product for selling**
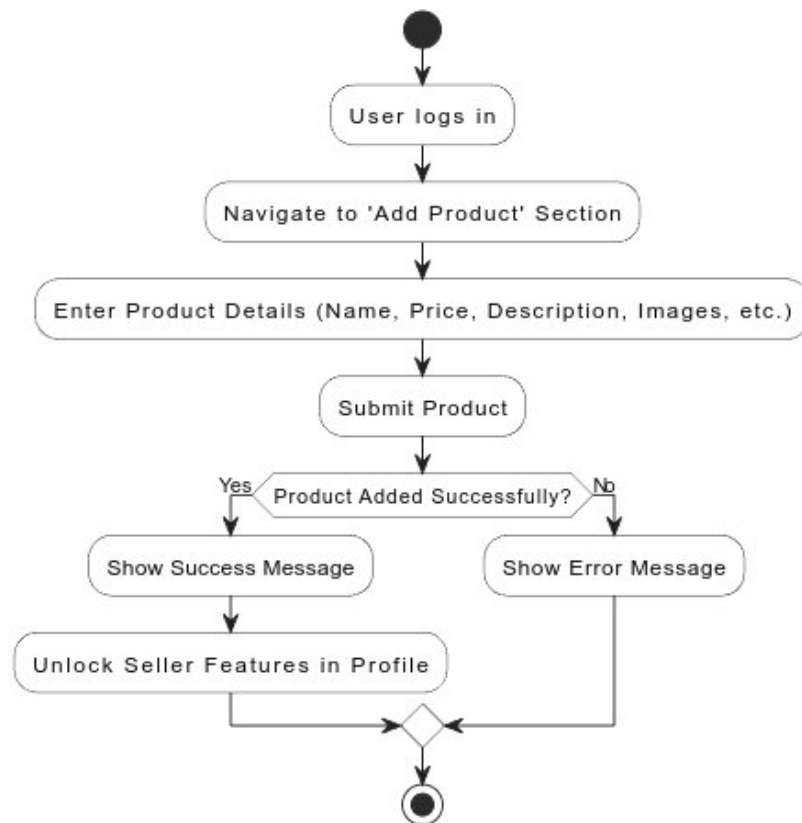
- **Add To Watchlist**

