

Waste To Taste

Software Requirements Specification

Version 1.0

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Document Approval

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1. Introduction

1.1 Purpose

The primary purpose of this document is to outline the requirements for the Waste To Taste web application. This document will contain all of the details that define the scope of our project and identify its intended functions and functionalities for the development team and the end users. All functions and functionalities that are described in this document are agreed upon by both the client and development team. This SRS is designed as a guide for design and implementation decisions and for stakeholders to understand the objectives and limitations of this project. This document will also facilitate clear communication and alignment among the project engineers ensuring the product's success as it will meet the predefined requirements and quality standards set in this document.

1.2 Scope

Waste To taste will be a Web based application that is optimized for desktop, laptop, and the mobile phone. The application is designed to reduce spendings and food waste by educating users on effective food usage including cooking, storage, and proper shopping techniques. The project will have 3 main parts included in the scope. User functions, recipe functions, and culinary technique/saving and storage functions. They all have sub-parts.

First is User functions which will include:

- **Registration**
 - Allow for new users to create a account with basic info (username, email, password)
 - Includes sign-up validation checks such as (valid email format), (password requirements)
 - Requires email verification for security and spam
- **Login**
 - Existing user user email and password to log into their Waste to Taste account
- **Profile management**
 - Will allow for users to update their profile information, including email and password.
- **Personal dashboard**
 - After logging in, the user will be met with a personalized dashboard displaying their saved recipes
- **Forgot password**

- Users are allowed to change their password in case they forgot by submitting their email and receiving a new password creation link.

Recipes will include:

- **Explore New Creations**
 - This is a sitewide repository that will contain recipes created by the developers or created by users that decided to share it to the web app that anyone with or without an account can view. Users can view and save these recipes to their “View All” repository. Saving and viewing is an account user function, while just viewing is a non-account user function. Users can also sort, filter, and search recipes.
- **Create New Recipe**
 - This is a function that will allow for users to create new recipes with a predetermined format for easy viewing. When creating the recipe you can add tags, allergens, videos, and detailed ingredients and instructions. This is an account user function only. And these recipes will include tags such as (healthy, cheap, expensive, Chinese, Italian, Filipino) Users can create their own tags so it'll be easier to find or share.
- **View All Recipes**
 - This will be a repository of all created and saved recipes pertaining to each individual user. If a user creates a new recipe or saves a recipe from “Explore New Creations” the recipes will automatically be saved into this repository for later viewing. This feature will only work for account users as the data will be linked to said account user. Users can also sort, filter, and search recipes.
- **Foodlist**
 - This will be a separate account user repository that will allow for account users to categorize recipes that they have saved or created to their own preferences. For instance they could create a healthy cheap recipe list, and an expensive unhealthy list and each would have their own list of foods that pertain to the title.
- **Culinary techniques/Strategic saving and storage will include:**
 - Culinary Techniques will mostly function as a media square where techniques are taught through embedded videos made by the development team. It will include:
 - Utilizing Utensils will teach you how to utilize every handheld tool in the kitchen, with proper handling and safety
 - Pots and pans will teach the user how to use pots and pans to their fullest extent including cooking techniques such as boiling and sauteing
 - Proper procedures will teach how to keep the kitchen clean and how to set up while cooking.
- **Strategic savings and storing will also mostly have media where videos, photos, and text will teach the user how to spend smarter and save more.**
 - Culinary techniques/savings and storage will be a feature that's available to all users, with or without an account.

Waste To Taste is designed as a comprehensive platform where users can share recipes beyond their network, backed by a FAQ section to address queries without integrating social media interactions like comments or likes, deemed superfluous to the platform's purpose. The initiative behind Waste To Taste

revolves around equipping individuals with essential cooking skills, insightful tips on economical shopping and storage, and offering a unified repository for recipes. This endeavor aims not only to curtail food wastage but also to optimize financial savings, providing users with a versatile, go-to recipe book accessible from anywhere.

At the heart of Waste To Taste lies the pivotal feature of personal recipe creation and management. Amidst the vast sea of recipes scattered across social media platforms and websites, users often find themselves overwhelmed by the dispersion. Waste To Taste addresses this challenge by enabling users to consolidate their favorite or newfound recipes within a singular, user-friendly "View All" tab, simplifying recipe organization based on personal preferences like dietary needs or cuisine types. Furthermore, the platform enriches the user experience with dedicated sections on "Culinary Techniques" and "Strategic Savings and Storage," offering valuable knowledge on cooking, storage, and grocery shopping from a singular source, thereby enhancing convenience and promoting a holistic approach to kitchen mastery and resourcefulness.

1.3 Definitions, Acronyms, and Abbreviations

Term	Definition
UI/User Interface	User Interface. The space where interactions between humans and machines occur. Mentioned in section 3.1.1 User Interfaces.
SRS	Software Requirements Specification. A document that fully describes the expected behavior of a software system. Referenced throughout the document.
Firebase	A platform developed by Google for creating mobile and web applications. Used for authentication as mentioned in Dependencies.
MongoDB Atlas	MongoDB's fully automated cloud service. Used for database services as mentioned in Dependencies.
YouTube	A video sharing service where users can watch, like, share, comment, and upload their own videos. Referenced in section 3.2.9 Recipe Saving for video content.

1.4 References

1. GeeksforGeeks, "How to Write a Good SRS for Your Project", geeksforgeeks.org. 17 Mar, 2023. <https://www.geeksforgeeks.org/how-to-write-a-good-srs-for-your-project/>

1.5 Overview

The Software Requirements Specification (SRS) document for the Waste To Taste project thoroughly defines the application's software requirements, beginning with a general description that outlines the project perspective, product functions, user characteristics, and general constraints. It progresses to detail the various interfaces, including user, hardware, and software interfaces, as well as the specific functional and non-functional requirements the system must meet. The document also addresses design constraints and logical database requirements, ensuring a comprehensive understanding of how information flows throughout the system. Diagrams and flowcharts provide additional clarity on data interactions and processes, making this document a foundational tool for guiding the development and implementation of the Waste To Taste application suite.

2. General Description

This section will provide a general overview of the Waste To Taste web application and render how it is envisioned by users, alongside outlining its core functionalities, user demographics, constraints, and external factors influencing its requirements. Additionally, it will outline the expected characteristics of its users, including their cooking experience levels and interest in sustainability, to ensure the platform meets their needs effectively. The discussion will extend to the technical and operational constraints faced during development, such as compatibility with different devices and compliance with data protection laws. Finally, it will touch on assumptions about the technology environment and external dependencies critical for the app's functionality, like the availability of certain operating systems or third-party services. This comprehensive overview sets the stage for the detailed specifications that follow, providing a clear picture of what Waste To Taste aims to achieve and the context in which it operates.

2.1 Product Perspective

Waste To Taste envisions being welcoming, applicable, and efficient, achieved through a user-friendly interface that provides users with the necessary tools and resources. The web app is designed to raise awareness and tackle the issue of food waste by educating users on how to be efficient anti-waste cooks.

Waste To Taste will have an easy-to-navigate homepage that welcomes all users featuring culinary knowledge contents and recipes. Once logged in, users will be taken to a personalized dashboard that features saved recipes, and quick links to recipe creation and exploration. The transition from visitor to community member is facilitated by intuitive login and signup pages, which are the gateways to the application's comprehensive features designed to empower users in their quest to become efficient and sustainable cooks.

Waste To Tastee aims to be a platform where users can learn and manage features such as recipe management, culinary education, and food storage tips. It is intended to stand out as easy to engage with and interact with, keeping users fascinated and involved.

2.2 Product Functions

Waste To Taste delivers a multi-functional platform that seamlessly combines features aimed at educating users and providing practical tools to reduce food waste. Going into the website, users land on the home page, where they are welcomed with informative showcases of articles, cooking tips, and recent highlights, creating an engaging entry point into the platform. Users will be prompted to sign-up before they can access additional features. User registration is straightforward, allowing them to easily create profiles by inputting basic information such as name and email followed by creating a password. The simplicity extends to the user experience upon logging in, where a personalized dashboard awaits. This dashboard serves as the user's main hub, showcasing recipes that have been saved and providing updates to make it simple to find new recipes or go back to favorites.

