

PROTOTYPE



# TasteBuddies

*"Dine with confidence"*

Team Iron  
Fall 2024



# Today's Menu

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# Meet the Team



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Creative Director  
Maître d'



Grant Fitch  
Project Lead  
Iron Chef



Ben Nissley  
Webmaster / Frontend Developer  
Sommelier / Cicerone



Andrew Miller  
Mentor  
Conseiller Culinaire



Oronde' Brown  
Backend Developer  
Saucier



Ashley Barasebwa  
Frontend Developer  
Grillardin



Nate Donald  
Database Developer  
Rôtisseur



# Problem Statement

Despite the fact that dining out offers a rich experience—bringing people together and enhancing social bonding—rising inflation has shifted the behavior of many Americans. With inflation up and restaurant prices increasing by 4.1%, 68% of Americans are now choosing to eat at home.<sup>[8]</sup> This means that people are missing out on new culinary experiences and the well-being benefits of communal dining.<sup>[4]</sup> Furthermore, with the overwhelming number of restaurant choices and generic reviews, finding the perfect dining option has become a risky financial decision, leaving many diners hesitant to explore new venues.



# Problem Characteristics



## High Financial risk:

With restaurant prices outpacing inflation, dining out has become a more expensive and risky decision for the average consumer. In recent years, United States food prices rose by 25%. <sup>[11]</sup>

## Overwhelming Choice:

Customers experience indecision when selecting dishes, making it difficult to confidently choose meals they will enjoy based on taste.

## Generic Reviews:

Online reviews may not accurately reflect the customer's personal taste, leading to dissatisfaction in the dining experience. About 30% of online reviews are fabricated. <sup>[9]</sup> How do you know which reviews to believe?

## Group Indecision:







Studies show that group decisions regarding where to eat are heavily influenced by social environment.<sup>[12]</sup> Can lead to individuals eating at places they do not enjoy just to fit in with the group and avoid conflict.

# Solution: Dine With Confidence

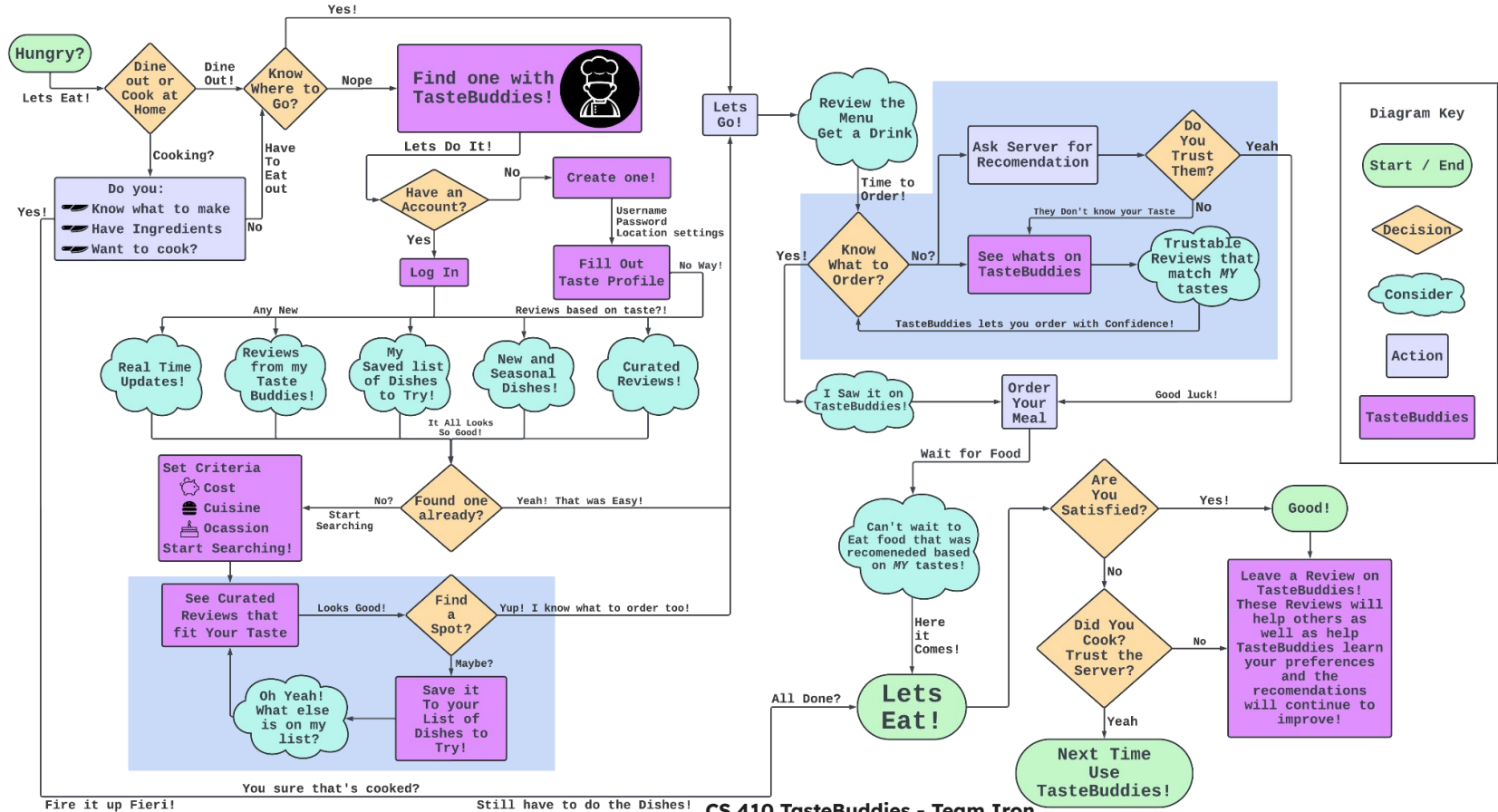
TasteBuddies is a smartphone app that will provide tailored restaurant and dish recommendations based on taste profiles. TasteBuddies will use data clustering to connect users with others who share similar preferences, offering relevant suggestions rather than generic reviews. TasteBuddies dynamically enhances user confidence with real-time feedback from crowdsourced data on dish quality and level of business, adding a layer of insight to support an optimal dining experience.

