

Pro Shopper

CSE 510 - HW4

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Problem and Solution

Being an effective shopper is a time consuming task. Before you even get to the store you need to compile a shopping list and many opt to assemble relevant coupons as well. Once at the store, it can be difficult to locate the products that you need and identify the best deal once you do. These problems plagues novice and experienced shoppers alike.

Pro Shopper is a mobile application that endeavors to minimize the time that you spend shopping. By offering smart location and product comparison tools, Pro Shopper allows you to make the necessary decisions and spend less time finding the information you need.

Contextual Inquiry Participants

Lisa McElmurry - Waitress and Mother:

We chose Lisa because she is an example of a very experienced shopper. Lisa has patronized the same grocery stores for over 20 years. Having a family of boys, she often makes large trips and is a very savvy shopper. Roy let her choose the location for the trip and took notes as she procured the items on her list.

Hang Le - CPE:

Hang Le is a busy working mom who needs to optimize for time when shopping. She chose Target because it's close to her home. She prepared for the shopping trip by making a list and clipping a few coupons from the Target adds in the paper. Though she would like to be, she does not consider herself a very organized shopper.

Vikas Rajvanshy - Software Engineer:

We chose Vikas because he often splits the household duties of shopping for groceries, etc., with his wife. Depending on who has time during the weekend, either Vikas or his wife head to the grocery store to re-stock for the week. Typically, the task of going to the grocery store needs to be optimized with several other weekend errands that they run, so he typically wants to get in and out of the store within 30 minutes. Though he typically shops for a household of 2, he often spends time looking at prices between various products to ensure he picks up the items that are on sale when appropriate.

Contextual Inquiry Results

Common Themes:

- Finding items in the store is a challenging task.
- Comparison of similar items is made over many axes and is time consuming.
- The shopper would often buy an appealing item if it was on sale.
- Traversing the store in an efficient way is hard to do.
- All participants brought a list, some brought coupons.

Lisa McElmurry - Waitress and Mother:

Roy went shopping with Lisa at Fred Meyer in Shoreline. Lisa said she chose this store because it often has the best prices for the kinds of items she had on her list, which was comprised largely of food and household utility goods. She prepared for her shopping trip by collecting coupons and building a shopping list that was ordered by aisle. Having shopped at Fred Meyer for many years, she knew to visit certain aisles last in order to keep produce and bread on the top of the cart and keep frozen foods cold. Her route was very efficient and methodical. We visited each aisle once and never backtracked to get to an aisle we already passed.

She had absolutely no problem locating items; she boasted that shoppers will often ask her where things are. Instead, the bulk of her time was spent inspecting the available items. In addition to comparing things like price per unit, she also had to consider sales and coupons and sometimes whether they work in combination. Others considerations were made for particular items. She favored quality of ingredients over price for chocolate chips, brand over anything else for garbage bags and canned peaches, and origin of production over price for cereal. She postponed buying some items if the current prices were too high and purchased some items that were not on her list if she saw prices that were really good.

The major finding from observing Lisa shop is that she spends a lot of her time comparing products. Often the information is only available in the store and is always changing, so even for an experienced shopper the process is time consuming. She had many considerations to make including price, sales, coupons, quality of ingredients, and origin, not all of which are always easy to find.

Hang Le - CPE:

Huy went shopping with Hang at Target in Redmond. She chose Target because her list had a lot of home items on it and also needed to find a few birthday gifts for friends. Hang is a busy person and does not have too much time to shop, so she tries to limit her trip to an hour if possible. She prepared for the shopping trip by making a list and clipping a few coupons from the Target adds in the paper. Though she would like to be, she does not consider herself a very organized shopper.

Upon entering the store Hang grabbed a cart and went to the nearest aisle. She perused her list for items that might be on that aisle and then progressed through the aisles. She never checked her coupons while considering products, but did spend some time comparing similar items. If an item was on sale or prominently promoted she would sometimes get these items even though they were not on her list. Acquiring vague items,

like presents, took quite some time because the number of things to compare was so much greater than with other items. Occasionally she had trouble finding where things were and had to find a clerk for assistance.

It seemed that Hang was rather unorganized. She spent a lot of her time locating items in the store and had to backtrack to aisles that she already passed or had already visited. She would rely on the store clerks for assistance but often after trying herself, which would eat up a lot of time. Price was a big factor in her purchases, but there were other things that were important to her such as brand, ease of use and safety. Making these considerations and locating items took up the majority of her time.