The platform facilitates an enriching culinary exploration with its extensive recipe features. Users can navigate through a diverse range of recipes, utilizing filters for personalized searches, saving favorites for easy access, and sharing their culinary creations with their community. This integration fosters a vibrant exchange of culinary ideas and tips, enhancing the user experience. Education is a cornerstone of Waste To Taste, with a dedicated section for culinary techniques that includes embedded videos, articles, and tutorials. In addition to promoting sustainable practices and food conservation techniques, this resource is made to improve cooking abilities and directly support the platform's waste reduction aim.

Finally, an admin panel will be integrated that provides necessary tools for administrators to enforce policy upon users through user account management, content moderation, and issue resolution, ensuring a smooth and respectful user experience across the platform.

2.3 User Characteristics

Intended users:

- Age: The age for the users should be ages 13 and up. As long as they have a relatively basic understanding on how to navigate the internet through their phone or desktop(such as searching, accessing websites, and using online forms). The user should also have a good understanding of instructions.
- Language: The application will be built completely in English so the user should be proficient in English, at the highschool level.
- Technological skill level: Users need to have a basic understanding of how to navigate the internet with either their phone, tablet, or desktop. Waste To Taste app is a web based application so it will require some basic knowledge.
- Culinary Skill level: The skill level for the average user can range from a complete beginner who just learned how to boil water to an average home cook who understands cooking very well but would just like a place to keep every recipe. The application will have video features built in to teach people how to increase their culinary skill level, from a complete amateur to a comfortable home cook.

- Dietary considerations: A big part of creating recipes is making sure that user dietary restrictions are taken into considerations when they are made. Each recipe that is made will include tags that will let users know if there are any necessary allergen warnings. Recipes can allow for substitutions and every ingredient is listed out where users with dietary restrictions can check beforehand to make sure the recipe is safe to recreate.
- Cultural understanding: An essential part of Waste To Taste is that users share their own unique culinary traditional foods and preparation techniques. So users who have cultural foods to share can share and those who want to learn can learn.

2.4 General Constraints

The efficacy and user experience of Waste To Taste as a web application is reliant on a stable internet connection and a relatively competent mobile/desktop. Waste To Taste relies heavily on its server to fetch, display, and update culinary content such as recipes and other user-generated content. If the internet was unavailable to the user then so would Waste To Taste.

Waste To Taste also relies on YouTube for all of its embedded video tutorials, as all videos are uploaded on YouTube and the link is embedded into the recipe. If the YouTube video were to be taken down or if there was anything to happen to the platform then Waste To Taste would have to utilize a new alternative hosting platform. The app is also built on React, Node.js, MongoDB and that could affect scalability, performance and device compatibility. High traffic volume to the web app would require very optimized code and database schemas to keep the user experience smooth.

The project timeline is fixed and that will also limit the scope of features that can be developed and polished before launching.

2.5 Assumptions and Dependencies

This subsection of the SRS will list each of the factors that affect the requirements of the Waste To Taste web app, stated in the SRS. These factors are not design constraints on the software but are, rather, any changes to them that can affect the requirements in the SRS.

Assumptions:

- Users have access to a kitchen, electronic multimedia device, and the internet.
- Access to a stable internet connection for using the application's online features.
- The effectiveness of the application in reducing food waste is partly dependent on user engagement and willingness to apply learned techniques.

Dependencies:

- Hosting Services: MongoDB Atlas for database services; Firebase for authentication.
- Third-Party Services: YouTube for video content.
- User Feedback: Gmail for collecting user feedback.
- Email Verification: Gmail for new user verification.

These general factors provide a comprehensive understanding of Waste to Taste's context, outlining how it is perceived by users, its core functionalities, the characteristics of its target audience, the constraints under which it will be developed, and the assumptions and dependencies that could influence its success.

3. Specific Requirements

This section of the Software Requirements Specification (SRS) provides a comprehensive list of requirements for Waste to Taste. These requirements are categorized into external interface requirements, functional requirements, and non-functional requirements. Each requirement is designed to be correct, traceable, unambiguous, verifiable, and uniquely identifiable to guide the software design, implementation, and testing phases effectively.

3.1 External Interface Requirements

3.1.1 User Interfaces

The user interface User Interface of Waste to Taste is designed to offer an intuitive, engaging, and seamless experience that guides users through the process of discovering, creating, and managing culinary content. With a focus on ease of use, the UI features a clean and modern design, structured around key components such as a welcoming landing page, a responsive navigation bar, and interactive recipe cards. From the recipe exploration to the detailed culinary techniques and savings tips pages, it is crafted to ensure users of all skill levels can navigate the platform confidently and comfortably. The UI integrates educational elements, encouraging users to learn and save recipes.

3.1.1.1 - State Flow Diagram

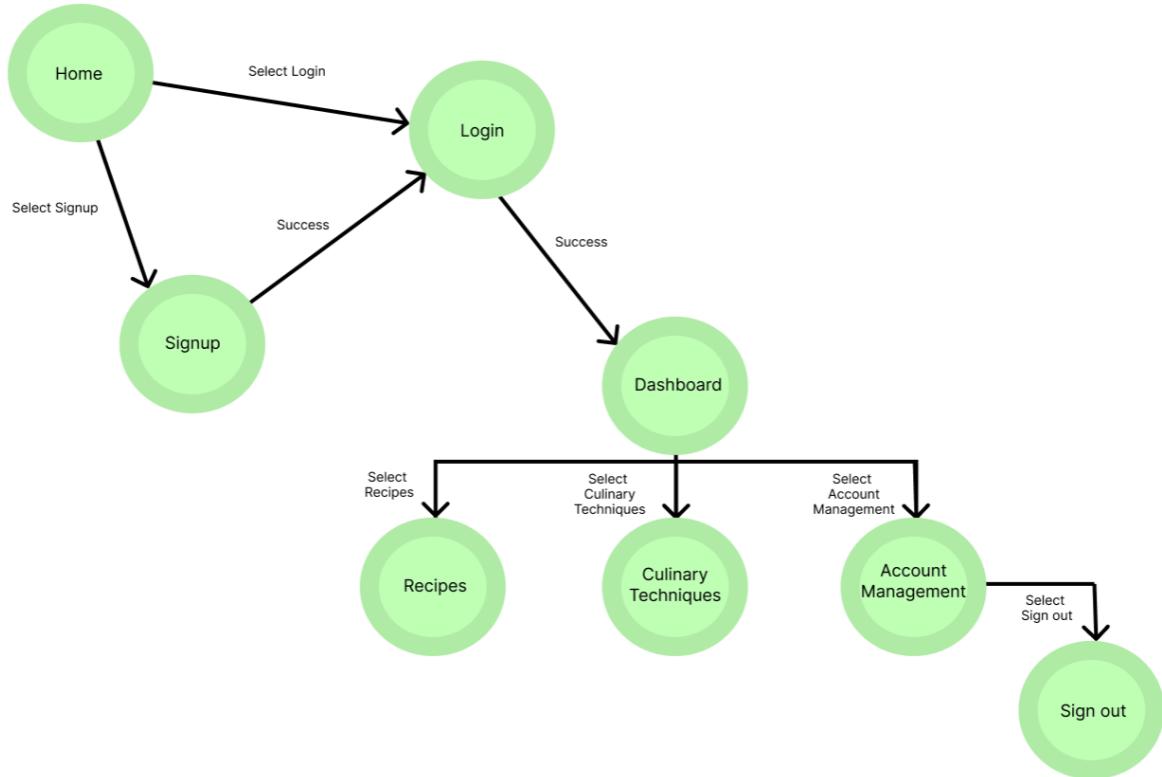


Figure 3.1.1.0

Upon visiting Waste To Taste, users land on the initial landing page which highlights the app's features and benefits, as well as highlighted culinary contents. From there, they can choose to log in or sign up. After successful authentication, they are directed to the Home View, where they can explore recipes, access cooking techniques, and manage their culinary preferences within a streamlined and user-friendly interface.

