Adama Science And Technology University

School Of Electrical Engineering And Computing

Department of software engineering

Course Title: Mobile Application Design and Dev.

Course Code: SEng3206

Title: football club System

Section :4

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Project Overview

The purpose of the Football Club System mobile application is to enhance fan engagement by automating ticket and merchandise sales, providing easy access to team information, and improving the overall fan experience. The app targets football fans, providing a seamless and interactive platform for managing various fan-related activities.

Problem Domain and Target Audience:
Football fans often face challenges such as long queues for tickets, lack of information about team events, and difficulty in purchasing merchandise. This application addresses these issues by providing a user-friendly platform for ticket and merchandise sales, team updates, and fan interactions.

User Requirements for Mobile App

1. User-Friendly Interface

Requirement: The app must feature an intuitive and responsive interface.

- **Details:** Fans should easily navigate and access various functionalities on smartphones and tablets.
- **Design Influence:**
    - Prioritize simplicity and ease of use.
    - Utilize mobile-friendly navigation elements like swipes, taps, and scrolls.
    - Ensure the layout is visually appealing and optimized for different screen sizes.

2. Secure Login Functionality

Requirement: Users must securely log in to manage their accounts and personal information.

- **Details:** Implement multi-factor authentication for enhanced security.
- **Design Influence:**
    - Include robust authentication mechanisms such as biometric authentication, password encryption, and account recovery options.
    - Ensure the login process is seamless yet secure, with clear instructions and feedback for users.

3. Automate Ticket Sales

Requirement: Facilitate online purchase and management of tickets, including seat selection, ticket transfers, and digital tickets.

- **Details:** Provide a user-friendly seat selection interface, support multiple payment methods, and offer real-time availability updates.
- **Design Influence:**
    - Design a seat selection interface optimized for touch input.
    - Minimize steps required to complete a purchase and offer clear instructions and confirmations at each stage.
    - Ensure integration with mobile wallets (e.g., Apple Pay, Google Pay).

4. Automate Merchandise Sales

Requirement: Enable fans to buy club merchandise online with an easy-to-navigate catalog.

- **Details:** Include detailed product descriptions and secure payment options.
- **Design Influence:**
    - Feature a searchable product catalog, detailed product pages with images and descriptions.
    - Design a streamlined checkout process optimized for mobile users.
    - Support inventory management to prevent overselling and offer order tracking capabilities.

5. Enhance Data Accuracy

- **Requirement**: Automate data entry and record-keeping processes to minimize errors and ensure reliable data management.
- **Detail**: Integrate with existing databases and third-party systems where necessary.
- **Influence on Design**:

  - Include validation mechanisms to check data accuracy at the point of entry.
  - Implement automated synchronization with central databases.
  - Ensure data entry forms are user-friendly and that error messages are clear and informative.

6. Ensure Data Security

Requirement: Protect fan data and transaction details through secure storage and processing mechanisms.

- **Details:** Use encryption and conduct regular security audits.
- **Design Influence:**
  - Incorporate secure coding practices.
  - Implement data encryption both at rest and in transit.
  - Conduct regular security audits to identify and mitigate vulnerabilities.
  - Include privacy notices and consent forms to inform users about data usage and protection measure

Design Concepts

User Interface (UI) Design Principles

- **Simplicity and Clarity:**
  - Minimalist Design: Maintain a clean and uncluttered interface, focusing only on essential elements to avoid overwhelming users.
  - Clear Visual Hierarchy: Use size, color, and placement to highlight important elements, guiding the user's attention effectively.
- **Consistency:**

- o Uniform Elements: Ensure consistency in fonts, colors, buttons, and icons throughout the app for a cohesive and professional look.
- o Standard Components: Use common mobile design patterns, such as navigation bars and tab bars, for familiarity and ease of use.

- **Accessibility:**
  - o Readable Text: Ensure text legibility with sufficient contrast against backgrounds.
  - o Accessible Touch Targets: Design touch targets like buttons and links to be large enough for easy tapping.
  - o VoiceOver and TalkBack Compatibility: Support screen readers for visually impaired users.

- **Responsive Design:**
  - o Adaptability: Ensure the app adapts seamlessly to various screen sizes and orientations.
  - o Fluid Layouts: Use flexible layouts that adjust smoothly to different screen dimensions.

User Experience (UX) Considerations

- **User-Centric Design:**
  - o User Research: Conduct surveys and usability testing to understand the needs and preferences of the target audience.
  - o User Personas: Use detailed user personas to guide design decisions.