Vikas Rajvanshy - Software Engineer:

Priya went shopping with Vikas Rajvanshy at Safeway because they consistently have better prices than QFC. Before going to the store Vikas built a shopping list by noting common items that he knows he is low on. Next he added items for meals that he plans to make later in the week. He added some household items as well after checking his stores. There was no particular order to the list.

At the store, Vikas grabbed a cart and headed straight for the frozen food aisle because frozen pizzas were the first thing on his list. He continued to navigate the store based on his list, often revisiting section of the store. Vikas found it difficult to locate some items and gave up if he could not find them. In one case, vegetarian frozen pasta was not located where he expected with the other frozen pasta, so he assumed that Safeway did not carry it. If an appealing item was on sale, he would pick it up even if it was not on his list.

Vikas spent a small amount of time comparing prices of similar items, but in many cases found it difficult to make comparisons of other features because the products did not seem to have a logical grouping. The major slowdown for him was finding items and traversing the store. As an example, he spent a few minutes trying to find where spinach was located within the produce section.

Task Analysis Questions

1. Who is going to use the system?

Budget conscious shoppers who typically look for the best price and value when going to the grocery store. For example, some of customers prefer to shop at Safeway over QFC due to the price difference in products. They often spend a lot of time scanning and hunting the product shelves to identify the best priced item for the product they wish to purchase.

We found that web services like Amazon Fresh help the customer easily do product comparison without the hassle of going to a store, however the price markup for delivery is often a deterring factor for customers. They prefer to go to a physical grocery store to eliminate costs where they can.

2. What tasks do they now perform?

At minimum shoppers create a list of items they wish to pick from the grocery store.

The amount of preparation amongst the shoppers we observed varied. Some of the more organized shoppers collected and clipped coupons, and even planned their list of items out by Aisle. However, when they went to the grocery store, they all experienced difficulty in locating some products, especially if it was one they had a coupon for.

Often times in larger grocery stores, customers would wander back and forth between aisles if they hadn't planned or sorted their list in order to be able to navigate through the store efficiently

Shoppers also tended to pick up items that were not in their grocery list if it was something they did use frequently to stock up if it was on sale.

3. **What tasks are desired?**

Shoppers would like to be able to quickly and efficiently find the product they are interested in within the store shelves. They would like to be able to easily scan through available/in-stock products based on price (which would include any coupons and in store sales) as well as quickly gauge if it meets their quality bar. The quality bar is usually a subjective set of criteria that adapts to individual preferences. For example, some shoppers prefer to buy organic products over regular items. Some customer have a nut allergy and need to know if the product contains any nuts or was manufactured in a facility where nuts are processed.

4. **How are the tasks learned?**

Shoppers who managed a household were the most experienced and often frequented the same store and therefore had a good sense of where items were located. They honed their skill for collecting coupons and identifying values.

Their method for stocking up on items that were on sale was ad-hoc. If something caught their eye and it was on a sale price, they usually picked it up.

Several other shoppers tended to make a list before heading to the grocery store to stock up on food for the week. They usually did not clip coupons or rarely checked the sale flier at the front of the store. However, when it came to selecting products from the shelf, they carefully scanned each price before making a decision.

5. **Where are the tasks performed?**

The preparation of the shopping list usually happened at home. The task for shopping occurred in a grocery store near their home. Participants usually had a regular grocery store they frequent due to price of goods and proximity to their location.

6. **What's the relationship between customer & data?**

For the data our app will be supplying, accuracy of price, validity of offers and coupons, and accuracy of ingredients list is important. From our observations, Shoppers spent a lot of time comparing products based on price and in some cases the quality of ingredients in the product.

The data presented to the customer must always be timely and accurate.

7. **What other tools does the customer have?**

Shoppers usually come with a list on a small piece of paper. More experienced shoppers also had a coupon organizer or coupon folder with coupons clipped from fliers, the Sunday paper, or some other source. Sometimes, customers would also pick up the paper from the front of the store and use that to reference any sale items that they were interested in.

8. **How do customers communicate with each other?**

The task of shopping in a grocery store doesn't really require that customer communicate with each other. Any form of communication may be with a store assistant to identify where a product might be located. Sometimes, the customer would receive a phone call while they are at the store with some updates to their list of items to pick up.