- **Manage Products**
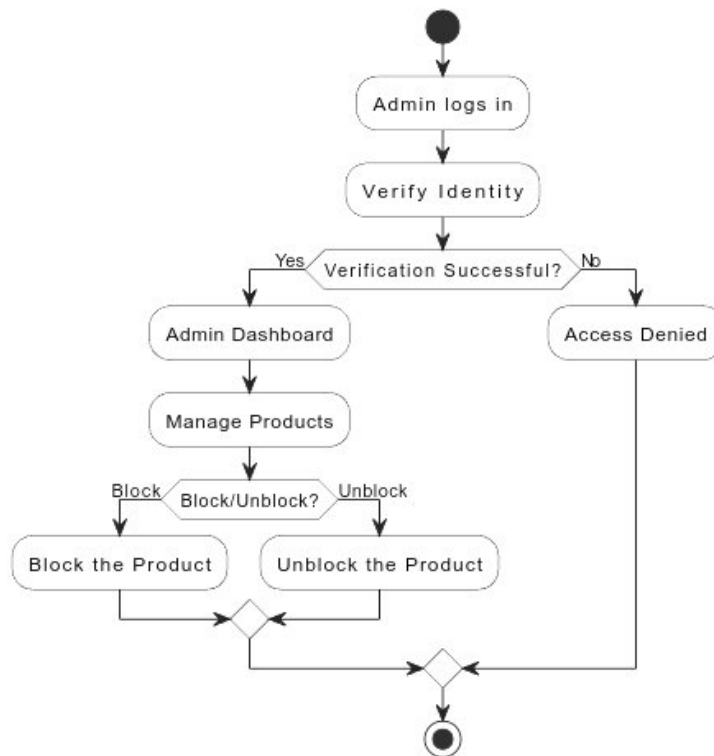
- **Manage Users**
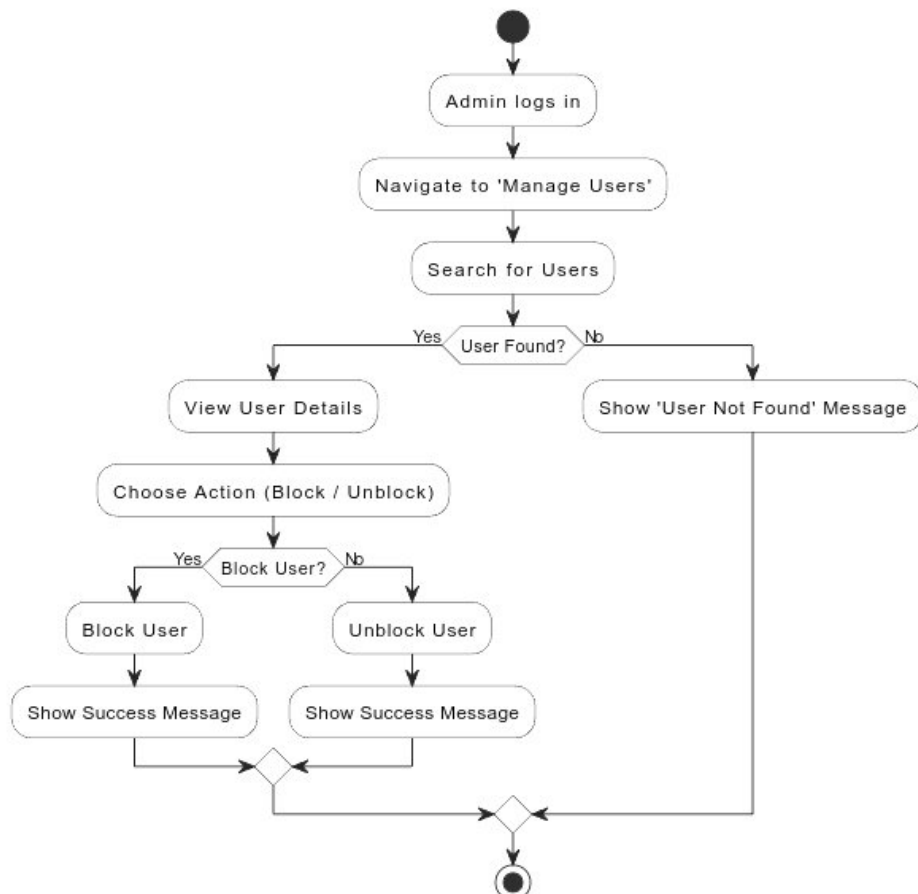
- **Manage Sellers**
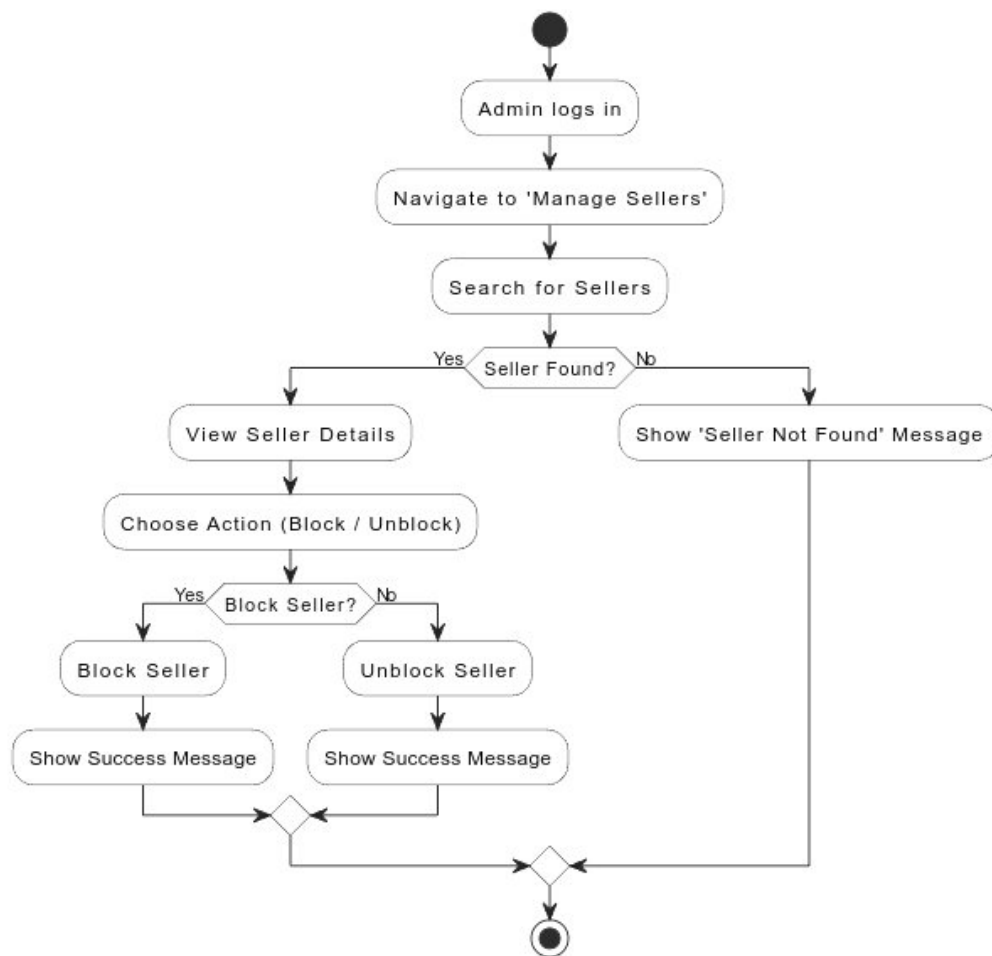
- **Manage Categories**
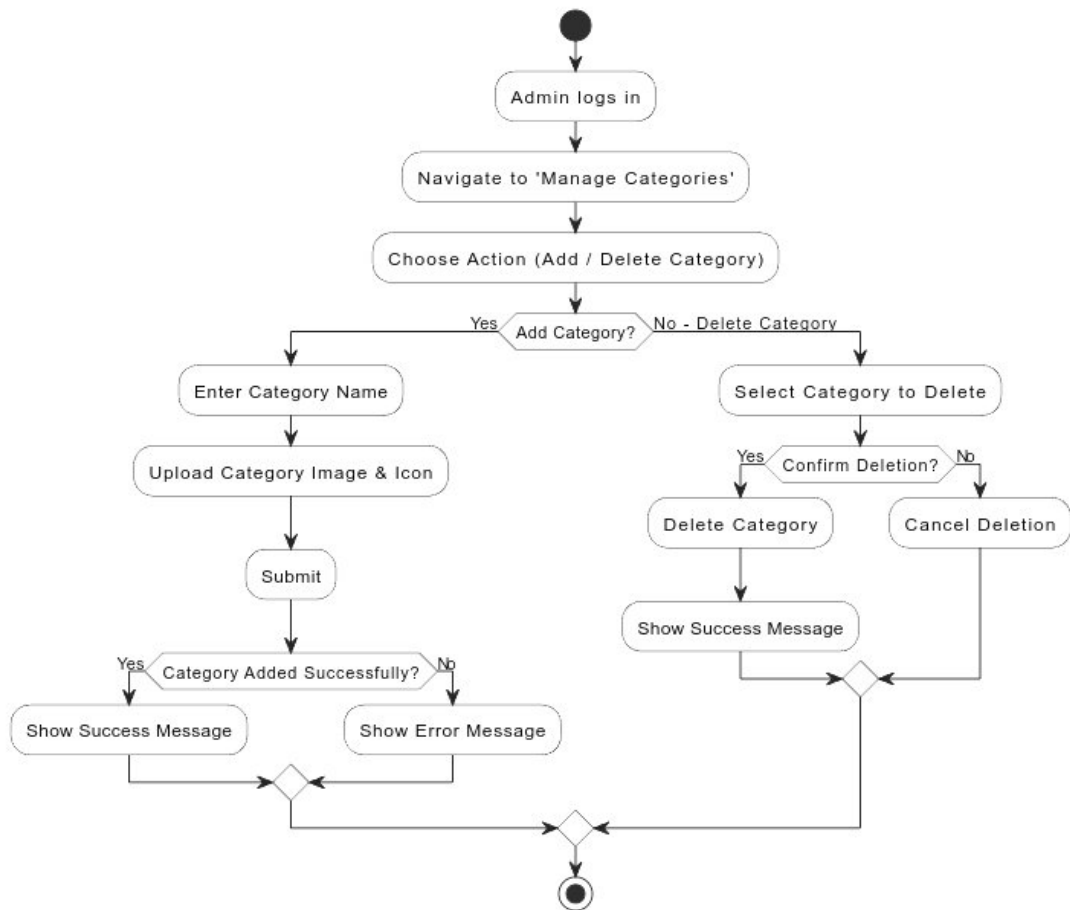
- **Manage Feedback and Reviews**
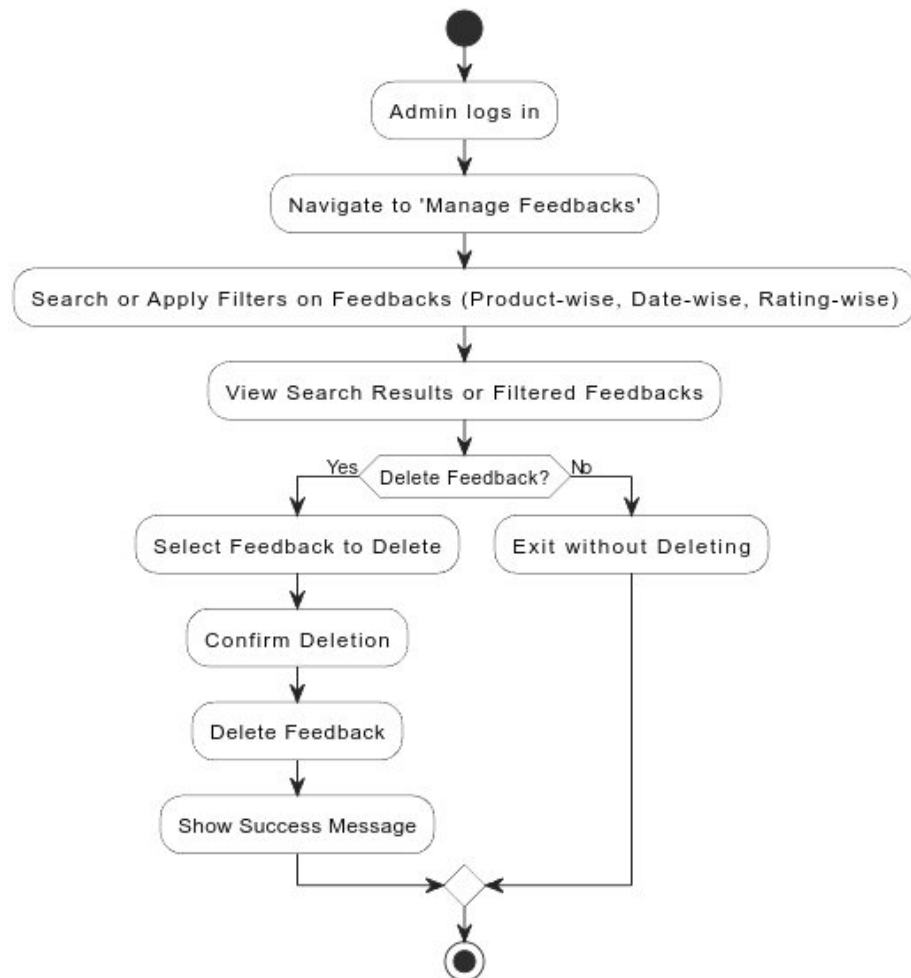
- **Send Promotional and Offer Messages**

