CS6750: Assignment M3 - Brainstorming Execution

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***Abstract*—**Health tracking apps provide an easy method for individuals interested in improving or maintaining healthier lifestyle habits to document their diet and exercise activities. Daily tracking of such activities is meant to drive consistent behavior and offer better outcomes when losing weight and improving one's fitness. *MyFitnessPal* (MFP) is a popular health tracking app for this purpose due to its free access and large food database derived from crowd-sourced content. This app includes many different functions including a diary, recipe finder, meal planner, exercise planner, and health visualization tools. As part of the M assignments, I will focus on improving the diary interface *MyFitnessPal* utilizes for tracking daily food intake, exercise, and water consumption and specifically focus on the food tracking portion of the interface.

1 BRAINSTORMING PLAN

I will take an individual brainstorming approach in which I do a stream of thought process for identifying potential improvements to the *MyFitnessPal* food diary interface. The rules I will follow are to write down my ideas, limit my ideas to high level concept improvements identified in M2, and to branch out from the two main ideas that were identified in order to have a focused set of possible improvements. I will do the documentation via Mindomo, an online mind mapping tool I have used in the past for personal brainstorming activities. I will set up the electronic whiteboard with the high level improvement concepts I identified from M2, specifically simplifying the usability of the UI for a home environment and improving the food dictionary functionality. I will spend 30 minutes adding branches to these set goals with whatever ideas come to mind, with a goal of reaching at least 10 nodes (ideas) for each main branch. If I do not feel the session yielded enough ideas, I will take a break and come back to the brainstorming session at a later time to perform another 30 minute brainstorming session.

2 BRAINSTORMING EXECUTION

Figure 1 shows the outcome of my brainstorming session. I ended up breaking out the brainstorming into two separate 30 minute blocks with several hours in-between to allow additional ideas to form.

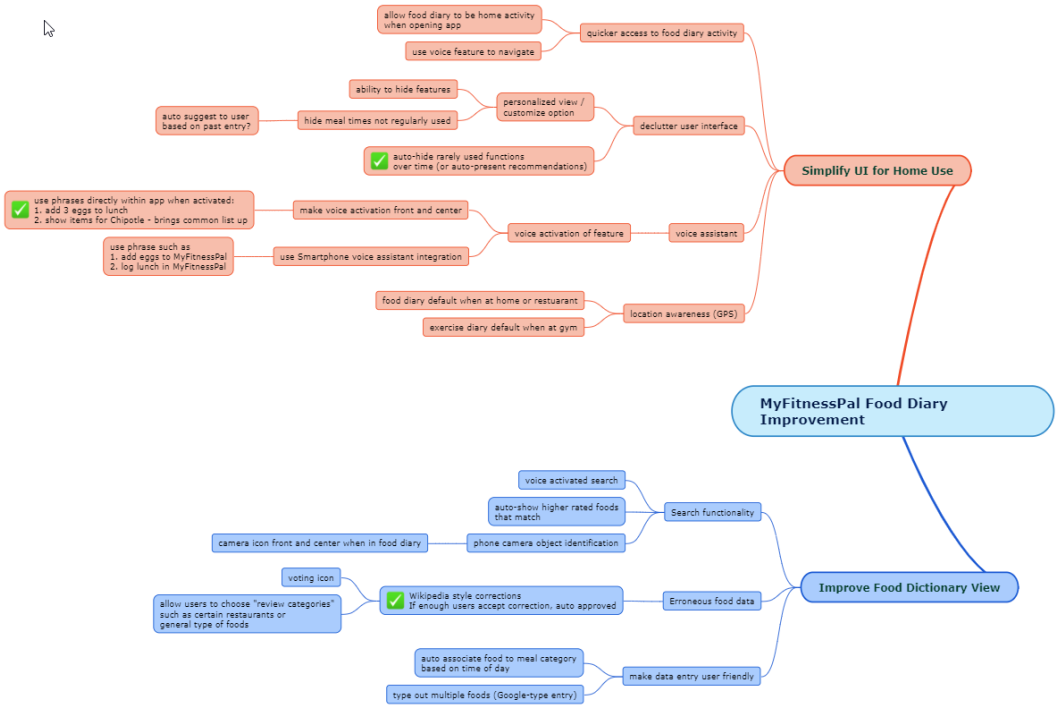

Figure 1—Mind Map from Brainstorming Session

For the sub-topic of **simplifying the UI for home use**, I was able to brainstorm four main branches. These included:

- Quicker access to the food diary activity through:
  - a voice feature to activate activities
  - making the activity the default when opening the app
- Decluttering the interface through:
  - personalization features to custom define the UI
  - auto-hiding rarely used functions with a prompt to the user for confirmation.
- Utilizing a voice assistant to:
  - navigate the app
  - add items to the food diary
- Using GPS location awareness to default functions of the app based on location of the user

For the sub-topic of **improving the food dictionary view**, I was able to develop three branches with various ideas, including:

- Improving search functionality through:
  - voice activated search
  - showing higher rated food items first
  - using phone camera object detection to identify foods to add
- Improving reporting erroneous food data through a Wikipedia-style correction methodology using reviewers and voting to determine automatic acceptance of edits
- Making data entry more user friendly by:
  - auto associating foods to meals based on time of day
  - allowing natural language complex sentence input to add multiple items to multiple meals

3 SELECTION CRITERIA

When selecting the ideas to move forward with, there are a couple of rules I wanted to use.

First, I wanted to ensure that I had at least one idea each that specifically addressed the two main sub-categories I identified in the M2 requirements definition, to simplify the food diary UI for home use and improve the food dictionary view within the food diary. The mind-map methodology helped identify this more easily, as during the brainstoming session itself, I connected the ideas (nodes) created to existing concepts to form relationships. This provided an easier way to identify those ideas that could meet each requirement defined.

Second, I wanted to make sure at least two ideas were more easily achievable within the constraints of the existing interface. In other words, the improvement or functions must be easy to integrate into the existing workflows. I also wanted at least one idea that was more novel in nature to push the boundaries of the improvements to the app.

After reviewing these rules and the ideas, I chose to move forward with prompting the user to auto-hide unused sections in the food diary to declutter the UI (simplifying the UI for home use), and providing a Wikipedia-style voting system for food edits (improving the food dictionary view). For the novel idea, I chose to use voice driven commands for adding food to the food diary. This

feature does not exist in the app currently and has no existing place within the workflow.

4 PROTOTYPE 1

4.1 Prototype Description

For the first prototype, I chose to use the textual prototyping method to describe decluttering the food diary UI by prompting the user to hide unused or rarely used sections.

When you are on the Diary screen within the *MyFitnessPal* app, the app will record which sections you are accessing and store that data within the app. For instance, when clicking on the Breakfast section to add food, it will record how many times you access that section.

After enough data has been recorded to identify the common sections or functions you access, the app will prompt you with a dialogue prompt at the top of the app when next accessing the Diary function. The prompt will say "Personalize this screen?". If the user clicks this prompt, it will take the user to a screen that allows the user to select which section or functions should be shown. Each item will have a checkbox next to it to keep or hide that item. Items that can be checked or unchecked include each meal section (Breakfast, Lunch, Dinner, Snacks), Exercise, Water, Nutrition (button), Notes (button), and the Calories Remaining section. There would also be the option to consolidate the meal sections into just one "All Meals" section.

The personalization screen will display "Uncheck options you wish to hide by default. Unchecked options can always be accessed at the bottom of the screen if needed. Based on your recent use, we suggest the following:". For each section or function that is unchecked by default, the app will display the reason.

An example may be the Breakfast item is unchecked automatically. Next to it will display "You have not added a food item to the Breakfast section in the last 30 days" as the reason.

Another example may be that all meals are unchecked and the option to show the consolidated "Food" view is checked. The reason displayed is "You appear to rarely group food by meal. We suggest using the consolidated 'All Meals' view".

4.2 Evaluation of Prototype

This prototype would help solve the requirement of **simplifying the food diary UI for home use** by allowing the user to simplify the interface to just those items that they use the most often. Since this prototype does not focus on the food dictionary portion of the food diary, it does not help in improving that particular item. Since there were many comments about the user interface being cluttered from both the survey I performed (across a wide age range) and the user reviews I researched, this prototype will likely improve the user experience for a large number of the more experienced users and align closely to the target audience identified in the data inventory in M2.

5 PROTOTYPE 2

For the second prototype, I used the paper prototype method to draw mock ups of the ability for users to edit food details in the food dictionary, similar to Wikipedia edits for crowd-sourced information.