By using TasteBuddies, diners are more likely to end up with a meal they truly enjoy, while reducing the stress of sifting through irrelevant reviews, enhancing their overall dining experience. Restaurants will also benefit from fewer complaints, less food waste, and happier customers who are more likely to return, give positive reviews, and tip well.

# Solution Characteristics

-  **Personalization:** Our revolutionary app will provide personalized dish and restaurant recommendations tailored to individual tastes rather than offering a one-size fits all approach
-  **Tailored Recommendations:** Instead of relying on broad, generic reviews, the app connects users with others who have aligned taste profiles, offering relevant reviews and a customized dining experience
-  **Customer Satisfaction:** By offering recommendations based on individual preferences, the app helps customers get a better value for their money, and food they truly enjoy, enhancing the dining experience.
-  **Reduced Waste:** With more accurate recommendations, fewer dishes are sent back due to dissatisfaction, reducing food waste and lost revenue for restaurants.
-  **Increased Tips:** Happier customers lead to increased tips for working staff and more positive reviews, benefiting restaurant owners and workers.
-  **Crowdsourced Real-Time Updates:** Our platform empowers users to share live updates on restaurant conditions, from wait times and menu availability to special events, ensuring a dynamic and responsive platform that adapts to users' real-time dining needs.

# Solution Process Flow





# Product Prototype Ingredients

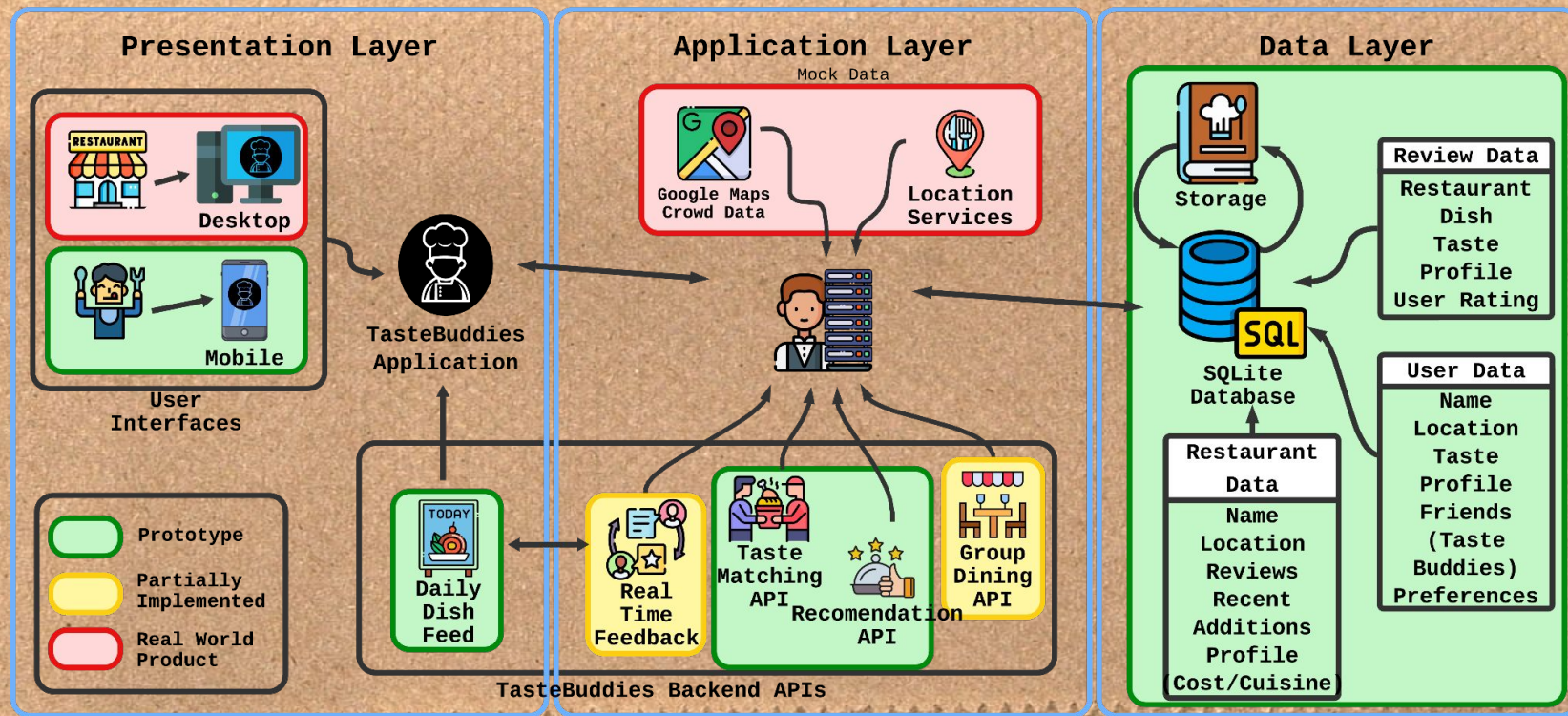
Category	Features	RWP	Prototype	Additional Notes
Account Management	Account Creation	👨	👨	
	Login / Authentication	👨	Eliminated	
	Access Permissions and Preferences	👨	Partially Implemented	Access Permissions required for database
	Taste Profile	👨	👨	
Mobile App Features	Social Engagement	👨	Partially Implemented	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	👨	👨	

