Project Plan

Tasteful Panthers: Food Recommendation at Dining Halls

Team Members
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Meetings
Initial meeting to discuss the plan: August 29, 2025 at 2:30 pm
Scheduled biweekly meetings starting on September 12, 2025 at 5 pm

Goal and Motivation
- The goal of Tasteful Panthers is to provide a personalized dining recommendation platform for Panther Dining Hall (PDH).
- We want to improve the campus dining experience by simplifying the meal decision process and providing a connected mobile platform for PDH guests to interact via food reviews.
- Tasteful Panthers also aims to improve PDH service/quality by allowing guests to report any food issues to PDH staff through the app.

Approach
- **Personalized Recommendations**:
  Guests can receive personalized dining recommendations
  - With personalized dining recommendations, guests can receive tailored meal suggestions as they walk into PDH.
  - The app will take user data and feedback such as dietary restrictions/preferences, past meal choices, and food reviews/interactions to provide guests with a daily food recommendation that fits their individual tastes.
  - This feature ensures that guests are immediately aware of dining options that fit their preferences.

- **Reviews & Suggestions**:
  Guests can write reviews on food items
  - Guests have the ability to leave feedback on their food through reviews, sharing their thoughts on the various components that made up their meal.
  - This feature allows guests to provide any satisfactions as well as issues pertaining to their food.
  - Reviews help other guests to make informed decisions.
  - App notifies users to post reviews 10-20 minutes after entering PDH to encourage review submissions.

Guests can write suggestions for food items

- Guests have the ability to suggest meals for the staff to bring to PDH
- This feature allows for a more tailored dining experience for students at Florida Tech
- Suggestions can be voted on by users with the most popular suggestions having the best chance of coming to the dining hall

Guests can view meal/review/suggestion information

- Guests have the ability to view meal, review, and suggestion metrics in the form of:
- Crowd Favorite: The dish that has the highest rating that day.
- Your Favorite: The dish available that day which the guest rated highest in the past. Tasteful Twin
- Meal Recommendation: The meal recommended to a certain guest based on our meal recommendation algorithm.
- Tasteful Twin: Another user that the guest is most similar to based on meal history along with the list of dishes that both users like.

- **Engagement & Incentives**:
  Guests can receive incentives for making reviews/interacting with the app
  - To boost engagement, guests can participate in contests with leaderboards, such as:
  - Top Reviewer of the Week: Guests can write multiple reviews, which are rated by other guests (e.g. like or not). Reviewers are ranked on the number of positive ratings their reviews receive. Top users are displayed on a weekly leaderboard. Guests can view their ranking from the dashboard as well as the reviewer leaderboard for the entire app population.
  - Tomorrow's Prediction: Guests will be able to predict the highest rated food item for the next day, which will depend on tomorrow's review ratings associated with the food item.

- **Staff Dashboard**:
  Dining staff can interact with reviews that have issues
  - PDH staff can engage directly with low rated reviews that pose issues with food quality or a problem with the dining environment.
  - Reviews that highlight an issue will be marked with a red flag, and once the issue is resolved, dining staff can flip this flag to green to alert guests of the fix.
  - Reviews will stay active for guests to confirm that the issue was handled.

Novel Features/Functionalities

1. GPS-Enabled Personal Recommendation
   - This falls under both a feature and functionality of the app.

- Guest's real-time location will be used to send the personal meal recommendation as a notification on their mobile device when near PDH.
- This ensures that guests receive a timely recommendation rather than one that occurs at a random time or location.