UI Designs of BeFit Mobile

Customer Side UIs

Splash Screen
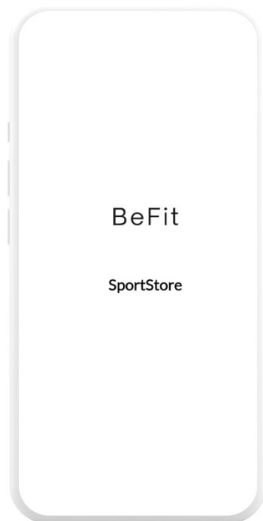
The Splash Screen Apears on application start

Onboarding Page
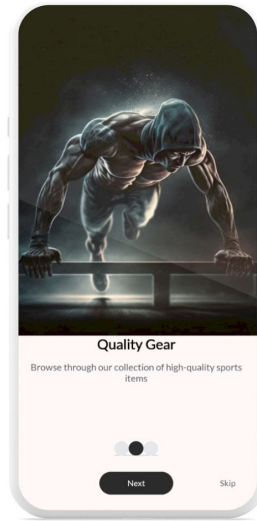
The onboarding page appears after the splash screen and provides a brief overview of the application's features and functionality.

Sign In Page
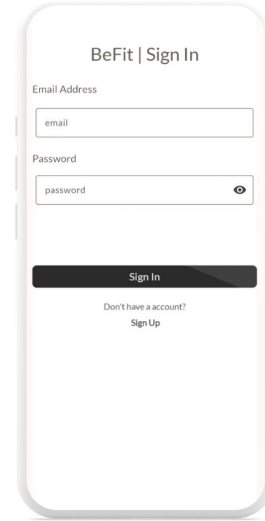
Users can signin to the application by providing email and password

Sign Up Screen
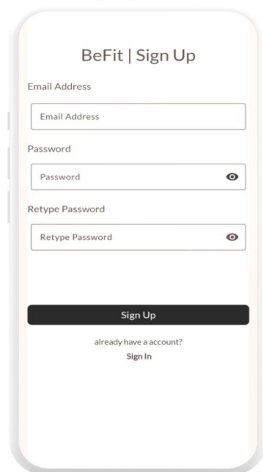
Users can signup to the application by providing email and password and confirm password

Home Page
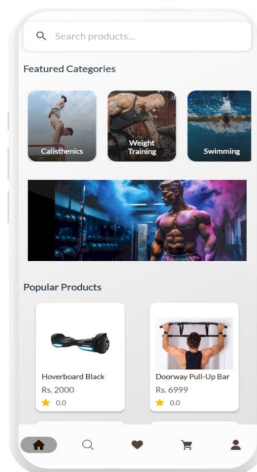
The onboarding page appears after the splash screen and provides a brief overview of the application's features and functionality.
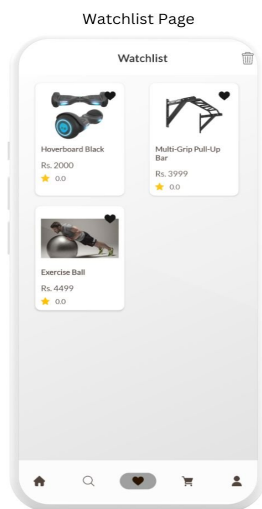
Search Page
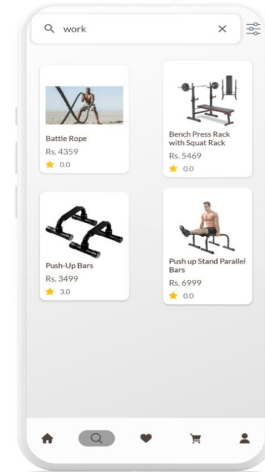
Users can search and filter products