Category		Features	RWP	Prototype	Additional Notes
Expanded User Mobile App Features	Social Engagement	TasteBuddies	👨	👨	
		Super TasteBuddies	👨	Partially implemented	Hard coded
		Add/Find Buddies	👨	👨	
		Follow TasteBuddy	👨	Eliminated	
		Follow Restaurant	👨	Eliminated	
		Add Kudos	👨	Eliminated	
	Live Interactive Updates	Daily Dish feed	👨	👨	
		Add reviews	👨	Partially implemented	Mock data provided
		Post restaurant update	👨	Eliminated	
		Post dish update	👨	Eliminated	
		Notifications	👨	Eliminated	
	Recommendation Engine	Taste Profile	👨	👨	
		Read Reviews	👨	Partially Implemented	
		Taste Matching	👨	👨	
		Dish Recommendation	👨	👨	
		Group Restaurant Matching	👨	Partially Implemented	Implementation time dependent
		Rewards	👨	Eliminated	
		Adaptive Taste Profile personalization	👨	Eliminated	Need active data over time
	Search	Restaurant filtering	👨	Eliminated	
		Dish filtering	👨	Eliminated	
	Engagement features	Rewards	👨	Eliminated	
		Badges	👨	Eliminated	
		Challenges	👨	Eliminated	

# Kitchen Aids (Development Tools)

		Planned	Actual
<b>Frontend</b>	Framework:	React	Flask with Jinja2
	Languages:	HTML, CSS, Javascript	HTML, CSS, Javascript
<b>Backend</b>	Framework:	Flask	Flask with SQLAlchemy
	Languages:	Python	Python
<b>Testing Frameworks</b>		Pytest, Jest & Maestro	PyTest
<b>Story &amp; Issue Tracker</b>		Trello & Github Issues	Github Issues
<b>Version Control</b>		Git through Github	Git through Github
<b>Documentation Tool</b>		Pydoc, JSDoc	PyDoc
<b>Database</b>		PostgreSQL	SQLite

# Major Functional Components Diagram









# Whats on the Grill

Task		Status
Dish Review	Create UI for Dish Reviews	Completed
	Connect UI to Dishes	In Progress
	Store and Update Dish based on review	In Progress
Dish and Restaurant	Restaurant Pages	Completed
	Dish Pages	Completed
Daily Dish	UI for displaying featured dishes and scroll for all other cards	Completed
	Logic for displaying reviews and recommendations	Completed
	Display Live Updates	In Progress

# Sprint Breakdown

## Sprint 0: Project Setup

- 🍔 Version Control, Git
- 🍔 Trello Board & Github Issues
- 🍔 Initial Repository Structure

## Sprint 2: User Accounts (2/8 - 2/19)

- 🍔 Account Creation
- 🍔 Taste profile setup
- 🍔 Add/View Buddies

## Sprint 1: Foundation (1/24 - 2/7)

- 🍔 Framework for Frontend UI
- 🍔 Framework for Backend
- 🍔 Setup database schema
- 🍔 Connect Everything