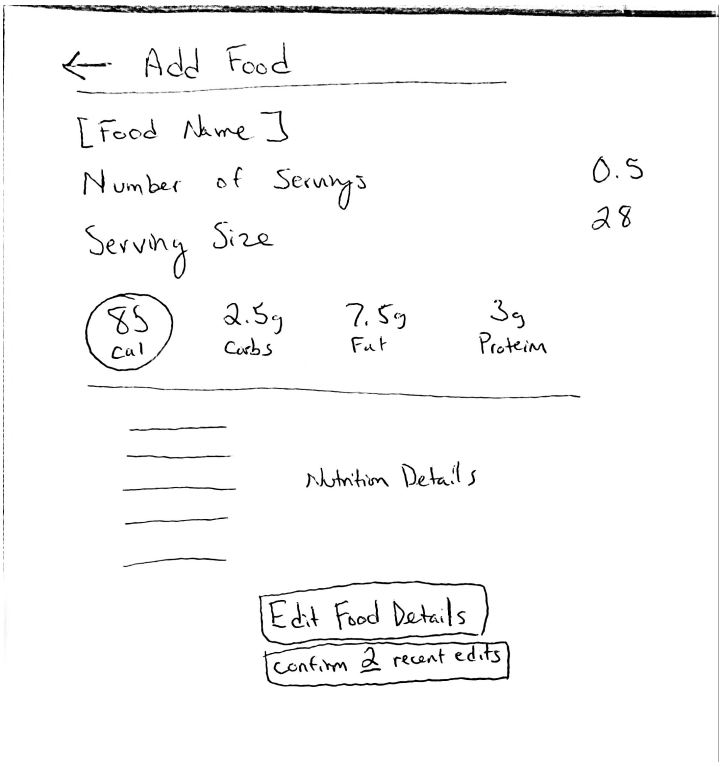

Figure 2—Add Food Screen with Edit Option

Figure 2 shows the screen that appears when a user has searched for a partic-

ular food item in the food dictionary and is reviewing the details of the food, including serving size and nutrition information. If the user sees a discrepancy based on their knowledge or reviewing the product package, they now would have the option to click the *Edit Food Details* link at the bottom of the screen. Clicking that link will take the user to the "Edit Food Details" screen as shown in **Figure 3**.

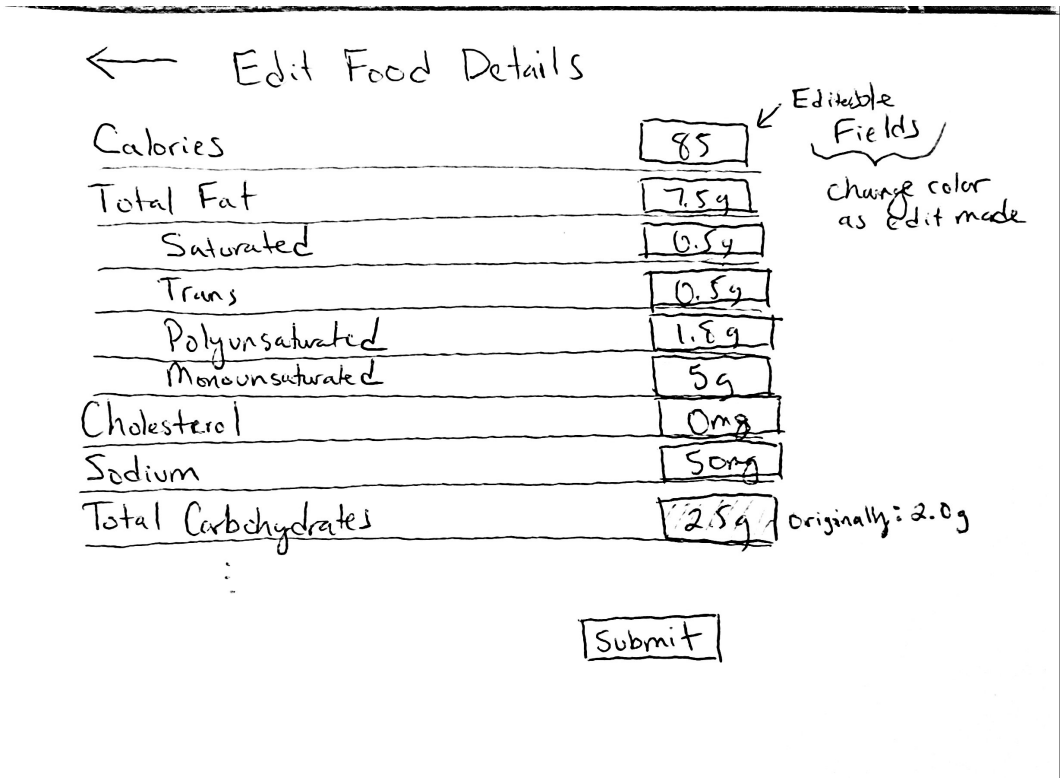

Figure 3—Edit Food Screen

The user can click any of the editable fields for the nutrition or serving size details and change the current value. If a value is changed, the field would change colors to indicate the field has been edited and the original value will appear next to the field for reference. Once the user is finished editing, they would click the *Submit* link to send the edits in for review by other users.