Customer Care Page

Users can contact customer care via email or call

Purchased History Page
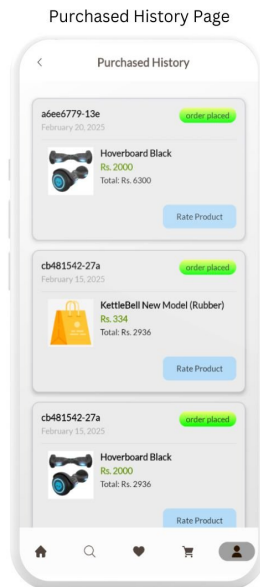
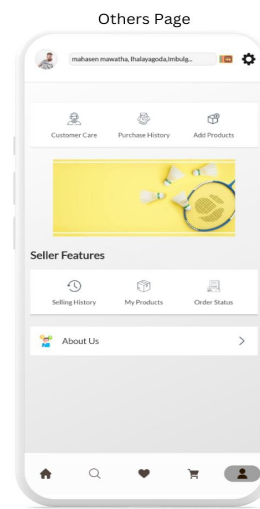Users can add products to cart for checkout
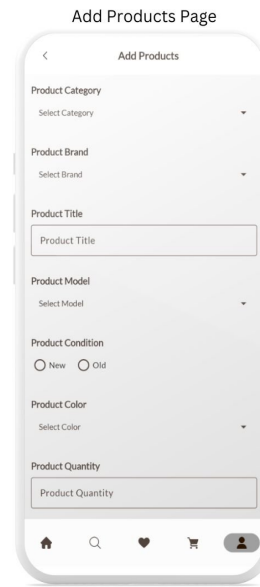
Add Products Page

Users can add products for selling by providing all the necessary details

Watchlist Page

Users can save to watchlist products for future purchasings

Cart Page

Users can add products to cart for checkout

Others Page
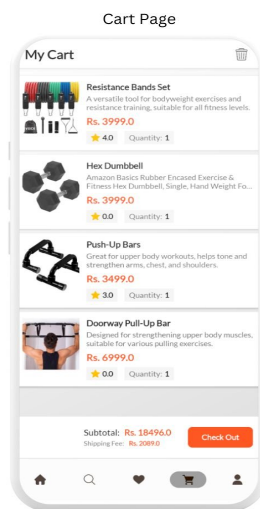
Users can navigate to key sections, including Settings, Customer Support, Purchase History, and Product Management, for seamless access to essential features.
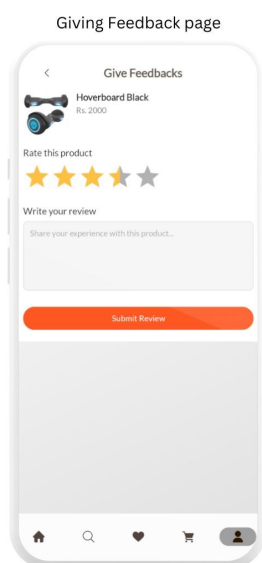
About Us Page
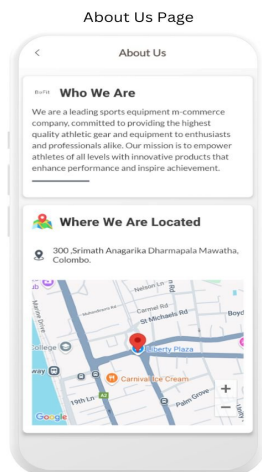
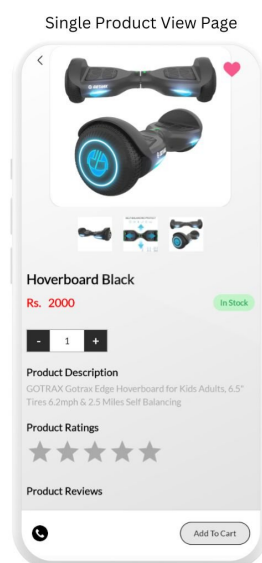Users can see the physical location and some details about the company

Settings Page


Users can navigate to all kind of settings from this page

Update Profile Page
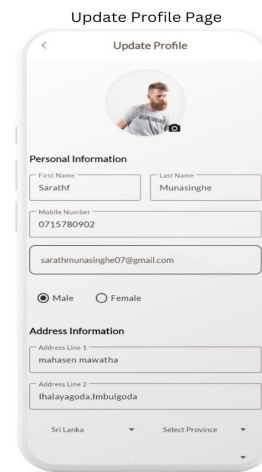
Users can update his details from this page

Giving Feedback page

Users can give feedback for the products that they bought
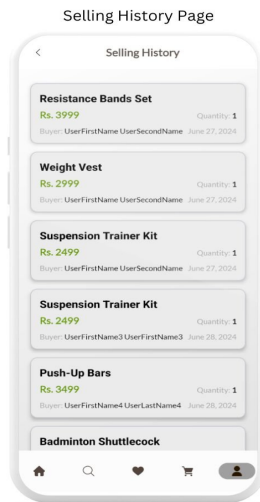
Single Product View Page

This page shows the details about the product that has selected including product name,price,description,ratings,etc.

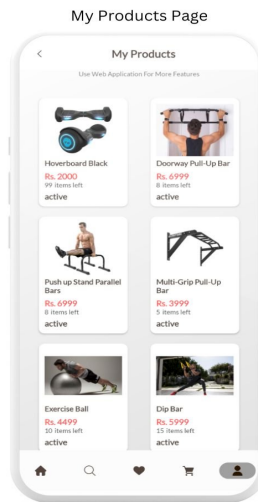## Onboarding page 2 Page
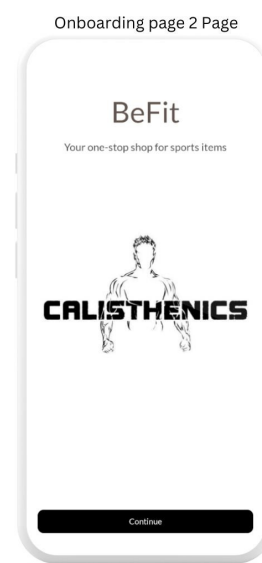
This page shows after the user logged out,by continuing the user can navigate to sign in

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Seller UIs

Selling History Page

Sellers can see his selling history

My Products Page

Sellers can see his own products

Order Status Page
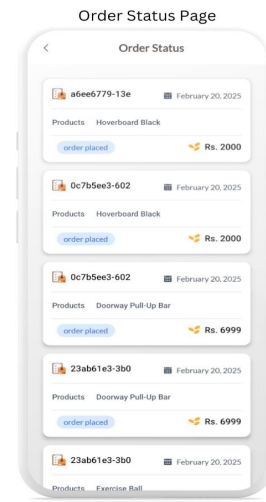
Seller can see customer orders of his products

Admin Dashboard UIs

Verification Page

In this page ,admin have to confirm his identity by providing the verify code received for his email