- **Ease of Use:**
  - o Intuitive Navigation: Implement simple and intuitive navigation paths.
  - o Onboarding Experience: Provide a smooth onboarding experience with guided tours and helpful tips.

- **Performance and Speed:**
  - o Fast Load Times: Optimize app performance for quick load times and smooth transitions.
  - o Offline Access: Ensure critical features are available offline.

- **Engagement:**
  - o Interactive Elements: Use interactive elements like animations and transitions.

- Push Notifications: Offer customizable push notifications for important updates.

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Navigation Flow

- **Main Navigation:**
    - Bottom Navigation Bar: Provides easy access to primary sections like Home, Tickets, Merchandise, and Profile.
    - Tabs and Sections: Organize content into clearly labeled tabs and sections.
- **Deep Navigation:**
    - Drill-Down Navigation: Implement for exploring detailed information like specific matches, seat selection, and product details.
    - Breadcrumbs: Help users keep track of their location within the app.
- **Contextual Navigation:**
    - Action Buttons: Prominently place contextual action buttons (e.g., Buy Now, Add to Cart).
    - Swipe Gestures: Incorporate swipe gestures for actions like deleting items and navigating between tabs.

Visual Elements

- **Brand Identity:**
    - Club Colors and Logo: Consistently integrate the football club's colors, logo, and branding elements.
    - Custom Icons and Illustrations: Create a unique visual experience aligned with the club's branding.
- **Imagery and Multimedia:**
    - High-Quality Images: Use high-resolution images of players, merchandise, and stadiums.
    - Video Content: Include video content like highlights, player interviews, and promotional materials.
- **Typography:**

- o Readable Fonts: Choose fonts for readability on small screens.
- o Consistent Typography: Maintain consistent typography for headings, subheadings, body text, and captions.
- **Color Scheme:**
  - o Vibrant and Accessible: Ensure the color scheme is vibrant yet accessible with sufficient contrast.
  - o Highlight and Accent Colors: Use to draw attention to important elements and calls to action.

Development Approach

Agile Methodology

We adopted the Agile development methodology for this project due to its flexibility, incremental progress, emphasis on collaboration, and continuous improvement.

- **Flexibility and Adaptability:** Agile allows for iterative development, enabling adjustments based on user feedback and changing requirements.
- **Incremental Progress:** Breaking the project into smaller sprints allows for regular delivery of functional components.
- **Collaboration and Communication:** Agile emphasizes regular meetings and constant communication, ensuring alignment with project goals.
- **Continuous Improvement:** Regular retrospectives help refine processes and practices.

Challenges Faced and Solutions

- **Requirement Changes:** Agile's iterative nature allowed us to incorporate changes without disrupting the project.
- **Coordination Across Teams:** Regular cross-team meetings and collaborative tools ensured transparency and alignment.
- **Time Management:** Rigorous sprint planning and task prioritization helped balance feature development, testing, and bug fixing.
- **User Feedback Integration:** A feedback loop with users allowed for rapid integration of insights into the development cycle.

By adopting the Agile methodology, we successfully navigated the challenges of developing a complex, user-focused mobile application. The iterative process, emphasis on collaboration, and continuous improvement culture were pivotal in delivering a high-quality product that meets the needs of our users and stakeholders.

Technological Stack

a. Android Studio

The official IDE for Android application development, providing a comprehensive set of tools for code editing, debugging, and testing.

b. Jetpack Compose

A modern UI toolkit for building native Android applications using a declarative approach, simplifying UI design and development.

c. Kotlin

A modern, concise, and expressive programming language that is fully compatible with Java, offering features like null safety and coroutines for asynchronous programming.

d. Firebase

A comprehensive suite of cloud-based backend services provided by Google, offering authentication, real-time database, cloud storage, and cloud messaging.

