Lab 2 – TasteBuddies Software Requirements Specification

Colette Woods

Old Dominion University

CS411W

Dr. Sarah Hosni

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1 Introduction

1.1 Purpose

The purpose of this document is to provide a detailed blueprint of a mobile application called TasteBuddies. The document is meant to be read by those who work on the application's development.

1.2 Scope

The TasteBuddies software analyzes tastes to personalize restaurant and dish recommendations for an individual or group. The app shall generate personalized recommendations to an individual, predicting dishes and restaurants palatable to the diner, also called a tasteBuddy. A live feed and social features enhance the experience by combining group dynamics, crowd-sourced updates, and rewards.

The application is primarily designed to allow a potential diner to interact with the app to show preferences for tastes, restaurants, and dishes. The app will use this data to connect the diner to other diners with similar preferences, thus generating recommendations based on fellow diners' insights within the parameters of localized area and selected criteria.

To address group indecision, TasteBuddies offers diners the option to add friends to a group, allowing the application to generate a selection of restaurants that best satisfy individual preferences within the group.

Restaurants interact with the app to verify dishes, promote specials, and provide updates about their establishment. Insights shall be offered regarding the clientele, reviews, and potential diners' interaction with the restaurant.

The application is strictly for dining purposes, and shall not be used for dieting, meeting new people, or finding the nearest clean commode.

1.3 Definitions, acronyms, and abbreviations

Crowdsourced Data: User-generated data on restaurant wait times, dish availability, and quality, and other topics of interest.

Curated Reviews: Reviews presented and weighed based on users with similar Taste Profiles.

Daily Dish Report: Provides live updates from TasteBuddies and restaurants such as the latest reviews, specials, and dishes.

Data Clustering: Grouping diners in a similar group to determine taste profiles and recommendations.

Dining Filters: Ability to filter restaurants by location, cuisine, occasion, and levels of business activity.

Generic Reviews: The issue of unauthentic online reviews, which the app addresses by focusing on personalized recommendations.

Google API: An external tool integrated into an app that provides real-time data on business activity levels and location data.

Group Dining Algorithm: Algorithm that combines multiple users profiles and provides reviews for restaurants and dishes that best match the group preferences.

Group Indecision: Conflicting opinions and preferences of a group lead to more difficult decision making which causes delays.

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Overwhelming Choice: An excessive number of options to choose from which makes decisions difficult.

Recommendation Algorithm: Algorithm that provides users with relevant recommendations based on their matched TasteBuddies, taste profile, and interacted content.

Restaurants: Venue that provides a sit-down dining experience where primary revenue is prepared food. It must have a nice bathroom.

Safe Space: Space where people are free to express and enjoy their interest without fear of being judged.

Social engagement: Promote users to interact with one another and be involved within the community.

Super TasteBuddies: Taste influencers or food experts that have specialized knowledge and can recommend specific cuisines or dishes.

Tailored Recommendations: Personalized recommendations based on a user's taste profile.

TasteBuddies: Users with highly similar taste profiles which lead to improved recommendations based on aligned tastes.

Taste Matching Algorithm: Key Algorithm of the app that pairs users based on similar taste profiles.

Taste Profiles: Personalized profiles created by each user based on their taste preferences, such as preferences for spicy, sweet, salty, etc.

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1.5 Overview

This document details the TasteBuddies mobile application. It first outlines the purpose and scope of the system, followed by key definitions and references in Section 1. Section 2 discusses the overall system description, including its architecture, user interfaces, and operational features. Section 3 details specific functional requirements that must be met, such as the system's inputs and outputs, and non-functional requirements, like security constraints, organized by mode of operation (system mode). Each section is structured to provide a clear understanding of the system's intended functionality, constraints, and operational environment.

2 Overall description

2.1 Product perspective

The TasteBuddies application shall perform analysis on user and restaurant data using algorithms to connect similar tastes to provide recommendations for diners. The application inputs are user interactions including logins, taste preferences, dish information, reviews, allergens, updates, and adding friends and diners to follow. The taste preferences and allergens are connected to the login and shall be read by the taste matching algorithm and fed into the recommendation algorithm to output recommendations personalized to the login account. The taste matching algorithm and following function will output a live feed called the Daily Dish consisting of dish recommendations and live updates from followed tasteBuddies and restaurants. Data analytics combined with user reviews shall drive the output for restaurant users to output statistics of how users interact with the app along with the restaurant's tasteBuddy demographics, in addition to reviews of their restaurant.

