CEN 4010 Principles of Software Engineering, Summer 2023

**Milestone 1: Project Proposal and**

**High-Level Description**

Team: Group 8

Project: Tastebudz

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We propose the development of TasteBudz, an innovative website that revolutionizes the way users create unique and delightful food recipes. TasteBudz aims to empower users by providing them with a personalized experience, enabling them to discover and craft delicious meals based on the ingredients they already have in their fridge. With the ability to create accounts and save recipes, TasteBudz will become a go-to platform for culinary enthusiasts, home cooks, and anyone else seeking inspiration in the kitchen.

**GitHub** : <https://github.com/CEN4010-Final-Project/FinalProjectDeliverable>

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**Objectives**

1. Develop a user-friendly website that allows users to enter ingredients from their fridge and generate a list of recipes that can be created with those ingredients.
2. Implement an intuitive and efficient search function that takes into account dietary preferences, cooking time, and other relevant factors.
3. Create a secure user authentication system, enabling users to create accounts, save favorite recipes, and interact with the TasteBudz community.
4. Leverage the Spoonacular API to access a vast and meticulously curated food, recipe, and nutrition database, ensuring a comprehensive and reliable resource for recipe recommendations.
5. Promote sustainability and reduce food waste by encouraging users to utilize ingredients they already have, minimizing unnecessary grocery shopping.

**Impact and Benefits**

Empowering home cooks: TasteBudz will empower users to create unique and delicious meals by utilizing the ingredients they already have, fostering creativity and culinary exploration.

Reducing food waste: By encouraging users to use ingredients from their fridge, TasteBudz promotes sustainable cooking practices and helps reduce food waste, contributing to a more environmentally friendly approach to food consumption.

Personalized experience: The user accounts and community features of TasteBudz will create a personalized and engaging experience, allowing users to save recipes, interact with others, and build a collection of favorite recipes.

Promoting healthy eating: TasteBudz can accommodate a range of dietary preferences and provide nutritional information, helping users make informed choices and maintain a healthy lifestyle.

**History Table**

|  |  |
| --- | --- |
| **Revision Date** | **Revision Description** |
| 6.16.23 | Worked on the cover page. Input requirements 1, 5, 6, 8, & 9. |
| 6.17.23 | Began working on input requirements 2&4. Added more content to 2, 4, & 5. Worked on official formatting |
| 6.18.23 | Began working on input requirements 3&7 |
| 6.19.23 | Added diagrams and edited the prompts after all team members reviewed |
| 6.20.23 | Completed final revisions for submission |

**1) Executive Summary**

TasteBudz is a cutting-edge online platform designed to revolutionize the way people approach cooking and meal planning. The application uses its comprehensive features and personalized recommendations to empower individuals of all culinary skill levels to unleash their creativity in the kitchen. By leveraging a vast recipe collection, a powerful API, and intuitive toolset, TasteBudz provides a seamless user experience and a valuable culinary resource.

The core functionality of TasteBudz revolves around its recipe search engine, food and nutrient database, meal planner, and kitchen helper, all supported by its robust API. The API offers developers, businesses, and individuals access to a wealth of detailed food-related data, including over 360,000 recipes, thousands of food products, and an extensive ingredient database. This allows for advanced search capabilities, dietary customization, and value-added services such as meal planning and price estimation.

TasteBudz stands out in the competitive food technology landscape due to its comprehensive data and versatile API. While other platforms may offer similar features, few combine the level of detail and range of functionality that TasteBudz offers. Its intuitive interface ensures a user-friendly experience, guiding individuals through the process of discovering new recipes, planning meals, and understanding nutritional information.

Looking ahead, TasteBudz will continue to innovate and expand to meet the evolving needs of its users. Personalization will be a key focus, with individualized meal recommendations and detailed nutritional analysis becoming even more prominent. Additionally, TasteBudz sees opportunities to integrate with smart kitchen appliances, enabling users to receive recipe suggestions and nutritional information directly through these devices.

