TasteBuddies

Team Iron
Fall 2024

Today's Menu

Meet the Team

Colette Woods
Creative Director
Maître d'

Grant Fitch
Project Lead
Iron Chef

Ben Nissley
Webmaster / Frontend Developer
Sommelier / Cicerone

Oronde' Brown
Backend Developer
Saucier

Ashley Barasebwa
Database Developer
Grillardin

Nate Donald
Backend Developer
Rôtisseur

The Dish (background)

🍔 Everyone eats

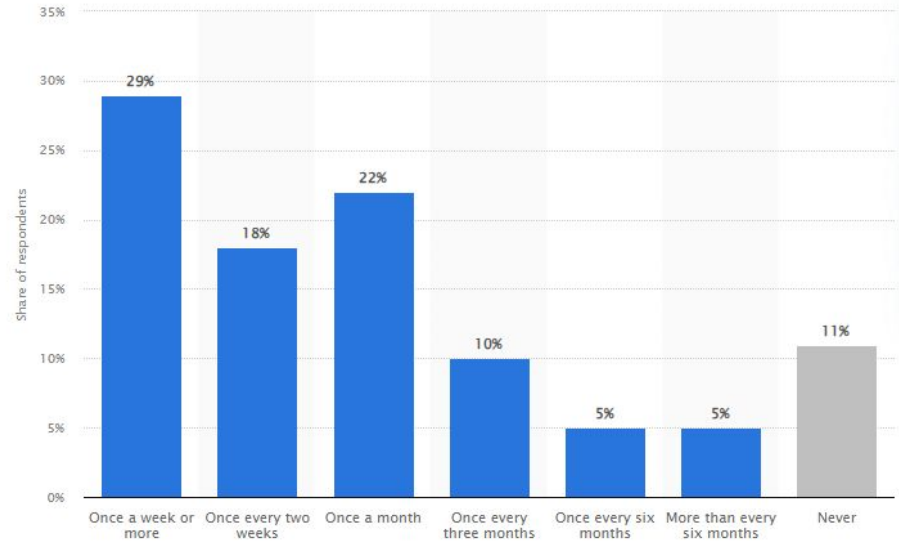🍔 In 2023, Americans spent $1.5 Trillion dining out[1]

🍔 Family spending on dining out has increased year after year, passing pre-pandemic levels[2]

🍔 Travelers spend 25% of their budget dining out[3]

Frequency of eating out at a restaurant in the United States as of January 2022

Source: Statistica [4]

The Dish

🍔 Dining out is used for several occasions, be it graduations, dates, or just promotes stronger bonding

🍔 Research suggests that communal eating increases an individual's wellbeing, social bonding, and happiness[5]

🍔 50% of American diners prefer to dine out in a group[6]
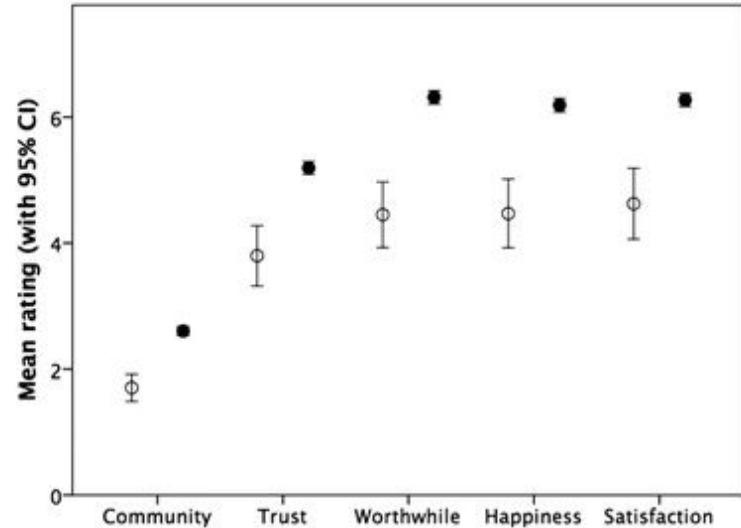
Mean rating (with 95% confidence interval)
Open symbols represent those who always eat evening meals alone.
Close symbols are those who at least sometimes ate with others. [7]

The Deep Dish

So why not just eat at home with family and friends?

🍔 **Time**
🍴 It takes time to cook, and people have busy schedules.

