Consumester

Task Analysis
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Problem Solution and Overview

Task Analysis Questions

Who is going to use the system?

- Identity: People with access to a mobile device. People who throw stuff away (everyone). People who shop at stores (most everyone).
- Background: May or may not have recycled. Have used some sort of mobile device.
- Skills: May know how to capture images with a mobile device. May or may not know proper recycling practices.
- Habits: Dispose of waste regularly. May or may not actively pursue recycling opportunities.
- Preferences: Various beliefs in personal consumption behavior.

What tasks do they now perform?

As we learned from our contextual inquiry of Alice and Rick, some families keep recycling receptacles in their homes to separate recyclable waste from regular waste. From our contextual inquiry with Art at InterConnection, we learned that some people are willing to make an effort to recycle special items by taking them to designated recycling centers. Finally, from our contextual inquiry at West Seattle Recycling, we know that some recyclers visit recycling centers for financial reimbursement of donated materials.

Our contextual inquiries and personal experiences also taught us that if a recycling option is available alongside garbage receptacles, many people will use it; however, without such an option, most people tend to dispose their recyclable materials in the garbage.

What tasks are desired?

- Learn proper recycling practices
- Actively attempt to recycle materials.
- Look up available nearby recycling options.
- Become more aware of their personal consumption over time.
- Improve individual consumption habits.
- Give away unwanted reusable materials/items instead of throwing them away.

How are the tasks learned?

Our app will help people learn proper recycling practices by providing easily-accessible information regarding the recyclability of materials. With repeated use, users will learn proper recycling procedures and hopefully commit them to memory. Additionally, the purchase tracking feature of our app will provide users with a breakdown of their purchase history. This will hopefully increase consumption awareness, reducing personal consumption over time. Through our give-away feature, users will learn the benefits of reusing materials rather than disposing of them, hopefully increasing how much material is reused over time.

Where are the tasks performed?
- At any store where purchases might be made.
- At the point of picking something up off the shelf that one is considering buying.
- After paying for goods at a store.
- At a residence where items are disposed.
- Any place where someone might need to dispose of something.
- Any area where someone might be giving away reusable materials/items.

What's the relationship between customer & data?
Customers access their data on their personal mobile device. This data will be private and stored in the cloud. This approach to data storage protects users against lost/damaged devices and also allows for multiple users on a device. Although personal data retrieval relies on an Internet connection, not every feature of our application is reliant on this data.

To access the give-away feature of our application, multiple users will retrieve data from and post data to the cloud concurrently. At this point in our design process, we see no need for any data to be passed from one device directly to another.

What other tools does the customer have?
Customers currently use a variety of tools to achieve proper recycling practices. These practices require obtaining knowledge on how to recycle. This relies heavily on the Internet to look up recycling centers for special items, information about proper disposal techniques for other items, and any other information they might need to know. The responsibility lies with the customer to diligently find the disposal information (if any exists). Users can try this by reading the label and packaging of items, although this information is not always printed.

In order to find free items in the local vicinity, people currently use classified search engines such as Craigslist to look up items within their respective city. Craigslist, however, provides location detail to only the city level.

How do customers communicate with each other?
The largest way that customers communicate is through posting free items. Others can view these items and then contact the person through anonymous phone calling and/or email communication. There will be no direct peer-to-peer connectivity in our application.

How often are the tasks performed?
Purchase tracking will probably be the most frequently-used feature, as this feature is usable by all users of the application since it requires no background knowledge. The situations in which users would use this feature occur most frequently.

The recycling assistant feature of our application will be used initially quite often as users begin to build their knowledge. As this knowledge grows, they will use this aspect application less frequently because they will have already learned the provided information.

What are the time constraints on the tasks?
Based on our contextual inquiry, users would not give the effort to research a product if it took too much time. Consumester must cater to users with a limited time frame. The consumption tracking feature of our application is not limited on time since users will use it at their leisure.

What happens when things go wrong?

If a user attempts to look up disposal information for a particular item and no information is found, we will present the user with a pointer to another search engine. This could result in a decline of the observed robustness of our application; he or she may question the usefulness of a recycling assistant that cannot find their item. Similarly, if no local listing are found when a user searches, we will point the user to the free section of their local Craigslist website.

♻ Revised Tasks

We added more detail to task 1 to better convey the situation of the task. Then we significantly changed the focus of task 2 to highlight a recently-developed feature. And in task 3, we altered the focus to better suit the goals of our application and added more detail.

