

Foodwatch



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<http://www.cs.washington.edu/education/courses/cse440/CurrentQtr/projects/foodwatch/reports/low-fi-testing.pdf>

Introduction and Mission Statement:

Wasted food costs American households approximately \$43 billion a year. To prevent this, we are developing a better way for people to keep track of their food in terms of quantities and freshness, and in addition be reminded of better food storage habits. Foodwatch will target these issues by giving the user an inventory of their food, reminding them when their food will spoil soon, track their food expenses, and inform them of ways they can store their food for more longevity.

Our goal is to provide the tools for customers to police their own food storage habits, guide their purchases, and motivate them to save money and reduce food waste.

Prototype:

Our prototype was driven by a list-oriented organizational model, as shown in all three of our main screens. By the time someone is able to use a smartphone, we are assuming they are familiar with lists and know generally how to operate them. Thus, our main screen opens directly to the customer's inventory (figure 1) maintained by our futuristic fridge, allowing information at-a-glance if someone just wants to check if they have something at home or not. In our prototype, we simulated scrolling through the list by cutting slits at the top and bottom of the inventory pane, and then inserting a much larger list that slides through. In the inventory, items are displayed with information on freshness and location. From any screen, the customer can hit the menu button (provided by the g1) to get a pop-up menu and switch to any of the main functions – inventory, recipes, shopping lists, statistics, and their application settings.

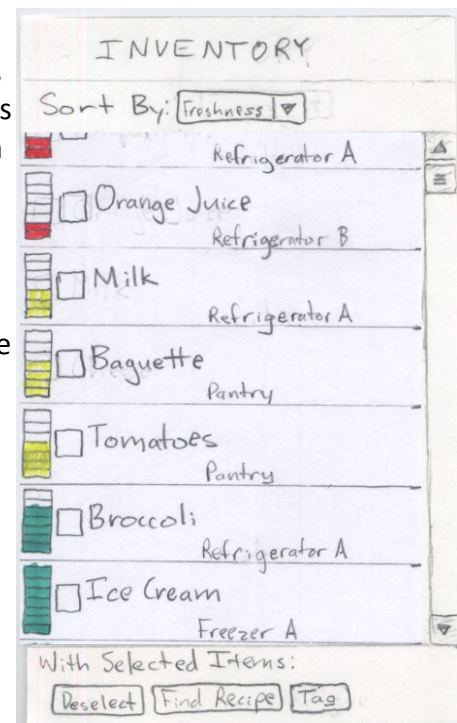


Figure 1: Inventory Screen



Figure 2: Recipe View

Switching to the recipe list (either via the menu or by selecting items from the inventory and hitting 'Find Recipes'), we get another list – of recipes matching whatever the user searched for or selected from their inventory. It follows a similar form to the inventory and shopping list, with a scrollable list in the middle, options about the list on top, and actions to perform at the bottom. When a desired recipe is selected, we depart from a list-like view to one more typical of a cookbook (figure 2), giving the customer a familiar context to work in. Information about the recipe (description, ingredients, directions, and photos) are navigated via tabs to the left of the recipe.

Assuming they decide to make the recipe, the customer can choose to add the ingredients to their shopping list. The shopping list is automatically populated with items you have run out of and frequently keep in stock. Like the other list-based views so far, it has list options at the top, and actions on list items at the bottom. Across the board, we tried to utilize internal consistency, have a close tie between the system and the users' language, and make the system efficient overall. Error prevention and correction has to

largely be left up to the user, with the exception that our automatically-sensing fridge will generally make up for small errors (accidentally deleting items) on its own.