Implementation Details
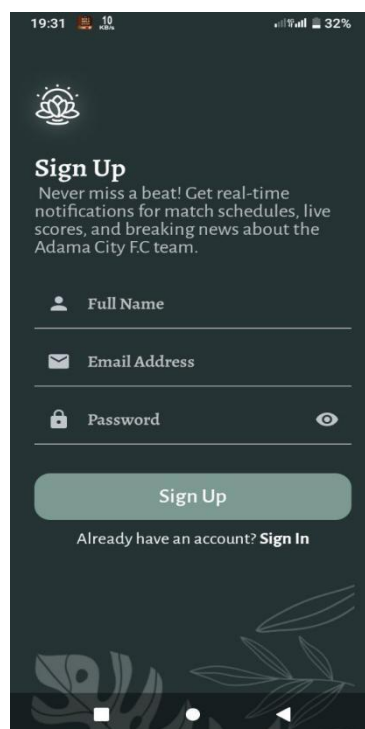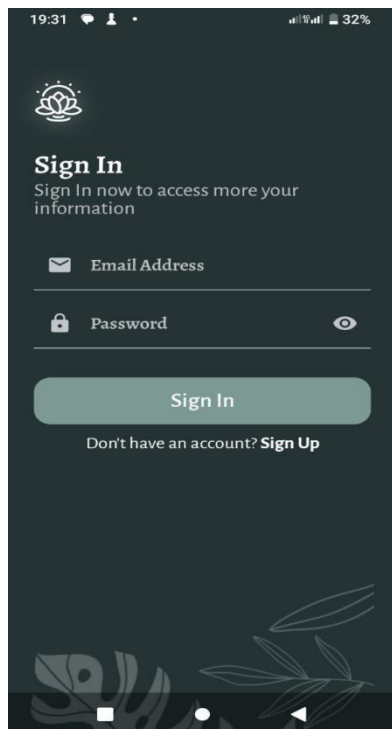
Bottom Navigation Bar

The app includes five different bottom navigation sections: Home, Matches, Players, Buy, and User.

- **Home:** Features recently posted schedules, news, player lists, and newly added shop items.
- **Matches:** Displays upcoming matches and results of played matches.

- **Players:** Provides a list of players with detailed information about each player.
- **Buy:** Includes screens for ticket purchasing, shop catalog, and the user's cart.
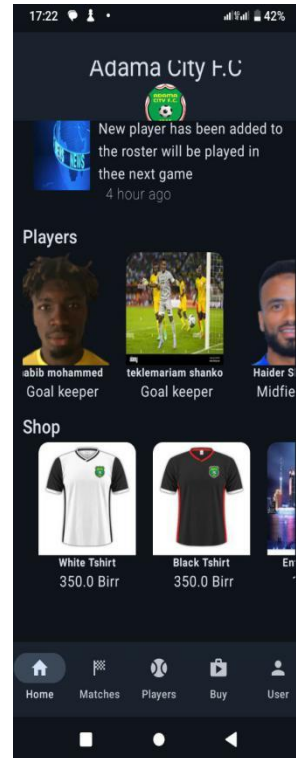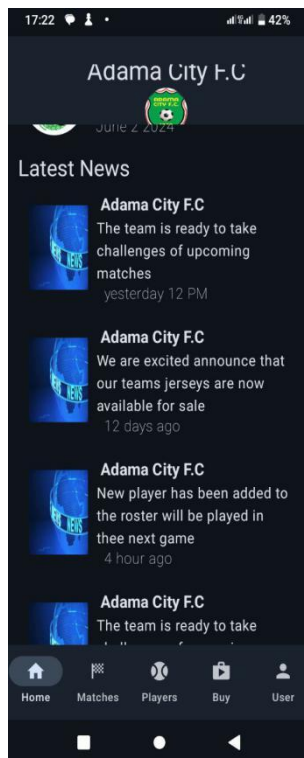- **User:** Allows users to change app themes and edit their profiles.

The app supports both light and dark modes.
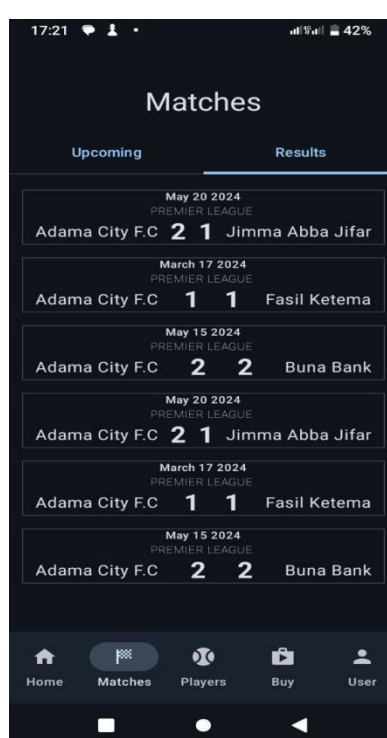
Login and sign up page

Home: Under home bottom navigation we have different functionalities. The interface is created by using Jetpack compose library lazy vertical list.