In conclusion, TasteBudz is poised to be a leading player in the intersection of food and technology. Its comprehensive database, powerful API, and user-centric features position it as a unique solution for accessing detailed food-related data. Whether for developers, businesses, or individuals, TasteBudz caters to a wide range of needs and provides personalized cooking solutions that empower culinary creativity. As the food tech sector continues to grow, TasteBudz is well-positioned to capitalize on future trends and solidify its position as a go-to platform for food enthusiasts worldwide.

**Features and Functionality**

Ingredient-based Recipe Search: Users can enter the ingredients available in their fridge and receive a tailored list of recipes that can be created using those ingredients, promoting creativity and resourcefulness in the kitchen.

Advanced Search Filters: Users can refine their recipe search based on dietary specifications, cooking time, cuisine types, and more, ensuring they find recipes that suit their preferences and requirements.

Step-by-Step Instructions: Each recipe will provide clear and detailed step-by-step instructions, along with visuals such as images and videos, making it easy for users to follow along and create their culinary masterpieces.

User Accounts and Recipe Saving: Users can create accounts, save favorite recipes, and create a personalized recipe collection, allowing for easy access to beloved recipes and fostering a sense of community and engagement.

Community Interaction: Users can engage with the TasteBudz community by sharing their own recipes, commenting on recipes, and providing feedback, creating a dynamic and supportive cooking environment.

**2) Competitive Analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Platform** | **Recipe Database** | **User Interface** | **Additional Features** | **Price** |
| **Spoonacular** | Curated collection | Traditional and intuitive | API services, menu planning / shopping tools | Free for small quantities, paid per additional request |
| **Yummly** | Curated collection | Traditional and intuitive | Menu planning / shopping tools | Free, supported by advertising |
| **AllRecipes** | User Generated | Varied, user-friendly | Menu planning tools, recipe collections | Free, supported by advertising |
| **Tasty** | Curated collection | Video-based, visual | Recipe videos | Free, supported by advertising |
| **Food.com** | User Generated | Traditional and intuitive | Menu planning tools, recipe collections | Free, supported by advertising |
| **BigOven** | Wide range of recipes | Traditional and intuitive | Menu planning tools, recipe collections | Free, supported by advertising |
| **Edamam** | Curated collection | Traditional and intuitive | API services, menu planning tools | Free limited API calls/day, paid excess use |
| **Epicurious** | Curated collection | Clean and intuitive | Cooking tips and videos, personalized recipe box | Free, supported by advertising |
| **Martha Stewart Recipes** | Curated collection | Elegant & user-friendly | Seasonal and holiday recipes, cooking techniques, meal planning tools | Free, supported by advertising |
| **ChefSteps** | Curated collection | Modern and visually appealing | Detailed cooking techniques, recipe scaling, community forums | Free with subscription-based premium |
| **Cookpad** | User Generated | Simple and intuitive | Recipe sharing & discussions | Free, supported by advertising |
| **Kitchen Stories** | Curated collection | Visually appealing | Cooking photos / videos, techniques, meal plan tools | Free, premium through subscription |

**Comparative analysis**

Recipe Database:

* Spoonacular, Yummly, Tasty, and Edamam offer curated collections of recipes, ensuring quality and variety.
* AllRecipes and Food.com rely on user-generated content, providing a wide range of recipes but with varying quality and consistency.
* BigOven offers a wide range of recipes from various sources, providing a diverse selection.

User Interface:

* Spoonacular, Yummly, AllRecipes, Food.com, and Edamam offer traditional and intuitive interfaces, making it easy to navigate and search for recipes.
* Tasty stands out with its video-based and visually appealing interface, providing a unique user experience.
* Epicurious and Martha Stewart Recipes offer clean and elegant interfaces with a focus on high-quality visuals.