3.1.1.2 - Registration

Description: An interface for new user registration. This interface will include form fields for the user's first and last name, email, and password for their registration. Once the user provides their credentials, an email will be sent to the address that they input. This email will contain a verification link, so that users may verify their email. This will promote the safety of the web app and will also hold integrity toward our users. In addition, there will be error handling messages, which will pop up when input errors are triggered. These messages will instruct the users to input correct credentials, and also will notify them about their verification email being sent.

Inputs: First name, last name, email, password

Outputs: Email verification sent, email verification confirmed, pop-ups for input errors

Error Handling: For registration, errors such as invalid email format, weak password (password criteria: 8 characters long, 1 special characters, 1 number, 1 uppercase letter, and 1 lowercase letter) will be clearly shown to the user, and they will be prompted to correct their input. If the user attempts to use an email that has already been verified, they will be prompted to use a different email for registration.

3.1.1.3 Login

Description: An interface for existing user login. This interface will prompt the user for their email and password for the user login. Once the user has verified their email via the link sent to them via email, they are able to log in. If the user hasn't been verified yet or has an incorrect input, error messages will pop up, prompting the user to verify their email, or correct their input. It will also provide links for users to reset their passwords.

Inputs: Email, password

Outputs: Confirmation of successful login, dashboard access upon login

Error Handling: For login, errors such as invalid email, already existing email, and incorrect password will be clearly communicated to the user via pop-up messages on the user's screen.

3.1.1.4 - Recipes

Description: Interface allowing users to navigate through the repository of recipes, including sorting and filtering capabilities, and presenting detailed views of selected recipes.

Components:

- **ExploreNewCreations:** Component for displaying newly added or highlighted recipes.
- **RecipeCard:** UI component representing an individual recipe in summary form.
- **RecipesPage:** The main page that aggregates and displays recipes in a user-friendly format.
- **ViewAllRecipes:** A dedicated interface for users to see a list of all recipes they have saved or created.

Inputs: Search queries, filter selections, user interactions for selecting a recipe.

Outputs: Display of recipes, detailed recipe view upon selection, and saved recipes list.

Error Handling: Provide helpful messages or suggestions when no results are found or in case of a search error.

3.1.1.5 - Landing Page

Description: The initial view users encounter when visiting the website. Waste To Taste will have an easy-to-navigate landing page that welcomes all users featuring culinary knowledge contents and recipes.

Components:

- **LandingPage:** A component that showcases the main features of the app and directs users to sign up or log in.

Outputs: Overview of the app's features and benefits, encouraging users towards registration or login.

3.1.1.6 - Culinary Techniques

Description: Educational section of the application providing users with resources to enhance their cooking skills and learn about food savings and storage.

Components:

- **TechniquesPage:** Interface for browsing and accessing various cooking techniques.
- **SavingsPage:** Dedicated interface providing tips and strategies for food savings and storage.

Outputs: Educational content in the form of videos, articles, and guides.

3.1.2 - Hardware Interface

3.1.2.1 - Devices Supported

- Desktop Computers and Laptops: Must be able to run modern web browsers (Chrome, Safari, Firefox, Edge). Recommended to have at least an Intel i3 7th gen processor and 4GB of RAM for optimal performance.
- Smartphones and Tablets: Should support the latest operating systems, namely iOS 11 and above for Apple devices, and Android 8 (Oreo) and above for Android devices, to ensure full functionality and touch-screen capabilities for interactive gestures.

3.1.2.2 - Connectivity Requirements

- A stable internet connection with a minimum speed of 3 Mbps for smooth operation and streaming of multimedia content like cooking tutorials or instructional videos.

3.1.2.3 - Peripheral Support

- Basic input peripherals such as a keyboard and mouse for desktops and laptops. Touchscreens for smartphones and tablets must be fully functional.

3.1.2.4 - Output Devices

- Display screens should support a minimum resolution of 1280x720 for clear rendering of web content, images, and videos.
- Audio output devices must be compatible for multimedia content playback.

3.1.2.5 - Browser Requirements

- Up-to-date web browsers (Chrome, Safari, Firefox, Edge) that support HTML5, CSS3, and JavaScript, ensuring full functionality of the application's features.

3.1.3 Software Interfaces

3.1.3.1 - Web Browser Interface

Description: The primary interface through which users interact with Waste To Taste web application. It requires a modern web browser capable of rendering HTML, CSS, and JavaScript effectively.

Requirement: Users require only a device with an internet connection and an updated web browser to access and use all the features of the web-app seamlessly.

3.1.4 Communications Interfaces

3.1.4.1 - Internet Connectivity

Users need a stable internet connection to access the web application, browse recipes, learn culinary techniques, and interact with the platform's community features.

3.1.4.2 - Email

Users must have a valid email address that can receive emails from the Waste to Taste domain. This ensures they can manage their account and stay informed about important app-related information.

3.2 Functional Requirements

3.2.1 - User Registration

ID: FR01	Title: User Registration
Description: Facilitates the creation of new user accounts by collecting essential information and ensuring data integrity and uniqueness within the system.	
Inputs: First name, last name, email address, password.	Outputs: Pop-up message notifying the user that their account has been created and that the verification email has been sent.

Processing:

1. Validates the uniqueness of the email format
2. Stores the user data in the database, encrypting the user's password
3. Generates and assigns a token to user upon registration
4. Sends an email to the user with the specific token in the form of a link, for verification process.

Error Handling: Provides error messages for empty fields, duplicate emails, invalid email format and invalid password formats.

Dependencies: FR. 03- Email Verification, Gmail Services

Priority: High

3.2.2 - User Login

ID: FR02	Title: User Login
Description: Authenticates user credentials against stored data, granting access to the application upon successful login.	
Inputs: Email, password.	Outputs: Access to the user's personalized dashboard.
Processing: Verification of user credentials and initiation of user session.	
Error Handling: Incorrect credentials result in an error message with an option to reset the password or retry.	
Dependencies: MongoDB Atlas for profile retrieval.	
Priority: High	

3.2.3 - Email Verification

ID: FR03	Title: Email Verification
Description: Ensures the validity of the user's email address through a verification link sent post-registration.	
Inputs: Click on the verification link.	Outputs: Email verification confirmation.
Processing: Verification of the email link's authenticity and activation of the user account.	
Error Handling: Invalid or expired links trigger a resend verification email option.	
Dependencies: Gmail for verification emails	

Priority: High

3.2.4 - Forgot Password

ID: FR04	Title: Forgot Password
Description: Provides users with the ability to reset their password through a secure process.	
Inputs: User's email address.	Outputs: Password reset instructions email.
Processing: Sends a password reset link to the user's email.	
Error Handling: Non-existent email addresses receive an error message.	
Dependencies: Gmail for reset links.	
Priority: Medium	

3.2.5 - Profile Management

ID: FR05	Title: Profile Management
Description: Allows users to update their profile information and preferences. Users will be allowed to update their profile information every 48 hours. And users can resume regular usage after making such changes. <ul style="list-style-type: none">● First Name Criteria: Letters only● Last Name Criteria: Letters only● Password Criteria:<ul style="list-style-type: none">○ Length: At least 8 characters long○ Requirements: At least: 1 number ,1 uppercase char, 1 lowercase char, 1 special char(!,@,#,\$, etc)	
Inputs: Updated first name, last name, password.	Outputs: Profile update confirmation.
Processing: Validates changes and updates user profile data in the database.	
Error Handling: Feedback on unsuccessful updates or invalid data.	
Dependencies: MongoDB Atlas for storing profiles.	
Priority: Medium	

3.2.6 - Personal Dashboard

ID: FR06	Title: Personal Dashboard
Description: Displays a personalized overview of the user's activities, and saved recipes.	
Inputs: User login.	Outputs: Personalized dashboard view.
Processing: Retrieves personalized content based on user's history and preferences.	
Error Handling: Default content for missing personalized data.	
Dependencies: MongoDB Atlas for dashboard data.	
Priority: High	

3.2.7 - Admin Panel

ID: FR07	Title: Admin Panel
Description: Provides administrative capabilities for managing users, content, and system settings.	
Inputs: Admin login credentials.	Outputs: Administration actions confirmation.
Processing: Access control and administrative actions processing.	
Error Handling: Restricted access error for non-administrative users.	
Dependencies: MongoDB Atlas for user/content management.	
Priority: Medium	

3.2.9 - Recipe Saving

ID: FR09	Title: Recipe Saving
Description: Enables users to save their favorite recipes for easy access and organization.	
Inputs: Selection of recipes to save.	Outputs: Updated list of saved recipes.