Admin Dashboard Page
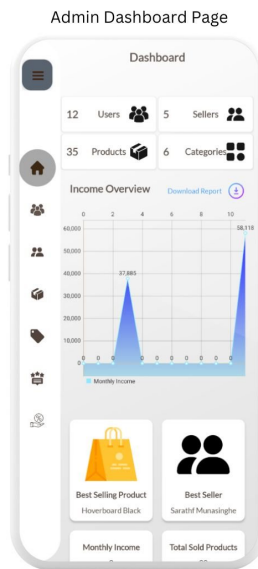
This page shows an overview about the BeFit platform, including users, products, sellers, categories count,income overview, downloading report, user registration chart, etc.
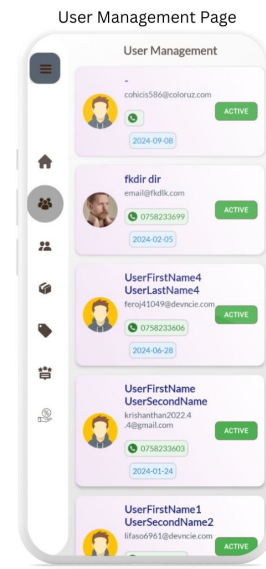
User Management Page

This page shows All the users details including names,emails,phone numbers, active status and registered dates.

Seller Management page

This page shows all the users details including names,emails,phone numbers, active status and registered dates.

Products Management Page
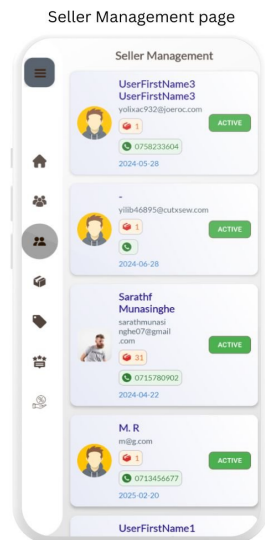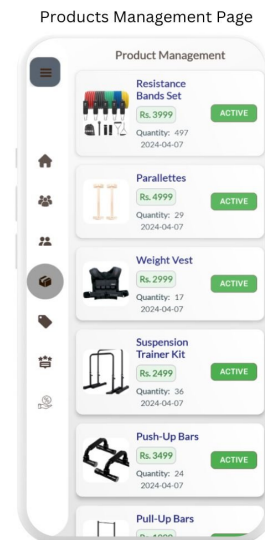
This page shows all the products details including names, images, prices, quantities, etc.
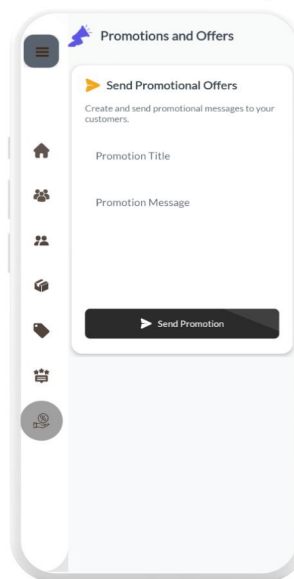
Category Management Page
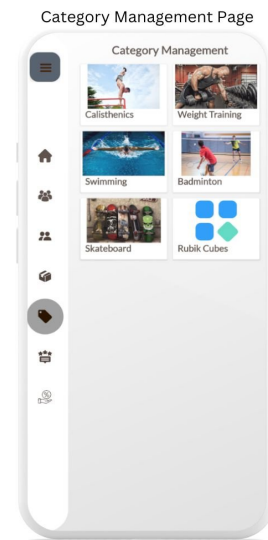
This page shows all the categories details including category names and category images.

Manage Feedback and Reviews page
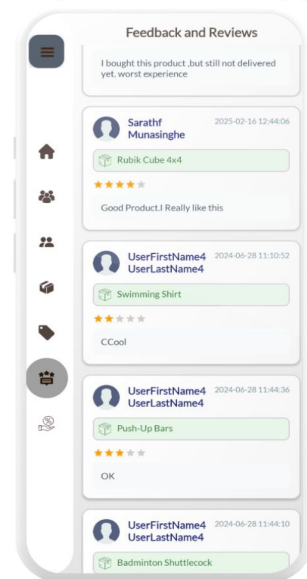
This page views all the feedback and ratings received for products by customers
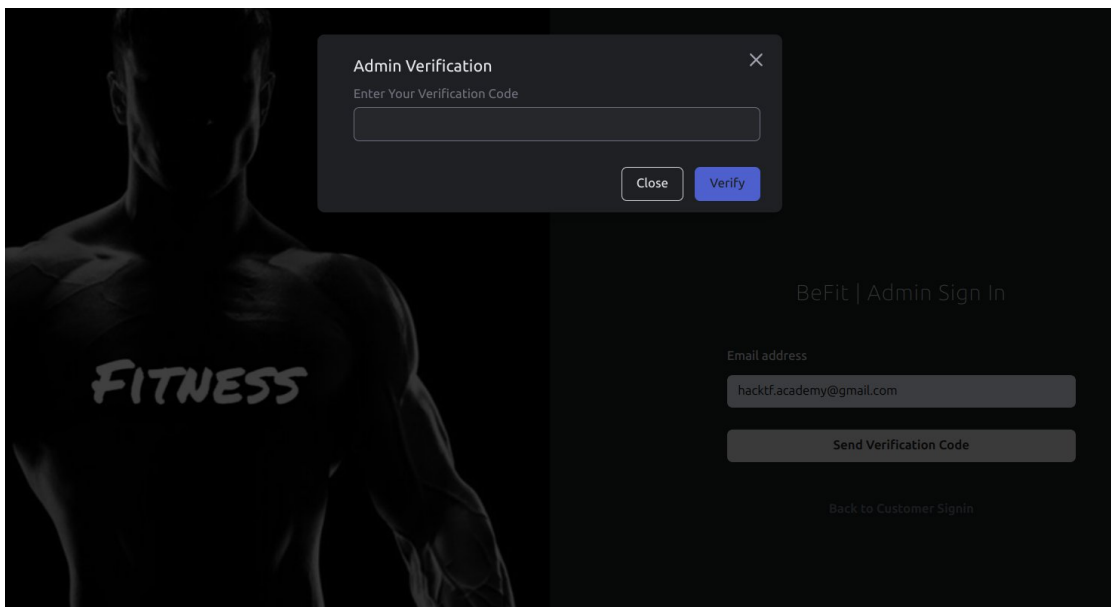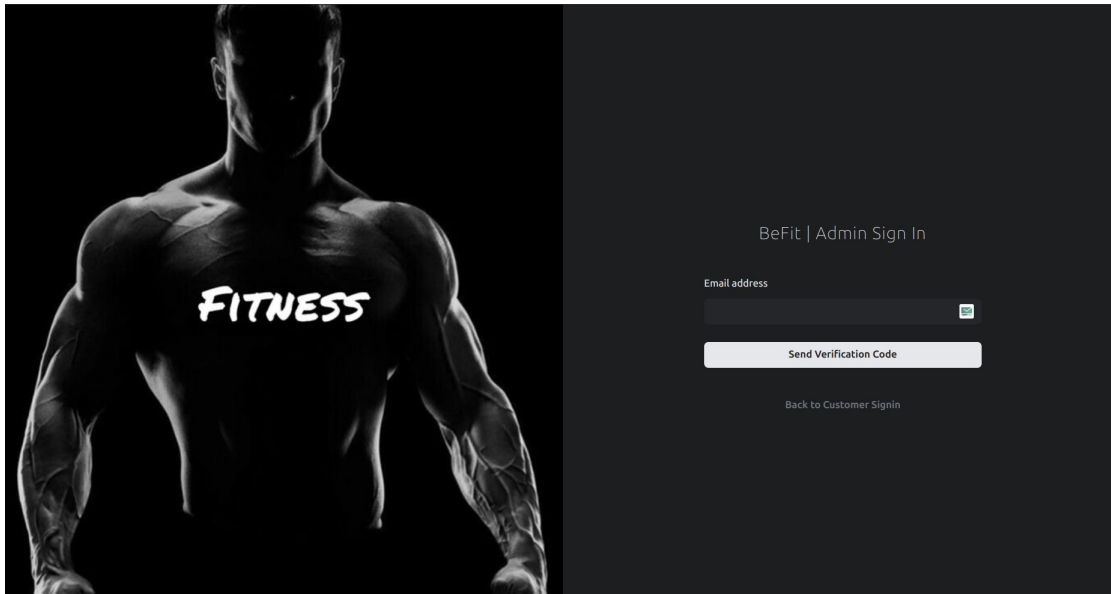
Promotions and Offers Page