Additional Features:

* Spoonacular, Yummly, Edamam, AllRecipes, and Food.com offer menu planning tools and/or shopping lists for better organization.
* Tasty and Epicurious provide instructional videos and cooking tips, enhancing the cooking experience.
* ChefSteps focuses on detailed cooking techniques and offers a community forum for discussion.
* Kitchen Stories offers step-by-step photos and videos to guide users through recipes.

Price:

* Spoonacular and Edamam offer free access to a limited number of API calls per day, with paid options available for more extensive use.
* Yummly, Tasty, AllRecipes, Food.com, BigOven, Epicurious, Martha Stewart Recipes, ChefSteps, Cookpad, and Kitchen Stories are primarily free to use, with revenue generated through advertising and sponsored content. Some platforms may offer additional paid features or premium content.

**3) Data Definition**

|  |  |
| --- | --- |
| **Data Entity** | **Description** |
| **Recipes** | |
| Recipe ID | A unique identifier for each recipe. |
| Recipe Name | The name or title of a specific recipe. |
| Description | A detailed description or summary of the recipe. |
| Ingredients | The list of ingredients required to prepare a recipe, including their names and quantities. |
| Preparation Steps | Detailed step-by-step instructions for preparing the recipe. |
| Cooking Time | The estimated duration required to complete the cooking process for the recipe. |
| Preparation Time | The estimated duration required for the preparation stage of the recipe. |
| Total Time | The total estimated time required to complete the recipe, including both preparation and cooking time. |
| Serving Size | The recommended number of servings a recipe is intended to yield. |
| Difficulty Level | An indication of the recipe's difficulty level, such as easy, medium, or advanced. |
| Cuisine | The culinary tradition or style associated with the recipe. |
| Dietary Information | Information related to dietary considerations, such as vegetarian, vegan, gluten-free, or allergen-free labels. |
| Nutritional Information | Comprehensive data on the nutritional composition of the recipe, including macronutrients (carbohydrates, proteins, fats), micronutrients, vitamins, minerals, and calories per serving. |
| Ratings and Reviews | User-generated feedback, ratings, and written reviews for the recipe. |
| **Ingredients** | |
| Ingredient ID | A unique identifier associated with each ingredient. |
| Ingredient Name | The name or title of a specific ingredient. |
| Description | A detailed description or overview of the ingredient. |
| Culinary Uses | Information on the typical culinary uses and applications of the ingredient. |
| Dietary Attributes | Information indicating dietary classifications, such as vegan, vegetarian, gluten-free, or allergen-free. |
| Substitutes | Recommendations for alternative ingredients that can be used as substitutes for the ingredient. |
| **Nutrition** | |
| Macronutrients | Detailed information on the composition of carbohydrates, proteins, and fats in recipes and ingredients, including specific values per serving. |
| Micronutrients | Comprehensive data on the presence and quantity of vitamins, minerals, and other essential nutrients in recipes and ingredients. |
| Calorie Content | The total number of calories present in recipes or associated with specific ingredients per serving. |
| **User-Generated Content** | |
| User Profiles | Individual user accounts created on Spoonacular.com, which may include personal information, preferences, and activity history. |
| Ratings and Reviews | User-submitted ratings and written reviews for recipes, providing insights and opinions on their quality, taste, and modifications made. |
| Comments and Discussions | User-generated comments, discussions, and interactions on recipes, ingredients, cooking techniques, and related topics. |
| **Search Results** | |
| Query Results | The outcomes generated by user searches on Spoonacular.com, encompassing relevant recipes, ingredients, articles, videos, cooking tips, and other content based on search criteria. |
| **Interactive Features** | |
| Meal Planning | Tools and functionalities for creating, organizing, and scheduling meal plans using recipes from Spoonacular.com. This includes customizable meal plan duration, meal schedule, and integration with grocery lists. |
| Shopping Lists | The ability to generate and manage grocery lists based on selected recipes or user preferences. It includes ingredient names, quantities, and potentially additional details like aisle numbers for easy shopping. |

**4) Overview, scenarios and use cases**

TasteBudz is an innovative and comprehensive platform designed to empower users in creating delicious meals based on their available ingredients. With a focus on meeting diverse dietary specifications and culinary preferences, our platform offers a range of features to enhance the cooking experience. By integrating Spoonacular's API, we can leverage its extensive food, recipe, and nutrition database, providing users with a reliable and comprehensive resource.