Please see appendix for revised tasks.
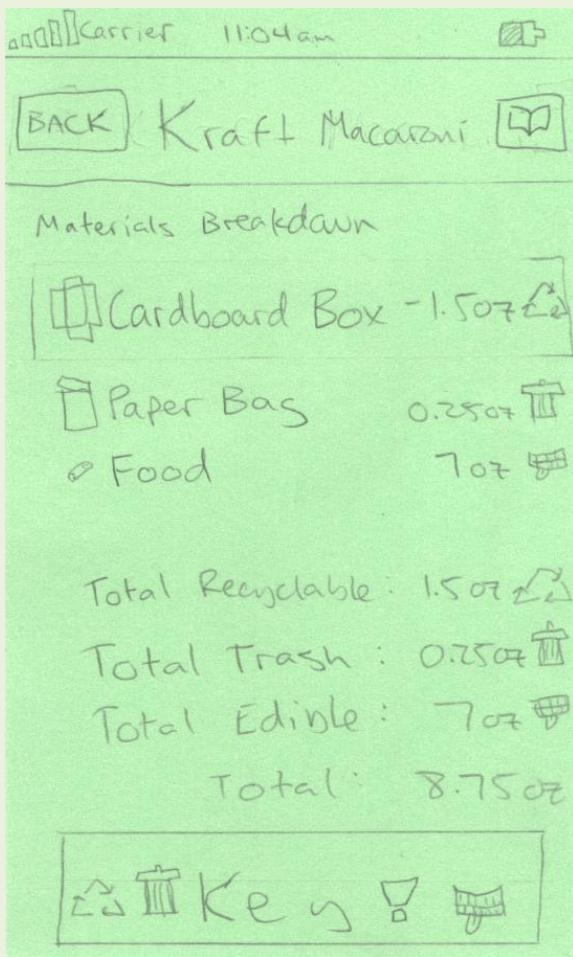
Storyboards

