

MealMatch Proposal

COMP3900 20T2

TEAM: I DON'T CARE

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Aim

MealMatch is a digital assistant software making it easier for everyone, from first time bakers to even the most experienced chefs, to find dishes to cook given the ingredients on hand. Our goal is to provide a novel and easy to use graphical interface combined with an extensive pool of ingredients and recipes, to ensure that users have full freedom to select the sorts of dishes they wish to create. We understand that it can be difficult to decide exactly what to cook sometimes, and even harder to know whether there is a matching set of ingredients in the fridge. That's why we aim to provide predictions of ingredients based on prior ingredient selections and useful meal predictions based on all ingredients a user has available, empowering users to create and innovate. At the same time, we intend for the software to also be useful for users who know exactly what they want, offering the complete freedom to enter their ingredients manually and ignore our suggestions. In this project, we are planning to offer a web-based solution that conforms to both the given specifications and the aims outlined above, empowering people to explore and innovate with food.

Background

Deciding what to eat typically requires some level of thought in regards to both the effort and complexity of the meal, and access to available ingredients. Whilst some meals; for example, instant noodles, are relatively self-contained and don't require meal assistance, often the simplicity of preparation compromises aspects such as nutrition, taste and the enjoyment derived from creating a meal. Most enjoyable and healthy meals require thought, gathering the required ingredients and some level of complexity in terms of preparation/cooking instructions. Often time can be an overwhelming constraint on an eager cook's ability to shop every time they want to create a dish. On top of this, for an inexperienced individual, the task of ingredient selection and making a decision to prepare a satisfiable meal can be quite difficult and overwhelming. Such meals are the core target of the MealMatch system, saving time by both providing ideas to users on what to cook, and also providing highly rated intuitive-to-follow recipes.

As a further requirement, guidance from others is a great way of learning about cooking, so some procedure of allowing user driven contributions should be made and encouraged amongst all users. Potential feedback from users who tried someone else's recipes may also help the recipe contributor hone their recipe and improve it for others to enjoy. This is helpful for everyone as personal recipe ideas (ranging from obscure family recipes to the unconventional and innovative dishes) enriches the experience of others and the wider cooking community.

We have performed significant analysis into other software based solutions providing similar solutions, guiding our product to fill the gaps in what is provided to users (See [Existing Works or Systems](#) pg. 5). Planning for such an application can quickly devolve into an extensive mess if requirements are not narrowed so we begin by identifying several points of importance that are going to be imposed for this project.

Desirable Features

Predictive selection

Inexperienced users are typically not accustomed to pinpointing an exact selection that aligns the most with their ideas. While they may have a broad idea of what they might like, the choices that they make can be conflicting and contradictory to what their aim actually is. Thus, it is suitable to offer some kind of predictive suggestions to the user for some possibilities that could match their ideal based on the input that they have given. At the same time, associated ingredients could be presented as an alternative to the ones that have been specified by the user, some of which might be more relevant to the meal that they may want to create. These predictions could also be enhanced by contributions from other users who give their own recipe suggestions so that others might benefit from their personal usage. Naturally, having an advisor to assist the user with some heuristics will improve the overall user experience and the predictive service itself in learning eligible meals and dishes. Thus, we introduce a novel ingredient recommendation system to aid users in their exploration.

Categorical choices

People have many different preferences, with an emphasis on their subjective notion of taste. Some will prefer various cuisines while others may prefer several flavours of some other kind. It becomes important to categorise such preferences to make it easier for users to distinguish their own tastes as well as narrow down what they primarily like. At the same time, some people may have medical conditions that prevent them from eating a certain kind of dish or cultural practices that prohibit them from consuming some meals. Regardless of these views, a constraint filter needs to be an option so that restrictions can be made on a user's particular tastes that gives them only the required constructs and categories that they have stated. This functionality is not available in all competitor websites and thus provides our service an additional edge.

User interface design

Intuitiveness is of necessity when it comes to user interface design so that the user is able to navigate without much hindrance or difficulty. There is a need to apply a uniform and coherent design principle that adheres to simplicity while also making things customisable if need be. The overall impression should be on making things discoverable for new users while also being accommodating for the recurrent and advanced power users (aka recipe contributors). At the same time, the appearance should be sleek and smooth with proper layouts and minimal loading times for rendering the pages to the user. Accessible design is ideal as it encourages new users to explore while also making it straightforward to deal with upon some exposure to the community. We aim to provide users a unique and outstanding user experience through this interface.