**Scenarios**

Blogging: Culinary bloggers can elevate their content by incorporating TasteBudz into their posts. Users can enrich their recipes with precise nutritional breakdowns, catering to health-conscious readers and providing valuable information.

E-commerce: For online grocery stores, TasteBudz offers a unique value proposition, as they can utilize our platform to provide an extensive recipe library along with personalized shopping recommendations based on selected recipes. This integration enhances the user experience, offering customers convenience and inspiration for their grocery shopping.

Meal Planning Service: Meal planning businesses can optimize their services by leveraging TasteBudz. Our platform grants access to a vast recipe database and detailed nutritional information, enabling businesses to curate personalized meal plans tailored to individual dietary needs, preferences, and budget considerations.

Dietary Management: Healthcare providers developing web-based tools for dietary management can benefit from TasteBudz, which can provide nutritional analysis of meal plans. This can help patients effectively manage their dietary restrictions and health conditions.

App Development: In the future, TasteBudz will seamlessly integrate into health and fitness apps, enabling users to log their meals and directly track their nutritional intake. The platform will provide detailed and accurate nutritional information for a wide array of foods, ensuring users have reliable data for their dietary management.

**Use Cases**

Nutritional Analysis: TasteBudz, powered by Spoonacular's API, offers comprehensive and reliable nutritional data for individual food items and recipes. This feature is invaluable for health and fitness apps, empowering users to track their nutrient intake accurately. It also supports professionals such as dieticians and nutritionists in designing personalized diet plans based on precise nutritional information.

Recipe Search: TasteBudz boasts an expansive recipe database, accessible through Spoonacular's API. Users can effortlessly search for recipes based on specific dietary criteria, available ingredients, or culinary preferences. This functionality streamlines the process of finding suitable and enjoyable recipes, enhancing user satisfaction.

Meal Planning: With TasteBudz, users can generate personalized meal plans tailored to their dietary preferences, nutritional requirements, and budget constraints. Spoonacular's API facilitates this feature by providing recipe suggestions and creating shopping lists, offering users a convenient and tailored meal planning experience.

Price Estimation: TasteBudz, in collaboration with Spoonacular's API, equips users with recipe cost estimates. This functionality proves beneficial for businesses such as restaurants or catering services, enabling accurate calculation of meal costs. Additionally, budget-conscious users and those focused on healthy eating on a budget can leverage this feature for financial planning.

Dietary Preference Management: TasteBudz allows users to filter recipes based on various dietary restrictions and preferences, such as vegetarian, vegan, gluten-free, and more. Through integration with Spoonacular's API, users can easily discover recipes aligned with their specific dietary needs, fostering inclusivity and accessibility.

Ingredient Substitution: TasteBudz, powered by Spoonacular's API, provides users with recommendations for ingredient substitutions. This functionality proves invaluable for users with dietary restrictions, allergies, or limited ingredient availability, offering flexibility and adaptability in their culinary endeavors.

**5 ) Initial list of high-level functional requirements**

User login: This feature will allow users to create and login to an account on the platform, which will provide a more personalized and tailored experience to an individual user such as saving favorite recipes and participating with the community.

Add, delete, view, list favorites: Users will be able to add recipes to their favorites list and delete them when they no longer want it. Listing favorites will allow users an easy way to organize and access preferred recipes making it much more accessible. From these favorites they can view the recipe and its corresponding information.

Search and filters: Search and filters will enable users to find more personalized recipes either by allowing them to search up particular recipes to try and/or allowing users to filter their searches based on dietary needs and ingredients.

Recipe information: This feature will provide users with more detailed information about recipes such as ingredients, videos, step-by-step directions. This comprehensive information will help users understand and follow recipes accurately as they prepare and cook.