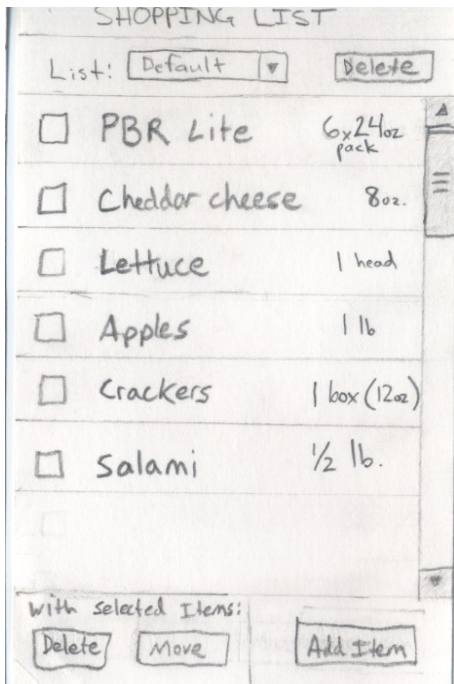


Figure 3: Shopping List

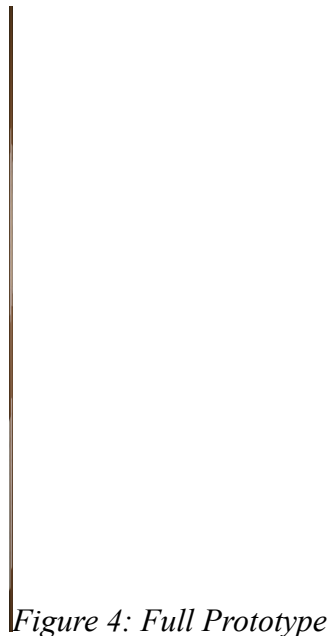


Figure 4: Full Prototype

Method:

Participants:

For our user testing, we went out to a local coffee shop and aimed to maintain as diverse a group of people as a sample from a coffee shop over a few hours could be. Participants were recruited by a member of the Foodwatch team approaching them and asking for a bit of their time. One of our aims was to find samples from specific age ranges (Early 20s, Late 20s/Early 30s and 40+). Our first participant was a middle aged man who was fairly familiar with technology, but more accustomed to the iPhone than the Android interface. Our second tester was a male Art History grad student at the University of Washington and lacked experience with smart phones. Our final subject was a female undergraduate student at the University of Washington who was quite familiar with the iPhone interface and made analogues to it frequently.

Environment:

Our tests were conducted at Cafe Solstice in the University District. The cafe provided tables and chairs which were a perfect working environment for our tests and allowed each of us to have a view of the participant and them working through the prototype. It also provided Foodwatch with a simple way of paying the participants with a beverage or food item of their choice.

Tasks:

Each user test included three tasks to provide the participant with an idea of the scope of Foodwatch. Each task was progressively more complex and explored more options than the last. The first task was to receive a notification from Foodwatch about misplaced food. The second task involved going into the program to change settings for when you receive your e-mail update. And the final task was given that the customer is out at a grocery store, utilize your inventory to look up recipes and purchase the items that you don't yet have. A more in depth look at our tasks is provided in our task script which is located in Appendix A.

Procedure:

Each participant was invited over to our table where we had the prototype set up. We would all introduce ourselves and then the facilitator would begin to read through the script (Appendix: A). The script simply outlined the goal of Foodwatch and provided the user with the gist of what they were to do. The facilitator made sure to assure the user that any fault in the design was ours and we were simply testing the usability of our design and any feedback that they could give by talking through the actions they made would be most helpful.

After establishing our purpose we asked the participant to sign a consent form that says that their participation is entirely voluntary and states our reason behind this research. The facilitator then went into a further description of the system and it's capabilities. For any user that wasn't familiar with the Android operating system they were provided with a brief summary of the functions that all phones that support Android have. Each task was presented to the participant by the facilitator and was read aloud, being repeated if necessary. After the user completed a task, the facilitator informed them that the task was finished and then moved on to the next task.