♻ Proposal 1: iPhone-based design

Figure 1.1 – Home Screen

Figure 1.2 – Give away an item

Leads to Figure 1.5
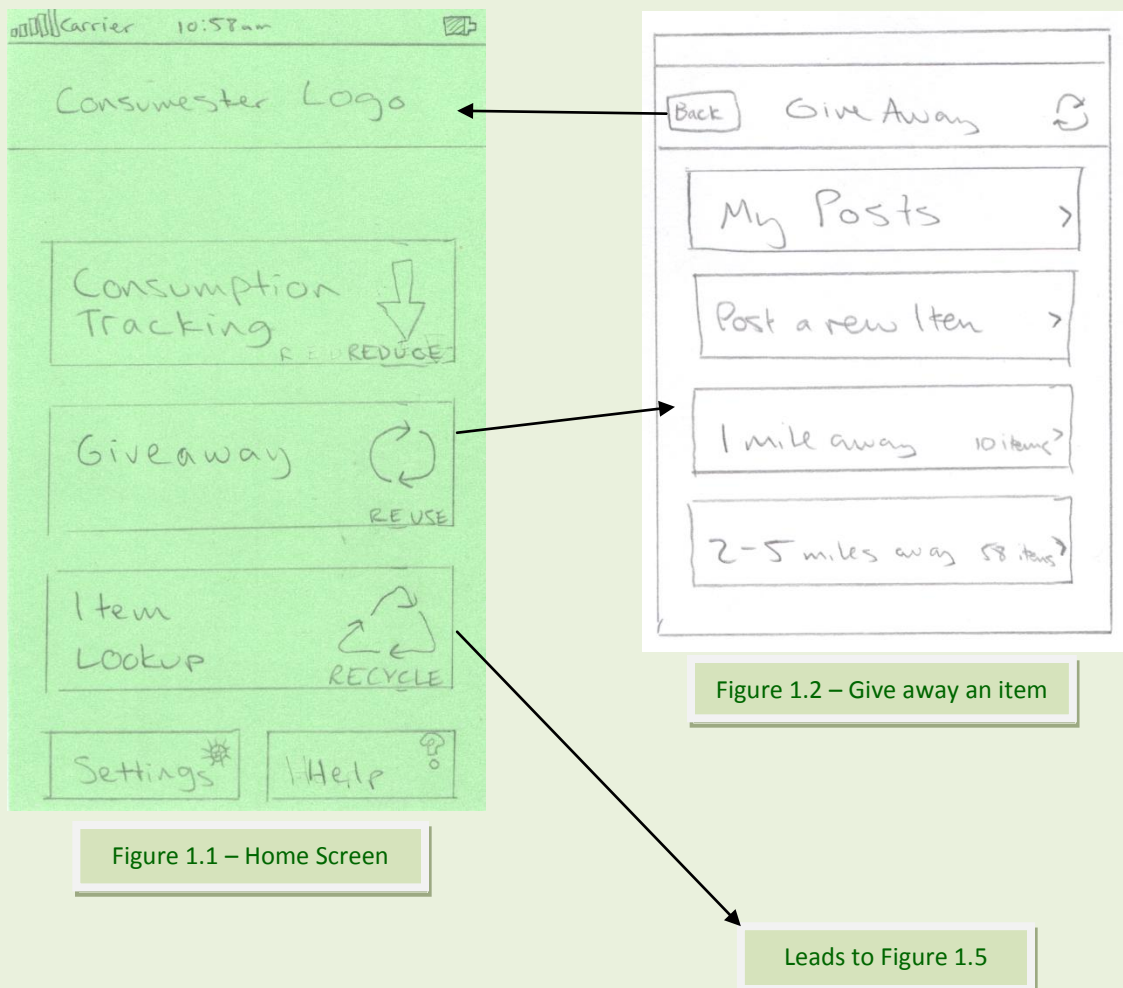
Figure 1.3 – Specific item general information
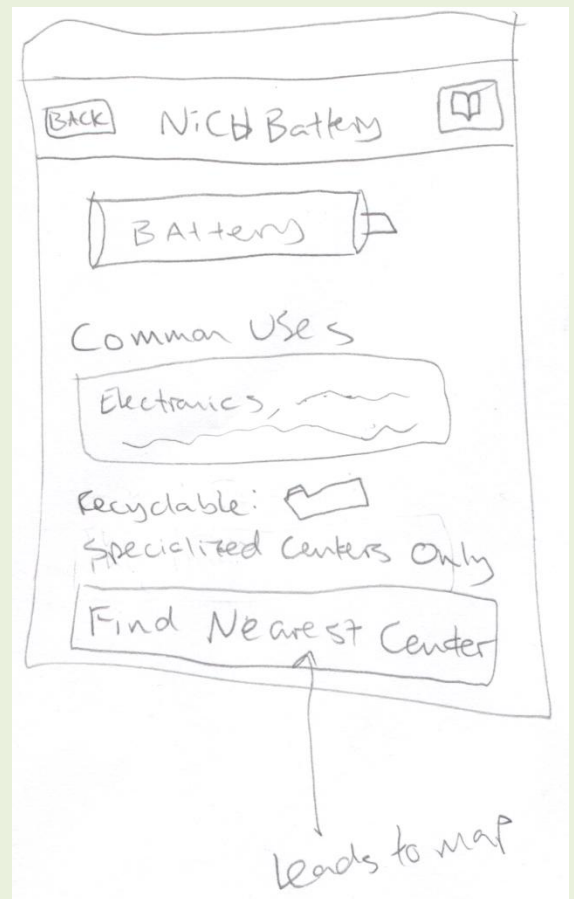
Figure 1.4 – Specific item materials information
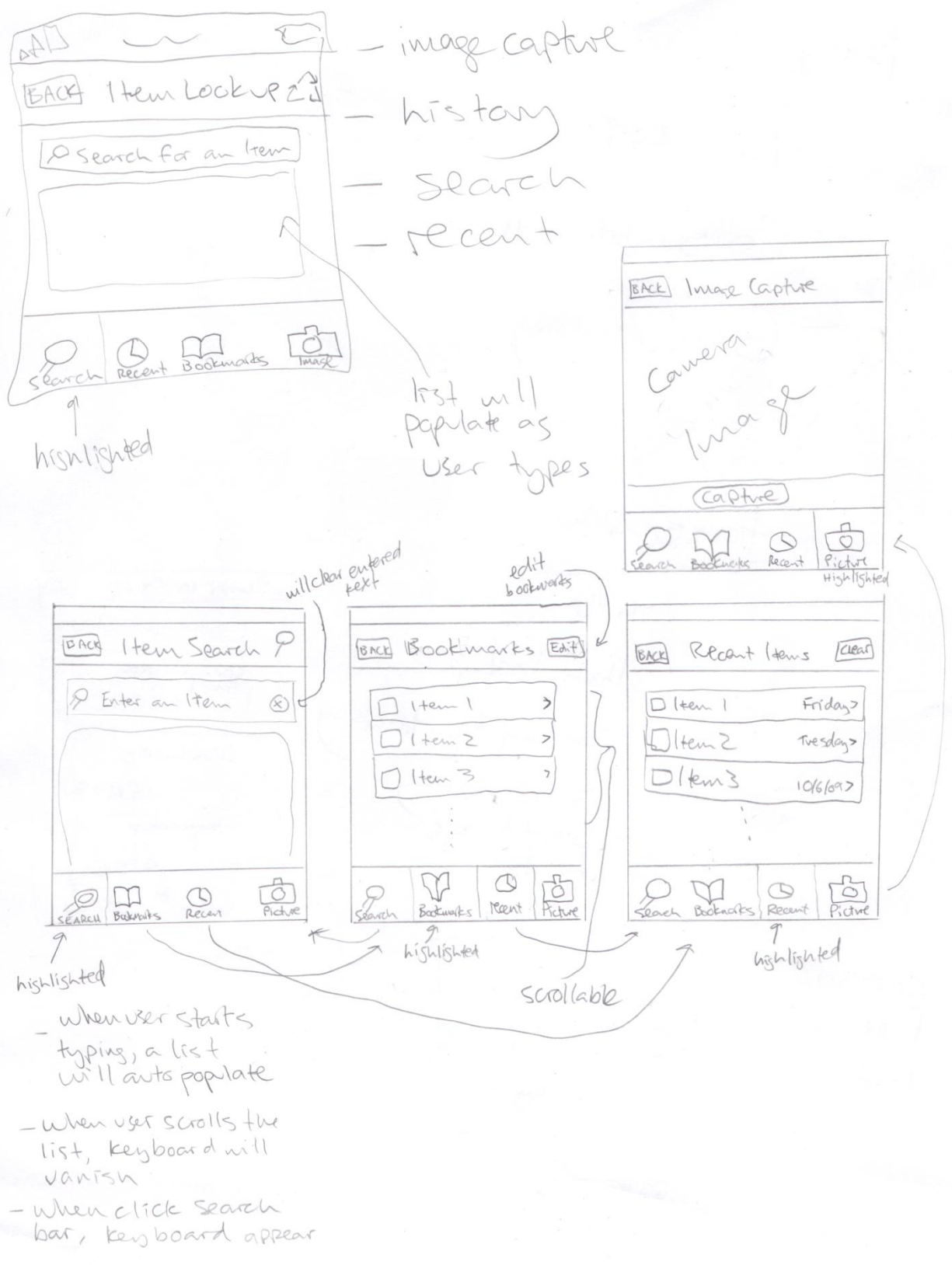
Figure 1.5 – Item look up via 4 modes: image capture, search, bookmarks, and recent searches