Admin can send promotional and offer notifications to users.

Admin Dashboard (Web Application) UIs

- **Admin Sign in and Verification**

Admins can sign in to the dashboard by entering their email and verifying their identity

- **Admin Dashboard Overview page**
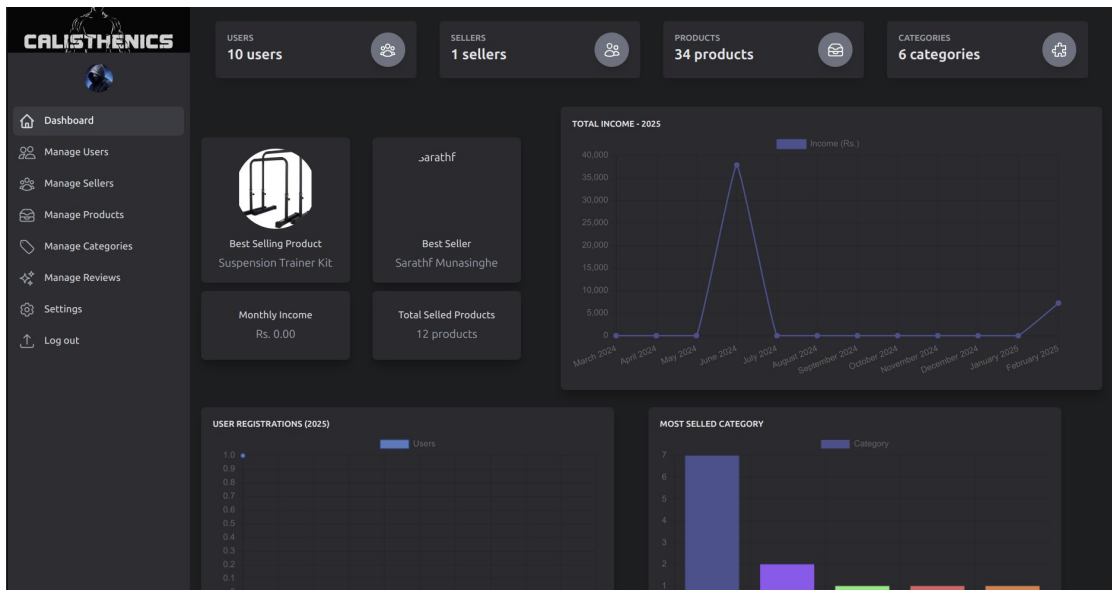
The **Admin Dashboard Overview** displays key metrics, including user, seller, and product counts, top-selling products, best seller, total income, and visual data charts.

- **Manage Users page**

Admin can manage users from this page including blocking and unbocking,searching users.

- **Manage Sellers page**
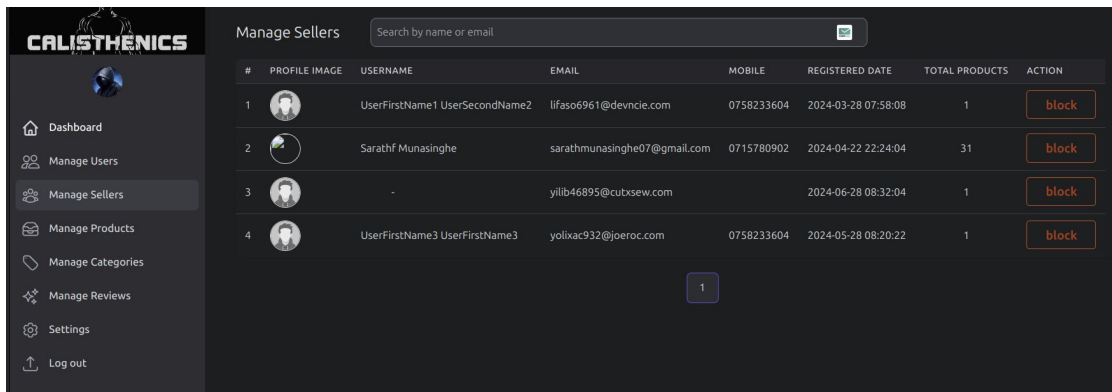
Admin can manage sellers from this page including blocking and unbocking,searching sellers.