Feb 26  
Demo 1

## Sprint 3: Reviews & Social (2/20 - 3/5)

- 🍔 Dish Review Function
- ~~🍔 Mock Data for Dishes, Restaurants, Reviews and User Taste Profiles~~
- ~~🍔 Simple Taste Matching~~

**Guest Check**

Date	Table	Guests	Server
			302701

APPY · SOUP/SAL · ENTREE · VEG/POF · DESSERT · BEV

**Rush Order!**

Logic and UI for Dishes & Restaurants

Tax: \_\_\_\_\_ Total: \_\_\_\_\_

www.coybopapp.com GC3632-1

Guest Receipt

Date	Amount	Guests	Server
			302701



# Sprint Breakdown

## Sprint 4: Recommendations (3/6 - 3/19)



Implement the Daily dish feed



Dish recommendation



March 26  
Demo 2

## Sprint 5: Daily Dish Feed (3/20 - 4/9)



Suggest Tastebuddies



Resolve UI decisions



Refine Taste Matching



(Group Dining)

April 23  
Demo 3

May 5  
Final  
Prototype

## Sprint 6: Polish & Finalize (4/10 - 4/30)



Testing & Bug fixes



Polish UI



Review and Improve algorithms

# User Stories: TasteBuddy



## As a TasteBuddy diner, I shall...

Fully  
Implemented



- create a personalized taste profile so I can get tailored restaurant recommendations
- find people I know on the app.
- see dish recommendations and how compatible I am with a dish based on my taste profile.
- receive a restaurant recommendation when I create a group with other TasteBuddies.
- modify and further build my taste profile
- view a live feed called the Daily Dish feed that provides recommendations and live updates from users and restaurants I follow.
- connect with other diners who share my taste preferences so I can get relevant recommendations

Partially  
Implemented



- find restaurants that other people with similar tastes enjoy so that I can dine with confidence
- see ratings and reviews from people with similar taste preferences so I can make informed dining decisions
- receive notifications about specials from restaurants that match my taste profile
- rate and review restaurants to help other diners with similar tastes

Not  
implemented



- have my taste profile altered based on my dish feedback and reviews.
- search for specific dishes near me to find restaurants that serve food I like
- track my dining experiences and preferences to improve future recommendations
- earn rewards through the reward system so I can get discounts at restaurants I enjoy
- filter recommendations based on cuisine type, location, and price range
- participate in the crowdsourcing system to help keep information accurate and up-to-date

# User Stories: Restaurant

## As a Restaurant owner/manager, I shall...

Not  
Implemented

- reach diners who are most likely to enjoy my restaurant's offerings
- maintain an updated profile of my restaurant's menu and specials
- receive feedback from diners who match our restaurant's taste profile
- understand what dishes are most popular among different taste profiles
- participate in the reward system to encourage customer loyalty
- access analytics about customer preferences and dining patterns
- respond to customer reviews and ratings
- showcase our restaurant's specialties to targeted customers
- receive notifications when our information needs updating
- connect with other diners who share my taste preferences so I can get relevant recommendations
- verify information reported by users about our restaurant
- view data about what potential customers in our area are searching for



# User Stories: Administrator

## As an administrator, I shall

Fully  
Implemented



- access analytics about customer preferences and dining patterns
- implement and maintain data privacy measures
- ensure data accuracy and system security
- backup system data

Not  
implemented



- analyze app usage patterns to improve user experience
- manage the reward system
- maintain and optimize the taste matching algorithm
- monitor and validate the crowdsourcing system
- handle user support requests and feedback
- maintain API integrations for location services and mapping
- monitor system performance and implement optimizations
- manage database operations and maintenance
- view data about what potential customers in our area are searching for
- manage user profiles and authentication systems
- generate reports on system usage and user engagement

# User Stories to Tasks



## Account Management

Feature	Task	User Story	User Type
Account Creation	Build a taste profile tied to account creation	create a personalized taste profile so I can get tailored restaurant recommendations	TasteBuddy
Access Permissions	Set up access permissions	Implement and maintain data privacy measures	Administrator
Taste Profile	Build and implement algorithm for developing taste profile	modify and further build my taste profile	TasteBuddy

# User Stories to Tasks



## Mobile App Features

Feature	Task	User Story	User Type
Dish Recommendations	Implement item-based collaborative filtering	see dish recommendations and how compatible I am with a dish based on my taste profile.	TasteBuddy
Taste Matching	Build algorithm that matches users to similar tastes to match dishes using k-means clustering	connect with other diners who share my taste preferences so I can get relevant recommendations	TasteBuddy
Daily Dish Feed	Implement the Daily Dish Feed to show restaurant and dish recommendations	view a live feed called the Daily Dish feed that provides recommendations and live updates from users and restaurants I follow.	TasteBuddy
Group Restaurant Matching	Build and implement group matching algorithm	receive a restaurant recommendation when I create a group with other TasteBuddies.	TasteBuddy
Social Engagement	Implement basic search	find people I know on the app.	TasteBuddy