♻ Proposal 2: Vertical-tabbed design
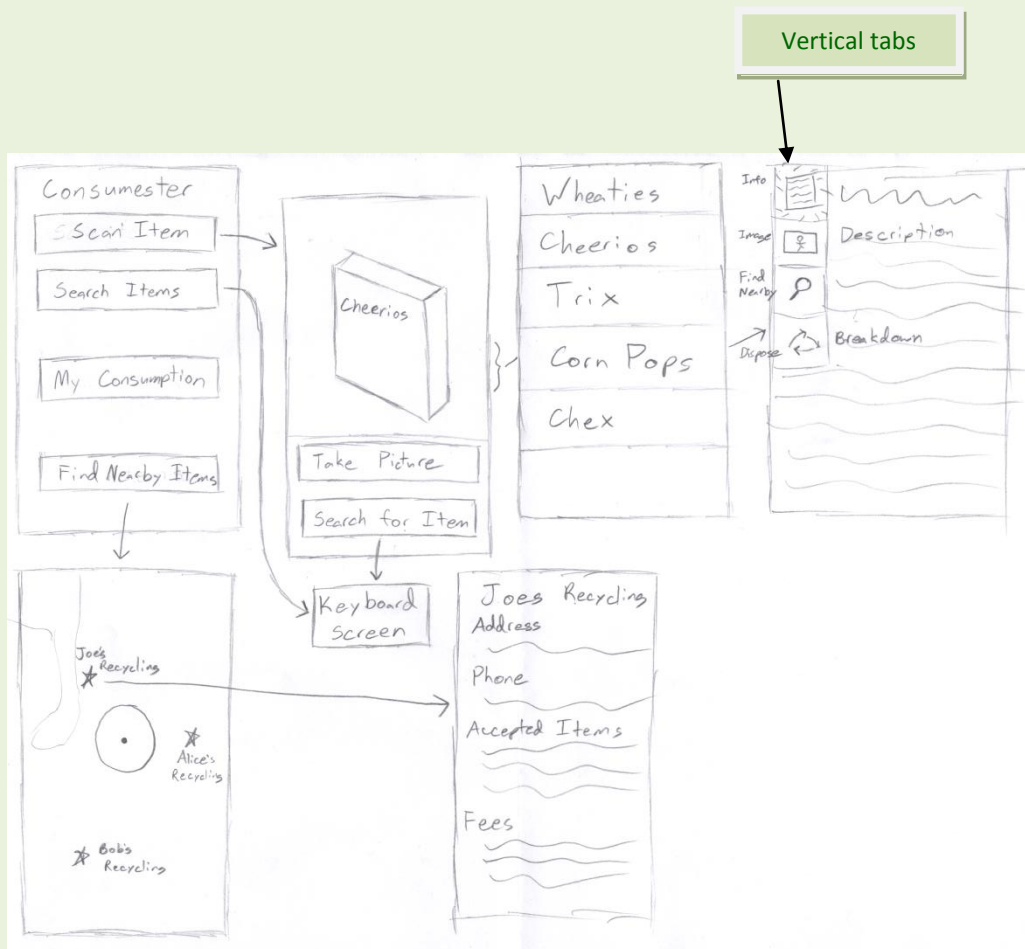
Vertical tabs