- **Manage Products page**
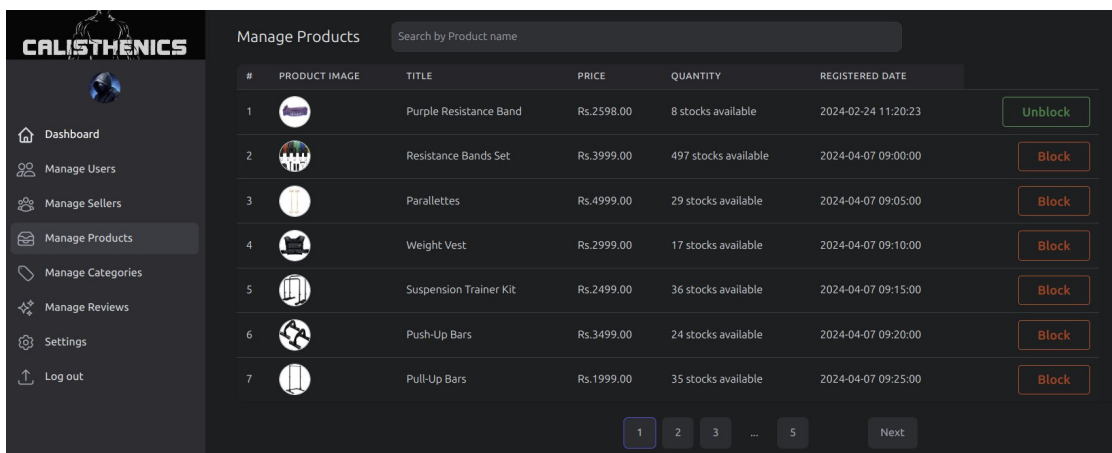
Admin can manage products from this page including blocking and unblocking, searching products.

- **Manage Categories page**
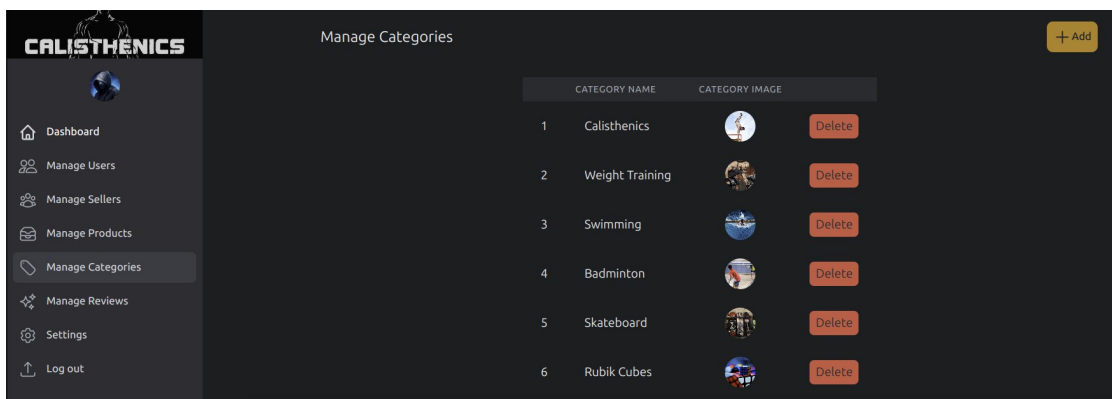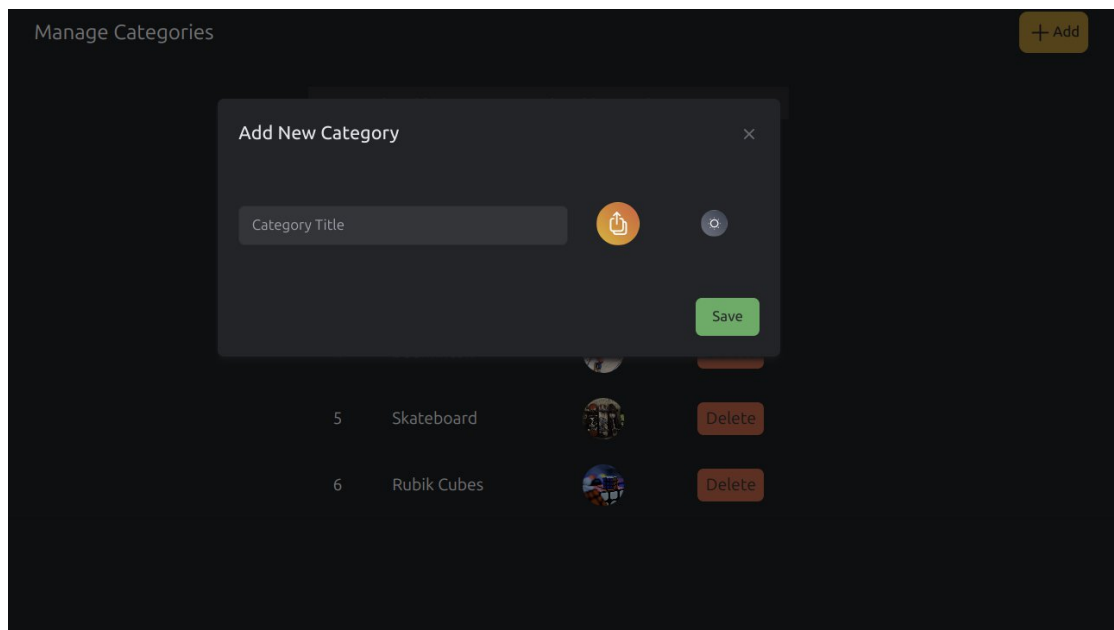
Admin can manage categories including deleting and adding categories

- **Manage Feedback and ratings page**
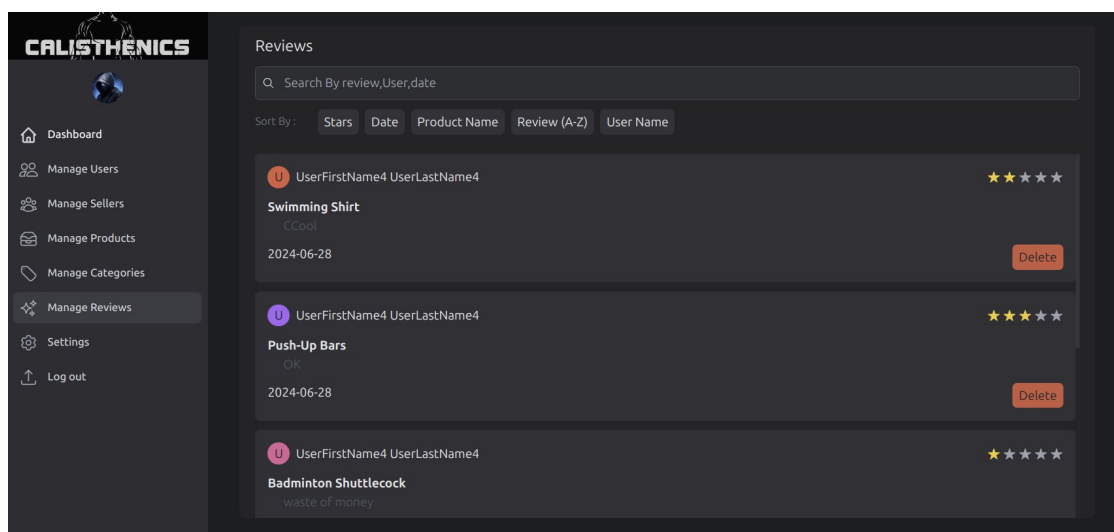
Admin can manage products feedback and ratings provided by customers including, searching and filtering feedback.