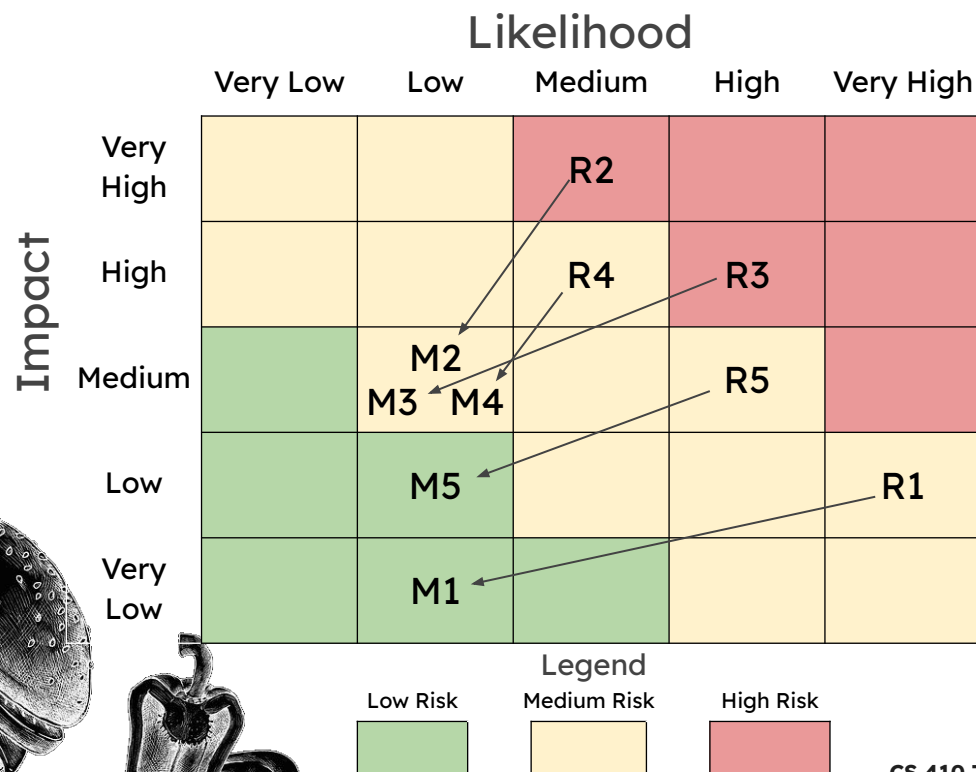
# User Stories to Tasks



## Database Management

Feature	Task	User Story	User Type
Data analytics	Use database to analyse data	access analytics about customer preferences and dining patterns	Administrator
Data Privacy and Security	Comply with data privacy regulations and implement access permissions based on user roles	implement and maintain data privacy measures	Administrator
	Create different levels of access permissions and type checks	ensure data accuracy and system security	Administrator
Data Backups	Implement method and policy for backing up data in timely intervals	backup system data	Administrator

# User Risk Matrix



## Risks

Prototype   Partial/Mock   Real World Product

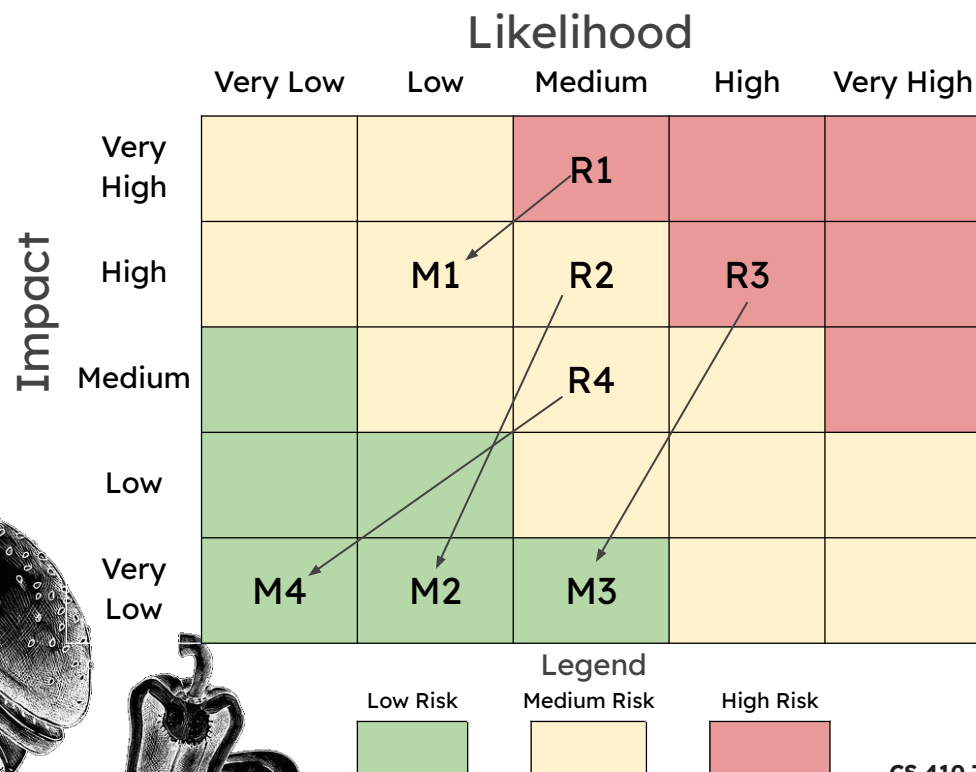
- R1: Fake Profiles and Reviews
- R2: User satisfaction with their recommendations
- R3: User Participation and Retention
- R4: Users evolving taste preferences
- R5: Users not wanting to share data

