

FoodWatch



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Problem and Solution Overview:

Wasted food costs American households \$43 billion a year. To reduce this waste, people need a better way of tracking their food to know what they have and what will soon go bad. They also need to be aware of proper food storage conditions. FoodWatch targets these three issues. Using our application, people will be able to view an inventory of their food, be reminded of food about to go bad, track their food expenses and be informed of proper ways to store food.

Inquiry Participants:

To get a better understanding of our potential customers and the issues surrounding food waste, we performed a contextual inquiry with four people. We chose a wide variety of customers in order to give us a broad perspective and multiple angles on how people buy, store, use and discard food. The following are details on our customers and how we interacted with them.

Debbie:

Debbie is 48 years old, living with husband and daughter. She does almost all of the cooking and shopping for the family. We chose Debbie because she says that food spoilage is not a huge issue for her and we wanted to get a closer look at the organization and systematic approach she has developed. We conducted the inquiry on Debbie while putting away groceries right after a shopping trip. Her shopping is determined by a list that she starts immediately after the previous shopping trip. She is always planning recipes ahead of time and adds to the list the ingredients that she does not already have. She also adds items that she already uses as they run low. Cooking balanced meals from scratch makes it so she always knows what she has and what needs to be used up soon. When she does shop, she reduces the need for having to shop again and saves money by buying what she

can in bulk at Costco. When she gets home she begins to unload the groceries into a few different areas.

Things do occasionally spoil or get freezer burn from being forgotten, but it does not happen often, and her organization and constant use of the fresh foods keeps this from being a significant problem and minimizes waste.

Clinton:

Clinton is 22 years old and is recently married. He is a fairly typical consumer, and represents a shopper who doesn't need to buy for many people, but may purchase a wider variety of food. We conducted the inquiry during a typical shopping trip at the local Safeway. At first because he didn't believe he put a lot of thought into purchasing decisions, when it turned out that with more questioning, he did. His main focuses while shopping are efficiency in both time and food waste, having had bad experiences in the past with wasting food. We analyzed the results of this inquiry to see how the average shopper thinks about purchasing decisions while in the grocery store, in the presence of food choices but not while specifically trying to store them properly.

Blake:

Blake is a 22-year-old college student who has been living in a house with five friends for the last four years. We chose Blake to participate in our contextual inquiry because his group living situation is common to many college-age people and thus represents a significant part of our user base. Members of the house go shopping as a group a couple times a week and spend about \$150 each time. They share all the food in the fridge and often one person cooks a meal for the group. We observed Blake's fridge and kitchen. We asked him to go through his fridge and then asked him questions related to how they keep track of the food and use it. Our role was to get him to step through the way his house treats food and to ask as many clarifying questions as necessary.

Lindsay:

Lindsay is in his early thirties and is a clerk/cashier at Matthew's Thriftway, a grocery store out in Bellevue, WA. His job while not cashiering is to maintain the first-in-first-out (FIFO) ordering of products in the dairy, juice and non-perishable parts of the supermarket as well as removing products with soon approaching sell by dates so that these items can be taken to the food bank instead of going

to waste. We chose to interview him as the grocery store is a great example of an entity that benefits from preventing food spoilage and also would present us with the set of ideas that comes with handling that issue in a business environment. We observed Lindsay as he went about his job, questioning him about his practices and methods as he pushed new merchandise out to the floor and making sure the product that was out, was suitable for selling.

Contextual Inquiry Results:

Recipes (How to use the contents of your refrigerator)

The first common problem we saw in our contextual inquiry was food that was just sitting around because a use couldn't be thought of for it. For example, Blake mentioned he had two open containers of sauerkraut that had been in the back of his refrigerator for a long time because he couldn't think of a use for them. These likely will be left to spoil. Matthew's Thriftway solves this problem by using items about to become unsellable in recipes for the deli. This practice can be adopted for customers facing Blake's problem by presenting them with some recipes that use a given ingredient or ingredients. Being able to look up recipes this way will also help people who are learning to cook for themselves or people who just want to minimize their expenses through using food currently on hand.

Reminders

Another subject that came up often was the ability to know when their food was going bad or was already spoiled. Given a cluttered fridge or improper storage, items are easily lost and forgotten about until it's too late to use them and they have compromised the integrity of your refrigerator with mold or harmful bacteria. A great example of this is in the inquiry with Blake, he found a rotten lime that had been left in the refrigerator that no one had noticed. Knowing that food is going to expire soon gives a person a chance to use it or freeze it and not let that food go to waste, saving them money.