9. **How often are the tasks performed?**

Tasks are performed once a week when customers need to re-stock their groceries at home. If the customer is entertaining or has some event for which they need to pick up groceries this may happen outside of the weekly grocery store trip.

10. **What are the time constraints on the tasks?**

There usually aren't major time constraints when going to the grocery store, but it is reasonable to expect that people don't want to spend half a day shopping for groceries. Depending on the amount of groceries that are purchased, the upper end of the time spent in the store is about 2 hours. For an average grocery store trip, the duration of the time usually took about 45 minutes to an hour from the time the customer entered the store to the time they left from the checkout counter.

11. **What happens when things go wrong?**

Our interpretation of this question is what can happen if the App we design fails the user. Under these circumstances, the customer typically stops using the app because it becomes unreliable. The app augments their existing shopping pattern, and therefore customer fall back to their usual habits.

The app's success depends on how easy it is to adapt into the user's current work flow while in the grocery store, without being a hindrance.

Tasks

Locate items in the store

You have a shopping list that contains items from Grocery, Stationary, Kitchen and Bakery departments. You need to pick up all these items in the store efficiently, avoiding unnecessary trips.

Find the cheapest item

You need to get the cheapest pair of poultry scissors that is available in the store.

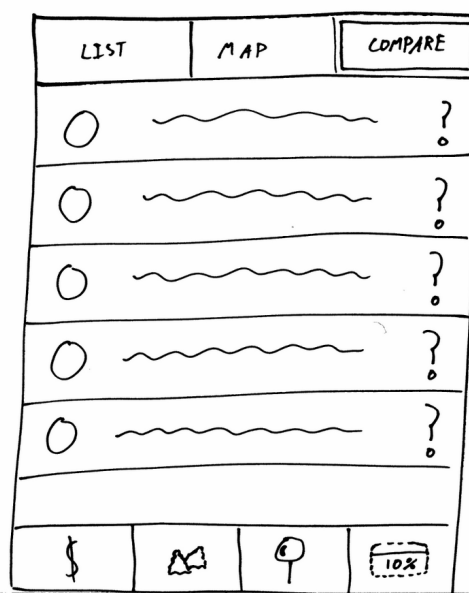
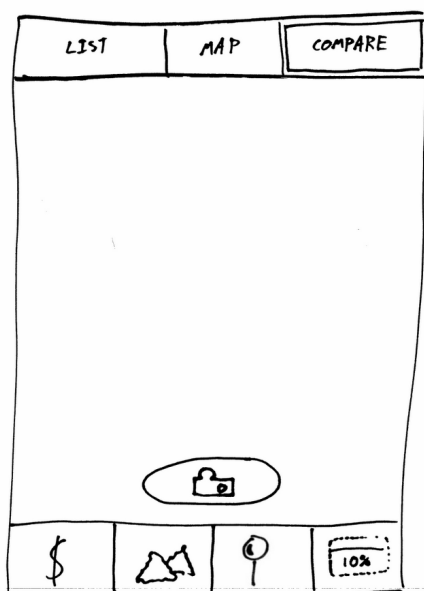
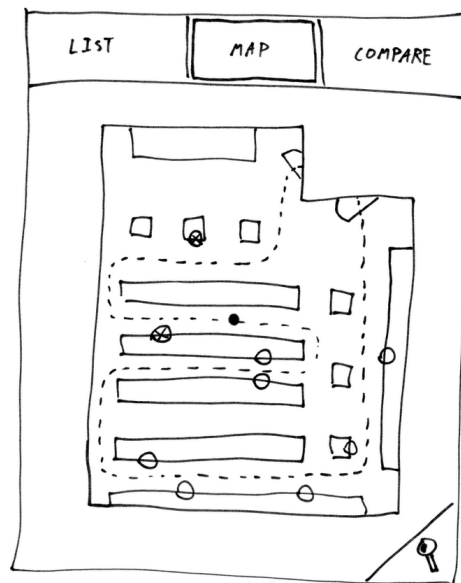
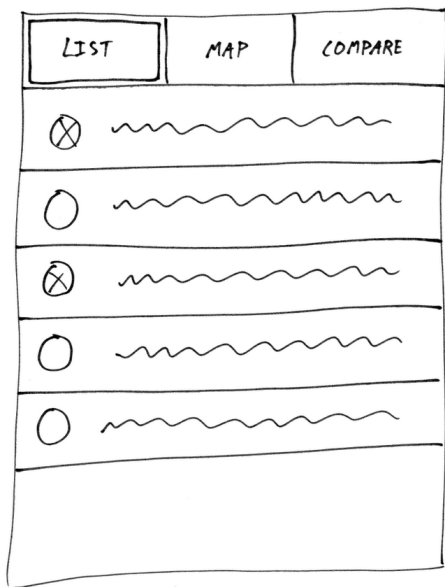
Find the cheapest high quality item