- **Administrator Settings page**
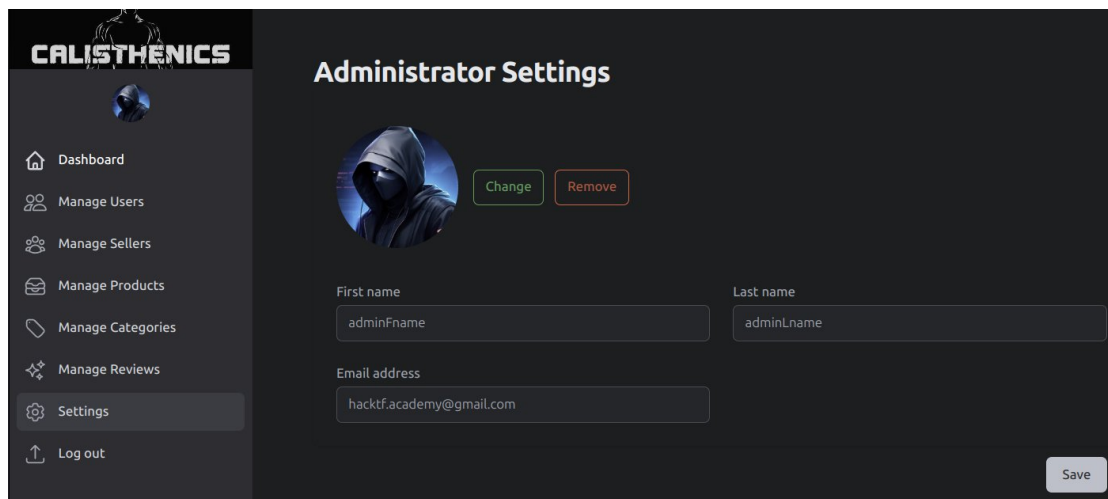
Admin can change his profile picture,names from admin settings page

Implementation

1. **Technologies Used**

- Android SDK
- Java
- PHP
- MySQL
- SQLite
- Firebase Firestore
- HTML
- CSS
- Tailwindcss
- Javascript

2. **APIs and Services Used**

- Payhere payment Gateway
- Google Map Place API
- Firebase Cloud Messaging Service

3. **Key Features Implemented for complete project**

- Sign In
- Sign Up

Admin Features

- Verification
- Admin Dashboard Overview
- Manage Users, Sellers, Products, and Categories
- Search, block/unblock users and sellers
- Add, edit, and delete categories
- Manage Product Feedback
- Filter, search, and delete feedback
- Send Promotional and Offer Notifications
- Admin Settings

Seller Features

- Add and manage products
- View customer order status
- View selling history

Customer Features

- Browse and search for products
- Filter products by category, price, and condition
- Add/remove products from the watchlist
- Add products to the cart and checkout
- Provide product ratings and feedback
- View single product details
- Update profile
- View order details and purchase history
- Contact customer support
- Locate BeFit physical store
- Contact sellers

Results and Evaluation

- Accuracy: The system maintained 99.9% data integrity, ensuring correctness in transactions and database operations.
- User Experience: The mobile application, developed using Java, delivered a seamless and responsive interface, enhancing usability and performance.
- Security: Authentication mechanisms, including session validation and secure cookies, effectively prevented unauthorized access, reinforcing system security.

Performance Evaluation
- Testing Success: All test cases were executed successfully, confirming the system's stability and reliability.
- Optimization: Performance metrics indicate efficient resource utilization and smooth user interactions.

User Feedback
- The customer provided positive feedback, highlighting the system's ease of use and reliability.
- Future enhancements are expected based on user interactions and evolving requirements.

Future Work

- Implement search and filter functionalities for Manage Users, Manage Sellers, Manage Products, Manage Categories, and Manage Feedback in the BeFit Mobile application.
- Implement block/unblock features for Manage Users, Manage Sellers, and Manage Products in the BeFit Mobile application.
- Enable adding categories, filtering, and deleting feedback in the BeFit Mobile application.
- Upgrade the web application to make it suitable for customers and sellers from other countries.
- **Google Authentication:** Allow customers to log in using Google Authentication for added convenience.
- **Theme and Animations:** Implement animations and enable theme changes when a customer adds their first selling item, enhancing user engagement.
- **Reward and Coupon System:** Introduce a coin-based reward system, allowing customers to use earned coins and coupons for purchases.
- **Feedback and Suggestions:** Provide customers with a feature to suggest new functionalities or report issues directly through the application.
- **Search History:** Enable customers to view their search history for easier navigation.
- **Product Recommendations:** Display personalized product recommendations on the home screen based on the customer's search history, wishlist, and recent purchases.
- **Advertisements:** Integrate targeted advertisements within the application.
- **Image-Based Search:** Allow customers to search for products using images for a more visual shopping experience.

- **Seasonal Themes:** Introduce dynamic theme changes for holidays like Halloween, Black Friday, and Christmas to create a festive atmosphere.
- **Promotional Messages:** Send promotional messages to specific user groups based on their user type.

Conclusion

The development of **BeFit Mobile** and the **Web Admin Dashboard** marks a significant step in enhancing the **BeFit brand's digital presence**. By providing a seamless **M-Commerce** experience for sports enthusiasts and an efficient **administrative platform**, the project successfully expands market reach and improves user engagement.

Reflection on Learning

The development of **BeFit Mobile** and the **Web Admin Dashboard** provided valuable insights into **mobile app development, backend integration, and secure authentication**. We gained hands-on experience in **UI/UX design, API management, and data visualization**, enhancing both technical and project management skills.

This project also deepened our understanding of **scalability, user experience, and global market expansion.** The challenges faced reinforced the importance of **structured development, and security best practices**, equipping us with essential skills for future software projects.

References

- Virginia Tech Information Technology (n.d.) Project documentation guidelines. Available at: https://it.vt.edu/projects/project_management/documentation.html (Accessed: [2025-02-22]).
- Creately (n.d.) UML diagram types and examples. Available at: https://creately.com/blog/diagrams/uml-diagram-types-examples/ (Accessed: [2025-02-22]).