Processing: Adds selected recipes to the user's saved list in their profile.

Error Handling: Feedback on unsuccessful save actions.

Dependencies: MongoDB Atlas for recipe storage; YouTube for video content.

Priority: High

3.2.10 - Recipe Management

ID: FR10	Title: Recipe Management
Description: Allows users to create, view, edit, and delete their own recipes, facilitating personal content creation and management.	
Inputs: Recipe details for creation or updates; deletion commands.	Outputs: Confirmation of recipe creation, update, or deletion.
Processing: Stores new recipes or updates existing ones in the user's profile; deletes recipes as requested.	
Error Handling: Validation errors for incomplete or incorrect recipe details.	
Dependencies: MongoDB Atlas for recipe data; YouTube.	
Priority: High	

3.3 Non-Functional Requirements

3.3.1 Performance

ID: NFR. 01	Title: Performance
Requirements: <u>As long as the web application shall host fewer than 100 concurrent users:</u>	
<ul style="list-style-type: none">• <u>Response Time:</u> The application should load a user-requested page within 3-6 seconds under normal operations for 90% of the time for all users.• <u>Processing Time:</u> Over 90% of the transactions of the application should be processed in under 3-6 seconds under normal operations (Database queries, API calls, and content rendering).• <u>Content Loading:</u> The video content that is embedded from YouTube should start playing within 3-6 seconds of the user clicking on the video 95% of the times under normal operations.	

Description: The system shall perform with rapid response times, ensuring smooth user interactions even under heavy load conditions. It must maintain high availability, with downtime minimized to maximize user engagement.

Priority: N/A

3.3.2 Reliability

ID: NFR. 02	Title: Reliability
Requirements:	
<ul style="list-style-type: none">• <u>System Stability</u>: This app should operate smoothly without any major problems.• <u>Error Rate</u>: The overall system error rate should be less than 0.1% for all actions performed in the system for all users.• <u>Data Integrity</u>: Data integrity checks should have 99.9% accuracy in user data retrieval and storage. The saved data for any users should be stable and when users log in, their data will be safe.	
Description: The system shall perform smoothly without any major problems with extremely low error rates for all users and data should be saved consistently and safely for the users.	
Priority: N/A	

3.3.3 Security

ID: NFR. 04	Title: Security
Requirements:	
<ul style="list-style-type: none">• <u>Email verification</u>: 100% of new user registrations must complete an email verification process to activate their accounts. This will be an effective way to mitigate spam.	
Description: The system prioritizes security through mandatory email verification for all new users, ensuring account authenticity and reducing spam.	
Priority: N/A	

4 Design Constraints

4.1 Compatibility

The application must function seamlessly across the major web browsers (Chrome, Firefox, Safari, Edge, Opera) to ensure accessibility. This involves utilizing features that are supported across all platforms and avoiding features that are not supported in all platforms. The application will support at least up to the last 3 latest versions of the major browsers.

4.2 Technology Stack

The choice of MongoDB, React.js, Express.js, and Node.js requires certain architectural and operational constraints. The applications scalability, performance, and data management is heavily managed by this tech stack. There is also a learning curve with all of these tech stacks.

- React.js for complex applications can cause slower rendering for applications within browsers, especially if the bundle size is large.
- MongoDB requires heavy consideration for document size limits as the maximum document size is limited to 16mb, and this can cause problems for data modeling especially for applications that require large amounts of data to be stored in a single document. MongoDB can face slowdowns during high-load operations especially if it isn't properly indexed .
- Node.js/Express.js use asynchronous code which can cause callback problems if the application code has a lot of nested callbacks.

4.3 Responsive Design

Waste To Taste is designed to run across all common multimedia devices therefore implementing responsive design principles is mandatory to make sure that user experiences are consistent throughout all supported devices. The application will be tested on mobile devices along with desktop devices to ensure the design's effectiveness across the different screen sizes and operating systems.

4.4 Performance

Load Time/Responsiveness: The applications design and development must prioritize performance and will aim for quick load times and smooth interactions. The application should load within 2 seconds and processing times should be under 1 second. This includes optimizing asset sizes, minimizing HTTP requests, and optimizing the database queries to ensure efficient application operation on both desktop and mobile devices.

5. Logical Database Requirements

5.1 Database Usage

A relational database management system will be used by Waste To Taste to effectively store, manage, and retrieve data. The main database for the program will be MongoDB, which is flexible and scalable and can accommodate the application's dynamic content and user-generated data.

5.2 Data Structure and Formats

- User Accounts: Data includes First and Last name, email addresses, hashed passwords, and verified status. Email addresses must conform to standard email format rules, and passwords are stored as hashed values for security.
- Recipes: Each recipe record will contain fields for title, description, ingredients (with quantities and units), preparation steps, tags (e.g., healthy, cheap), creation date, and user ID of the creator. Images and videos may be stored as links to external storage.
- Culinary Techniques: Stored as multimedia content, including text descriptions, video links, and related images. Metadata for categorization and searchability will also be included.
- Verification Tokens: Created once the user signs up for a new account, or decides to change account password. Data includes a hashed verification code, which is converted into a link, sent to the user. Once the user clicks on this link, the verification token is deleted and the newly created user account becomes verified.