2. High-Level Meal Prediction Algorithm
    - The meal prediction algorithm is one of the key features of *Tasteful Panthers*. It analyzes each guest's dining history, preferences, and reviews to suggest meals they are most likely to enjoy.
    - The system takes into account factors such as personal preferences, dietary restrictions, trending meals, and how users interact with reviews. It can also leverage similarities between users to provide more accurate recommendations.
    - Recommendations are based on guests with similar tastes, recommending items that they like. These guests are referred to as Tasteful Twins.
    - While advanced AI techniques may be explored, the initial version will rely on keywords and tags from user profiles and reviews

Algorithms and Tools

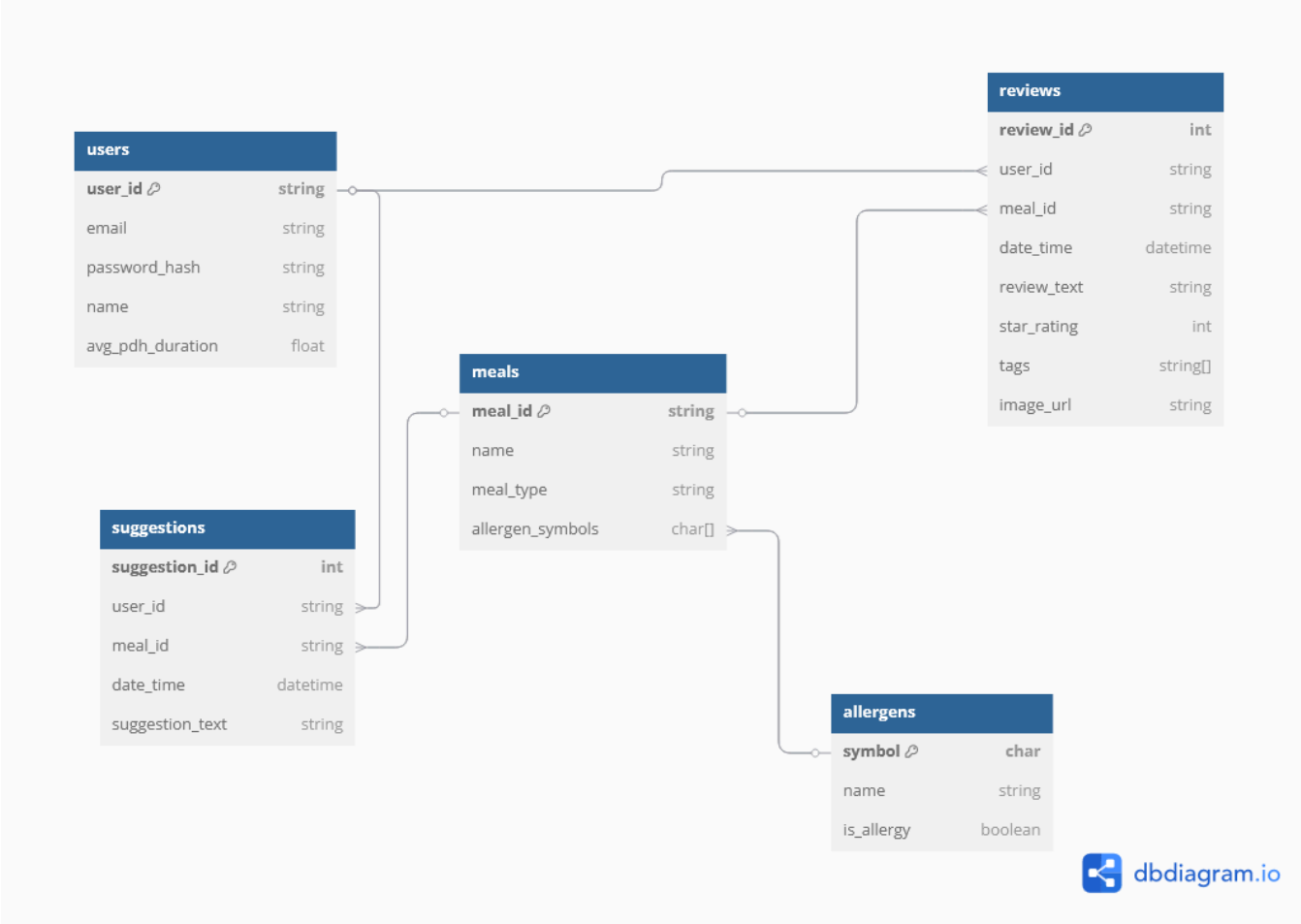
- Frontend: Flutter (Dart) cross-platform development.
- Backend: Firebase (authentication, encryption, and database).
- Algorithms:
    - Python-based web scraping to retrieve PDH menus.
    - Keyword filtering and collaborative filtering for meal recommendations, we will need to program this ourselves.
- Testing Environment: Android Studio emulator.