A high quality loaf of bread is one that is made from organic ingredients and does not

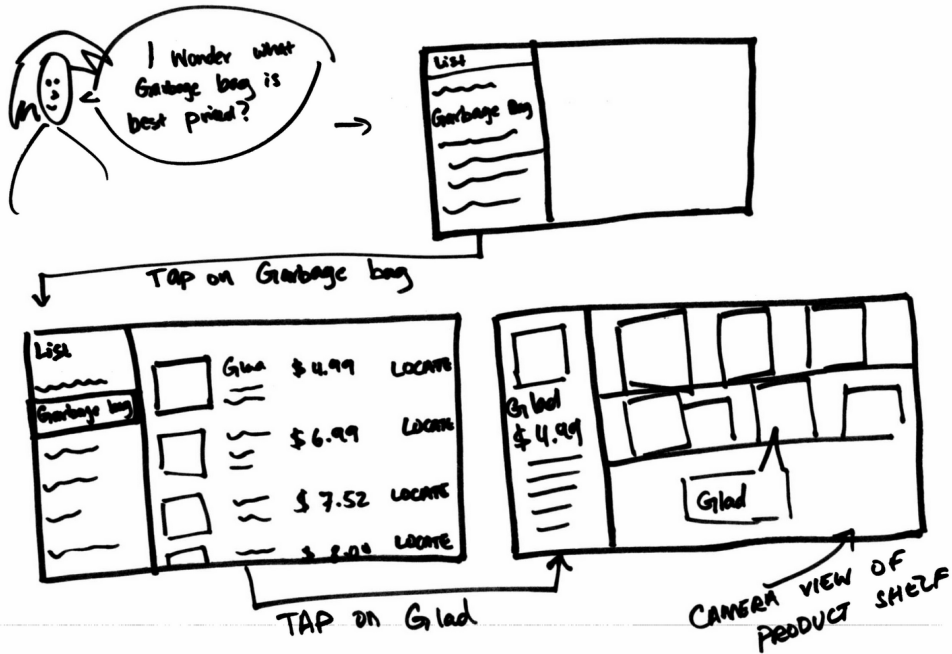
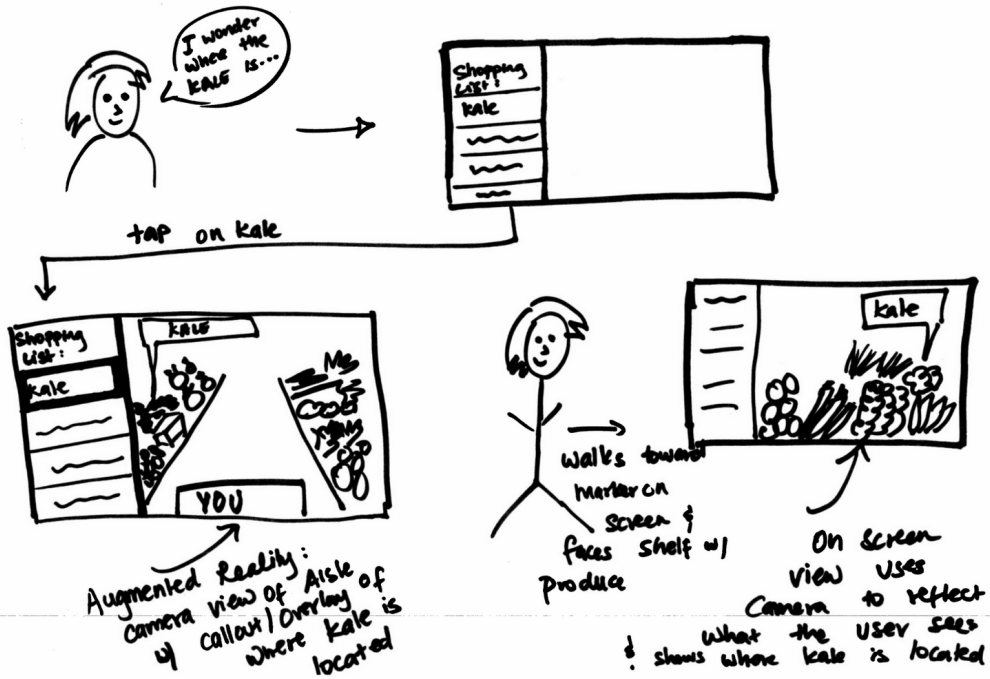
have gluten. You need to get the cheapest loaf of bread that has high quality.

