fridgit

TEAM

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PROBLEM & SOLUTION OVERVIEW

According to the National Resources Defense Council, American households waste around 25 percent of the food products they buy. Our project focuses on reducing this number by helping users remember what foods they have in stock and encouraging them to make responsible decisions about the foods they have.

Our product is a smart refrigerator that keeps a user's food inventory for them. This refrigerator, the Fridgit, acts as a traditional fridge, but also houses an internal computer that can tell a user how long an item has been in it and if there are any items that the user should use soon. To make the process of adding items easy, the Fridgit's computer can track the movement of items in and out of it by using two internal cameras. An external display allows manual alteration into the food database and provides statistics about a user's habits.

CONTEXTUAL INQUIRY TARGETS & PARTICIPANTS

Overview

We observed and interviewed a total of 3 people from differing backgrounds. Our first two contextual inquiries were focused on college students living in the U District. Both of these students were referred by people we knew (RAs in the Dorms). The participants were more than happy to conduct the inquiries in their homes, and they each provided us access to their refrigerators & food shelves, walking through them with us and describing their thoughts behind each food item. Fridgit is geared towards augmenting user behavior with food waste, and as a result, the observations proved especially useful, as participants often noted which foods they neglected in their fridge or actively knew about.

Overview cont.

For the interviews, we followed a general interview protocol while also leaving the interviewer free to follow leads and topics that emerged from the conversation. We covered the process of planning to buy foods, trips to the grocery store, food storage, cooking, eating, throwing away food, and knowledge of kept food. We also asked participants to take us on a home tour of their pantry/fridge, walking us through how they stored or kept food.

Alice

Alice, our first interviewee, is a freshman living on campus at Mercer Court. She's not in a situation to worry about her finances, but is often concerned about her school/social balance. She has her own studio, refrigerator and cooks much of her own food. Around once a week, she goes out with her friends to buy groceries. However, she also spends around $20 per week eating out, and its these leftovers that most often spoil. As she answered questions, she often would guiltily confess that she had thrown away food. During the inquiry, she realized she had forgotten about some of the items in her fridge, and told us more about what she remembered in her fridge vs didn't.

Bob

Bob is a senior here at the UW. He is majoring in Japanese and lives off campus in a house with 8 others. Growing up in a Buddhist household, he places a high value on food and tries his best to minimize food waste. The amount that he cooks a full meal is striking, nearly every day of the week. He cited relatively low cost and desire to not let food go to waste as motivation to cook daily. We chose Bob as he was a good example of one end of the spectrum of users we wanted to target: a student who had to balance school/work/food yet still found the time to cook consistently.

Carl

Carl is a senior at the University of Washington who is majoring in Computer Science. He is very active in sustainability movements and environmental responsibility around the University and was formerly on compost committee of SEED. He is trying to create the Food Recovery Program at UW geared towards donating originally wasted food to homeless shelters. His interview was not so much focused on home food waste but on the topic as a whole, having a very passionate view on the topic. Upon further questions, he revealed a whole different problem space with leftover foods from events and dining halls across campus. We chose Carl as we wanted a food expert; someone who was relatively experienced and knew a lot about the problem of food waste.

CONTEXTUAL INQUIRY RESULTS & THEMES

Shopping Planning

A common theme that came up from the contextual inquiries was the idea of planning out grocery trips. Though Alice often planned weekly trips with friends, she noted that as the quarter went on, she went to the grocery store whenever was most convenient for her. Bob also tended to go on grocery trips whenever he noticed his general inventory of food was going down. Both people had a general idea of what they needed, but rarely created lists to help them remember what specific foods they needed. Since they didn't get the chance to look at their fridge before running to the grocery store, they weren't as cognizant of buying foods they might've already had.

Cooking/Eating

Something that was interesting yet counterintuitive about the participants we observed was that they all claimed they cooked quite a lot. Each of the participants actively cooked, and as such seemed to be using most of the food in their pantries/refrigerators at a consistent pace. Participants noted that they would often survey what foods they had left, and would try to cook a recipe based off of what they saw. Alice, in particular, noted that she turned to the Internet in order to search for recipes given certain leftover ingredients. Bob found the time to cook consistently everyday, and tended to only have trouble with food in bulk.