🍔 **Space**
🍴 Not everyone can accommodate all their friends and family

🍔 **Tastes**
🍴 Who's cooking? Vegan Val might not find any suitable dishes at Carnivore Carl's house.

🍔 **Skill**
🍴 Not everyone is capable of cooking at home.

Top 5 Reasons Gen Z & Millennials Don't Cook More at Home

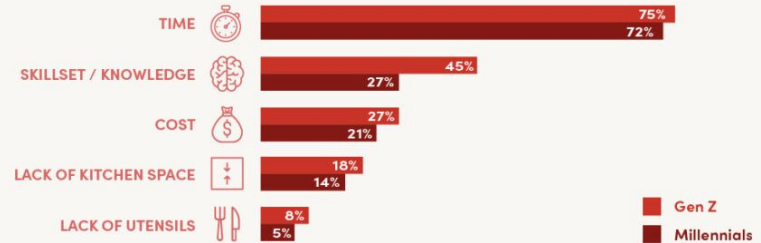|	Gen Z	Millennials
TIME	75%	72%
SKILLSET / KNOWLEDGE	45%	27%
COST	27%	21%
LACK OF KITCHEN SPACE	18%	14%
LACK OF UTENSILS	8%	5%

Image Source: [8]
https://www.homeruninnpizza.com/news-blog/fun-facts/cooking-habits-gen-z-millennials/

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The Deep Dish

Working/studying from home? How will you see others? Invite them to your house? No! Meet at a restaurant.

They provide:

🍔 Social engagement
🍔 Safe space
🍔 An opportunity to bond over food without the hassle.

But wait...

Which restaurant will you go to?

🍔 You can look at online reviews, but they can be unreliable, resulting in inefficient decision making [9]

🍔 Besides, what does your buddy want to eat? How can you find a place that suits both of you?

🍔 By the time you decide on a place, you may as well have cooked something. What can help you?

The Deeper Dish

🍔 Inflation is up 2.53% over the year with restaurants up 4.1%, affecting the price of dining out and wages not keeping up with these increases.[10][11]

🍔 The financial risk may cause people to avoid going to a restaurant for a possibly disappointing experience.

Food prices have risen more than wages and overall inflation

Percent change from January 2019 to May 2024
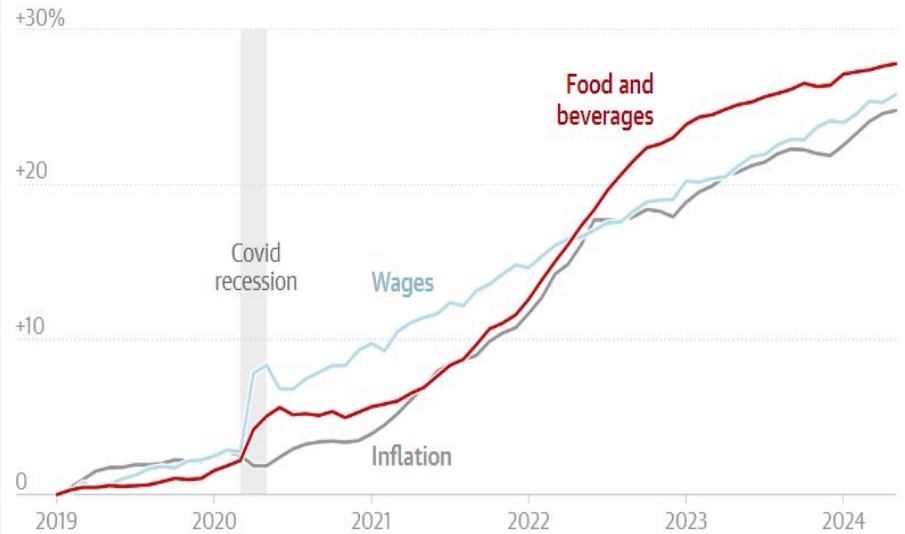
Guardian graphic. Source: Company profit growth is calculated using a recent quarterly SEC filing compared to the same quarter two years prior. Companies' quarterly calendars differ, their most recent profits range from late 2023 to early 2024. US workers' wage growth from BLS is the change in the inflation adjusted median weekly earnings of private employees. Food and beverage and inflation figures from BLS. Source: T. Perkins [13]

Problem Statement

68% of Americans are eating at home instead of going to restaurants due to general inflation and the 4.1% price increase of restaurants compared to eating at home that has dropped by 0.2%.[10] While there are benefits to eating at home, people miss out on new culinary experiences and social bonding which shows strong correlation with wellbeing.[5] The difficulty of finding worthwhile restaurants best suited to an individual or group is a risk many are not willing to take. There is no current assured way to dine out and enjoy the company of others without risking disappointment and financial loss.