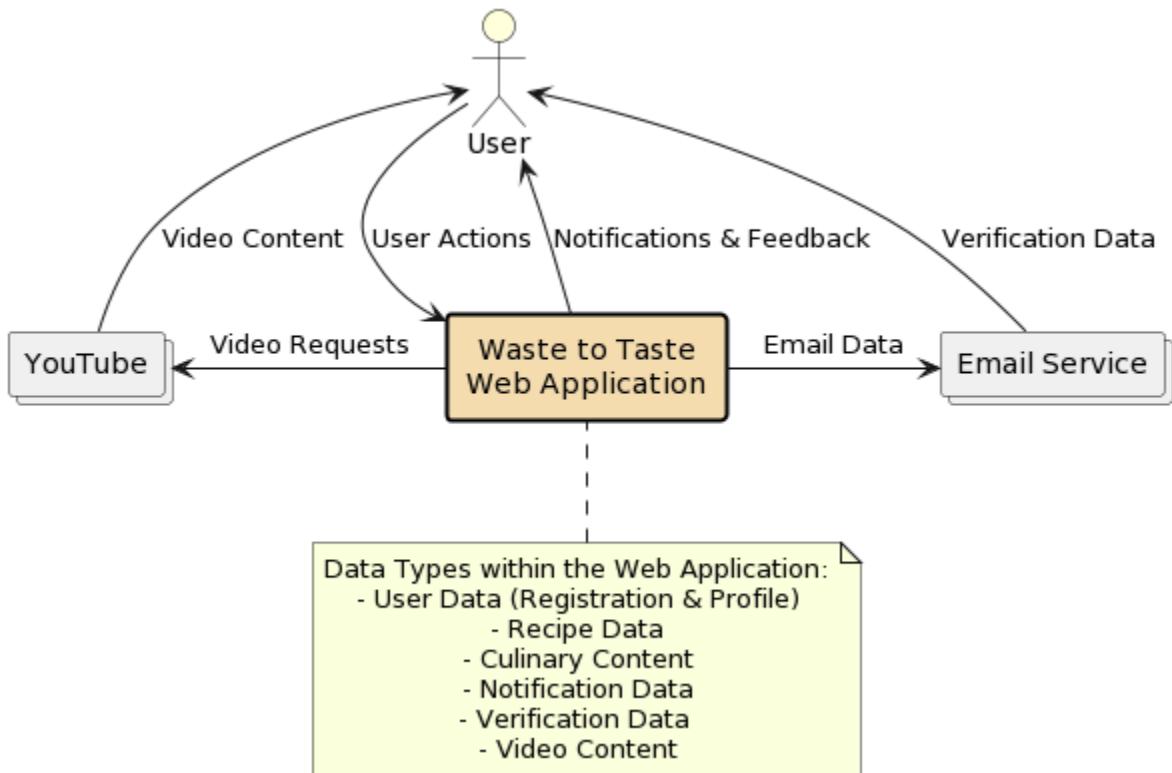
5.3 Data Integrity

- Implement validation rules on the application side to ensure data entering the database conforms to expected formats and constraints.
- Use Verification Tokens, sent to the users email so that they may verify their emails prior to logging in. This will preserve the integrity and security for the entire app and its users.
- Use J Web Tokens, created upon user login, and saved in the users' browser cache. This token is unique to each user and it is temporary. This token will stay active until the user logs out, which in such cases will be deleted. The purpose of this specific token is so that the user may navigate freely through the website once they login, without the need of the database checking their "verified" status every single time they swap pages within the web-app.
- Sensitive information, such as passwords, will be encrypted using industry-standard practices.

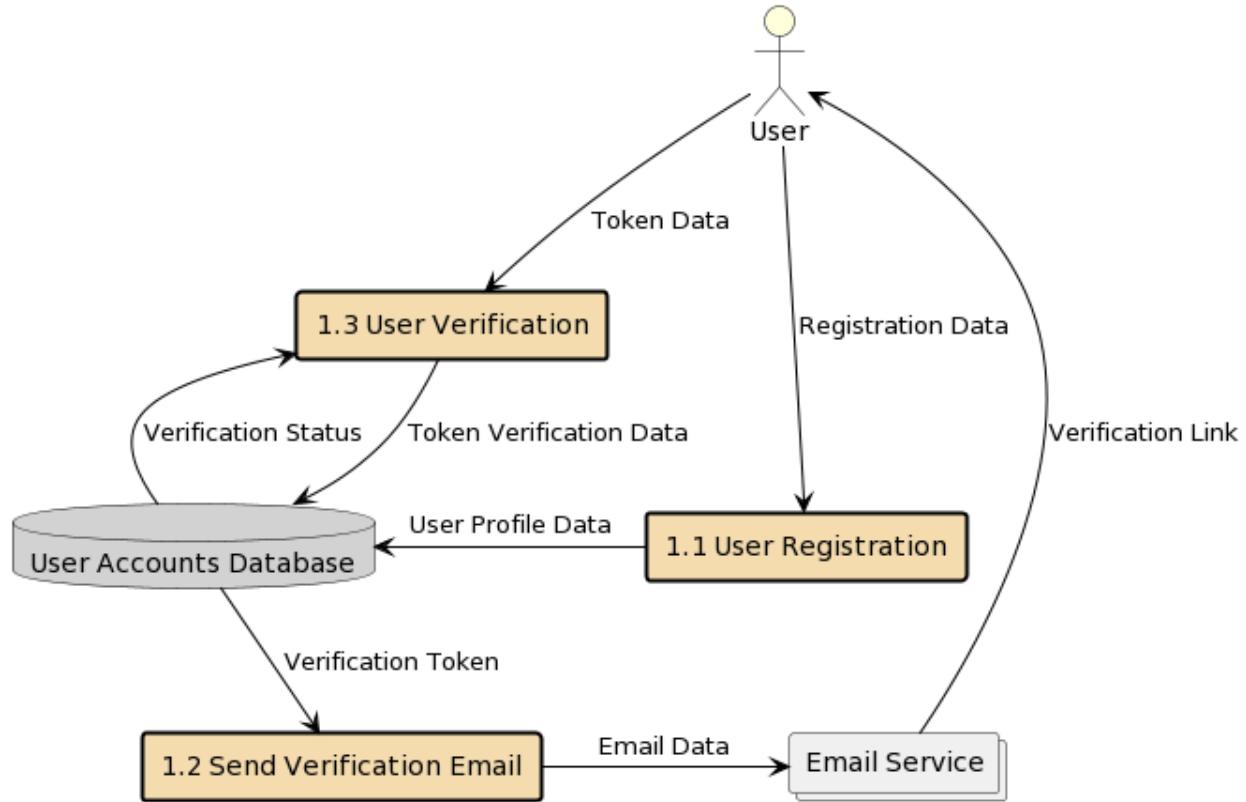
6. Analysis Models

6.1.1 Data Flow Diagrams (DFD)

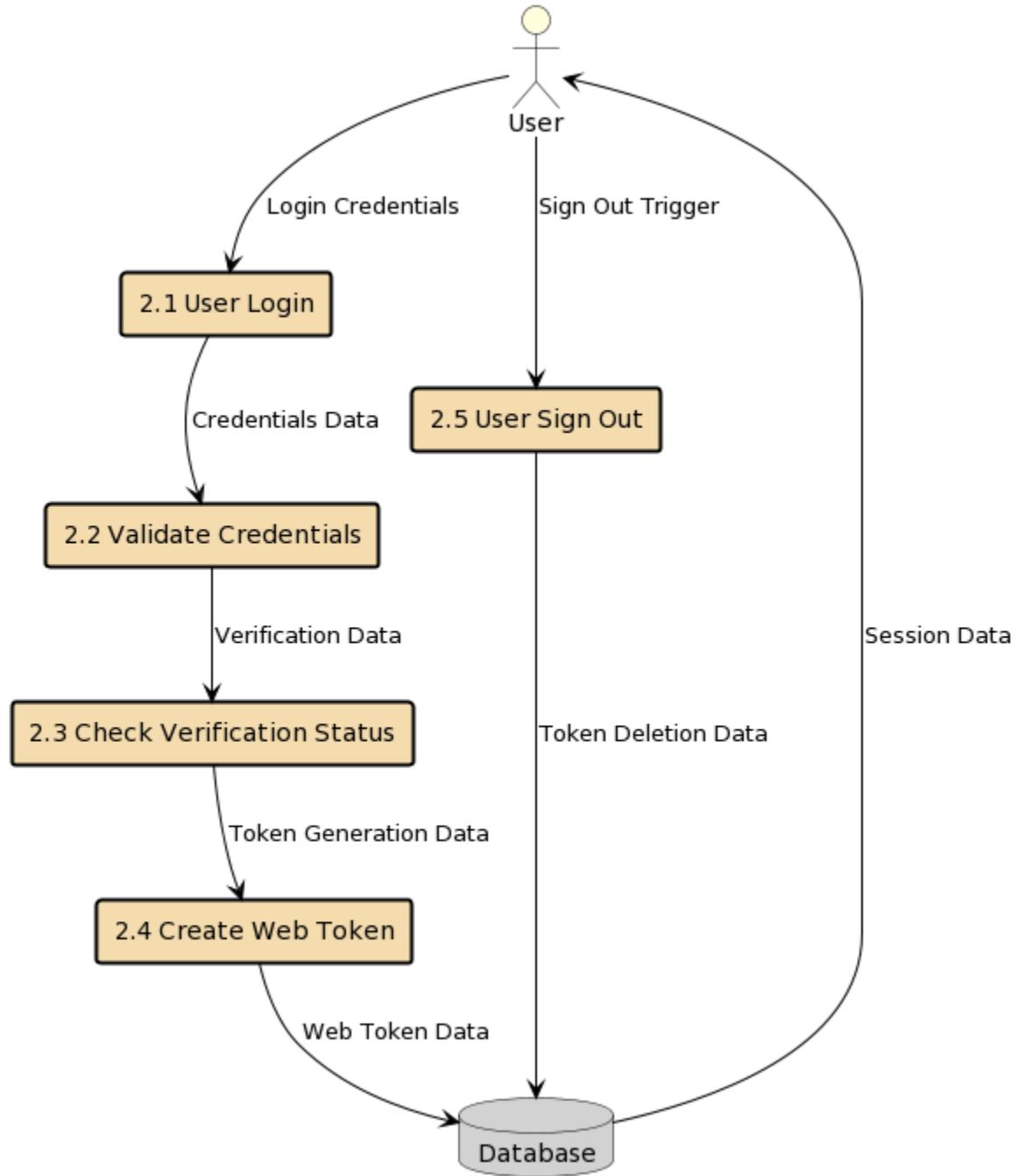
6.1.1.1 Level 0 DFD (Generalized Web-App)