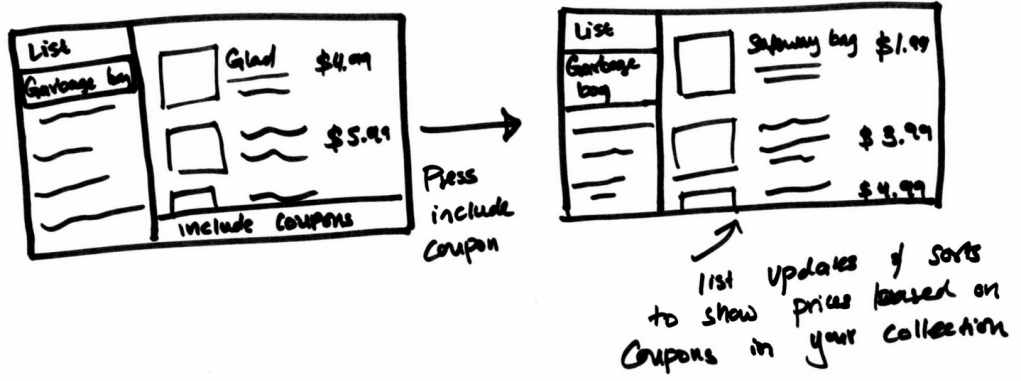
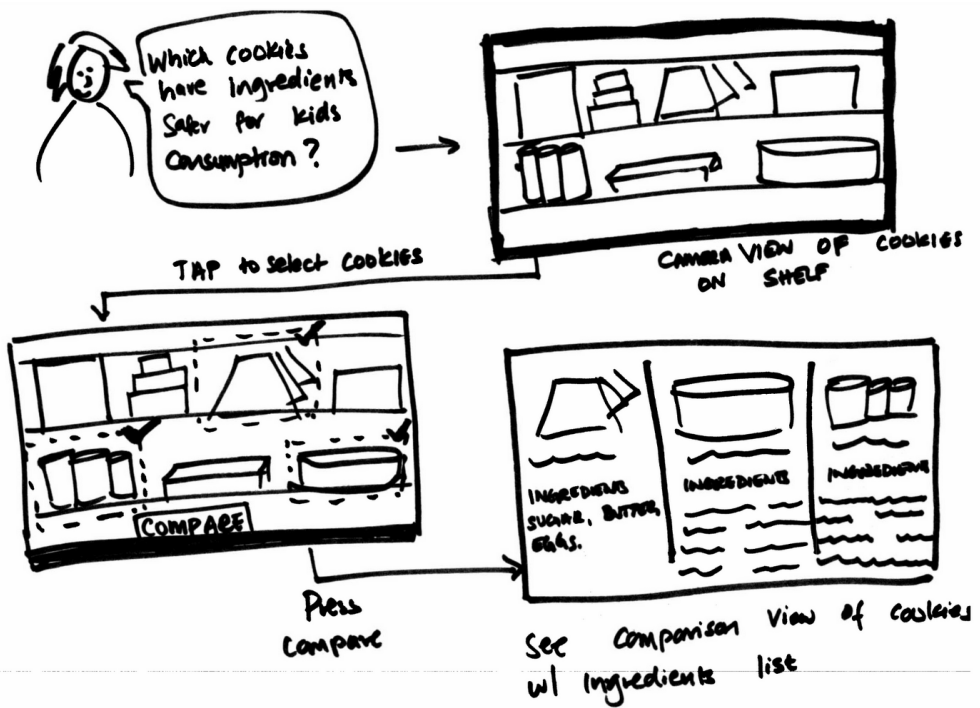
Storyboards

Interface 1:

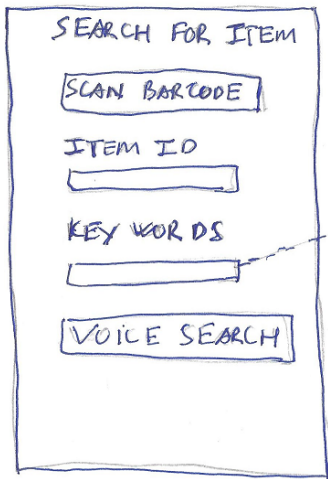


Interface 2:

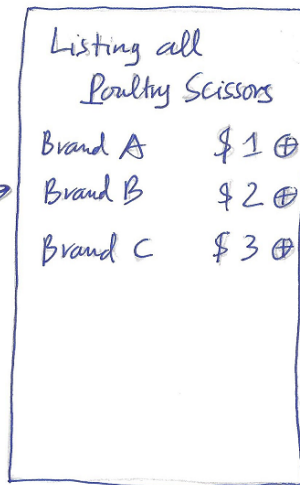




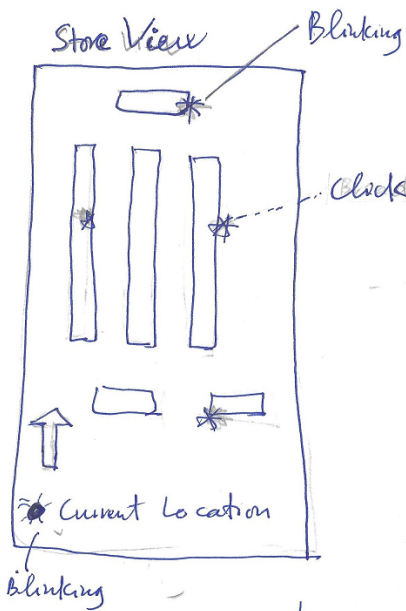
Interface 3:



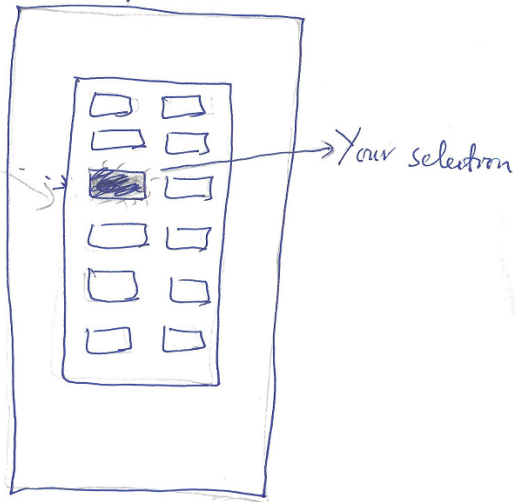
Search



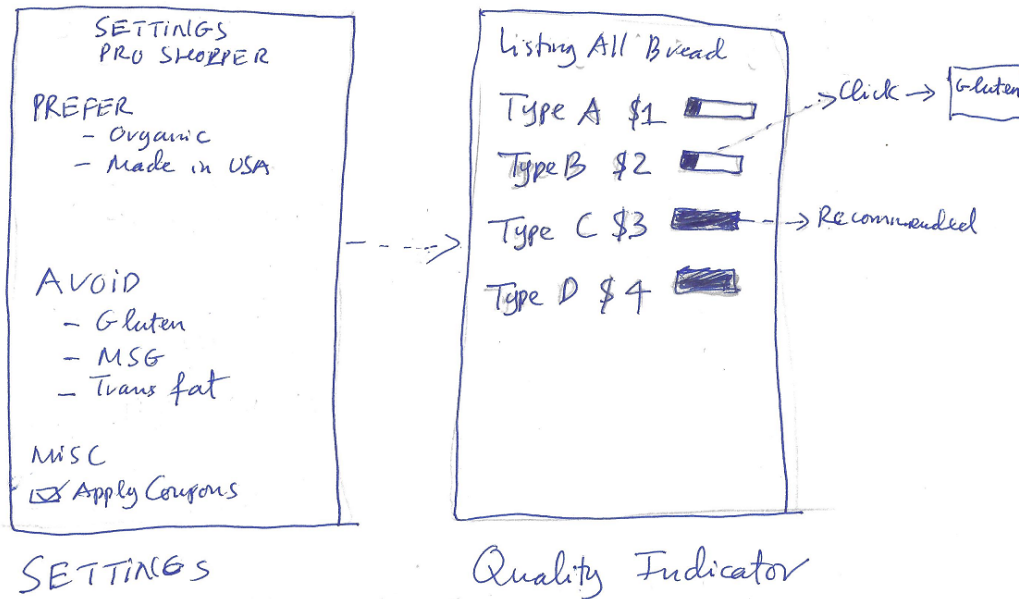
Results display sorted by price



3D Shelf View



Locate Items



Interface Considerations

Mapping Interface:

We all agreed that there should be some sort of map interface that helps the user locate items in the store. There were two proposed interfaces, the first is a top-down map of the whole store that presents a suggested route and beacons for products. An example of this interface can be seen in Interface 1 above. The other is a 3D walkthrough interface similar to Google maps street view. We chose the top-down map for a few reasons. An example of this interface can be seen in Interface 3 above. First off, prototyping and implementing the 3D interface poses a huge challenge, but second, the top-down interface presents a holistic view of the store. An attractive aspect of the 3D interface is that you can direct the user to the exact location of an item on the shelf which is something that the top-down view is incapable of.

Comparison Interface:

It was clear that the user needed a way to compare similar items in many ways. One idea was to apply filters to the list of items, another was to use some algorithm to order the items in some smart way based on user preferences. We decided on a third option, which is to order the items by price, but provide decorators next to items that quickly reveal important information like quality of ingredients or origin. In general we decided that it would be too difficult to satisfy the customer with either of the other interfaces. With filtering, it is unclear what to do when the filters eliminate all of the choices. With smart listings we run the risk of misleading the user. This decorator interface has the benefit of catering to users with complicated needs while not producing bogus suggestions or hindering the casual shopper.

Selected Interface

Our selected design evolved after we each had a chance to storyboard and sketch how customers would accomplish the tasks we had outlined after our Contextual Inquiry. We decided to create a mobile app to help shoppers because we needed to provide value without interrupting their existing flow. Most shoppers make a list of what they are looking for in the store, and since they already carry their cell phones with them, the seamless way to integrate with the shoppers' workflow is via a mobile app.

The main app screen shows the list of groceries the customer has added to their list for the week. Typically shoppers use this to frame their shopping trip, so starting the app with the list makes it easy for them to refer to it while shopping. We discussed a number of ways to extend the list to make it easier for the shoppers to add items they regularly purchase to their list. This didn't necessarily fall into one of the core tasks we were addressing based on our contextual inquiry, so we deferred exploring these interactions.

From the main list view, customers can easily tab to seeing the map layout through the store. The Map layout has waypoints or markers for where items in the customer's list appear in the store. As the customer progresses through the path highlighted through the store, the app notifies the customer of what items on their list are in nearby. From our contextual inquiry, we also noticed that customers tend to purchase items that are not on their list for the week, but if something they frequently purchase is on sale, then they tend to pick it up. The map view also highlights waypoints for the customer's frequently purchased or favorite items. This can be combined with any store sale or coupon offers so the customer can be alerted to deals on these items and use that to stock as needed.

There is a final view to search for an item not on the customer's list. This is through a search box. Often times, customers tend to get a last minute request for an item. We will go into the details of why this view would be more useful than just perusing the shelves for the item to purchase a little later.

From the main list view, users can tap on any of the items to be taken to a detailed list of all products that match that item. For example, if the customer had bread on their shopping list, tapping on bread will show them a list of all bread products available in the store sorted by price. Though price was an important consideration when shopping, it was not the only consideration. Customers were willing to pay a bit more if the ingredients were healthier, organic, sourced locally, etc. This set of criteria we termed the "Quality bar" as it reflects individual preferences. We pre-set some of the criteria, but customers can change these in the settings pane.

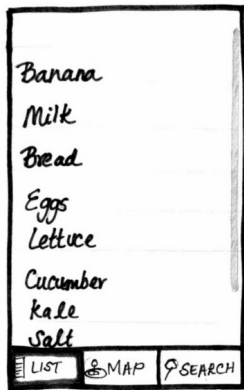
Once the customer has identified the product they wish to purchase, the App can further help them locate it within the store. Once the waypoints have been triggered or a product has been selected, the customer is presumably near the product. By holding the phone's

camera up to the shelf where the products are arranged, the app can overlay information on screen to help the user find the specific product they are interested in.