The real-world product of TasteBuddies is arranged as a three-tier architecture system. The presentation layer for diners consists of a mobile application platform to provide input into the app and receive output relating to recommendations and live interactions. Restaurants shall be able to

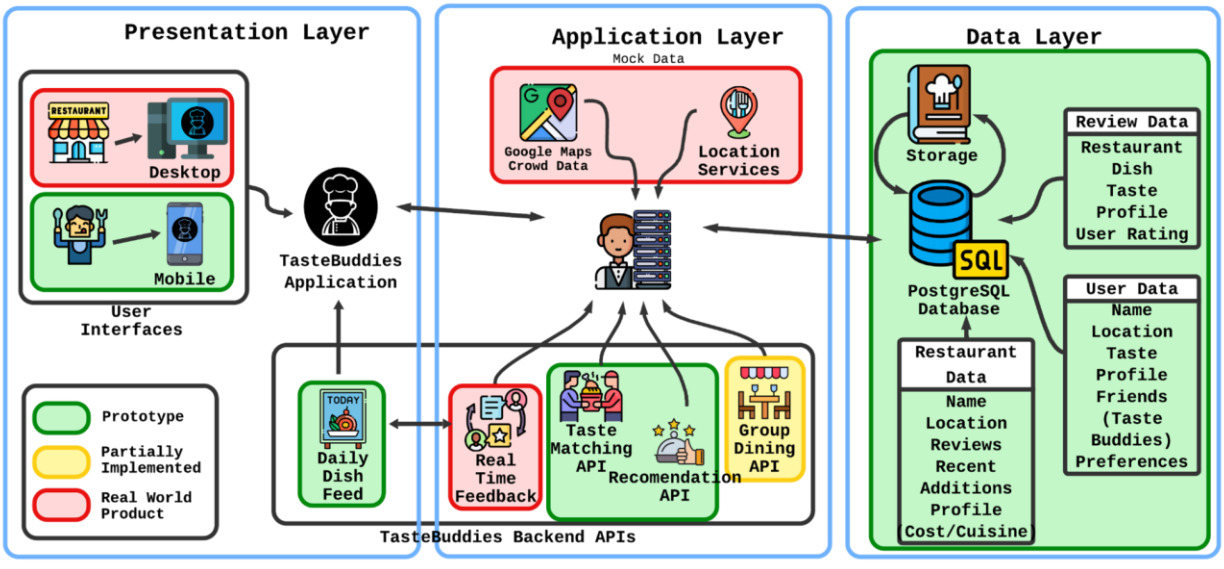
access it from a web application accessible on a desktop or mobile device where they shall interact with the presentation layer providing restaurant and dish information as input and analytics and tasteBuddy demographic information as output.

Once the user has input information from the presentation layer, data is sent to the application layer which utilizes location services and integrated APIs which then pulls data from the database layer to formulate a match or recommendation. Data from the user will also be stored in the database layer for the purpose of refining the algorithm and future functional use. The data formulated by the API will then be presented back to the user in the presentation layer.

This data flow allows for the creation of the dynamic Daily dish feed, social networking features, and personalized recommendations which allows TasteBuddies to transform the dining experience.

Figure 1

Multifunctional Components Diagram



2.1.1 System interfaces

The real-world product shall utilize the React framework for the front-end utilizing HTML, CSS, and JavaScript. The real world's backed will operate in the Flask framework using the Python language with the Database using PostgreSQL The prototype shall be written using CSS and HTML supporting the front end, Python in the backend, and SQLAlchemy using Flask as our framework using Jinja in the frontend and SQLite for the backend.

2.1.2 User interfaces

The application will have a separate user interface for each type of user: tasteBuddies, restaurants, and admin.

2.1.2.1 A tasteBuddy will interact with the program primarily through a mobile application using haptics to navigate between screens and provide functionality. Typed input is accepted to write detailed reviews and input key information such as login credentials. The application shall accept the following input from a tasteBuddy as valid:

- Buttons for app navigation, confirmation, and selection
- Text input for username and password, reviews, and additional allergen information.
- Radio dials to indicate level of satisfaction and criteria such as allergens and dietary restrictions.

The interface shall be accessible to all who would typically be expected to interact with it. The expected set of users are people aged 16 and over who can read and view information.

2.1.2.2 Restaurants shall interact with the program using buttons for navigation and selection as well as typing for updating dish information. The interface shall have similar functionality to that of the tasteBuddy user as detailed in 2.1.2.1.

2.1.2.3 The user interface for the administrator shall be desktop based, where the administrator may make changes to the database, view analytics, and be able to delete users. This user interface is implemented in the real-world product only. The interface shall be accessible to only those with administrator privileges including:

- Development staff
- Database administrators
- Authorized TasteBuddies personnel familiar with the software documentation.