- View recently posted Schedule
- View News
- View some players list
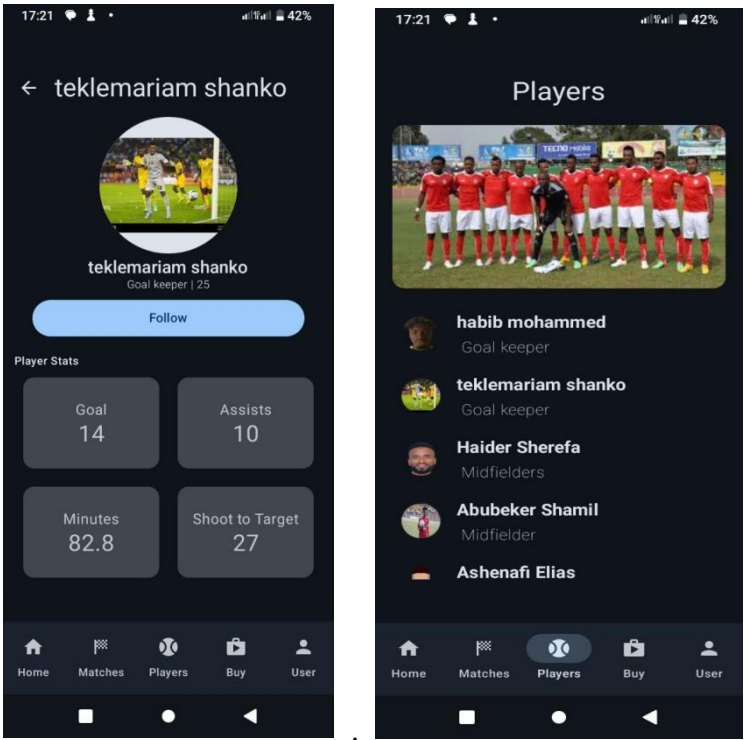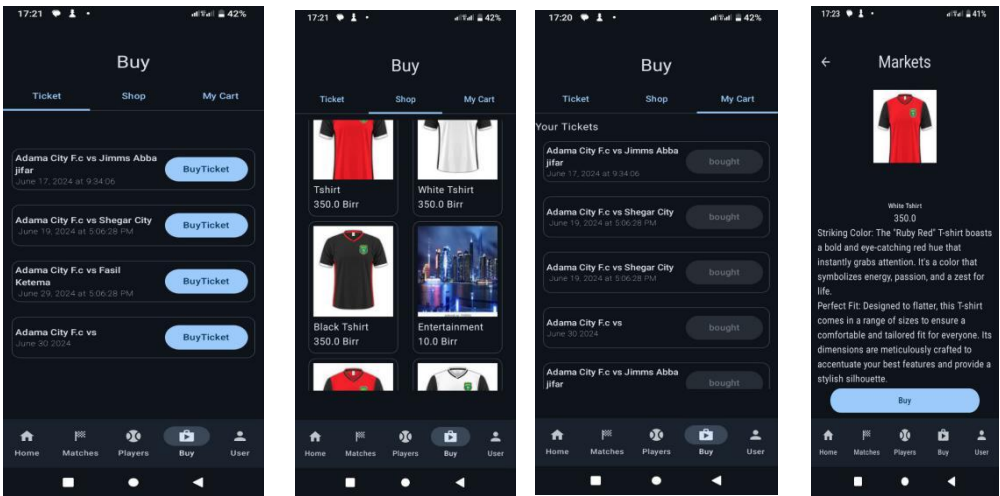- View recently added shop