Forgetting Food Inventory

Every interviewee admitted that they had forgotten about food in their fridges at some point. During a tour of Alice's fridge, she found several items that she had forgotten. She pointed out things that had been in the fridge for awhile that she hadn't gotten around to throwing out yet. Bob, too, admitted that he often forgot about leftovers he had taken home from restaurants. Carl's largest source of food spoilage came from produce that he had forgotten or could not use quickly enough. This all leads to the same pattern that people tended to forget what exactly they had in their pantry/fridge, and weren't sure as to the amount of time those foods had been there.

PROBLEM & SOLUTION OVERVIEW

Who is going to use the design?

Our design is aimed at those who often cook for themselves. It solves the issues associated with keeping a mental tab on foodstock from large grocery shopping trips.

What tasks do they now perform?

Users keep a mental tab on what's in their food inventory and when items expire. They assess food safety by reading printed dates if they exist or by doing an inspection themselves.

What tasks are desired?

A way to better keep track of what foods they have and how long they have had them, particularly for leftovers.

How are the tasks learned?

Tasks are learned based on their parents' habits, Googling techniques for proper food storage and usage, consulting with living partners, and trial and error.

Where are the tasks performed?

Tasks are performed at their place of residence and may involve personal or communal fridges. Getting information about food (e.g. recipes) is mostly done online or through parents.

What are the time constraints on the tasks?

To remove the need to remember foodstock mentally, our immediate goal is to provide the user with an interface for checking their food inventory. In the future, Fridgit could provide other statistics on historical food trends and the effects a user is having on the environment.

PROBLEM & SOLUTION OVERVIEW CONT.

What happens when things go wrong?

When food spoils, customers will throw it out, eat it, or choose to deal with it later. For example, a customer choose to pick around mold on a loaf of bread by eating around it.

What is the relationship between the person and data?

The most crucial piece of information that a user needs concerning their food is how old it is. From here, the user can better assess whether they can use the food later, should use it soon, or throw it out. In this way, they can better assess their own food habits as well.

What other tools does the person have?

All of our interviewees had access to smartphones and computers, but did not use them to track their food habits.

How do people communicate with each other?

Those interested in reducing food waste may join groups devoted to sustainability, shoppers at a grocery store may chat with each other, and those living with others may ask for advice.

How often are the tasks performed?

Interviewees looked at their food inventories daily, but do not reassess everything they have when looking. Foods are also consumed daily, with some being eaten less often than others.

TASKS

Caring about the issue of food waste

According to the expert we interviewed, food waste is a growing problem in the country and that it's impossible to effect change until people care about the issue at hand. Accomplishing this task would encourage users to be more responsible about food waste.

Checking their food inventory

Two of our interviewees revealed that they keep a mental tab on the foods they have in their fridge and pantry and both stated that they regularly let leftovers spoil. One also found several items that they had forgotten during the interview process. By keeping a record of foods a user has in stock, they would be less likely to forget about food and let it spoil.

Easily adding and removing food from their inventory

A major concern for our team is a user's apathy. If our platform does not allow a user to easily add and remove foods from their inventory, then it's likely they will get lazy and stop doing so. We need to ensure that the process of adding/removing food is a simple process to prevent users from getting lazy.

Deciding what to eat based on when food spoils

When users decide what food of theirs to eat, one factor of their decision is when each different food item expires. For example, one might decide to eat a salad with lettuce that won't be good tomorrow instead of a less perishable item like pasta. Potentially, the more users are aware of the waste that will occur if they don't eat near-spoiled food, the more they will decide to eat this food instead of non-perishables.