Existing works or systems

- **Supercook** - SuperCook is a recipe discovery app offering a personalised menu of recipes you can make using the ingredients you have at home.^{1 2}

Advantages

- Works on desktop, Android and iOS platforms.
- Suggests recipes based on currently given options.
- Attempts to give predictive suggestions for ingredients that you may want to buy but do not currently have.
- Ingredient search by user-input or categorical matching on multiple ingredients.
- Allows for meals to be selected on the basis of diet (e.g. vegan, gluten free), cuisine (e.g. Italian, French, Thai) and meal type (e.g. breakfast, lunch, dinner).
- Large scope of available ingredients and recipes with referrals to external websites.
- Shows what subset of input ingredients a recipe uses.

Disadvantages

- Relatively slow loading times on their desktop application counterpart.
- Selecting the help button (i.e. the question mark icon) will display a modal popup that is partially covered by the left bar. This means that some parts of the helper instructions are not visible to the user as it is somewhat truncated.
- The referrals on ingredients and recipe selections is somewhat of a double edged sword as they are somewhat cumbersome for internal exploration (i.e. they redirect the user to some place elsewhere to continue rather than giving information on the actual meal itself).

- **Recipeland** - Recipeland is a website for finding recipes. There are various methods of finding recipes, including by ingredients.³

Advantages

- In addition to finding recipes that can be made from input ingredients, there is also the option to filter out recipes containing certain ingredients i.e. a “without” list
- The details of recipes, including nutrition facts, are display in site
- Recipes can be rated
- The website looks pretty clean and has a fitting/homely theme to it.

¹ "Supercook." <https://www.supercook.com/>. Accessed 6 Jun. 2020.

² "SuperCook Recipe By Ingredient on the App Store." 11 Jan. 2020, <https://apps.apple.com/us/app/supercook-recipe-by-ingredient/id1477747816>. Accessed 6 Jun. 2020.

³ "Recipeland" https://recipeland.com/recipes/by_ingredient. Accessed 8 Jun. 2020.

Disadvantages

- Results appear to be limited as it attempts to find recipes that contain all input ingredients, rather than a subset of the list
- Ingredients are not categorised, so one can only put in ingredients that they remember they have.
- Does not suggest related ingredients intelligently. The only suggestions are ones that contain the same keyword.
- Can't filter by meal type when searching by ingredients

- **Foodwise**⁴

Advantages

- There is the option to filter for vegan, vegetarian and gluten free results

Disadvantages

- Can only find ingredients by going alphabetically and looking through a big wall of text
- Only way to tell ingredient has been added to list is in "My Ingredients" after the wall of all ingredients, which is not very intuitive
- Clicking Letters to search by shows all ingredients with that letter rather than starting with that letter (e.g. L shows apples)

⁴ "Foodwise" <https://www.foodwise.com.au/recipe-room/our-recipe-finder/>. Accessed 8 Jun. 2020.

User Stories

Note: The bolded number in brackets represents the story points. (1 point = 1 hour)

Epic 1

As a user, I should have my own account, so that I can contribute recipes to others and participate in the community.

- **E1S1** - As a user, I should be able to create an account so that I can view and edit my recipe contributions. **(4)**
 - The home page should display a button that redirects the user to the account creation screen.
 - If the user is logged in, the account creation button is no longer shown.
 - Each account should have a unique username and a corresponding password.
 - Upon signup, an error message will appear if the username is already in use. Otherwise the account's details will be stored in the database.
 - Passwords must be entered twice and match each other for valid account creation. If the two passwords are mismatching, an error message will appear.
 - Passwords should be hashed and salted for security in case of database breach.
- **E1S2** - As a user, I should be able to login to my account so that I can view and make contributions at any point in time. **(4)**
 - The home page should display a button that redirects the user to the account login screen.
 - A successful login happens when the user has entered a valid username with the corresponding password.
 - An error message will appear if the username and password combination is invalid.
 - A successful login will redirect the user back to the home page (logged in view).
 - If the user is logged in, the account login button is no longer shown.
- **E1S3** - As a user, my details should be stored on my account so that when I login I am ready to go. **(4)**
 - All contributed recipes of the account should be discoverable from the dashboard
 - Any other sign up details must be retained for the account.
 - If the user has added a contribution beforehand then this contribution should be visible to the user upon logging back into the community.
 - Likewise, if the user has deleted a contribution beforehand then this contribution should not be visible to the user upon logging back into the community.
- **E1S4** - As a user, I should be able to log out of my account after logging in, so that I can switch between accounts easily.
 - A log out button should be accessible from all pages.
 - After clicking log out, a user should be able to login again as a different user.