Each member of our group took part in the user testing. Kyle was the computer, switching in and out parts of the prototype to react to the users actions. Brandon and Mike observed and took notes when they noted something interesting, the user was confused or had input of their own. And finally Sean acted as the facilitator, reading allowed the script and each task that the participant was to complete. After the third task was complete we asked them if they had any more questions or comments regarding Foodwatch and were sure to take note of anything they had to say. Finally, we thanked them for their time.

Test Measures:

While we were performing our user testing, we made sure to take plentiful notes. We mostly focused on when the user became confused and didn't know how to proceed or misunderstood the visual information we provided. Any comments that were provided on what makes more sense to them were noted as a good deal of the time spent making decision on what the prototype should look like was spent on picking out what we thought to be the proper word choices. And lastly we made sure to take note on any action the participant made that didn't help them towards the next state and what cues, visual or otherwise would have lead them to do that.

Results:

Receiving Notifications:

Overall our participants were quite unfamiliar with the Android operating system and therefore the notification system it provides. Before we started the first task we made sure to provide an explanation of the Android OS and basic functions of it.

Button Text:

Generally our participants understood what text on buttons meant, but there were a few cases that were commonly misunderstood: "Move It" on the notification pop up, "Set" on the settings menu to change the time, and "Buy Needed Items" on the single recipe screen to add anything you didn't already have for that recipe to your shopping list.

E-mail/To-Watch List:

Overall our participants were indifferent to our list of items we send out in the e-mail. The one suggestion we did receive is putting the e-mail in more of a list format with bullet points so that the e-mail can be glanced at and more information can be gleaned, more quickly.

Opening Screen, Inventory:

Our subjects understood how the inventory screen worked, that you had the ability to slide the list of items up and down with the touch screen and that the check boxes on the side afforded being checked. No one was displeased at immediately starting on this screen, but covering that the menu button allowed you to jump to any screen was covered in our task script.

Recipes and Recipe Screen:

For the most part, our participants were happy with the recipe screen but were possibly confused over what the stars meant, given that we didn't have a "rating" label and also wanted us to have an expected preparation time for the meal and the ability to sort by both rating and time to make. The

problem that we ran into consistently was that users weren't sure what to make of the ingredient screen and what the checks and x's meant. It was suggested dividing up the ingredients into two categories, what you have and what you need as well as providing the user an option for only selecting some of the items to add to their list. Overall, it needs to be made more clear what you're adding and how.

Freshness Bar:

In general our participants were confused by what the freshness bar(s) meant. One of our participants thought that it represented the quantity of the food rather than the time remaining. As one of the focuses of our application, finding a way to represent this effectively is turning out to be quite the challenge.

Discussion:

The user testing left us with the feeling that for the most part our design is sound yet there are still some revisions to be made that will make it that much easier for our customers to understand the application and be more likely to continue using it as well. Despite providing a brief synopsis in our task script people still were confused by the text on some of the buttons and what it meant to press that button. In addition, people would also find it generally helpful if in our recipe screen we gave each column a header so that when they were looking at the screen, they knew what the column meant and what options they might have to sort by before opening the sort menu. Overall the quickness with which our subjects moved through our application even on the first run highlights its ability to be used while on the go.

Our largest disconnect happened around our freshness meter. With one user thinking it was quantity and the others unsure of what to make of it, we need to focus on developing a way to effectively convey some sense of the time their food will remain unspoiled. Our current trains of thought are leaning towards a stopwatch and simply displaying a range of days in some succinct manner. Both of those come with advantages and disadvantages of their own so our best bet seems to be going out and seeing how people would like that information relayed to them.

Most of the other changes are fairly minor and include adding, removing or changing text to better suit a user's perceptions. This includes changing out recipe ingredient screen to be more clear with what items you already have, what items you need and what you're adding to your shopping list. In addition, cleaning up our notification system so the user knows exactly what they're being told and is not inclined to ignore/turn off any kind of help Foodwatch tries to provide. Although, some of the difficulties users had with the prototype can be attributed to it being drawn in pencil and buttons and text not being as clear or obvious as they would be in a finished version.