Determining if food has gone bad or not

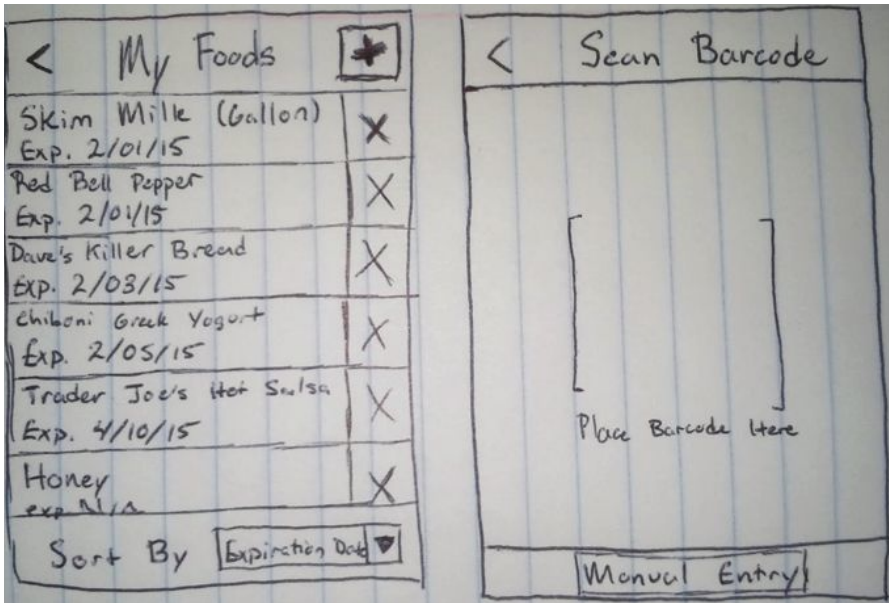
One concern for users is not being sure if it's still safe to eat leftovers or cook potentially spoiled food. More than likely, users would not touch their leftovers and let bacteria grow in their leftovers. By designing this task, users will become more aware of how they are storing and preparing their food. This will also encourage users to become more knowledgeable in food spoilage and food safety.

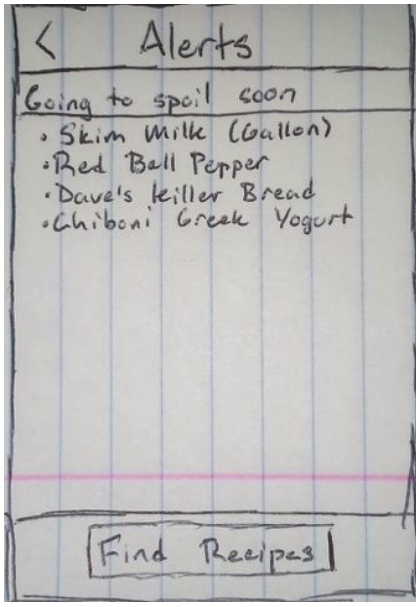
Deciding what and how much food to buy

Every time a user shops for food, they must decide what food to buy, and how much of it. Which food is based on personal preference and what food they already have. How much food is based on an estimation on the user's part of how much of a food item they will actually want to eat, and how much of it they will be able to eat before it spoils.

PROPOSED DESIGN SKETCHES

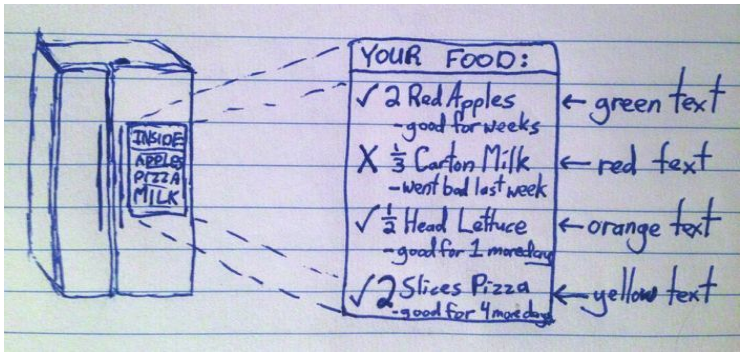
Design #1

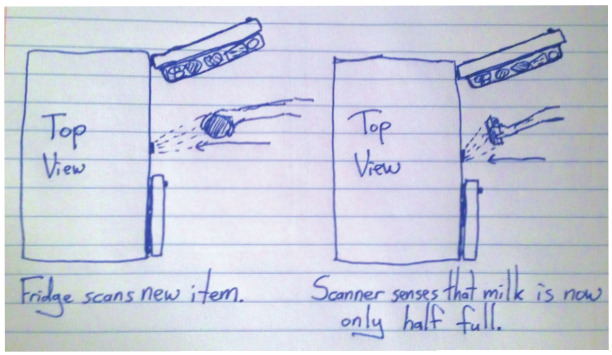




This design is a phone application which keeps an inventory of a user's food and provides suggestions for how the user should use the food. To complete tasks two and three, the app presents the user's current foods with an item description and expiration date. Users can remove items, manually add them, or scan items with a barcode scanner. To address tasks four and five, the user receives alerts when an item in their inventory is about to spoil. Additionally, the user has an option to find recipes that involve one or more of these soon-to-spoil items.