Epic 2

As a recipe explorer, I should be able to search for recipes by ingredients, so that I can find a recipe I am able to cook.

- **E2S1** - As a recipe explorer, I should be able to search for ingredients using a search bar so that I can find ingredients easily by name. **(5)**
 - A search bar is available to enable the user to search and select an ingredient upon selection.
 - Ingredients that match the given search should be able to be selected as input.
- **E2S2** - As a recipe explorer, I should be able to see the ingredients I've already added to my recipe input so that I don't forget what I'm looking to make. **(2)**
 - Inputted ingredients should be visible and in its own separate list.
 - Inputted ingredients are flagged as used in the list of all available food ingredients.
- **E2S3** - As a recipe explorer, I should be able to remove any ingredients from the input list, so that if I've accidentally clicked on one or changed my mind I don't have to start again. **(2)**
 - Removed ingredients should no longer be shown in the input list.
 - Removed ingredients are no longer flagged as used in the list of all available food ingredients.
 - Removing an ingredient will enable the user to pick the ingredient again.
- **E2S4** - As a recipe explorer, I should be able to filter recipes by meal type (e.g. Lunch, Dinner), so that I can quickly find a recipe to suit the time of day. **(3)**
 - Users are able to select a meal type to be filtered by.
 - Only recipes that fit the filtered meal type should be shown.
- **E2S5** - As a recipe explorer, I should be able to select a recipe from results and view its details so that I can follow steps and create meals. **(5)**
 - Clicking on a search button should display a list of the recipes that fits the user's input list criteria.
 - Users are able to select a meal type to be filtered by.
 - Clicking on a recipe should enable the user to view the recipe's page.
 - The recipe's page should show the title, ingredients and steps as described by the recipe contributor.
- **E2S6** - As a recipe explorer, I should be able to find ingredients based on their food categories (e.g. Dairy, Meat) so that I can easily input my ingredients and be prompted without remembering everything in my fridge. **(5)**
 - Clicking on a category button should show all the ingredients that correspond to that category.

- Ingredients that are shown should be able to be selected as input.
- **E2S7** - As a recipe explorer, I should be able to select an ingredient to be added into my input list so that I can search for a recipe based on my needs.
 - Clicking on an ingredient should add the ingredient to an input list.

Epic 3

As a user, I should be assisted by the system while searching for recipes with suggestions of next ingredients to input, so that I can find the recipes that I have ingredients to make easily.

- **E3S1** - As a user, I should be able to find recommendations for new ingredients based on my inputted ingredients, so that I can view a wider range of recipes to choose from (partial matching). **(8)**
 - Ingredients suggestions based on inputted ingredients are visible and in its own separate list.
 - If a suggested ingredient is clicked on, the ingredient is added to the input list.
 - When the list of inputted ingredients is modified (ingredient is added or removed), the list of suggested ingredients is also updated accordingly.