## Mitigations

- M1: Checking for duplicate accounts and emails, ensuring emails are unique by checking for dot agnostic and + tags for potential false emails.
- M2: Allow user feedback on recommendations
- M3: Implement milestone-based Badges and rewards system for leaving reviews, and send reminder notifications to encourage participation
- M4: Allow users to update preferences and periodically prompt users for updates, "Do you still like..."
- M5: Allow users to opt in or out of data collection for specific features



# Customer Risk Matrix



## Risks

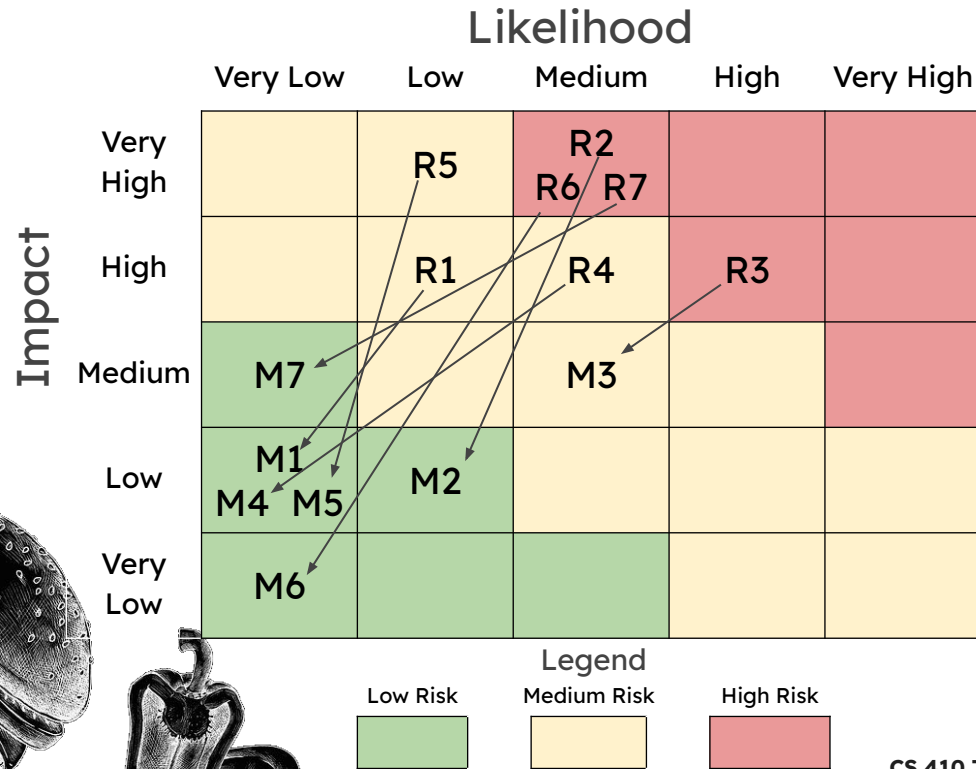
Prototype Partial/Mock Real World Product

- R1: Restaurants will not upgrade to premium accounts
- R2: Matching with closed restaurants
- R3: Matching with outdated dishes
- R4: Users may feel overwhelmed by excessive notifications

## Mitigations

- M1: Offer trial subscription to premium accounts and data-driven insights for the success of other restaurants with premium accounts
- M2: Enable users to report a restaurant closure with a review process to prevent misuse, as well as reviews triggered by events (ending subscription)
- M3: Enable user feedback as well as send periodic reminders to restaurants to verify dish availability
- M4: Allow users to customize notification settings  
Limit notifications restaurants can send based on subscription tier

# Technical Risk Matrix



## Risks

Prototype Partial/Mock Real World Product

- R1: Inaccurate recommendations due to error in algorithm
- R2: Not enough users to create a reliable database
- R3: Credentials / Data Compromisation
- R4: App performance issues
- R5: Server downtime
- R6: User refuses location services
- R7: Loss of Cell/Internet Connection