The low fidelity prototype testing gave us a good amount of information and feedback to work with to improve our design. Having run through our tasks in a cafe, we were limited to the context of pretending the person was at the grocery store instead of seeing the application in action. We also were limited by the scope of our prototype in that sometimes our participants would try to choose options that we hadn't planned for and were curious to see the breadth of the design, but we did not have the required note cards to support their actions. A fully working prototype that we could test out in the real world would allow us to get the feedback we need to ensure that the program is easy to use when out such that customers are inclined to use Foodwatch.

Appendices:

Appendix A, Consent Form:

Consent Form

The Foodwatch application is being produced as part of the coursework for the University of Washington Computer Science course "CSE 440: Introduction to Human-Computer Interaction". Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of Foodwatch. Data will be collected by interview, observation, and questionnaire.

Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers (Sean, Mike, Brandon, and Kyle) or with Professor James Fogarty, the instructor of CSE 440:

James A. Fogarty
Computer Science & Engineering
University of Washington
206-685-8081
jfogarty@cs.washington.edu

Participant anonymity will be provided by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the researchers and their supervisors.

I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the experiment and my participation in it. I give my consent to have data collected on my usage and opinions in relation to the Foodwatch experiment. I understand I may withdraw my permission at any time

Name _____

Date _____

Signature _____

Witness name _____

Witness signature _____

Appendix B, User Testing Notes:

Subject 1: age 43

Task 1:

- confused that freshness bars meant how much is left [4]
- immediately know to slide
- tapped notification
- text too small to read [1]
- clicked remind me later [2]

Task 2:

- clicked menu after observing the screen
- hit settings
- confused by "every day"
- tapped the time instead of set button [3]
- suggested change "set" to "change" label

Task 3:

- checked boxes in inventory
- clicked scroll arrow down on inventory
- find recipe button no problem
- had to tilt head to see angled text on recipe tabs
- didn't understand the X's and checks on the ingredients tab [3]
- suggested dividing into two sections "you have" and "you need"

Comments:

(none)

Subject 2: age 30

Task 1:

- didn't know about the icon in the upper corner, instead, tried to press the menu button
- wanted to know how long the steak would last in fridge [2]
- picked "move it" option

Task 2:

- reading the inventory screen thoroughly instead of finding menu button [2]
- couldn't figure out what to do and was mistaken about the function of the inventory screen
- once on settings page, clicked "set" button without delay
- read email and understood

Task 3:

- clicked chicken on the right side, instead of selecting the check box
- needed to be directed to the select recipes button [3]
- wondered what the stars on the recipe screen meant
- suggested that the recipe screen shows prep time [2]
- wanted to sort by prep time
- clicked the tab for ingredients on the recipe screen, no problem
- mentioned that he might not want to buy everything the recipe needed [1]

Comments:

- wanted to prepare a shopping list entirely by hand, didn't see that the functionality existed

Subject 3: age 22

Task 1:

- mistook freshness meter for quantity [4]
- trouble pulling down notification from icon
- wondered where the destination was once the "move-it" button was clicked
- clicked the "move-it" button

Task 2:

- hit menu, then settings with no problem
- confused what "set" meant [3]
- suggested that you click on the number and then scroll wheels pop up to adjust (like iphone)
- thought the email should have bullet points instead of full sentences

Task 3:

- no problems until reached the needed items screen
- confused on how to add the items to the shopping list [3]
- attempted to click the ingredient in order to add
- understood the meaning of the "X" and the "check" mark

Comments:

- wants to use it in real life :)

Appendix C, Other Prototype Photos:

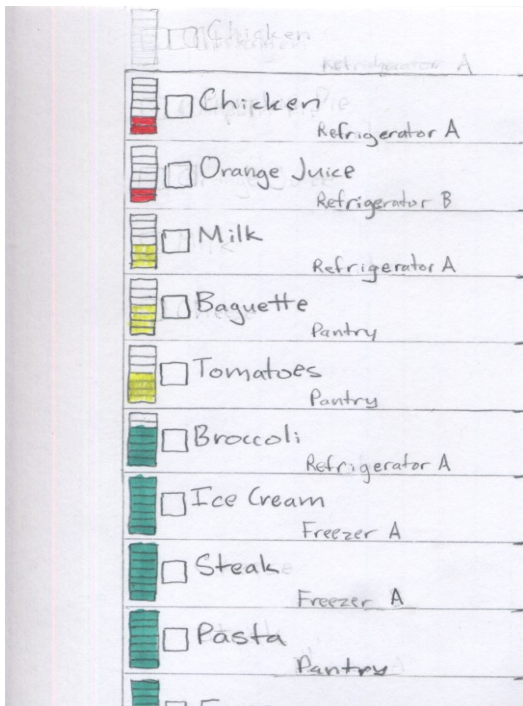


Figure 5: Sliding Inventory

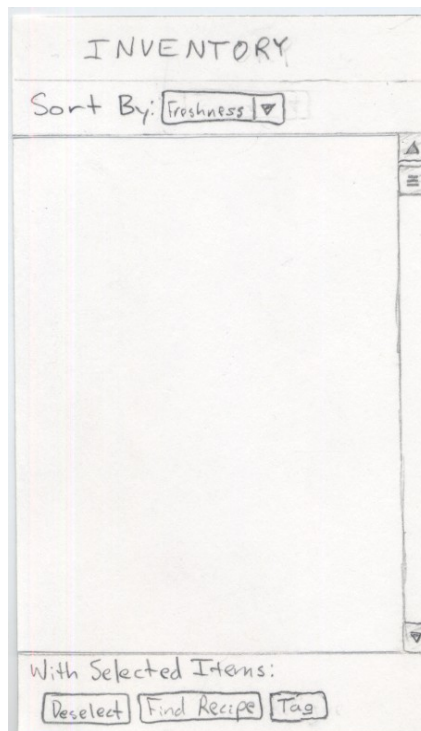


Figure 6: Inventory Frame

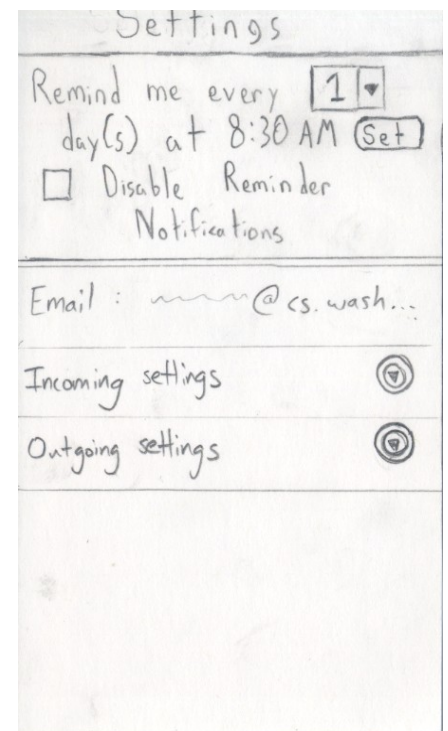


Figure 7: Settings

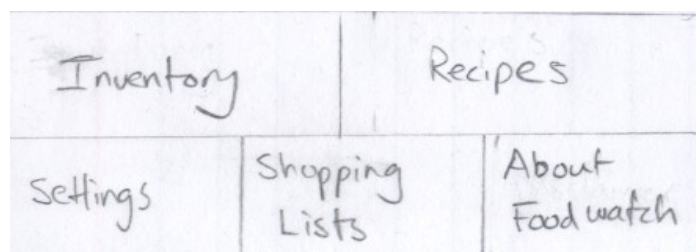