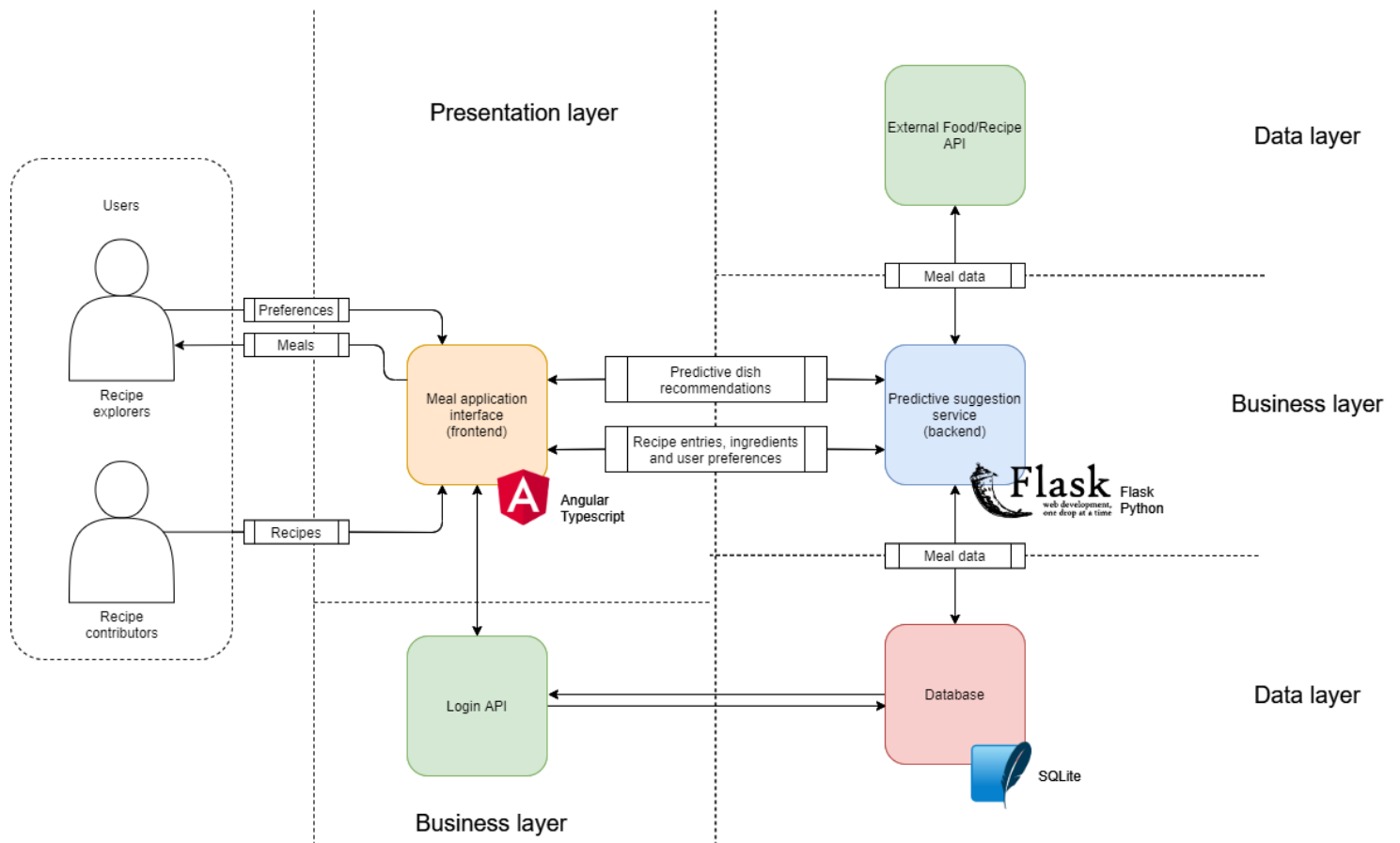
Epic 4

As a recipe contributor, I should be able to contribute to the pool of recipes, so that the users have more recipes to choose from.

- **E4S1** - As a recipe contributor, I should be able to contribute recipes so that I can share my knowledge with others. **(5)**
 - The recipe contributor's dashboard displays a button that redirects them to the recipe creation screen.
 - The individual must input fields for title, ingredients, steps and meal type used for the recipe.
 - Ingredients can only be chosen from a predefined list.
 - Specifying an ingredient will also require the individual to specify the quantity with predefined units (e.g. ml, tsp)
- **E4S2** - As a recipe contributor, I should be able to view my recipe list so that I can see what contributions that I have made. **(4)**
 - A list of all the recipes written by the recipe contributor is shown on his/her dashboard.
 - For each corresponding recipe the individual has contributed, a link is provided that enables the user to view the recipe page.
 - A unique message is displayed if the user has not contributed any recipes.
- **E4S3** - As a recipe contributor, I should be able to remove my recipes so that I can protect my contributions if I change my mind or make a mistake. **(3)**