Matches

Under this section there is upcoming which helps to show all upcoming matches and result screen which helps to show all played matches and their result.
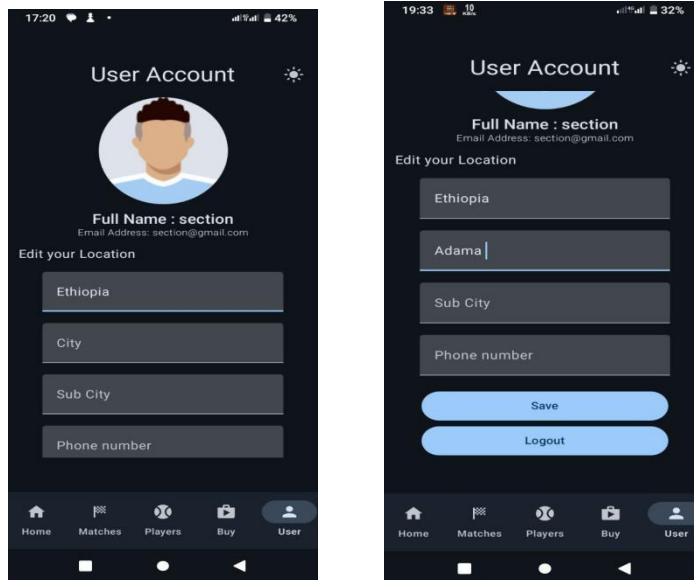
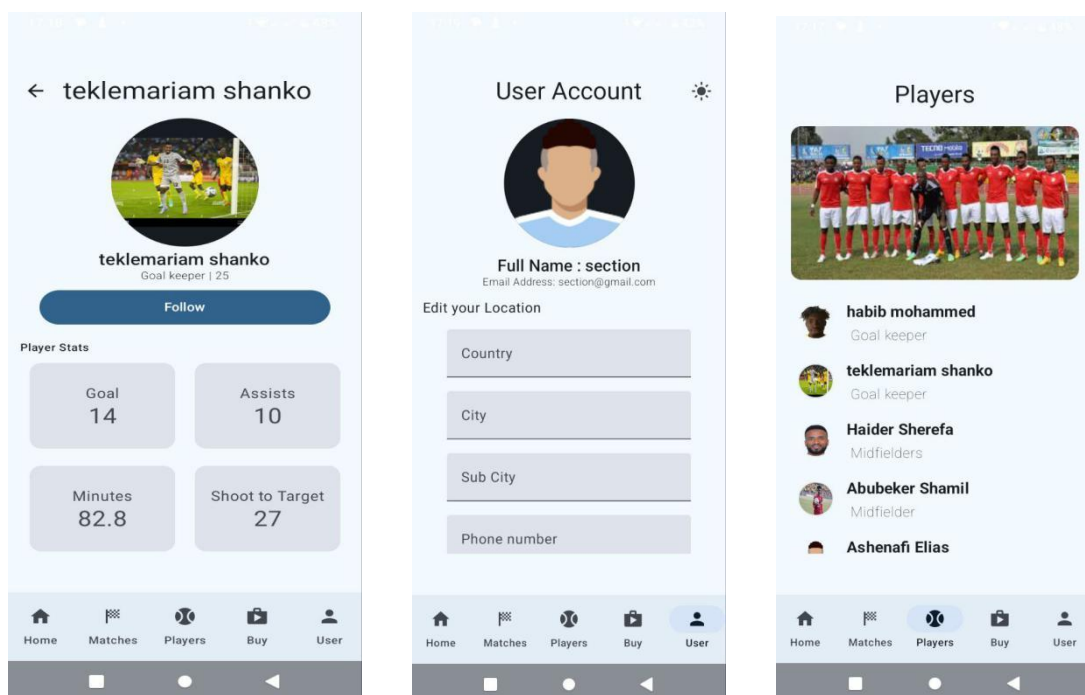**Players:** Under this section user able to see list of players and all information about each player.

Buy: under this navigation button there is three screen called ticket, shop and my cart. My cart is help to show all bought

User in this section user can change app theme which saved in shared preferences and able to edit his profile, like location.

Our app is also support both light and dark mode. Here some of screenshot in light mode.

Testing and Quality Assurance

1. Unit Testing

Conducted using Android Studio's testing framework to validate individual components and functionalities.

2. Integration Testing

Performed to verify seamless integration and compatibility of different modules and components.

3. User Acceptance Testing

Involved group members and representative users to gauge usability and effectiveness, validating the app against user expectations.

4. Security Testing

Tested for vulnerabilities and potential exploits to ensure the security of user data.

Future Enhancements:

Potential future enhancements and features that could be integrated into the Adama City F.C mobile application include:

a. Live match updates and notifications: Implement real-time updates and push notifications to provide users with live match scores, commentary, and important updates. This feature would enhance user engagement and keep fans informed about matches in real-time.

b. Player profiles and statistics: Introduce a section within the app dedicated to player profiles, including detailed statistics, performance history, and achievements. This would allow fans to access comprehensive information about their favorite players and track their progress throughout the season.

c. Fantasy league integration: Integrate a fantasy league component into the app, allowing users to create their own virtual teams, participate in leagues, and compete with other fans based on real match performances. This would increase user engagement and provide an interactive and competitive experience. Social media integration: Incorporate social media sharing and integration features, enabling users to share match updates, player performances, and their experiences with the app on popular social media platforms. This would facilitate user-generated content and promote the app's reach and visibility.