Problem Characteristics

🍔 **Inflation rates** on dining out are up 4.2% while eating at home is only 1.2%, making eating out significantly more expensive than dining at home. [5]

🍔 **Food prices have risen** more than the average worker's salary in the U.S. [13]

The Cost of Eating Out Continues to Rise Faster Than the Cost of Food at Home
% change in US consumer price index, March 2023-March 2024

Food away from home: 8.8% 8.6% 8.3% 7.7% 7.1% 6.5% 6.0% 5.4% 5.3% 5.2% 5.1% 4.5% 4.2%
Food at home: 8.4% 7.1% 5.8% 4.7% 3.6% 3.0% 2.4% 2.1% 1.7% 1.3% 1.2% 1.0% 1.2%

March 2023, April 2023, May 2023, June 2023, July 2023, Aug 2023, Sep 2023, Oct 2023, Nov 2023, Dec 2023, Jan 2024, Feb 2024, March 2024
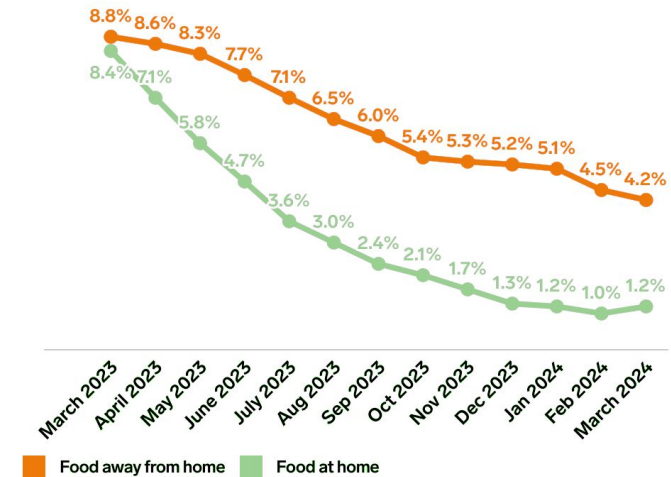
■ Food away from home ■ Food at home

Image Source: [14]

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Problem Characteristics (continued)

🍔 **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%. [15]

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

Percent change
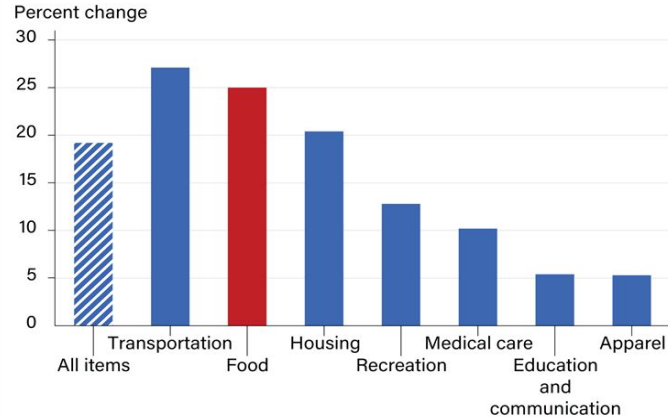
Source: USDA, Economic Research Service using U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index data.

Problem Characteristics (Continued)

🍔 **Mismatched Expectations:** 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. [11] How do you know which reviews to believe?

Above: a fake review generated by AI [16]

🍔 **Difficulty in Dish Selections:** Customers experience indecision when selecting dishes, making it difficult to confidently choose meals they will enjoy based on taste.