- On the list of recipes written by a recipe contributor (dashboard), a remove button is shown for each recipe.
- Upon clicking the remove button, the recipe contributor is prompted to either confirm or cancel the removal.
- Removing a recipe will no longer make the recipe searchable. It will also not be shown in the user's contributions.
- Any references to the recipe's page are also deleted.
- **E4S4** - As a recipe contributor, only the recipe owner should be able to edit their own recipes so that the owner can protect my recipes from malicious changes. **(3)**
 - An edit button should appear on the recipe's page if the author is the logged in user.
 - On the list of recipes written by a recipe contributor (dashboard), an edit button is shown for each recipe.
 - Clicking an edit button will redirect the user to the screen where the recipe is able to be edited.
 - Existing details of the recipe are prefilled.
 - Editing a recipe enables them to edit the title, ingredients, steps and meal type.
- **E4S5** - As a recipe contributor, I should be able to see ingredients for which there are no recipes, so that I can add them to the recipe catalogue. **(5)**
 - When clicking the add a recipe button, a prompt is shown. The prompt has two buttons one of which redirects the user to the recipe creation page. The other button displays sets of ingredients for which there are no recipes.
 - Sets of ingredients for which there are no recipes are able to be selected. Selecting a set of ingredients and clicking a button to create the recipe will redirect the user to the recipe creation page. However, the set of ingredients chosen will be prefilled.

Software architecture



Storyboards

Note that these are only an approximation; they may change in the future, but it should be a good overview of the finalised product.

Finding recipes by ingredients

MealMatch [Login](#) | [Sign up](#)

Find a recipe by ingredients

E2S1

My Ingredients List **E2S2**

Do you also have... **E3S1**

Pick Ingredients (by category) **E2S6**

☐ Butter

☐ Cream

☒ Milk **E2S7**

Meal type **E2S4**

MealMatch [Login](#) | [Sign up](#)

Results...

Recipe Name

Uses: Flour, eggs, sugar, ...

Recipe Name

Uses: ...

Recipe Name

Uses: ...

Recipe Name

Uses: ...

Recipe Name

Uses: ...

Recipe Name

Uses: ...

MealMatch [Login](#) | [Sign up](#)