Community interaction: Community interaction is a feature that will be designated to logged-in users which will create a community of collaborative and engaging users who want to share their experiences, rating a recipe, and post reviews. This will help other users as they themselves decide which recipes they want to try.

**6 ) List of non-functional requirements**

Simple design: One of the non-functional requirements is a design that is extremely easy to use. This means when a new user comes to use the website they are able to easily pick it up and use all of the website functionally with no problems. This includes not flooding the user's view with distracting information like advertisements

Manageable performance: The site will maintain performance and make sure there is little delay in the speed of loading data. The connection with the database will be in the highest order component, loading and adding content extremely quick. This site is not a real-time system, but if a user is sat with long loading times they will quickly leave for a faster alternative.

Security: We will also prioritize user security by using the most up to date encryption software to protect our users data. We will make sure to do regular security audits to make sure that there is no unwanted web traffic on our site. If a user doesn't have trust in the website's security they would be a lot less likely to entrust it with their personal information such as payment methods.

Accessibility: We will focus on making our site easily accessible. For instance, we will use a color to make sure the site is easily readable for those with impaired vision. We will avoid using colors that hinder legibility. There will be no distracting colors that detract from the website's usefulness. The website will also work across all major web browsers and include a responsive design that works seamlessly across various devices.

Scalability: The application will be designed to accommodate increasing user demand and be able to handle a growing number of recipes and user base without compromising performance. We will use frameworks that allow for ease of scalability allowing for a seamless process.

Reliability: We will ensure that there will be minimal downtime if necessary after major development concludes. There will also be a backup system in place that ensures even if the site runs into a bump and goes down it will have a method to restart itself.

**7 ) High-level system architecture**

Client-Side Components

* User Interface: Renders the TasteBudz website and provides an interactive user interface.
* User Input: Accepting user input for ingredient selection, recipe customization, and other interactions.

Server-Side Components

* Web Server: Receives and handles client requests, manages routing, and delivers appropriate responses.
* Database: Stores recipe data, user profiles, saved recipes, and other relevant information. It provides persistent storage and allows for efficient data retrieval and management.

Third-Party Integrations

* Social Media Integration: Uses firebase to allow users to connect their account to social media to share recipes, and engage on TasteBudz.
* External Service Integration: Integrates with external services, such as online grocery platforms or recipe management tools, to enhance user experience and provide additional functionalities.

Analytics and Monitoring

* Analytics Engine: Uses firebase to collect and analyze user behavior and performance metrics to gain insights into the user experience
* Logging and Monitoring: Monitors overall website performance, logs errors, and generates alerts for potential issues.

**8 ) Team Roles**

* Colton Rohan (Scrum master): Implement and connect the API
* Divyesh Mangapuram (Product owner): Manage the project documentation
* Rohit Varghese (Developer): Configure and test the databases and input queries
* Brandon Pojoga (Developer): Create the website’s base design
* Logan Karstens (Developer): Engineer and develop the application’s pages and UI

**9 ) Checklist**

* Team decided on basic means of communications DONE
* Team found a time slot to meet outside of the class - DONE
* Front and back end team leads chosen - DONE
* Github master chosen - DONE
* Team ready and able to use the chosen back and front-end frameworks - DONE
* Skills of each team member defined and known to all - DONE
* Team lead ensured that all team members read the final M1 and agree/understand it before submission - DONE

**Conclusion**

In conclusion, TasteBudz is an innovative platform that revolutionizes the way users create unique food recipes. By leveraging ingredient-based searches, user accounts, and the Spoonacular API, TasteBudz will empower users, reduce food waste, promote healthy eating, and foster a vibrant community of culinary enthusiasts. TasteBudz main competitive advantage is its Spoonacular API, providing a wealth of data that can be leveraged in many different applications. Our goal is to focus more on the end user experience, providing recipes and meal planning tools directly to consumers. We are excited about the potential impact of TasteBudz and look forward to bringing this innovative platform to life.