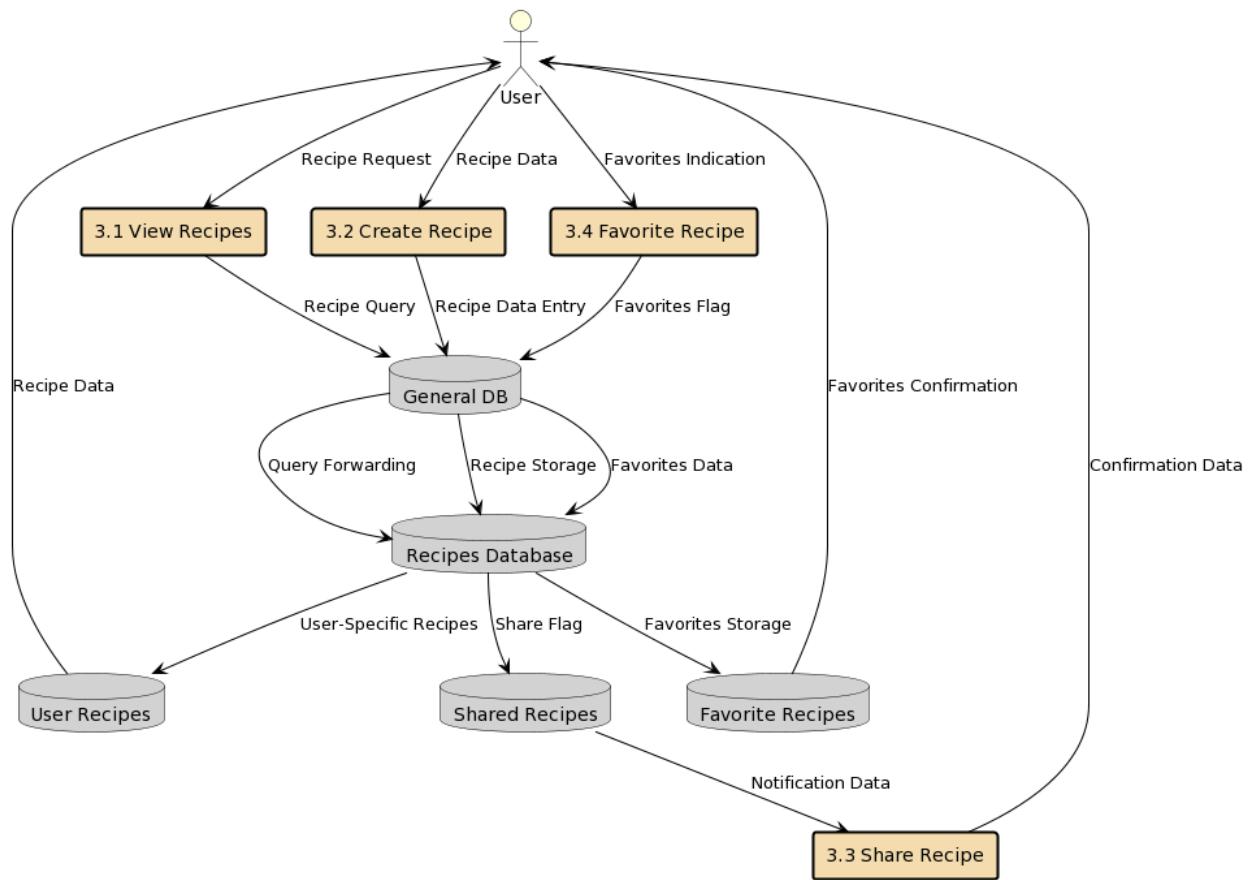
6.1.1.2 Level 1 DFD (Registration)



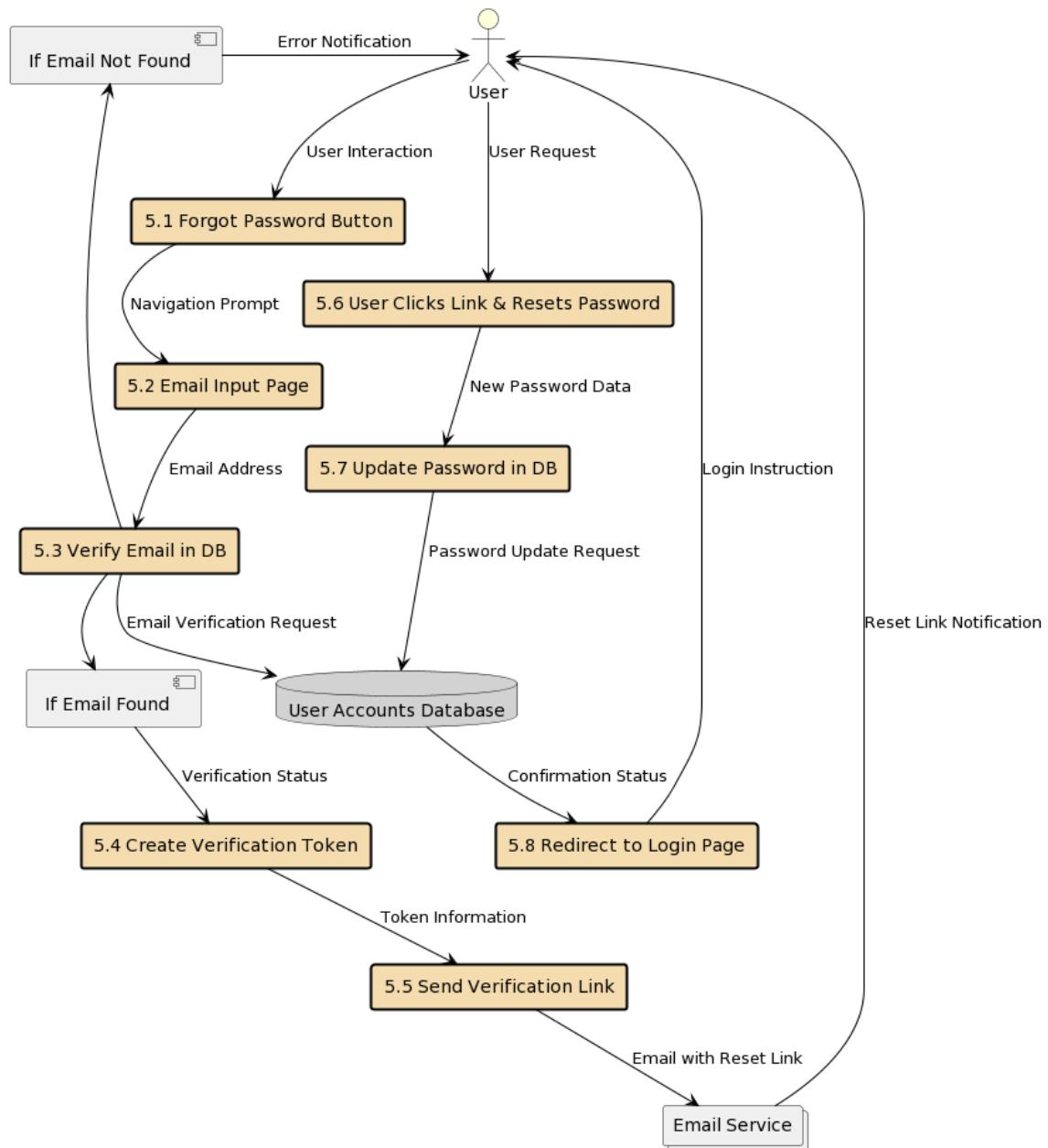
6.1.1.3 Level 1 DFD (User Login)