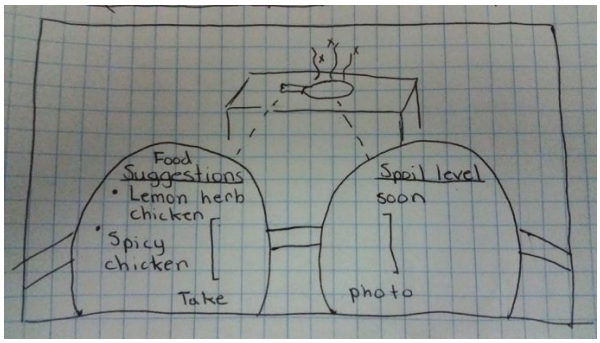
Design #2

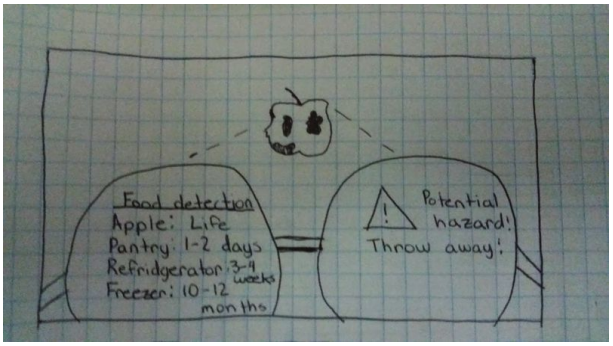


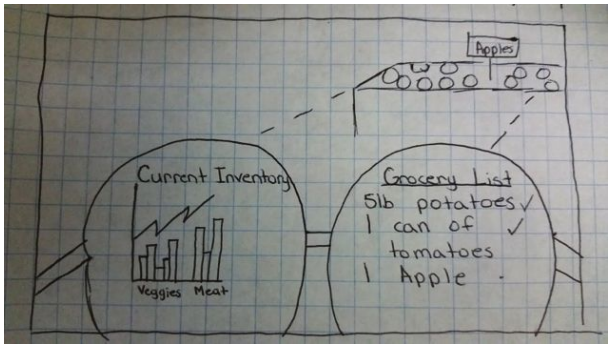


This smart refridgerator is designed to relieve as much user burden as possible. Fulfilling tasks two and five, it features a screen on the front main door which allows users to see their food inventory and when foods will spoil, letting users know if their food items are still good without making them open the fridge and spend time searching. Addressing task three, the front of the fridge features a sensor to scan food that is put in & taken out of the fridge. The fridge scans everything that comes in or out, automatically updating its inventory.

Design #3







Our third design explores the potential of applications for wearable devices such as Google Glass or Microsoft Hololens. Addressing task five, the application will be able to diagnose food quality, alerting the user if something is spoiled, or when a food item will last until. Based on what of the user's food items spoil when, this application will be able to suggest meals for the user to cook, fulfilling task four. Additionally, when the user is grocery shopping the application will be able to suggest what foods and how much of them to buy, based on past data (fulfilling task six).

SELECTED DESIGN

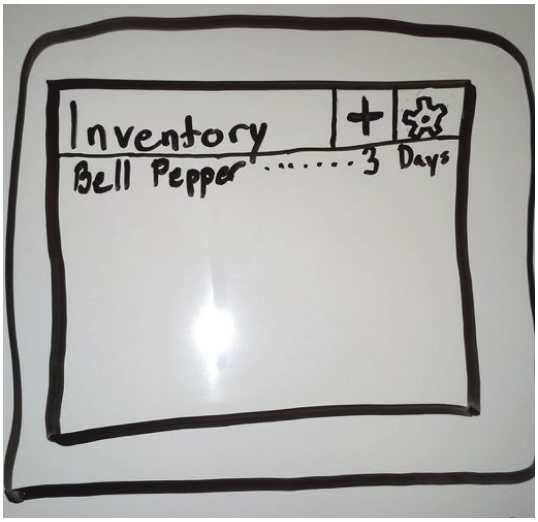
We have chosen the smart fridge (Design #2) as our design to focus on and refine for the remainder of the quarter. This design will focus on tasks two and three, keeping a user's food inventory and providing a smooth addition/deletion process for this inventory. Modifications to the original design include the ability for the user to manually edit the food inventory in addition to the ability for users to access their food inventory via mobile devices (though we will not focus on this mobile application in this project).