Recipe Name

Ingredients

Steps

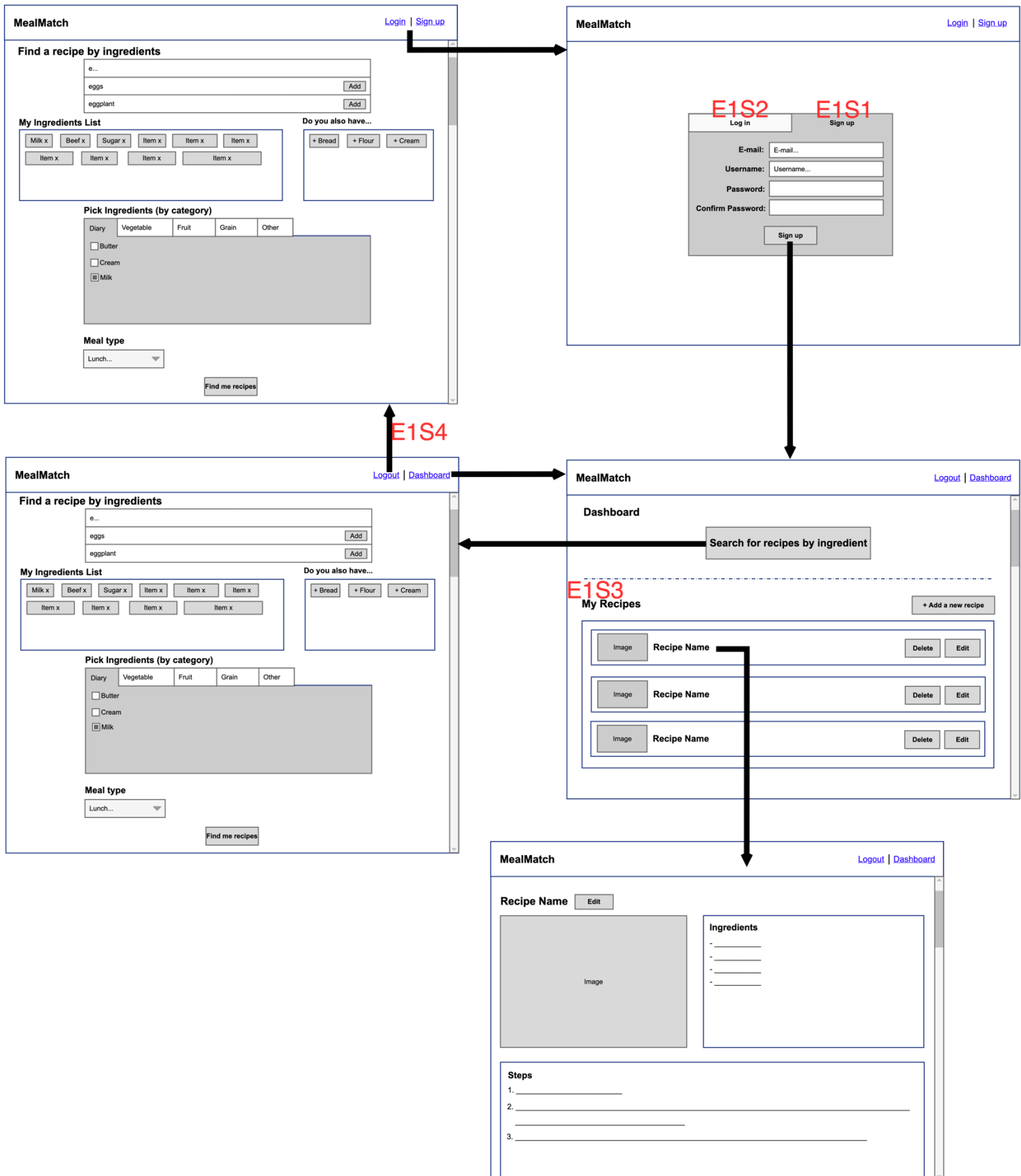
1.

2.