Problem Characteristics (continued)

🍔 **Group Indecision: Studies show that group decisions regarding where to eat is heavily influenced by social environment.[17] Can lead to individuals eating at places they don't enjoy just to fit in with the group and avoid conflict.**
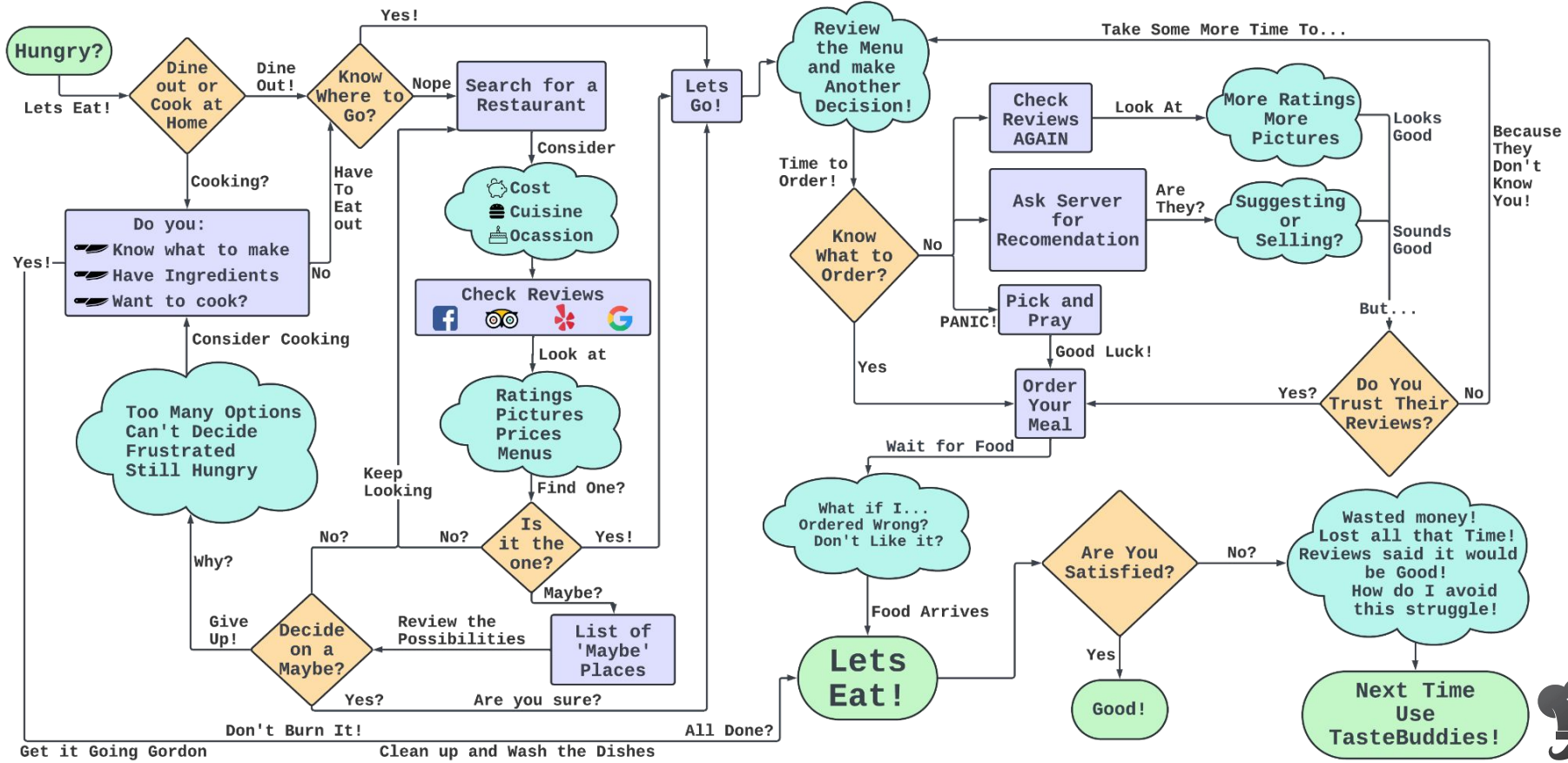
- Sarah hates spicy foods, but Jerry lives for spice. Meanwhile, Ted wants vegan options. They need something that can combine their needs and tastes so they can enjoy a meal together again.

Current Process Flow

Diagram Key

Start / End — Decision — Consider — Action

Hungry? → Lets Eat! → Dine out or Cook at Home → Dine Out! → Know Where to Go? → Yes! → ...

Dine out or Cook at Home → Cooking? → Do you: Know what to make, Have Ingredients, Want to cook?