If a user is on the food item screen and other users have submitted edits, then the user would see an option at the bottom of the screen to *Confirm [X] Recent Edits*. If they click that link, they would see a list of specific nutrition or serving size items that differ from the original and the edits made by end users. The user can confirm or reject each individual change. If enough users confirm the

edit, it automatically becomes a change for that food item.

5.1 Evaluation of Prototype

This prototype would help to solve the requirement of **improving the food dictionary** portion of the Food Diary interface by allowing a crowd-sourced method of more quickly correcting inaccurate information in the food dictionary. The Wikipedia-style edit process, in which users can make simple corrections to the details and allow other users to review and confirm the corrections, is a proven process that works well to gather accurate data (Holman Rector, 2008).

This prototype would not help solve the requirement of **simplifying the UI for home use** and would in fact add an additional component that would add to the interface complexity instead of simplifying it. That trade-off is necessary in order to fix the complaint made in both the surveys and app reviews by users that food nutrition information was often inaccurate, but there was no way to quickly fix. This prototype would mesh well with that particular audience that care about the details of the food they are adding to the diary and ensuring it is accurate for their nutrition macros.

6 PROTOTYPE 3

For the third prototype, I chose to use the Wizard of Oz method to describe a way for the user to utilize voice commands to add food to the food diary. The script is laid out with the actors of the *Designer* (me) and the *User* that is being interacted with.

6.1 Wizard of Oz Script

Designer: This interface utilizes a button to activate voice commands with the food diary section of *MyFitnessPal*. Once you click the button, you would hear a brief tone to indicate the device is listening to you and then you can start speaking your commands. To add food, start your phrase by saying "add", followed by either the quantity of the food or the food itself. You can also specify what meal to add it to. Any questions?
User: No, I'm good.
Designer: You've clicked the voice command icon.
User: Add broccoli
Designer: The voice assistant responds "What meal do you want to add 'broc-

coli' to?"
User: Lunch
Designer: [simulate adding broccoli to lunch manually] The assistant responds with "'Broccoli' has been added to 'Lunch'". You've clicked the voice command button again.
User: Add 2 eggs to breakfast.
Designer: [simulate adding 2 eggs to breakfast manually] The assistant responds with "'2 eggs' have been added to 'Breakfast'". You've clicked the voice command button again and you say a food that is uncommon.
User: Add Taco Surprise to Lunch
Designer: The voice assistant responds with "'Taco Surprise' is unknown. Please clarify in the app". A line is then added to lunch with a note of 'Taco Surprise' for you to reconcile later.
Designer: What about removing an item added incorrectly? If the assistant in your earlier command said "'2 hams' have been added to 'Breakfast' instead of '2 eggs', what command would you want to give to fix it?
User: Delete that last food
Designer: What other commands would you like it to do? [write down any suggestions]
Designer: [The user may ask for functionality such as adding multiple foods at once. Discuss different ways they may want to specify the different foods such as using pauses, the word "AND" between foods, or if they expect to have the voice assistant figure that out.]

6.2 Evaluation of Prototype

This prototype would help solve the requirement of **simplifying the food diary UI for home use**. It does this by allowing a user that is in their home environment to more easily interact with *MyFitnessPal* to add items they just ate while their cognitive load is on other tasks they may be performing. This same voice command functionality could be translated over to the food dictionary view within the food diary to interact with it as well, so it could also help with the requirement to **improve the food dictionary**. When compared to the audience from the data inventory, this feature could be helpful to the entire age range of users of the app based on the survey responses received where they wanted an easier way to interact with the food diary.

7 REFERENCES

[1] Holman Rector, Lucy (2008). "Comparison of Wikipedia and other encyclopedias for accuracy, breadth, and depth in historical articles". eng. In: *Reference services review* 36.1, pp. 7–22. ISSN: 0090-7324.