## Mitigations

- M1: Thorough User feedback forwarded to development team to improve algorithm along with thorough testing
- M2: Conduct an initial survey among foodies/employees to populate data. Prototype only; extensive mock data.
- M3: Use Best Practices for Cybersecurity
- M4: Optimize codebase for speed and efficiency
- M5: Use reliable hosting services with automatic failover and scaling capabilities. Implement backup and recovery plan
- M6: Allow user to search by Zip Code or City
- M7: Notify user, store recent suggestions in cache

# Legal & Security Risk Matrix

		Likelihood				
		Very Low	Low	Medium	High	Very High
Impact	Very High			R2 R3		
	High			R1		
	Medium		M2 M3			
	Low		M1			
	Very Low					
		Legend				
		Low Risk	Medium Risk	High Risk		

## Risks

Prototype   Partial/Mock   Real World Product

- R1: Civil lawsuits against the app including potential user disputes or trademark violations
- R2: Data privacy regulations and potential mishandling of user data
- R3: Allergens not listed in dish description

## Mitigations

- M1: Detailed terms and conditions for both users and restaurant that must be agreed to before use.
- M2: Obtain explicit user consent in the initial terms and conditions before collecting any personal information to ensure compliance with data privacy laws, including GDPR, CDPA, and the Privacy Act of 1974
- M3: Require restaurant provided dishes to be tagged with any allergens. User submitted dishes will be tagged as 'Unverified Allergens' until the restaurant provides appropriate tags



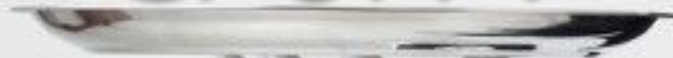
TasteBuddies



*Thank you*



Q & A





# Grant's orders

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Taste Profile:

Work with Ben on initial and revisited taste profile. Needs to track individual steps and ensure data is being saved

Also need to be able to change!

Tax

Total

www.royalpaper.com GC3632-1

Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Daily Dish:

Display real time updates

Work on review display algorithm so it displays users higher matches

Follow back?

Tax

Total

www.royalpaper.com GC3632-1

Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Logic for evolving taste profile. Build into review once basic review structure is created.

Allow negative reviews to alter initial taste profile based on feedback.

Tax

Total

www.royalpaper.com GC3632-1

Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

www.royalpaper.com GC3632-1

Guest Receipt

Date	Amount	Guests	Server
			302701



# Colette's orders

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Work with Ashley  
and Oronde on  
group matching  
page

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Put finishing  
touches on  
friends page to  
make it more  
dynamic and  
visually show  
added friends  
along with group  
match button

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Attach  
write-review page  
to dish\_detail  
page

Tax

Total

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### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Clean  
presentation for  
next round and  
clean UI elements

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701



# Ashley's orders

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Collaborate with  
Chef's Colette &  
Oronde on group  
matching

Tax

Total

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### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Display friends  
in group matting  
UI

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Logic for keeping  
the information  
from a deleted user

Tax

Total

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### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Verify  
restaurant  
suggestions  
during group  
creation

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701



# Ben's orders

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Debug pages for  
tastebuddies  
algorithms

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Edit front end  
of daily dish feed  
for live updates  
feature

Continue work  
on taste profile  
pages

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Tweak front end  
to use same  
styling on all  
templates

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Updating 411  
TasteBuddies website  
on githubpages

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701





# Nate's orders

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Connect database with elements on the frontend and backend. Most of this is done now with our existing tables. This overlaps with the daily dish feed.

Tax

Total

www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Ability to delete live updates or automatically delete live updates after a set time. Maybe auto delete after 3 hours? Maybe delete after 3 users say it is irrelevant? Soft delete or hard? I reckon hard delete.

Tax

Total

www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Daily Dish, how is it stored in the database?

We have this mostly figured out. It's basically a conglomerate of the data from a bunch of tables. Live update may or may not be worked into this.

Tax

Total

www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Ability to remove friends. Really we just need to make the UI more intuitive, this will come in our polishing sprints

Tax

Total

www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

# Oronde's orders

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Connect current  
routes for create  
groups and  
matching with  
Group matching  
page

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701

## Guest Check


Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Finish creating  
and  
implementing  
logic for group  
recommendations