6.1.1.4 Level 1 DFD (Recipe Management)



6.1.1.6 Level 1 DFD (Forgot Password)



6.1.2 DFD Overview

The Data Flow Diagrams (DFDs) provide a structured overview of the Waste to Taste web application, focusing on user interactions, processes, data management, and external communications. Here's a breakdown of the diagrams components and their interactions:

6.1.3 External Entities

- **User:** Represents the end-users of the application, including both registered and unregistered individuals seeking to access and interact with the system's features.
- **Email Service:** Acts as an intermediary for sending verification and password reset emails to users, facilitating secure access and account recovery.
- **YouTube:** Serves as a content source, particularly for the Culinary Techniques & Savings section, providing video materials embedded within the application.

6.1.4 Processes

- **User Registration/Login:** The entry point for new and returning users to create an account or access their existing account. It's directly connected to users and initiates the process for email verification and session token creation.
- **Email Verification:** A security step that follows user registration, where a verification link is sent to the user's email address to confirm its validity.
- **Forgot Password:** A process that allows users to reset their passwords if forgotten, involving generating a reset token and sending a reset link to the user's email.
- **Profile Management:** Enables users to update their personal information, such as profile pictures, usernames, and passwords, after logging in.
- **Recipe Management:** Allows users to create, update, and delete recipes, managing the content within their personal dashboards and the broader application.
- **Culinary Techniques & Savings:** Provides users access to educational content on cooking techniques and savings tips, drawing from the application's database and YouTube videos.

6.1.5 Data Stores

- **User Accounts:** Stores user profile information, including login credentials and personal details.
- **Recipes:** Contains recipe information created or saved by users.
- **Culinary Content:** Houses educational material and tips related to cooking and food savings.
- **Verification Tokens:** Temporarily stores tokens generated for email verification purposes.
- **Session Tokens (JWT):** Manages JSON Web Tokens used to maintain user sessions upon login.
- **Password Reset Tokens:** Temporarily stores tokens used for the password reset process.

6.1.6 Data Flows

- Data flows between users and the system for registration, login, verification, profile management, recipe handling, and content access are depicted, showing interactions with the database for storing and retrieving information.
- The Email Service is shown to interact with users for sending verification links and password reset emails, aiding in account security and recovery.
- YouTube's role as a content provider for the Culinary Techniques & Savings section illustrates the application's integration with external media sources.

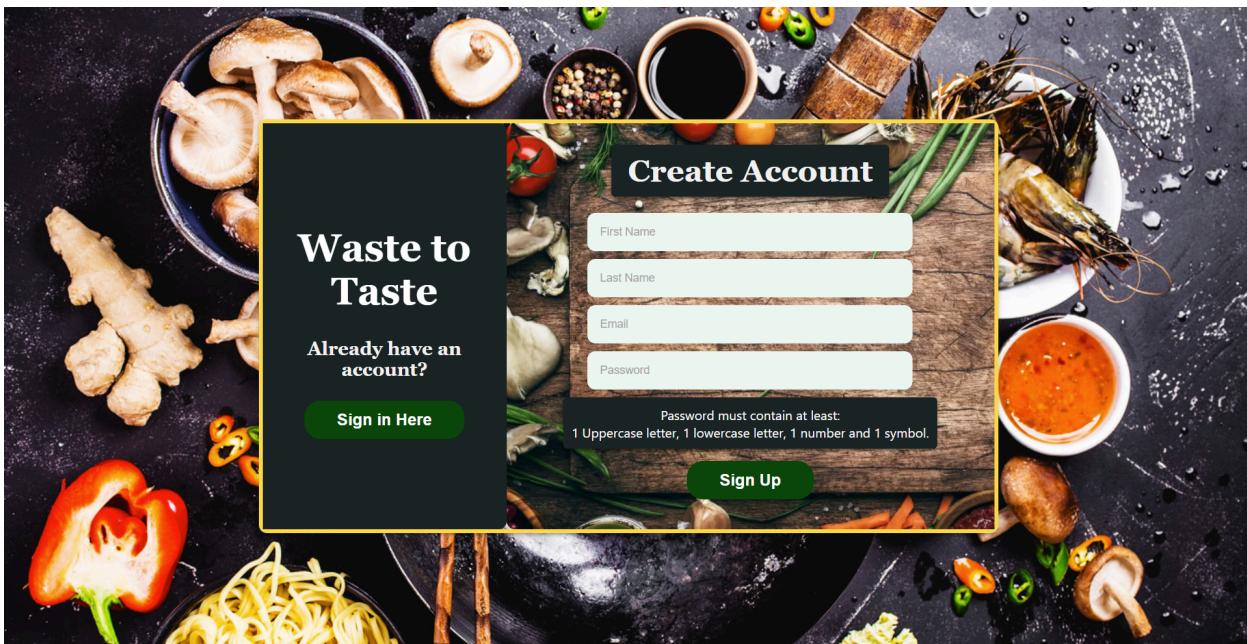
7. Appendix - Web Application Designs

7.1 Homepage



A screenshot of the Waste To Taste dashboard. At the top, there's a navigation bar with buttons for 'Dashboard', 'Recipes', 'Culinary Techniques', 'Strategic Savings and Storage', and 'Sign Out'. Below the navigation is a large title 'MAKE YOUR MENU' with a 'EXPLORE NEW CREATIONS' button. There are three thumbnail images: a bowl of pasta with toppings, a person cooking in a pan, and a wooden spoon next to an open book. At the bottom, there are three calls-to-action: 'VIEW ALL RECIPES', 'CREATE NEW RECIPE', and 'CREATE FOODLISTS'. A small footer note at the bottom left says 'localhost:3000/view-profile'.

