

FOO MY FOOD

CS307_Team 29

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Problem Statement:

In modern society, people living alone often face significant challenges when it comes to meal planning. These challenges include not knowing what to eat, how to cook, what has been purchased, and how to make use of it. While existing applications have addressed many of these issues, there remains a notable gap when it comes to tracking and reminding users of the freshness and expiration dates of food they already own. Our team aims to fill this gap by developing an application specifically recording the ingredients with dates being purchased, notifying the user about the expiration date of the purchased food and recommending recipes based on the selected food as well as record nutritional data.

Background Information:

I. Audience:

The primary audience for the "FOO MY FOOD" application is international students who may lack strong cooking skills and people seeking to improve the efficiency of their meal planning. These individuals are often faced with challenges in managing their food, such as keeping track of what ingredients they have, planning meals, and making sure food is consumed before it expires. The app is designed to assist them by offering expiration reminders, recipe suggestions, and nutritional data, tailored to simplify their cooking and food management process.

II. Similar Platforms:

There are various food and meal planning apps available, such as "[Yummly](#)" and "[MyFitnessPal](#)," which provide recipe suggestions, grocery lists, and nutritional tracking. However, these applications typically focus on broad meal planning, health tracking, or cooking assistance but may not offer in-depth features like tracking food expiration dates or offering customized expiration alerts based on individual needs. "FOO MY FOOD" differentiates itself by integrating these aspects into its platform, offering not only recipe suggestions based on available ingredients but also providing detailed nutritional data and personalized expiration reminders.

III. Limitations:

Neither Yummly nor MyFitnessPal provides a robust system for tracking ingredient expiration dates. While these apps are excellent at recipe recommendations for calorie tracking, users are left to manage the freshness and expiration of their ingredients independently. The primary feature of "FOO MY FOOD" is automatic expiration tracking. Users can log when ingredients were purchased, and the app will notify them when ingredients are nearing their expiration. This functionality helps reduce food waste and ensures ingredients are used before they expire. Apps like Yummly provide recipe suggestions based on users answering numerous questions but the suggested recipes may include ingredients that the user does not have on hand. This often leads to suggestions that require purchasing additional items, which can be inefficient. "FOO MY FOOD" focuses on generating recipes based on the current inventory of ingredients the user has. The app automatically matches recipes to the ingredients that are about to expire, helping users make meals without needing to buy more items. This not only saves time and money but also reduces food waste.

Functional Requirements:

I. Account System:

1. As a user, I would like to sign up for a FOO MY FOOD account via email with a unique username on both iOS and Android platform, so that I can easily distinguish my account and access the app through a traditional method.
2. As a user, I would like to be able to log in for my FOO MY FOOD account via email address.
3. As a user, I would like to be able to log out of my FOO MY FOOD account at any time to ensure the security of my account and to protect personal information.
4. As a user, I would like to be able to reset my FOO MY FOOD account's password through a confirmation email with the reset link if I forget it in order to regain access to my account.
5. As a user, I would like to set a new password for my account by answering a security question, without waiting for an email.
6. As a user, I would like to be able to set my profile information (e.g., username, email address, avatar) for my FOO MY FOOD account, in order to display my basic information.
7. As a user, I would like to be able to change my profile to keep my information up to date.

8. As a user, I would like to be able to select an avatar from the gallery or just take an avatar photo in order to update my profile in real time.
9. As a user, I would like to be able to set my food and cooking style preferences (e.g. dietary restrictions, preferred cuisine) in my FOO MY FOOD account so that the app can recommend personalized recipes and meal plans based on my preferences.
10. As a user, I would like to be able to update my food and cooking style preferences at any time (e.g. adjusting my dietary restrictions or adding new preferred dishes) so that the app can continue to recommend personalized recipes and meal plans based on my latest needs.

