

# **ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY (ASTU)**

# **SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTING**

# **FUNDAMENTAL OF SOFTWARE ENGINEERING (SEng2206)**

# **Group Project**

# **DEPARTMENT:  SOFTWARE ENGINEERING**

# **SECTION: 04**

# **NAME                                                             Id**

# **1. Nanati Asamnew …………………………………………..…..………….…. UGR/25330/14**

# **2. Mikiyas Hailegebreal ………………………………………….…….…..…. UGR/25820/14**

# **3. Tsion Ketema …………..…………………………………..………………… UGR/26087/14**

# **4. Beka Abate …………………………….……………………..……………..…. UGR/25439/14**

# **5. Elham Feysel ……………………………………………………………………. UGR/26452/14**

# **6. Dureti Mohammedsani ……………………………………………………. UGR/25295/14**

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# Mobile App Project Documentation

## 1. Project Overview

The purpose of this mobile application is to provide users with a comprehensive platform for managing and sharing their favorite food recipes. The application aims to address the needs of home cooks, food enthusiasts, and individuals who want to explore, create, and share delectable culinary experiences. The target audience for this application includes home cooks, food bloggers, and anyone interested in discovering new recipes and connecting with a community of like-minded individuals.

## 2. User Requirements

The key user requirements for this mobile application include:

1. **User Authentication/Login and Registration**: Users should be able to create an account and log in to the application securely.
2. **Favorite Foods Management**: Users should be able to add their favorite foods to a personalized list, allowing them to quickly access and reference their preferred recipes.
3. **Recipe Creation**: Users should be able to create and upload their own recipes, including the ability to add images, videos, and detailed instructions.
4. **Recipe Sharing**: Users should be able to share their recipes with other users within the application, fostering a collaborative and interactive community.
5. **Image Handling**: Users should be able to upload and incorporate images and videos into their recipe posts, enhancing the visual appeal and providing a more immersive experience.
6. **Search History Management**: Users should be able to delete their search history, ensuring privacy and control over their personal data.

These user requirements have directly influenced the design and functionality of the mobile application, ensuring that it meets the needs and expectations of the target audience.

## 3. Design Concepts

The design of the mobile application follows a clean and intuitive user interface (UI) with a focus on providing a seamless user experience (UX). The navigation flow is designed to be straightforward, allowing users to easily navigate between different sections of the application, such as the recipe feed, recipe creation, and favorite foods list.

The visual elements of the application, including colors, typography, and iconography, have been carefully selected to create a visually appealing and consistent brand identity. The UI design also incorporates responsive design principles to ensure a consistent experience across various device sizes and orientations.

## 4. Development Approach

The development of this mobile application has adopted an Agile methodology, which emphasizes iterative development, continuous integration, and close collaboration with stakeholders. This approach has allowed the development team to quickly respond to changing requirements, prioritize features, and deliver high-quality software in a timely manner.

One of the key challenges faced during the development process was integrating the various features, such as user authentication, recipe creation, and image/video handling, into a cohesive and seamless application. The team addressed this challenge by implementing a modular and scalable architecture, which allowed for the efficient integration of different components and facilitated future enhancements.

## 5. Technological Stack

The mobile application has been developed using the following technological stack:

* **Frontend**: React Native, a popular framework for building cross-platform mobile applications.
* **Backend**: AppWrite a Backend-as-a-service platform used for authentication, API enpoints,and File storage.
* **Database**: Appwrite’s robust database storage.
* **Image and Video Handling**: Appwrite’s Storage for secure and scalable media storage and retrieval.
* **User Authentication**: Appwrite Authentication for providing seamless user authentication and authorization functionality.

**Other packages and tools used**:

* Native Wind: allows using Tailwind CSS within a React Native app.
* React Native Reanimated: gives multiple animation choices for our app.
* React Native Hero Icons: a package to import images from a Hero Icons.
* React Native Responsive Screen: a package that makes our apps responsive on different screen sizes.
* React Native Masonry List: a package that gives a comprehensive listing option for scroll views.
* React Native YouTube Iframe: a package that allows a YouTube video to be embedded within our app.

The choice of these technologies was driven by their widespread adoption, active community support, and their ability to provide a robust and scalable solution for the mobile application project.