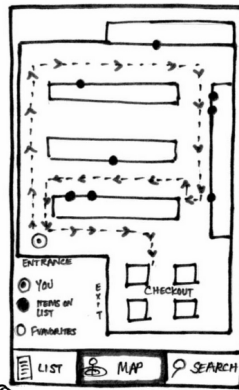
The search page from the main screen helps users quickly find products and jump directly to this feature to locate it within the store. The list of results is the same as the list of products shown when the user selects an item from the grocery list. The list of products are marked up to also indicate whether each product meets the quality bar specified by the user

The quality bar checks each product and matches it to the criteria specified by the user. These criteria can be simple checks like No MSG or Corn syrup in the ingredients list, or they can be more complicated like country of origin. If the customer has a nut allergy, they can indicate this so products containing nuts are marked up. There are other options as well.

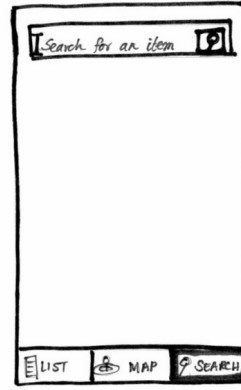
From any of these detailed views, the user can press back to get back to the main view of the grocery list.



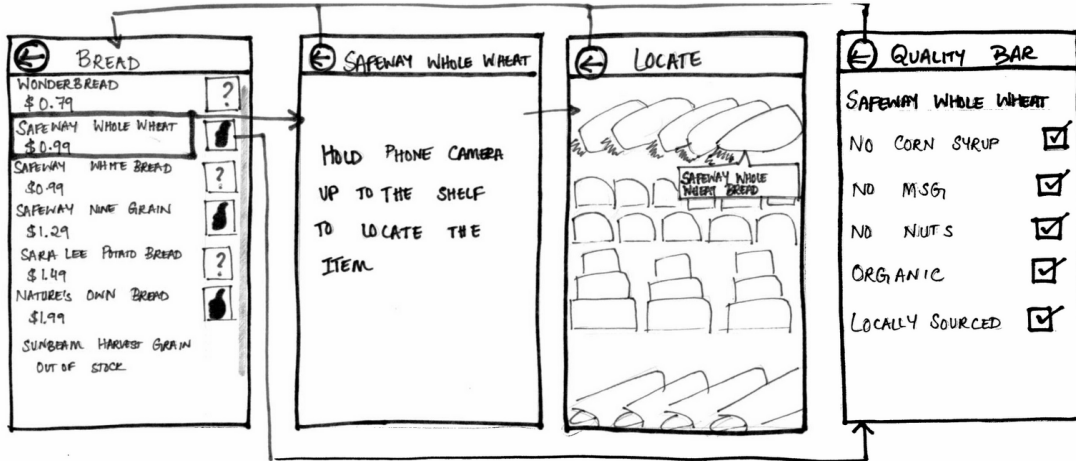
① The app launches in the grocery list view. There are 3 tabs in the main view of the app



② The map view shows the trail or path through the store based on items in the grocery list



③ Search view to find something that isn't already on the list.



Scenarios

Tomorrow is Thanksgiving Day and Melissa realizes that she needs to go to Safeway to get a few items to prepare for this special occasion. Melissa fires up the Pro Shopper shopping app on her cellphone to start compiling the shopping list.

Melissa knows she needs to get poultry scissors, but does not know which brand to pick. Melissa switches to the Search tab of the Pro Shopper app and types in "poultry scissors". Pro Shopper searches the store and pulls up all available brands, sorted by price. Melissa picks Kitchen Aid brand as it's the cheapest option. Melissa knows she also needs to pick up a few loaves of bread. Being a health conscious person, Melissa already told Pro Shopper to prefer organic items and to alert her when items have gluten and other unhealthy ingredients. When Pro Shopper displays all available bread selections in the store, it also shows Quality Bar Indicators for each of the bread options. Melissa browses through the list and decides to pick Arnold Whole Wheat because while it's not the cheapest, it has several Quality Bar Indicators that she prefers. After saving the shopping list, Melissa is ready for her fun shopping trip.

When Melissa gets to Safeway she walks into the trolley line and fires up the Pro Shopper app again to help guide her through the store so she could pick up all items in the shortest time possible. Switching to the Map tab of Pro Shopper, Melissa sees that the app knows where she is currently located. It also shows here the direction to all relevant areas of the store, with items on her list represented by waypoints.

As she picks up the poultry scissors from the shelf, Melissa realizes that she also needs to get a baking tray. Melissa quickly searches for the item and adds it to the list. Pro Shopper app automatically updates the route to include this new item it the map.

After everything is picked up from the store, Melissa checks out and goes home ready to make her favorite rotisserie turkey.