Figure 2.1 – Vertical tabs
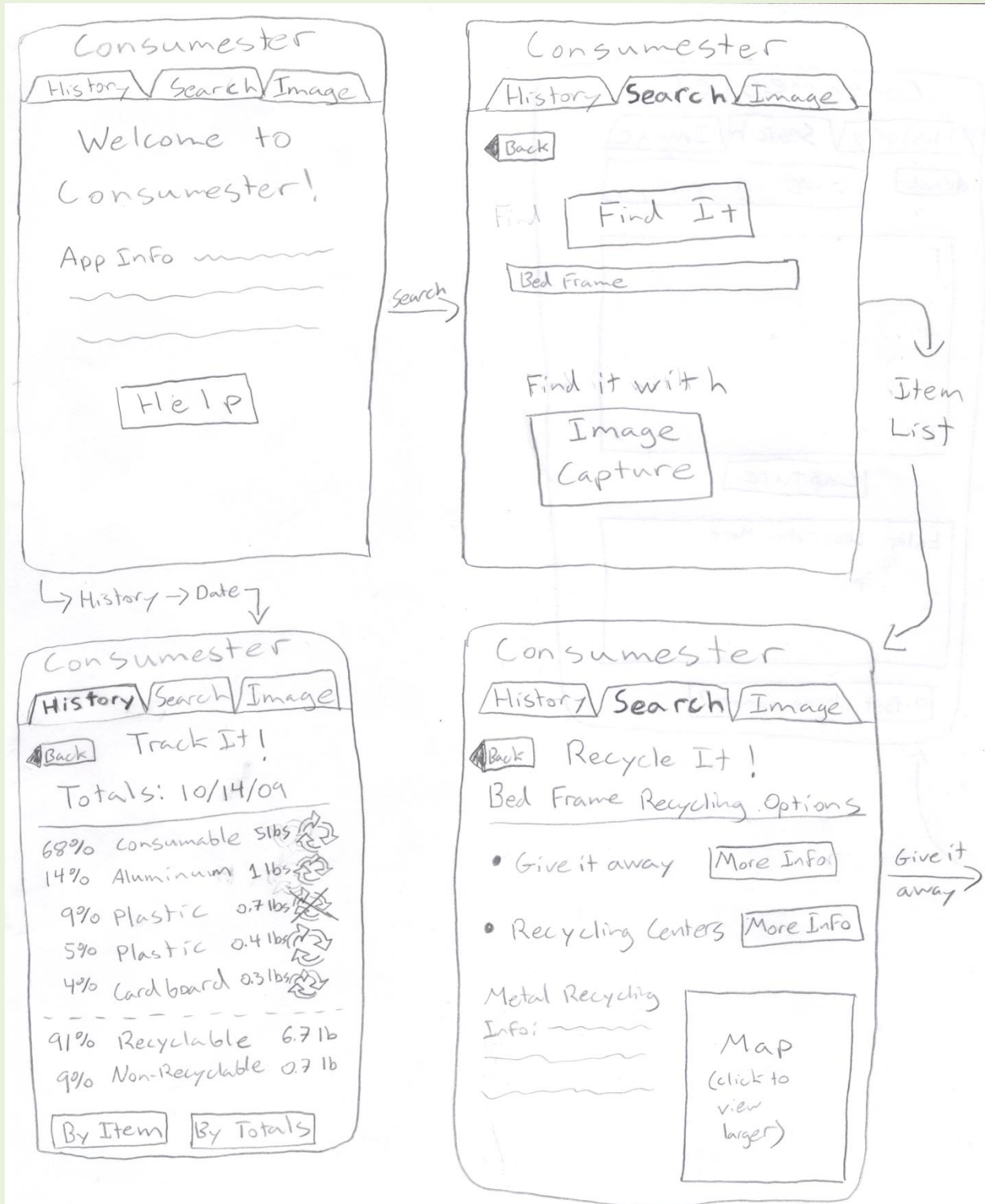
♻ Proposal 3: Traditional Tabs