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701


## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701


## Guest Check

Date	Table	Guests	Server
			302701

APPT - SOUP/SAL - ENTREE - VEG/POT - DESSERT - BEV

Tax

Total

 www.royalpaper.com GC3632-1

### Guest Receipt

Date	Amount	Guests	Server
			302701



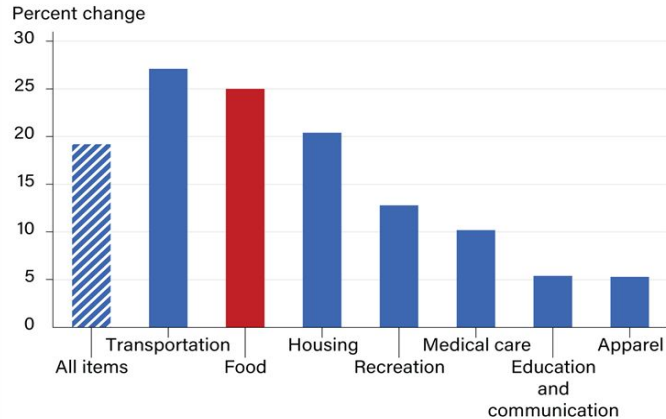


# References

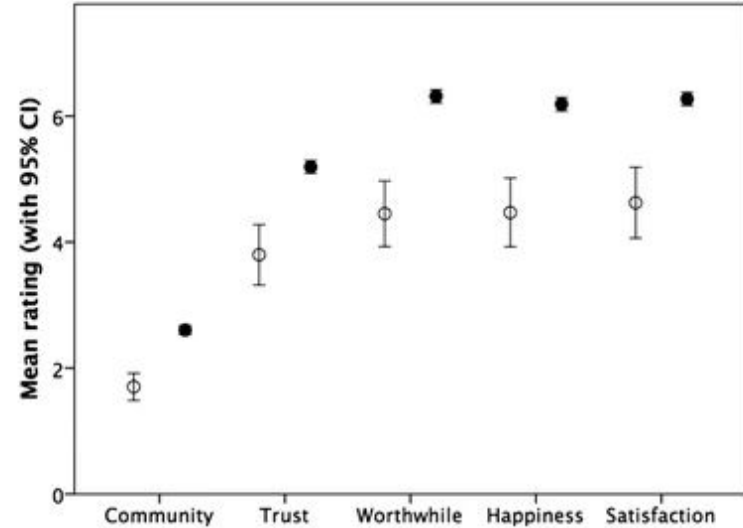
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# Appendix

Price change for major Consumer Price Index (CPI) categories, 2019-23



Source: USDA, Economic Research Service using U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index data.<sup>[11]</sup>



Mean rating (with 95% confidence interval)  
Open symbols represent those who always eat evening meals alone.  
Close symbols are those who at least sometimes ate with others.<sup>[17]</sup>

# Appendix (Matching Algorithms)



## Collaborative Filtering

Collaborative filtering is one of the most common algorithms used for recommendation systems and can be applied to matching TasteBuddies.

### User-Based Collaborative Filtering:

Identifies users who have similar taste preferences (e.g., similar restaurant ratings or dish preferences).  
Matches users based on their shared preferences, creating a group of TasteBuddies who enjoy similar dining experiences.

### Item-Based Collaborative Filtering:

Analyzes similarities between restaurants or dishes based on user ratings.  
Groups users who rate similar items positively, assuming that they share similar tastes.

### Implementation:

Use cosine similarity, Pearson correlation, or Jaccard index to measure the similarity between users.

## Matrix Factorization

Matrix factorization is a machine learning technique commonly used in recommendation systems.

### How It Works:

Decomposes a user-item interaction matrix (e.g., ratings of dishes or restaurants) into latent factors.  
Matches users with similar latent factors, representing hidden patterns in preferences.

### Algorithms:

Singular Value Decomposition (SVD)  
Alternating Least Squares (ALS)

### Benefit:

Captures complex relationships between users and preferences beyond simple correlations.

## Content-Based Filtering

This algorithm focuses on matching users based on the attributes of their taste profiles and dining preferences.

### How It Works:

Uses the attributes of a user's taste profile (e.g., preference for spicy, salty, sweet dishes, or dietary restrictions).  
Matches users with similar attributes and preferences.

### Implementation:

Represent user preferences as vectors and use cosine similarity or Euclidean distance to find the closest matches.

## Graph-Based Algorithms

Graph-based approaches model user relationships and interactions as a network.

### How It Works:

Represent users and their interactions (e.g., shared preferences or mutual likes) as a graph.  
Apply graph algorithms to identify similar users or clusters.

### Algorithms:

#### PageRank:

Identifies influential users (Super TasteBuddies) based on their connections within the graph.

#### Community Detection:

Identifies tightly connected groups of users with shared preferences.

### Implementation:

Use libraries like NetworkX (Python) to build and analyze user graphs.

## Clustering Algorithms

Clustering algorithms group users into clusters based on their taste profiles and preferences.

### K-Means Clustering:

Groups users into clusters based on their taste preferences.  
Users in the same cluster are matched as TasteBuddies.

### Hierarchical Clustering:

Creates a hierarchy of user groups based on their preferences, allowing for finer granularity in matches.

### DBSCAN:

Groups users with dense taste similarity while ignoring outliers.

### Implementation:

Use user profile data as input features for clustering.  
Cluster users and recommend TasteBuddies within the same group.