Know Where to Go? → Nope → Search for a Restaurant
Know Where to Go? → Have To Eat out → No

Search for a Restaurant → Consider → Cost, Cuisine, Ocassion → Check Reviews → Look at → Ratings Pictures Prices Menus → Find One? → Is it the one?

Is it the one? → Yes! → Lets Go!
Is it the one? → No? → Decide on a Maybe?
Is it the one? → Maybe? → List of 'Maybe' Places

Do you: ... → Consider Cooking → Too Many Options Can't Decide Frustrated Still Hungry → Why? → Decide on a Maybe?

Decide on a Maybe? → Give Up! → Too Many Options...
Decide on a Maybe? → Review the Possibilities → List of 'Maybe' Places
Decide on a Maybe? → Yes? → Are you sure?

Get it Going Gordon — Don't Burn It! — Clean up and Wash the Dishes — All Done? → Lets Eat!

Lets Go! → Review the Menu and make Another Decision! → Time to Order! → Know What to Order?

Review the Menu and make Another Decision! ← Take Some More Time To...

Know What to Order? → No → Check Reviews AGAIN → Look At → More Ratings More Pictures → Looks Good → But...
Know What to Order? → No → Ask Server for Recomendation → Are They? → Suggesting or Selling? → Sounds Good → But...
Know What to Order? → PANIC! → Pick and Pray → Good Luck! → Order Your Meal
Know What to Order? → Yes → Order Your Meal

More Ratings More Pictures / Suggesting or Selling? → But... → Do You Trust Their Reviews?
Do You Trust Their Reviews? → Yes? → Order Your Meal
Do You Trust Their Reviews? → No → Because They Don't Know You!

Order Your Meal → Wait for Food → What if I... Ordered Wrong? Don't Like it? → Food Arrives → Lets Eat!

Lets Eat! → Are You Satisfied?
Are You Satisfied? → Yes → Good!
Are You Satisfied? → No? → Wasted money! Lost all that Time! Reviews said it would be Good! How do I avoid this struggle! → Next Time Use TasteBuddies!

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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. Instead of guessing if a review is relevant, TasteBuddies users can rely on aggregated data that is catered to their taste.

By using TasteBuddies diners will get the most out of their dining experience, reducing dissatisfaction, while restaurants 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 tailor-made 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 a more accurate and customized dining experience

🍔 **Customer Satisfaction:** By offering recommendations based on individual preferences, the app helps customers get a better value for their money, 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