Figure 8: Menu Page

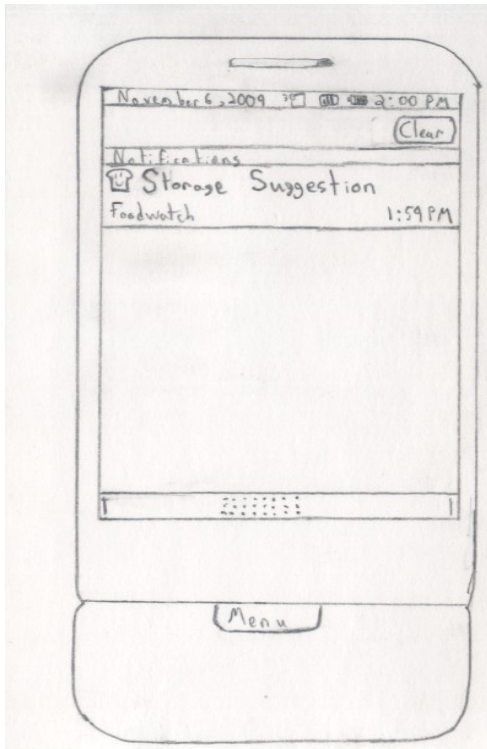


Figure 9: Notification Dropdown

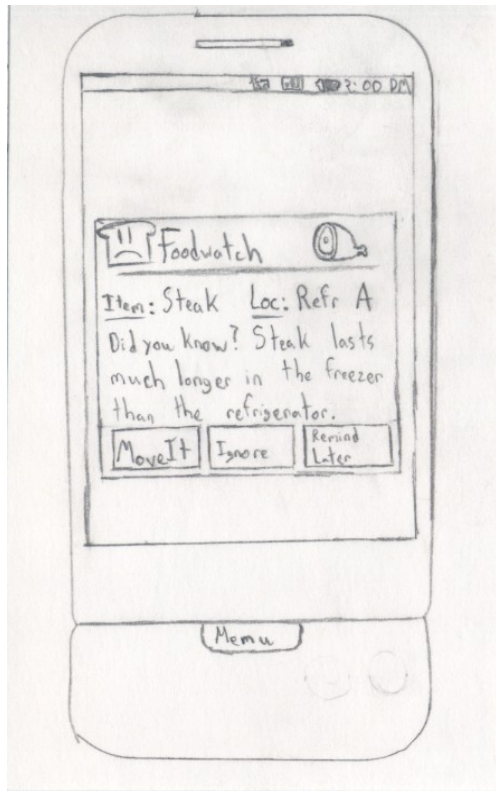


Figure 10: Notification Dialog

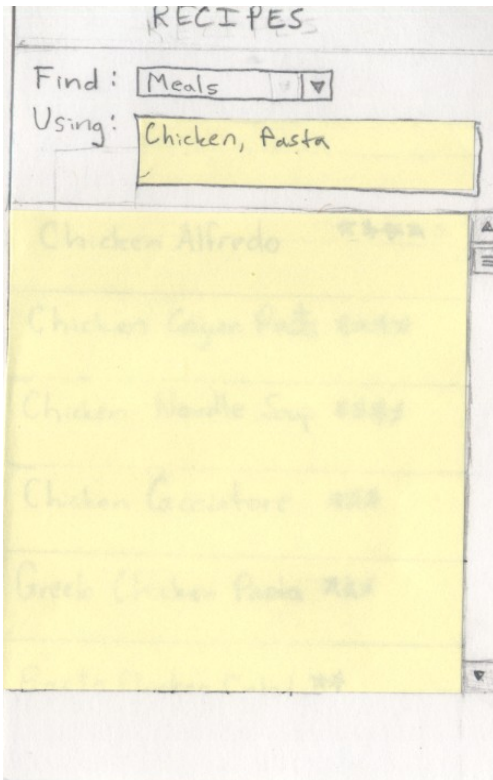