2.1.3 Hardware interfaces

The real world tasteBuddy user interface of the application shall use a mobile platform with a touchscreen allowing full screen display of the application. The mobile device shall require:

- A minimum of 4 GB RAM
- A minimum of 64 GB of storage
- A 64-bit processor
- Either Android Marshmallow (6.0) or later release, or iOS 8 or later release

The prototype may be run in the form of a full-screen desktop display or of a shell contained in a computer window. All commands deliverable to the system shall be able to be input via a hardware keyboard or via an on-screen keyboard operated either through a touch screen, mouse, or comparable controller. Minimum device requirements are as follows:

- A minimum of 8 GB RAM
- Dual-core processor
- Minimum 1920x1080 display
- Updated browser (Chrome recommended)

Admin user interface shall utilize the basic command line interface for input and output operations to handle administrative tasks.

2.1.4 Software interfaces

2.1.4.1 The real-world product of the tasteBuddies user interface shall require:

- Either Android Marshmallow (6.0) or later release, or iOS 8 or later release.
- Location Services (GPS)
- The prototype requires an updated web browser, with a recommendation for Chrome.

2.1.4.2 The restaurant user interface requires an updated web browser with a recommendation of Chrome.

2.1.1.3 The administrator user interface requires a command line that can accept python and SQLAlchemy inputs.

2.1.5 Communications interfaces

The system shall communicate with the database using Restful API to use HTTPS protocol to exchange data in a JSON format to ensure safe data transmission.

2.2 Product functions

The product functions include the taste matching algorithm, the taste profile builder, the recommendation algorithm, and the group matching algorithm which are the core innovations of TasteBuddies.

The taste matching algorithm matches users to other users with similar taste profiles based on user input and interactions. The Taste profile builder generates a summary of a tasteBuddy's taste using quantified data. The Recommendation algorithm generates dish and restaurant recommendations based on taste matching which pulls data accumulated by the taste profile builder. The Group matching algorithm provides restaurant recommendations to accommodate several tasteBuddies taste profiles in a group.

The prototype fully implements the core features outlined above and omits less innovative technologies that the real-world product shall observe. The prototype entirely focuses on the diner eliminating features tailored for restaurants to promote its uniqueness and refine the core features.

Figure 2

Real World Product (RWP) vs Prototype

Category	Features	RWP	Prototype	Additional Notes
Account Management	Account Creation			
	Login / Authentication		Eliminated	
	Access Permissions and Preferences		Partially Implemented	Access Permissions required for database
	Taste Profile			
Mobile App Features	Social Engagement		Partially Implemented	Find friends only for group matching
	Daily Dish Feed			
	Group Restaurant Matching		Partially Implemented	Implementation is time dependent
	Dish Recommendations			
	Taste Profile Builder			
	Reviews		Partially implemented	Mock data for compatibility matching
	Community Updates		Eliminated	
	Dish Validation		Eliminated	
	Taste Matching			
	Notification Features		Eliminated	
	Engagement Features		Eliminated	
Database Management	Data Analytics		Eliminated	
	Data Privacy and Security			
	Trend Reports		Eliminated	
	Data Backups			

2.3 User characteristics

The primary users of the TasteBuddies apps include all people who enjoy eating. A special focus is turned to college students and their friends, who will be the primary targets of the prototype due to their level of education, technological savvy, and social nature to allow for greater use. The real-world product would also focus on adults who have a desire to eat and want to decide on an establishment quickly. Families with selective eaters are also a target, with hopes to find an acceptable restaurant with little hassle, allowing them to enjoy their family rather than bicker with them. Event organizers who need to accommodate many guests and procure a venue will also find the app useful. Travelers who are unfamiliar with an area can use TasteBuddies when they're feeling hungry for a satisfying experience.

Our real-world product would also include restaurant management, who would use the app to validate their dishes and promote their restaurant to potential clientele.

2.4 Constraints

Further constraints to the app beyond hardware and software interface constraints from Section 2.1 is that it will be limited to one user per account. The system shall only search the selected localized area as to not overload the database. The system must be connected to the internet to allow the flow of data and provide live updates.

2.5 Assumptions and dependencies

The TasteBuddies system relies on several assumptions and dependencies to ensure functionality and a seamless user experience. The system will utilize Google API for location services and analytics, providing precises and informed recommendations. A continuous internet connection is essential for delivering real-time updates and recommendations, allowing diners to receive the most current dining insights and personalized suggestions.

The success of the application depends on restaurant participation, providing accurate dish information including availability and allergens. The recommendation algorithm's effectiveness is dependent upon achieving a critical mass of users to ensure meaningful and diverse dining suggestions can be achieved. Furthermore, the recommendation algorithm is dependent on diner data being accurate and helpful to provide depth that allows the platform to make smart matches and recommendations.