Solution Process Flow
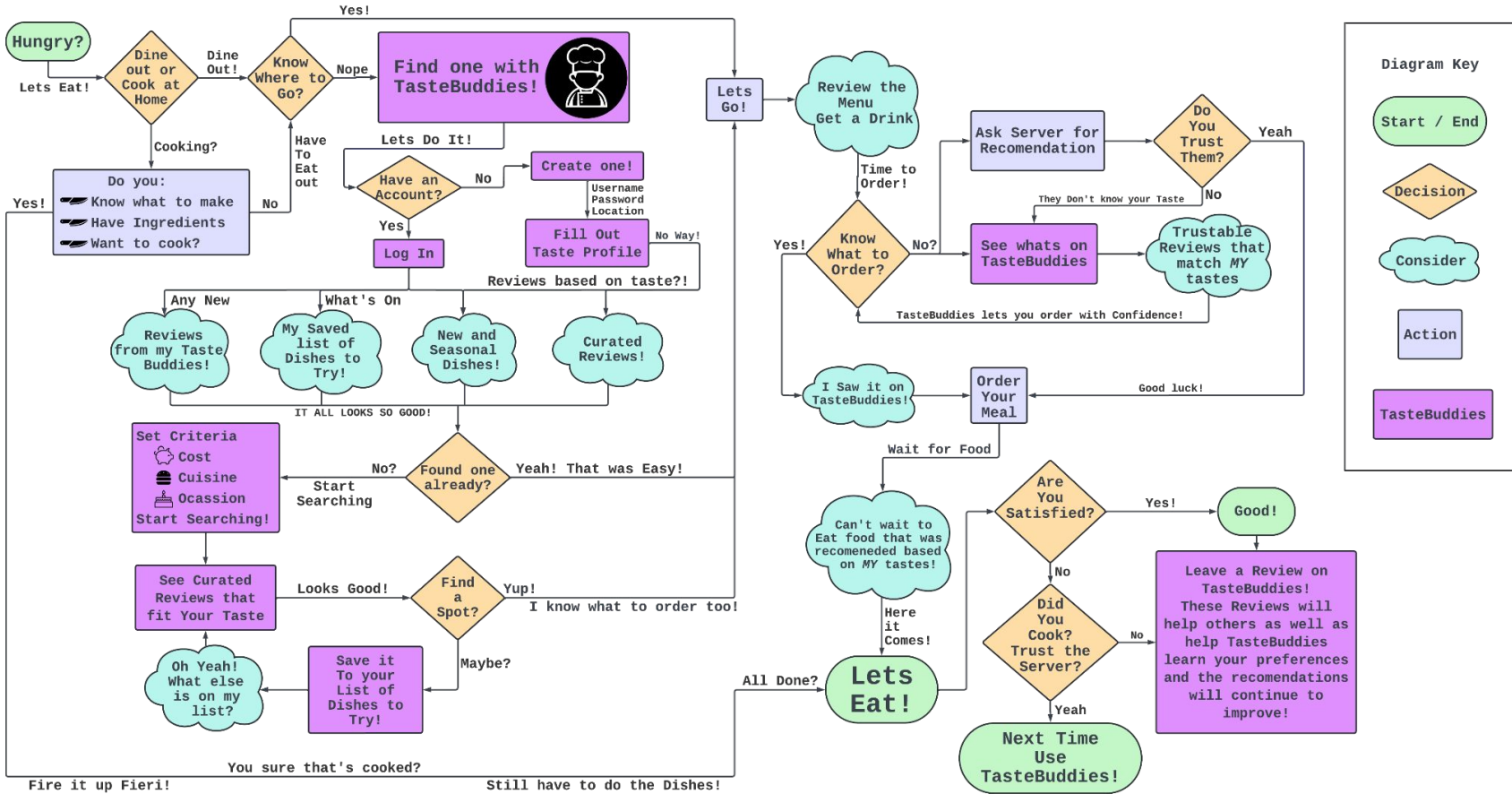
Steakholders

Local Economy Feasts on Diners

Respondents of the OnePoll study say that restaurants help boost their local economies by:

67%
providing jobs locally

65%
encouraging spending in the local area

43%
increasing footfall in the area

26%
encouraging people to move to the area
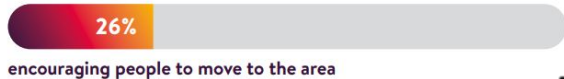
Source: OpenTable Restaurant Impact Report [18]

Stakeholders

🍔 Restaurants attract more visitors.
🍔 Increased foot traffic supports surrounding businesses, creating a positive effect in the local economy.
🍔 The more guests enjoy their dining experience, the more likely they will spend impulsively.[19]

Community Wellbeing

Stakeholders

🍔 **People** will be encouraged to eat out more, increasing socialization and wellbeing, promoting a sense of wellbeing when connected to the community whilst reducing social isolation [5] [20]

🍔 **Local event organizers** may have options of where to hold their event or eat thereafter, increasing community bonds while bolstering the local economy.

Restaurants win

Customers

🍔 Increased Customer Satisfaction
🍔 Less Food Waste
🍔 Increased Revenue
🍔 Potential for regular clientele
🍔 New Dishes land
🍔 Targeted Client Outreach
🍴 Subscription allows notifications about featured dishes and other updates

Everyone Eats, and Everyone Wants to Eat Well.

Users

🍔 **Adventurous Eaters**
🍴 People looking to try new things and explore different cuisines.

🍔 **Conservative Eaters**
🍴 Users who prefer familiar foods but may be in a new location and want reliable recommendations.

🍔 **Travelers**
🍴 People from out-of-town are always looking for a dining spot

🍔 **Foodies**
🍴 Whether looking for a new place to review, post on your blog, or just please your buds, TasteBuddies has you covered.

TasteBuddies Will Provide..

Social
Engagement

Taste
Profiles

Intelligent
Systems

...Social Engagement

🍔 **Tastebuddies**: Connect with users who share highly similar taste profiles for accurate suggestions.

🍔 **Super Tastebuddies**: Follow taste influencers for expert recommendations in specific cuisines or dishes.

🍔 **Opt-in notifications** for seasonal dishes or specials that users loved previously.