Figure 11: Recipe Search Frame

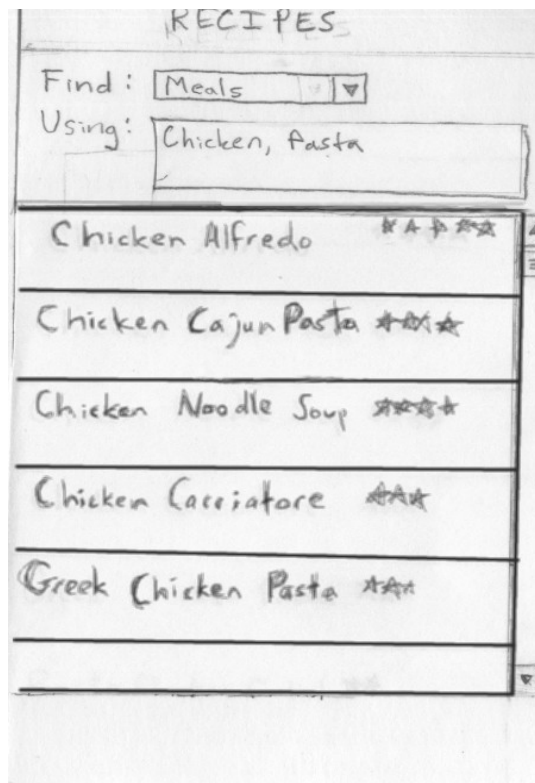


Figure 12: Recipe List

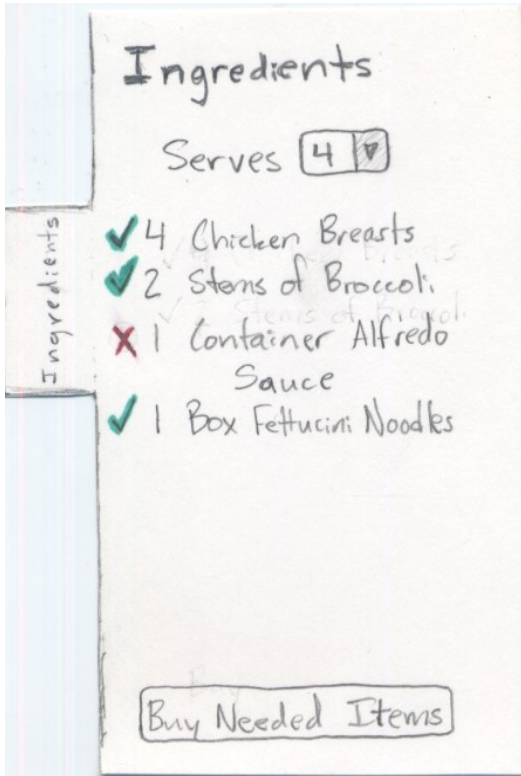


Figure 13: Recipe Ingredients Tab

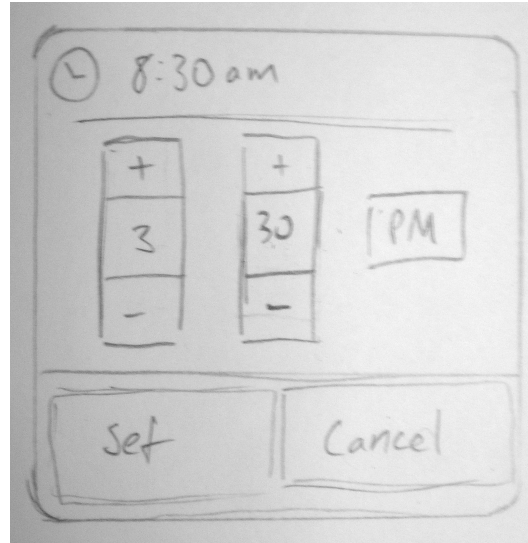


Figure 14: Set Time Popup