Technical Challenges

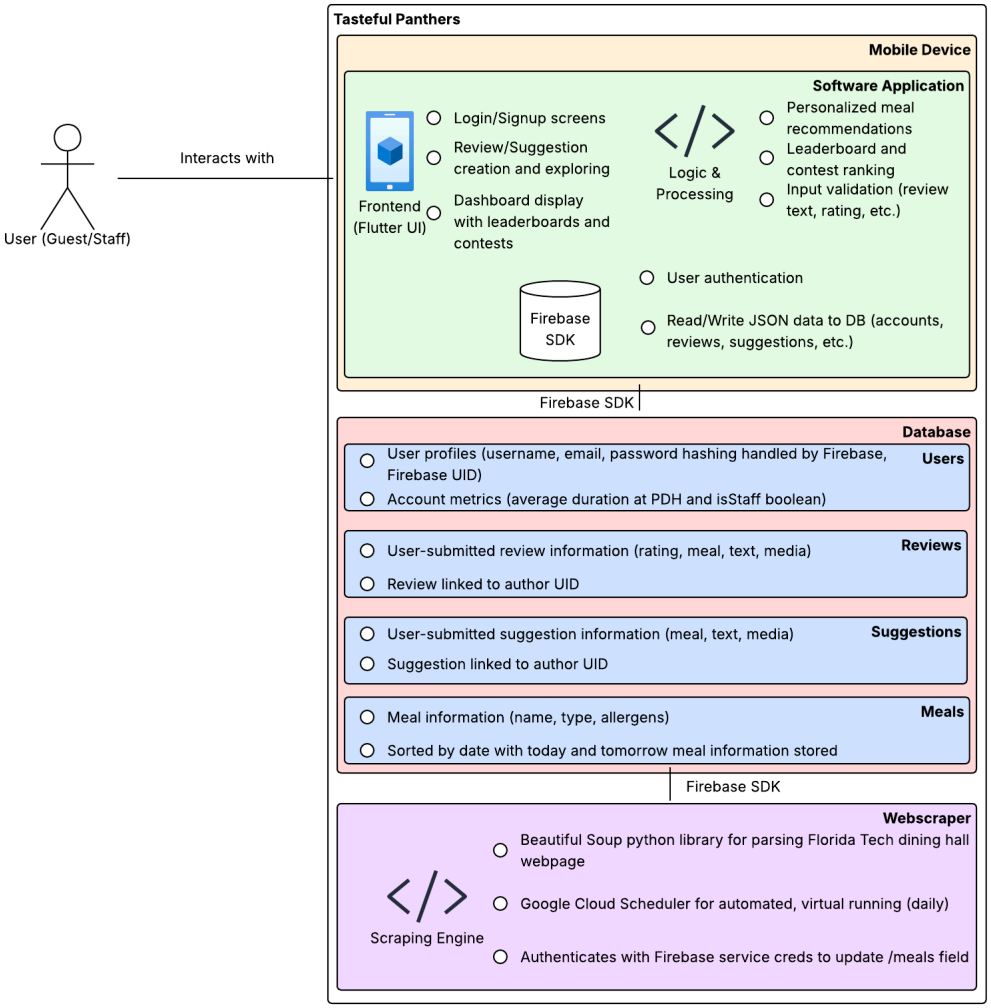
- Implementing GPS functionality while avoiding excessively draining user battery, and without major functionality error will prove difficult.
- Implementation and perfection of the recommendation algorithm will require significant effort and early testing to achieve reliable results.
- A dedicated staff view still needs to be built, including features such as issue tracking and resolution management must be added.
- After stabilizing the Android version, adapting and polishing the app for iOS will present additional technical hurdles.