## 6. Implementation Details

The mobile application features the following key functionalities:

**User Authentication/Login and Registration**:

* **Login**

Users can log in to the application using their email and password. The login process will validate the user's credentials and create a session to keep the user logged in across page loads.

* **Registration**

New users can register by providing their username, email, and password. The password will be securely hashed and salted before storing in the database. Upon successful registration, the user will be logged in automatically.

**Favorite Foods Management**: Users can add their favorite recipes to a personalized list, which can be accessed and managed from the "Favorites" section of the application.

**Recipe Creation**: Users can create and upload their own recipes, including the ability to add images, videos, ingredients, and step-by-step instructions. The recipe creation interface is designed to be user-friendly and intuitive.

* **Create Recipe**

Authenticated users can create new recipes by providing the following information:

* Recipe title
* Ingredients (with optional quantities and units)
* Instructions (rich text or markdown formatting)
* Cook time
* Number of servings
* Recipe description (optional)
* Featured image (optional)
* Additional images and videos (optional)

The recipe data will be stored in the application's database, associated with the user who created it.

* **Edit Recipe**

Users can edit their own recipes, modifying any of the fields provided during the creation process. The application will update the recipe data in the database accordingly.

* **Delete Recipe**

Users can delete their own recipes, removing the recipe data from the database.

**Recipe Sharing**:

Users can share their recipes with other users within the application. The shared recipes are displayed in a feed, where users can browse, comment, and interact with the content.

* **Publish Recipe**

Users can choose to publish their recipes, making them visible to other users on the platform. Published recipes will be displayed on the homepage and in search results.

* **Share Recipe**

Users can share their recipes with others through various channels, such as social media or email. The application will provide shareable links or buttons to facilitate this process.

**Image Handling**

Users can upload images and videos to accompany their recipe posts. The application seamlessly integrates with Firebase Storage to provide secure and scalable media handling.

* **Upload Media**

Users can upload images and videos to be associated with their recipes. The application will handle the file uploads, optimizing the media for storage and performance (e.g., resizing, compressing, generating thumbnails).

* **Media Management**

Users can manage the media files associated with their recipes, including the ability to replace, delete, or rearrange the order of the images and videos.

* **Media Display**

The uploaded images and videos will be displayed within the recipe details page, providing a visually appealing presentation of the recipe.

**Search History Management**:

Users can delete their search history from the application's settings, ensuring privacy and control over their personal data.

The application's user interface and workflow are illustrated in the following screenshots:

## 7. Testing and Quality Assurance

The mobile application has undergone comprehensive testing to ensure its functionality, performance, and reliability. The testing strategy includes the following components:

* **Unit Testing**: Individual components and modules of the application have been rigorously tested using unit tests to verify their correctness and reliability.
* **Integration Testing**: The integration of different features and components has been tested to ensure seamless interaction and data flow within the application.
* **End-to-End (E2E) Testing**: The application has been tested from the user's perspective, simulating real-world usage scenarios to validate the overall user experience and workflow.
* **Performance Testing**: The application has been tested for its responsiveness, scalability, and ability to handle increasing user loads and data volumes.
* **Security Testing**: The application's security measures, including user authentication, data encryption, and input validation, have been tested to ensure the protection of user information and prevent potential vulnerabilities.

The testing approach has been effective in identifying and addressing issues during the development process, ensuring that the final product meets the desired quality standards.

## 8. Future Enhancements

To further enhance the mobile application and address evolving user needs, the following future enhancements are proposed:

1. **Personalized Recommendations**: Implement a recommendation engine that analyzes user preferences and behavior to suggest personalized recipe recommendations, fostering exploration and discovery.
2. **Social Engagement**: Expand the social features of the application, allowing users to follow each other, comment on recipes, and share their culinary experiences within a vibrant community.
3. **Offline Capabilities**: Develop offline functionality that enables users to access and interact with their favorite recipes even when they have limited or no internet connectivity.
4. **Voice-based Recipe Search**: Integrate voice recognition technology to allow users to search for recipes using natural language queries, enhancing the overall user experience.
5. **Meal Planning and Grocery List Integration**: Introduce features that enable users to plan meals, generate grocery lists, and seamlessly integrate with external services for convenient shopping experiences.

These future enhancements align with the project's objectives and user needs, providing a roadmap for continuous improvement and ensuring the long-term relevance and value of the mobile application.