II. Expiration Tracking and Notification:

11. As a user, I would like to add new items into my inventory by selecting preset ingredient options for quick updates.
12. As a user, I would like to be able to manually enter ingredients to add to inventory in order to enter ingredients that are not in the preset options.
13. As a user, I would like to be able to see the current inventory of ingredients to have a better idea of what is in my home.
14. As a user, I would like to be able to change the names of the ingredients in my inventory in order to update incorrect or outdated entries.
15. As a user, I would like to be able to modify the quantity of each ingredient in my inventory to accurately reflect the amount of ingredients available.
16. As a user, I would like to be able to delete items from my current inventory shelf for recording the immediate consumption.
17. As a user, I would like to set custom expiration dates for my ingredients so that I can take into account personal preferences or storage methods.
18. As a user, I would like to set food preservation methods (e.g., freezer, pantry) for ingredients.
19. As a user, I would like the system to suggest appropriate saving methods and saving times when adding or modifying ingredient information.
20. As a user, I would like to receive an automatically updated food status from the app, calculated with the provided preservation methods and starting datesation dates with my Google calendar so that I can receive notification on my device.
21. As a user, I would like to synchronize ingredient expiration information with my Google Calendar so that I can receive notification on my device.

22. As a user, I would like to synchronize ingredient expiration dates with my Apple calendar so that I can receive notification on my device.
23. As a user, I would like to receive an in-app notice of the expiration information.
24. As a user, I would like to receive a notice from the calendar of the expiration information.
25. As a user, I would like to receive a preview notice of the expiration information.
26. As a user, I would like to receive expiration notifications for ingredients either at a preset or customized number of days before expiration, and at a preset or customized time.
27. As a user, I want to be able to filter ingredients based on different categories to make it easier to manage and view specific ingredient categories in my inventory.
28. As a user, I want to be able to receive an automatically categorized inventory shelf after each modification.
29. As a user, I would like to be able to change the categorization of an ingredient at any time so that I can manually adjust the categorization if the automatic categorization is inaccurate.
30. As a user, I would like to be able to filter and sort current inventory by preset or customized "expiration times".

III. Smart Menu:

31. As a user, I would like to get menu suggestions based on what I have at home so I can plan meals without having to buy additional ingredients.
32. As a user, I would like to get menu suggestions based on what ingredients are near the expiration dates so I can avoid food wastes.
33. As a user, I would like to record the times of cooking a specific dish with the cooking date.
34. As a user, I would like to receive a reminder when checking a dish recipe that has been cooked too often, either within a preset or customized period of time.
35. As a user, I want recipe recommendations and meal plans tailored to my current ingredient preferences
36. As a user, I want to categorize recipes with labels like 'Breakfast', 'Vegetarian', etc.
37. As a user, I want to be able to create my recipes via text, image or video links and keep accurate records.

38. As a user, I would like to be able to edit and delete recipes that I have previously created.

39. As a user, I would like to see a calculated nutritional report after selecting specific dish recipes.

IV. Shopping List:

40. As a user, I would like to have an in-app list function to track what I am going to buy soon.

41. As a user, I would like to have a categorized search feature in the list to help me keep track of my inventory while shopping.

42. As a user, I would like to be able to get a pop-up notification when adding an existing ingredient on the shelf into the shopping list.

V. User Clustering:

43. As a user, I would like to be able to build up a group chat with other users.

44. As a user, I would like to be able to make friends with other users.

45. As a user, I want to add friends by searching for usernames or emails.

46. As a user, I would like to be able to upload my created recipe into a group chat.

47. As a user, I would like to be able to hit “like” buttons on recipes posted from others publicly.

VI. Other Functions:

48. As a user, I want to track the nutritional value of each item on the shelf and see detailed nutritional info, such as calories, to make healthier meal choices.

49. As a user, I would like to have a personal main page showing my public collection folders and other information.

50. As a user, I would like to be able to change the theme color from the provided options.

VII. Advanced Features (If Time Available):

51. As a user, I want the app to automatically recognize the newly purchased items via scanning receipts.

52. As a user, I want receipt scanning to generate default shelf life values for ingredients and paired with the added items in my inventory shelf.

53. As a user, I would like to be able to modify the scanned items' names to correct the errors created through scanning.

54. As a user, I would like to be able to manually edit the shelf life of each ingredient to ensure accuracy and avoid missing important information when scanning.