...Taste Profiles

🍔 Users can select their favorite restaurants and dishes, as well as to input their preferences for core taste components, including spicy, salty, sweet, sour, and savory. These preferences will be used to create a personalized taste profile.

🍔 Uses machine learning to continuously refine taste profiles and improve recommendation accuracy.

🍔 Recommendations are based on the collective data of users with similar profiles.

🍔 Filters for allergies, dietary restrictions, and preferred dining experience.

Intelligent Systems

🍔 **Prioritizes reviews** and ratings from users with similar taste profiles and preferences, ensuring relevant feedback.

🍔 **Match restaurants** to fit the preferences of a group, perfect for company dinners or family outings.

🍔 **Recommends dishes** based on the user's current mood.

TasteBuddies Will Not

🍔 Provide recommendations for non-restaurant establishments or experiences

🍔 Offer health advice or weight loss recommendations

🍔 Prioritize generic reviews from all users

🍔 Offer food delivery or pick up

🍔 Offer budgeting tools

Competition Matrix

Feature	TasteBuddies	yelp	Tripadvisor	Google	facebook	Foodaholix
Taste Profiles	👨‍🍳					
Personalized Dish Recommendations	👨‍🍳					
Lifestyle Personalization	👨‍🍳	👨‍🍳				
Restaurant Reviews	👨‍🍳	👨‍🍳	👨‍🍳	👨‍🍳	👨‍🍳	
Dish Review	👨‍🍳					👨‍🍳
Followers	👨‍🍳	👨‍🍳			👨‍🍳	👨‍🍳 *
Restaurant Notifications	👨‍🍳				👨‍🍳	👨‍🍳
Group Restaurant Matching	👨‍🍳					

Kitchen Aids / Chef Knives? (Development Tools)

Integrated Development Environment (IDE) - VSCode

Version Control - Git through GitHub.

Continuous Integration (CI) and Continuous Deployment (CD) - GitHub Actions & Workflows

Selected Language (Backend) - Java for the app and python for any ML.

Selected Language (Frontend) - HTML,CSS, JS for the site. JavaFX or Swing for an application but I should look into mobile app languages that work on android and IOS like react native. Could just do it in android studio and ignore ios for sanity reasons and just never address it. In my mind the mobile app is just a UI for communicating with the back end so it shouldn't be too difficult.

Testing Framework(s) - PyTest for Python, Jest for JavaScript, and Junit for Java.

Documentation Tool - pydoc for Python, JSDoc for JavaScript, and Javadoc for Java.

Major Functional Components

Presentation Layer

🍔 **User Interface**
- Smartphone app
- Web applications

🍔 **Social Features**
- TasteBuddies
- SuperTasteBuddies
- DailyDish Feed contains new Dishes and Curated Reviews

🍔 **Dining Filters**
- Location
- Cuisine
- Occasion

Application Layer

🍔 **Web Server**
🍔 **User Profile Manager**
- User registration, login and preferences

🍔 **Restaurant and Dish Database**
🍔 **Taste Matching Engine**
🍔 **Recommendation Engine**
🍔 **Group Dining**
- Pair with other users for recommendations