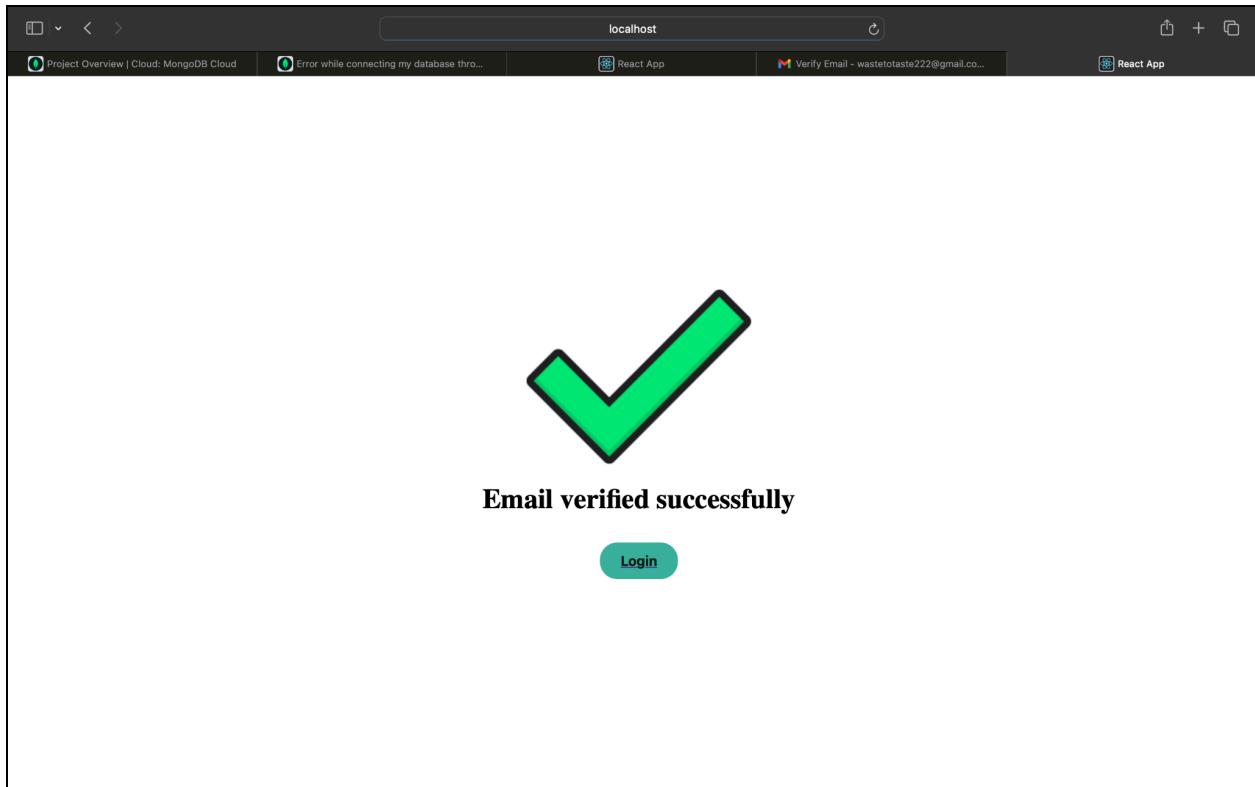
7.2 Registration & Login : (desktop, laptop interface)



7.3 Registration and Login for Smaller Screens (Smartphone Interface)



7.4 Email Verification Page



7.5 View All Recipes Page

View All Recipes

Search recipes... Sort Options

Filter by tags:

Chicken Chinese Easy Time: Short Affordable Gluten-Free High-Protein Vegetarian Difficult Vegan

HAINANESE CHICKEN: CRISPY CHICKEN THIGH STYLE

[View Recipe](#)
A spin on tradit...
Chicken Chinese Easy Time: Short Affordable
Share
Allergen-FREE

BOILED EGGS

[View Recipe](#)
A basic recipe ...
Gluten-Free Easy Time: Short Affordable High-Protein Vegetarian
Share Egg Soy more...

FRIED RICE

[View Recipe](#)
A classic modif...
Chicken Easy Time: Short
Share Egg Soy more...

WHITE RICE

[View Recipe](#)
The lifecycle o...
High-Protein Difficult Vegan Vegetarian Easy Affordable
Share Allergen-FREE

View All Recipes > RecipeDetails

Fried Rice

A classic modifiable dish that is simple, affordable, healthy, and delicious!

[Edit](#)[Chicken](#) [Easy](#) [Time: Short](#)

Allergens

- Egg
- Soy
- Shellfish
- Sesame

Ingredients

- 2 - Eggs
- 3 cups - cooked white rice(leftover rice from the day before is better)
- Scallions
- Minced Garlic
- Soy Sauce
- Sesame Oil
- Optional: Oyster Sauce

Instructions

- Take your egg(s) and whisk them thoroughly till the whites and yolk are mixed.
- Turn on the stove to high heat
- Add a tablespoon of neutral oil into a hot pan/wok, and spread it around.
- Add the egg and cook it thoroughly and after its done cooking, add your rice! Make sure to continuously stir the eggs to stop it from sticking and burning!
- Let it cook and soften the rice a bit, and then you can add your sauces to taste
- After letting the sauces fully mix in with the rice/egg you can add you meat and vegetables!
- Cook thoroughly and serve!



7.6 Foodlist

The screenshot shows a dark-themed web application for managing food lists. At the top is a search bar with the placeholder "Search foodlists...". Below it is a green button labeled "Create New FoodList". The main content area features a card titled "CHEAP EATS" with a subtitle "A list of cheap...". It includes three buttons: "View" (green), "Edit" (yellow), and "Delete" (red).

7.7 Explore New Creations

The screenshot shows a dark-themed web application for exploring new recipes. At the top is a search bar with the placeholder "Search recipes..." and a "Sort Options" dropdown. Below is a section titled "Filter by tags:" with a grid of tags: Chicken, Chinese, Easy, Time: Short, Affordable, Gluten-Free, High-Protein, Vegetarian, Difficult, and Vegan. The main content area displays four recipe cards:

- HAINANESE CHICKEN: CRISPY CHICKEN THIGH STYLE**
View Recipe
A spin on trad...
Chicken, Chinese, Easy, Time: Short, Affordable, Allergen-FREE
- BOILED EGGS**
View Recipe
A basic recipe ...
Gluten-Free, Easy, Time: Short, Affordable, High-Protein, Vegetarian, Egg
- FRIED RICE**
View Recipe
A classic modif...
Chicken, Easy, Time: Short, Egg, Soy, +more
- WHITE RICE**
View Recipe
The lifecycle o...
High-Protein, Difficult, Vegan, Vegetarian, Easy, Affordable, Allergen-FREE

7.8 Culinary Techniques

The screenshot shows a web browser window with the URL `localhost:3000/techniques` in the address bar. The page has a dark header with navigation links: Dashboard, Recipes, Culinary Techniques (which is highlighted in yellow), Strategic Savings and Storage, and Sign Out. Below the header is a large title **MASTER YOUR KITCHEN**. Underneath the title are three images: a person chopping nuts on a wooden board, two stainless steel pots on a stove, and a person stir-frying food in a wok over an open flame. Below these images are three yellow buttons labeled UTILIZING UTENSILS, POTS AND PANS, and PROPER PROCEDURES.

Culinary Techniques > Utilizing Utensils

UTILIZING UTENSILS

This screenshot shows the 'Utilizing Utensils' sub-section. It features a top navigation bar identical to the main page. Below it, a breadcrumb trail reads **Culinary Techniques > Utilizing Utensils**. The main title is **UTILIZING UTENSILS**. Three images are displayed below the title: a chef's knife on a cutting board surrounded by various vegetables, a collection of various kitchen tools like a rolling pin, whisk, and strainer on a dark surface, and a close-up of a well-used wooden cutting board.

KNIVES **VARIOUS TOOLS** **CUTTING BOARD**

Knives

Rick Astley - Never Gonna Give You Up (Official Music Video)

Watch later Share Info

Contents

- Types of Knives
- Knife Handling
- Ways to Cut
- Knife Care

MORE VIDEOS

▶ 0:00 / 3:33

ROCKASTLEY

YouTube

MAXIMIZE YOUR SAVINGS



SPENDING



STORAGE

8. Appendix: Requirements Traceability Matrix

Requirement ID	Requirement Description	Test Case ID	Test Case Description
FR01	User Registration	TC-1	Verify that a new user can register with a unique email address and password.
FR02	User Login	TC-2	Verify that a user can log in with correct credentials and is denied access with incorrect ones.
FR03	Email Verification	N/A	Not to be tested.
FR04	Reset Password	STC-3	Verify that users can reset their password via an email link and access their account with the new password.
FR05	Profile Management	N/A	Not to be tested.
FR06	Personal Dashboard	TC-29	Verify that the personal dashboard displays user's saved recipes correctly.
FR07	Admin Panel	N/A	Not to be tested
FR08	Recipe Saving	TC-23	Verify that users can save recipes to their profile and access them later.
FR09	Recipe Management	TC-28	Verify that users can create, edit, and delete their recipes and the changes are accurately reflected on the platform.

NFR01	Performance	PTC-1	Verify that the application's response time meets the specified performance criteria under normal operating conditions.
NFR02	Reliability	N/A	Verify that the system operates smoothly and maintains data integrity across various actions performed by the users.
NFR03	Security	SecurityTC1 SecurityTC2 SecurityTC3	Verify that all user data, especially passwords and email addresses, are securely stored and transmitted.