55. As a user, I would like recurring purchases to automatically adjust their expiration dates based on historical data.
56. As a user, I would like to save my favorite recipes as pictures into my device gallery.
57. As a user, I would like to be able to collect favorite recipes posted from others publicly.
58. As a user, I would like to be able to share the publicly uploaded recipes from others with friends.
59. As a user, I want to generate a shareable link for my inventory so friends can view what I have in stock.
60. As a user, I want to be able to share links from other websites to share recipes or cooking tutorials.
61. As a user, I want to control permissions on shared links, making them either view-only or editable.
62. As a user, I would like to be able to set my "like" and "collected" recipe folders into public or private.
63. As a user, I would like to be able to set an expiration date for my shared link so that access to my inventory or recipe is automatically revoked after a certain period.
64. As a user, I would like to receive an email or in-app confirmation when my link has been successfully shared so that I know the sharing process was completed.
65. As a user, I would like to be able to set customized tags for my recipe or in the collection folder.
66. As a user, I would like to be able to customize my preferred language in the app.
67. As a user, I want to get suggestions for food chosen based on the ingredients I use frequently in order to make healthier choices in my meal planning.

Non-functional Requirements:

I. Architecture and Performance:

"FOO MY FOOD" would be built with fully separated frontend and backend architecture, allowing us to divide work efficiently and reduce compatibility issues between the two. The backend will follow a RESTful API (Representational State Transfer) model and will be written in Java using the Spring Boot framework. Spring Boot is a powerful Java framework that comes with many built-in features to help us build scalable applications,

such as database caching and integrated ORM (Object-Relational Mapping) support. Additionally, Spring Boot simplifies the configuration process, enabling faster development and deployment of backend services. For the frontend, we will use Flutter, which will communicate with the backend via API calls. Flutter is a cross-platform framework that allows us to build applications for both iOS and Android with a single codebase. This separation of the frontend and backend will also make it easier to expand to other platforms in the future, should we decide to do so.

II. Security :

To enhance account security, "FOO MY FOOD" will implement Two-Factor Authentication (2FA). Users will be required to enter a second form of verification, such as a one-time passcode (OTP) sent via SMS or email, in addition to their standard login credentials. This extra layer of security helps prevent unauthorized access even if a user's password is compromised. The 2FA option will be available for users during both login and sensitive actions, such as updating account details or resetting passwords. Since SQLite will be used for local data storage, several measures will be taken to secure the database. While SQLite does not natively support encryption, third-party encryption solutions such as SQLCipher can be integrated to ensure data at rest is encrypted. This will protect sensitive information, like user credentials or inventory data, stored on the user's device. Additionally, prepared statements will be used in SQLite queries to prevent SQL injection attacks. For database access control, the app will implement role-based access to ensure only authorized users can interact with sensitive data.

III. Response Time:

The response time for "FOO MY FOOD" is a critical aspect of the application's performance and user experience. All user actions, such as adding ingredients, searching for recipes, and loading content, should complete within 500 milliseconds. This ensures that the application feels responsive and smooth, which is essential for maintaining a seamless user experience, particularly in a cross-platform environment like Flutter. The server-side API calls should return data within 300 milliseconds, particularly for lightweight queries like ingredient lookups and login actions. For more complex operations, such as querying large datasets (e.g., generating recipe suggestions based on inventory), the response time may extend up to 1 second. However, the app should handle these operations asynchronously, ensuring that the UI remains responsive while waiting for the data to load. While exact response times can

vary based on network conditions and server load, the overall goal is to ensure that the application remains responsive at all times, with no noticeable delays. To achieve this, database queries should be optimized, caching mechanisms may be used for frequently accessed data, and content delivery should be distributed efficiently using CDN (Content Delivery Networks) where appropriate.

The application should be capable of scaling to handle up to 500 simultaneous requests during peak usage periods (estimated average simultaneous requests would be upto 200), while maintaining the target response times. This requires efficient load balancing, optimized server configurations, and the use of horizontal scaling when necessary. Additionally, since "FOO MY FOOD" is expected to operate 24 hours per day, it is crucial to ensure high availability and reliability through redundancy, failover strategies, and robust monitoring. The infrastructure should be designed to minimize downtime, even during maintenance or updates, ensuring a seamless user experience around the clock.

IV. Usability:

Compared to other existing similar applications, the usability of "FOO MY FOOD" focuses more on optimizing the user interface (UI) to be visually appealing and highly functional. The design should be clean and straightforward, ensuring that users can navigate the app easily and efficiently. Key tasks, such as recording ingredients or searching for recipes, should be intuitive and require minimal effort. The UI must present information clearly, with minimal clutter, and guide users through actions with clear visual cues. The overall design should strike a balance between aesthetics and practicality, enhancing the user experience by providing both an attractive and highly usable interface.