🍔 **Location Services**
- Required for local recommendations

Data Layer

🍔 **PostgreSQl Database**
- Review Data
- User Data
- Restaurant Data

🍔 **Storage Container**
- Cloud Storage
- Other data such as images

🍔 **Other External API**
- Google Location for connecting to local reviews

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Major Functional Components Diagram
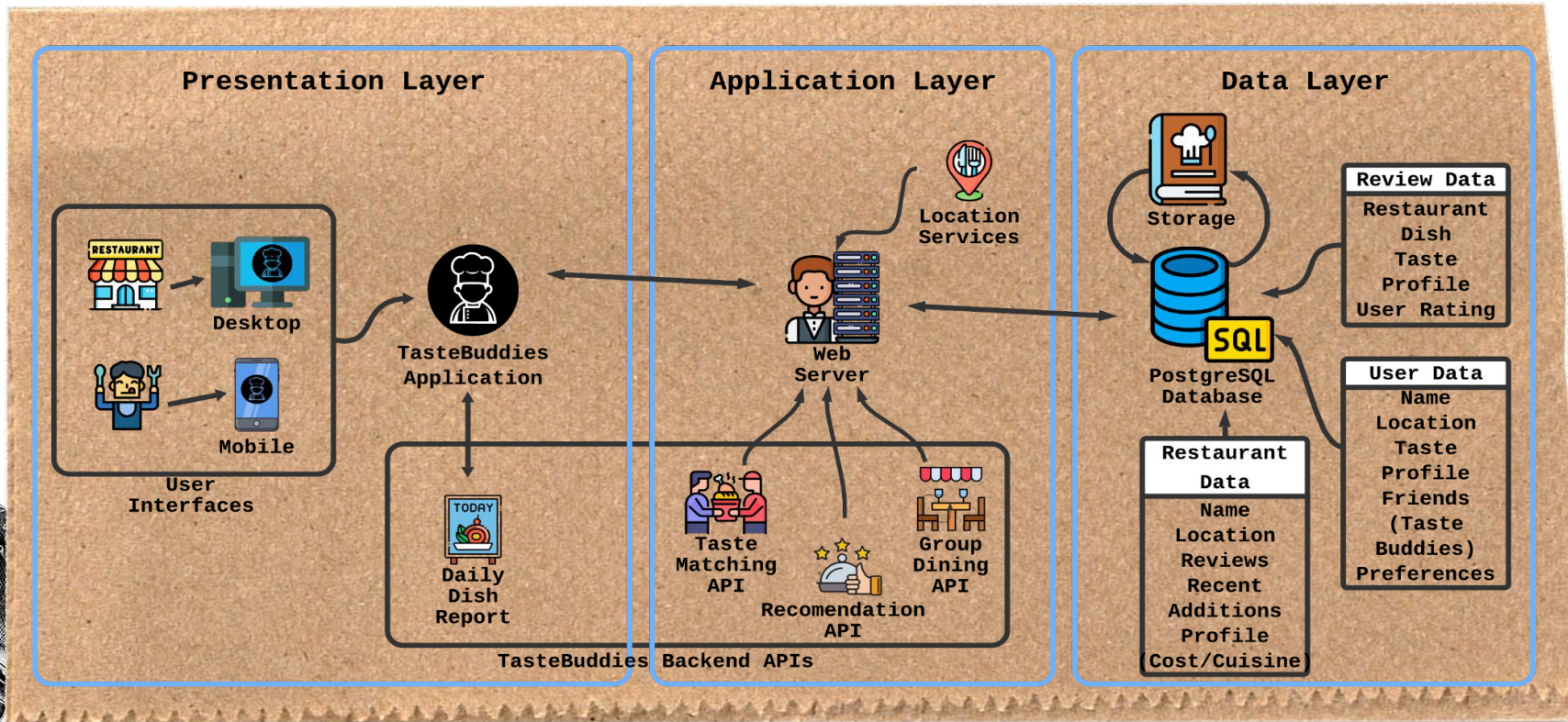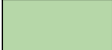
User Risk Matrix

Likelihood

	Very Low	Low	Medium	High	Very High
Very High			R2		
High			R4	R3	
Medium		R2 R3 R4		R5	
Low		R5			R1
Very Low		R1			

Impact

Legend

Low Risk   Medium Risk   High Risk

Risks
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: Require users to tie accounts to phone numbers and ban phone numbers from websites that provide temporary phone numbers
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

Likelihood

	Very Low	Low	Medium	High	Very High
Very High			R1		
High		M1	R2	R3	
Medium			R4		
Low					
Very Low	M4	M2	M3		

Impact

Legend

Low Risk	Medium Risk	High Risk

Risks
R1: Restaurants wont 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

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Technical Risk Matrix

Likelihood

Impact	Very Low	Low	Medium	High	Very High
Very High		R5	R2 R6 R7		
High		R1	R4	R3	
Medium	M7		M3		
Low	M1 M4 M5	M2			
Very Low	M6				

Legend
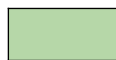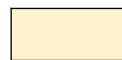
Low Risk	Medium Risk	High Risk

Risks

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: User feedback forwarded to development team to improve algorithm
M2: Conduct an initial survey among foodies/employees to populate 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
Very High			R2 R3		
High			R1		
Medium		M3 M3			
Low		M1			
Very Low					

Impact (vertical axis label)

Legend
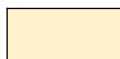
Low Risk	Medium Risk	High Risk

Risks
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

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