The idea of a smart fridge was chosen because of its already close tie-in with food spoilage. The refrigerator is where most food spoilage occurs, and the contents of someone's fridge is essentially their food inventory. Because of this, tasks two and three work very well with this design.

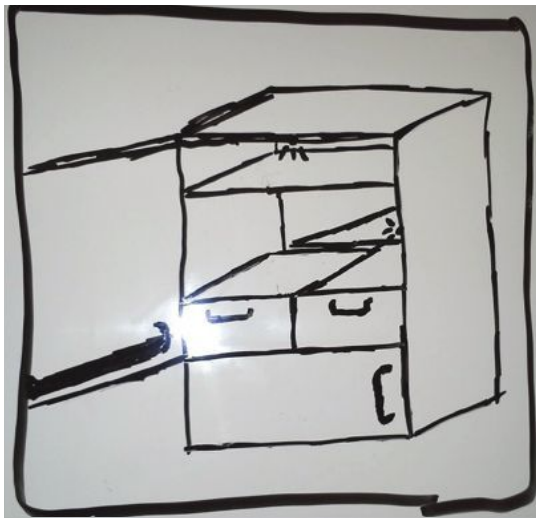
Our target audience for Fridgit is college students and young professionals, both very busy demographics without food as their main focus. An inventory of their current food items accessible both at home and on their mobile device will help them to not overbuy at the grocery store, and will remind them what they have and when they bought it, preventing food from being forgotten. Additionally, this demographic does not want to spend time manually entering food data into an app, so the easiness of Fridgit's sensor automatically updating their food inventory is ideal.

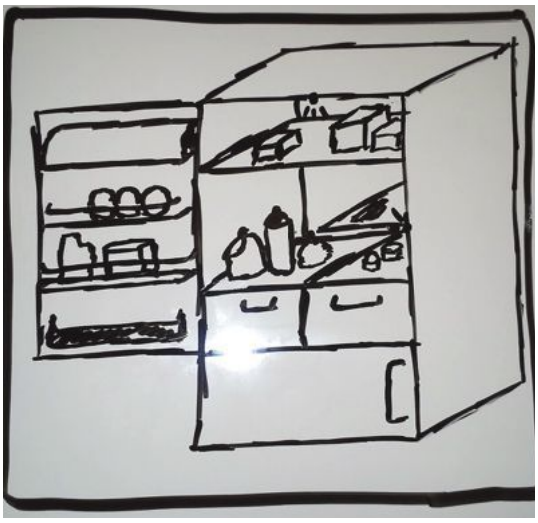
STORYBOARDS & SCENARIOS

Bob gets home from a shopping trip

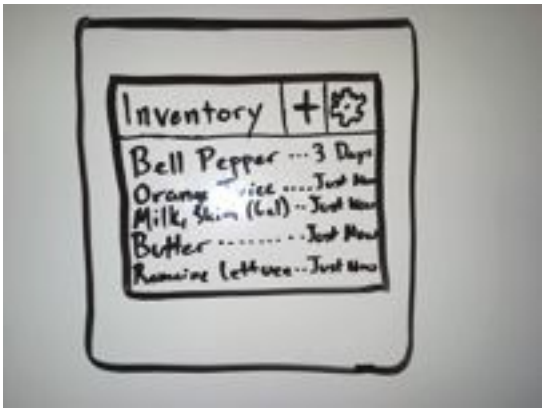


Fridgit shows what he has





As Bob puts away his groceries, sensors on the top and side of Fridgit capture his purchases



Fridgit has recorded all of Bob's items

STORYBOARDS & SCENARIOS CONT.

Lauren is at home, and she is hungry.

She checks her food inventory on her Fridgit.

Fridgit tells her how old her food items are.

Her strawberries will go bad soon!

Because of this, she decides to eat them.

Lauren's happy, and the berries won't go bad!