Design

ER Diagram explaining DB schema



System Architecture Diagram explaining how the app and database interact with each other and other systems.



Evaluation

1. Speed
    a. Fast application and screen loading times
    b. Smooth review/suggestion posting with minimal delay
    c. Efficient account creation and login for both guests and staff.
    d. Timely leaderboard updates and notification delivery.
    e. The user (guest, staff) is given tasks, and we measure how fast the user can complete each of them.
2. Accuracy
    a. Reliable GPS detection and location tracking.
    b. Correct calculation of average dining duration.
    c. Evaluate quality of recommendations: Did they make a review from recommendation? If not, assuming it was not eaten thus was a bad recommendation. If so, how did they review? Better Review = Better Accuracy.
    d. Accurate outputs for features such as Tasteful Twin and leaderboards.
3. Reliability
    a. Stable app performance with no unexpected crashes.
    b. Reviews and suggestions post successfully on the first attempt.

    c. Account login/logout functions consistently on the first try.
    d. Dashboard navigation and links work correctly.
4. User Survey
    a. Guests evaluate ease of use (scale 1–10) for account creation, login, logout, posting reviews/suggestions, searching, flagging, and dashboard access.
    b. Staff evaluate ease of use (scale 1–10) for account creation, login, logout, handling flagged issues, searching, and dashboard access.

Progress Summary

The ‘Tasteful Panthers’ app has built a strong and functional foundation that will allow us to build extra features on top without the initial hassle that came with designing and implementing the initial feature set. Users can currently write reviews for menu items scraped from the menu website, as well as write suggestions for new food items. Implementing the other features required like food recommendations and leaderboards will require manipulation of the data the system we have created collects.

Module/feature	Completion	To do
Reviews	90%	Add video support and star/tag filters.
Suggestions	90%	Enable voting and popularity ranking.
GPS Integration	60%	Improve precision, full testing in Milestone 5.
Notifications	25%	Add review reminders, mid-meal notifications, and dashboard redirection.
User Profile	25%	Show top-rated dishes, update dining duration.
Meal Recommendations	0%	Build and test recommendation algorithm.
Staff Dashboard	0%	Build dashboard, add flag issue handling.

Leaderboards	0%	Develop a ranking system for top reviewers and predictions.

Milestone 4 (Sep 29)

- Writing Reviews: Incorporate video and 4 buttons, 1 for favorite items, 3 for shorter alphabet groupings
- Reading/Searching Reviews: Filter by star rating, tags, key words, etc.
- Notifications: Include second notification halfway through PDH and redirection to dashboard of recommendations and to writing reviews for 1st and 2nd notification, recording entry and exit times for duration
- User Profile: Include highly rated dishes, updating PDH duration, and displaying profile
- Personalized Meal Recommendation:
    - Step 1: Calculate distances to other users, then Divide distance by number of overlapping dishes
    - Step 2: Find the closest
    - Step 3: Recommend highly rated dish that user D has not tried (i.e. no rating before)

Milestone 5 (Oct 27)

- Implement staff view and functionality
- Release demo app for user testing and record user data to test recommendation algorithm
- GPS full functionality testing and and debug
- Design leaderboard/social screens
- Implement, test, and demo guest dashboard with 6 main components (reference 3.2.1.2 in requirements doc)

Milestone 6 (Nov 24)

- Create Poster
- Implement leaderboard functionality
- Test all app features and functions
- Implement extra features/platforms
- Implement, test, and demo staff dashboard with 3 main components (reference 3.2.2.2 in requirements doc)

Task matrix for Milestone 4

Task	Alex	Jiahao	Anthony	Lexi
Notifications	0%	0%	100%	0%

Writing Reviews	100%	0%	0%	0%
Reading/Searching Reviews	0%	100%	0%	0%
User Profile	0%	0%	0%	100%
Personalized Meal Recommendation Algorithm	25%	25%	25%	25%

Approval from Faculty Advisor

"I have discussed with the team and approved this project plan. I will evaluate the progress and assign a grade for each of the three milestones."

Signature: _____ Date: _____