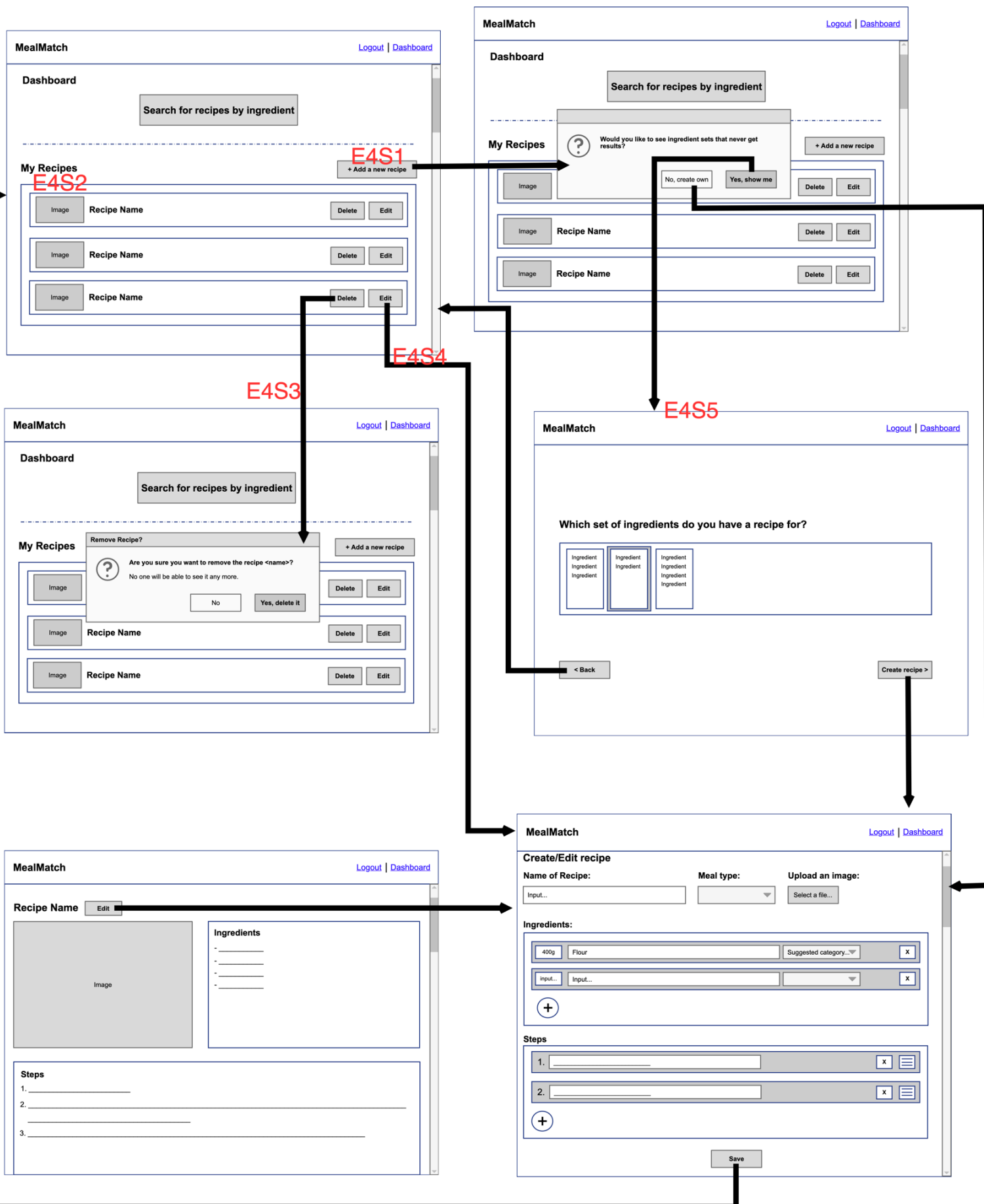
3.

E2S5

Sign up and log in



Community contribution



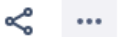
Sprint schedule

Sprint Number	Sprint Date	Sprint Length	User stories planned
Sprint 0 (unofficial)	Wk1 Thu - Wk3 Wed	2 weeks	Establish infrastructure, setup GitHub, finish proposal.
Sprint 1	Wk3 Thu - Wk5 Wed	2 weeks	Epic 1 (User Authentication) – E1S1, E1S2, E1S4 Epic 2 (Recipe explorer) – E2S1, E2S2, E2S7
Sprint 2	Wk5 Thu - Wk8 Wed	3 weeks	To be determined...
Sprint 3	Wk8 Thu - Wk9 Fri	9 days	To be determined...

Sprint 1

COMP3900 Sprint 1

☆ ⌚ 7 days remaining Complete sprint



Complete user stories involved in sprint. Predominantly focused around user authentication and searching ingredients.

🔍 OS A KW MH WA 👤 Only My Issues Recently Updated

TO DO

E1S4 - As a user, I should be able to log out of my account after logging in, so that I can switch between accounts easily.

Epic 1 - User Authentication

📌 ↑ 2 COMP3900-27 OS

E2S2 - As a recipe explorer, I should be able to see the ingredients I've already added to my recipe input so that I don't

Epic 2 - Recipe Searching

📌 ↑ 2 COMP3900-13 WA

E2S7 - As a recipe explorer, I should be able to select an ingredient to be added into my input list so that I can search for a recipe

Epic 2 - Recipe Searching

📌 ↑ 1 COMP3900-25 KW

IN PROGRESS

E1S1 - As a user, I should be able to create an account so that I can view and edit my recipe contributions.

Epic 1 - User Authentication

📌 ↑ 4 COMP3900-7 A

E1S2 - As a user, I should be able to login to my account so that I can make and view my contributions at any point in time.

Epic 1 - User Authentication

📌 ↑ 4 COMP3900-8 OS

E2S1 - As a recipe explorer, I should be able to search for ingredients using a search bar so that I can find ingredients easily by

Epic 2 - Recipe Searching

📌 ↑ 5 COMP3900-26 MH

DONE