Inventory

Keeping track of inventory is a key aspect of preventing food spoilage. A lot of the food that spoils does so due to the owner forgetting about it or repeatedly buying the same thing and having too much to use in time. This can be helped by storing the more perishable items towards the front of the fridge, but it usually isn't possible to keep all of such items in plain sight. Our participants (other than

the grocery store clerk), all relied on their memory for keeping track of what's in the fridge. Memories often miss things or may lead us to think we have more or less of something than we actually do. One example is Clinton, who had to contact his wife at home to double-check for cheese in the fridge. An inventory would eliminate this problem. Even if a customer is a more impulsive shopper, they could use our application to see what is in their kitchen while at the store, preventing them from buying more of something that they already have. In Blake's situation, buying duplicate food items was caused by unorganized food storage as well as multiple food buyers. To address the first cause, our application would encourage the user to develop a food organization scheme and label storage areas. For the second cause, multiple customers using the application can share the same inventory to reflect the reality that they are sharing the same food. By consulting this group inventory before or during shopping trips, no duplicate items will be bought.

Budgeting

It isn't always obvious how much the waste is hurting a customer directly until they see the numbers. Working in a business that deals with moving hundreds of perishable items, Lindsay understands this and it is obvious to him that spoiled food can be a significant problem if it isn't dealt with. For those who don't deal with the issue on a larger scale, it is hard to put a number on how much is being thrown away. Our participant Clinton said that he thinks the waste might be offset by the money he saves when buying bulk, but is it really? And how much more would he save by buying bulk *and* eliminating waste? Being able to track a running total of wasted food with our application might provide additional motivation to use what you buy before it goes bad. Not only that, but being able to see a graph showing your waste month-to-month would show you how much you have improved since you started using the application.

Getting Down to Business – Tasks:

Easy – storing food properly

Sarah has just come back from a trip to the grocery store, and is in the process of unpacking her food. She purchased milk, cereal, French bread, wheat bread, some vegetables, peanut butter, ground beef, chicken, and some seasonings. As she puts each item where she believes it belongs, sensors inside the refrigerator note the new item and send that data to the application. The application then checks the food item's properties against the temperature of the storage area (refrigerator, freezer, or

cupboard/pantry), and if Sarah has mistakenly put the beef in the vegetable drawer, it will send out an alert to her phone. This constant monitoring system works well with larger groups of people using the same storage – if someone accidentally puts the ice cream in the cheese drawer, Sarah will know and can move it before the drawer is full of iced cream cheese soup.

Medium – notification of food spoiling

As Sarah's phone keeps a constant inventory of the food in her household, it knows basic food type and the temperature it's stored at. With this knowledge, it can track the progression of 'spoilage' based on stored statistical data. Let's say that Sarah and her roommates have been eating lots of takeout lately, and those vegetables purchased earlier haven't been seeing much daylight. As time passes, the inventory in the phone tracks the vegetables as they slowly lose freshness, and move from the 'green' zone, to the 'yellow' zone, finally ending in the 'red' zone. This critical period triggers a notification to be sent to Sarah, and she decides to use the vegetables in her dinner plans that night. To do so, she can use the application to look up recipes using those vegetables as an ingredient, as well as other items in her inventory that she wants to include – so she doesn't have to buy much more food, and doesn't waste more food that she already has.


Hard – making dinner/purchase plans based on budget and current inventory

A week or two later, Sarah needs to go to the grocery store again. On this trip, in addition to buying more staple items, she needs to find something to make for dinner. While she's in the store, she consults her phone to see what she needs. She has some bread and cheese left at home that should be used up soon, but she can see they're only in the 'yellow' zone and don't need to be replaced or thrown away quite yet – she can pick some more up on a small trip after she runs out. She enjoys yogurt with breakfast, and her inventory says she doesn't have any at home, but she checks her Statistics page and sees that for the month, she's already let \$2.00 of yogurt spoil. It looks like the large container isn't being used up quickly enough, so she opts for the smaller cup this time. Moving on, she picks up a few other general necessities, and begins to think about dinner. Passing over her inventory of food at home and the food budget she has set for the month, she decides to make a meal using the chicken and rice she already has. Selecting those on her inventory, the recipe aspect of the program chooses a few meals that she can make, she selects one, and proceeds to pick out a couple small items at the store to complete the meal.

Interface Sketches:

Statistics

- Inventory Value: \$250.00
- Monthly Budget: \$150.00
- Monthly Expenses: \$125.00
- Food Waste: \$25.00
- Achievements: 🏆 ⭐

Graphs 

Inventory

Group By Sort

| | |
|---------------------------------|----------|
| <input type="checkbox"/> Red | 3 items |
| Red Bacon Pizza | Fridge 1 |
| Cottage cheese | Fridge 1 |
| Broccoli | Fridge 1 |
| <input type="checkbox"/> Yellow | 3 items |
| 2% Milk | Fridge 2 |
| Bagels, Wheat | Pantry |
| Twinkies | Pantry |
| <input type="checkbox"/> Green | 30 items |