Figure 3.1 – Traditional tabs

Selected Interface Design

We chose to design our application based on Patrick's design, using the iPhone. After comparing and contrasting the three proposed designs, we decided that the iPhone-based

Figure 4.1 – Selected Home screen

design presented our application in a simple and attractive way. The iPhone is arguably the most popular mobile device today, and many people are familiar with its menu style and touch functionality. While we did incorporate features from the other proposals sporadically, we felt the iPhone-style design provided the best overall layout for ease of use. This ease is provided through the use of large button menus, bottom page tabbed browsing, and simple presentation of information.

The home page (Figure 4.1) contains buttons to each of our three main functions: personal consumption tracking, item giveaway, and item look up. In addition, our help menu and settings options are available via small buttons at the bottom of the page. We identified these features to likely be most often accessed by consumers. By putting them on the homepage, they are quickly accessible for our users, which is one of our key goals based on our contextual inquiry results.

The top of each page has the page title and a back button (Figure 4.2). All pages of the application follow this format to promote uniformity and consistency, leading to a smoother interface for the user. We believe it is important to always allow the user to return to the previous screen,

Figure 4.2 – Title & Back button

should they feel like they have made a mistake or feel lost in our application. At the bottom of each feature page are tabs for easy navigation through page contents. We took this approach because we could not fit all necessary content on a single screen, but did not want users scrolling very much, particularly for navigational elements. The icon-assisted tabs at the bottom
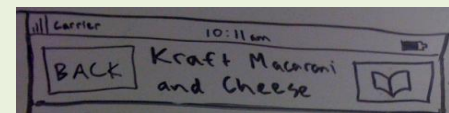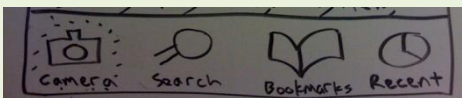

Figure 4.3 – Icon-assisted tabs

of the page (Figure 4.3) allow the user to know exactly what they are looking at in relation to other functionality. For example, on the Lookup Item page the bottom tabs contain "picture", "search", "bookmarks", and "recent". Our application allows users to look up individual items through four different techniques, and the tabs at the bottom of the page inform users the other options throughout their entire process of looking up an item.

In order to reduce waste, we provide the function of consumption tracking. The concept relies on the ability to increase awareness about what a consumer is buying. "What" refers to the actual items, as well as the materials, the amount purchased, and whether or not they are able to be recycled. This concept is attained by our application's ability to store "consumed" items. This can be done through individual item look up and storage, but will most often be done through image capture and recognition. Image capture can be of an individual item or of an

itemized receipt. In the case of a receipt, each item will be stored for that given date. One can then view what was bought when, what materials made up the purchase, and how to dispose of said materials. This feature will allow easy consumption tracking over time. For example, a consumer can easily view what materials (and how much of them) they bought in the previous month and compare it to the current month. It is important to note that we realize that we are not directly tracking "consumption." Rather, we are providing the ability to track potential consumption by providing convenient tools to allow conscious consumption. It is hypothetically possible for the consumer to buy lots of green-friendly products, but then throw those products away. It is up to the users to be honest with themselves, and hopefully they will be with the added help of the convenient Consumester application.

Our second function allows user to promote the reusing of items rather than throwing it away. This concept is attained by our application through the function of location-based item give away. If a consumer has an item they want to get rid of that is still in usable condition (e.g. a piece of furniture), they can post it on Consumester's database to give it away. To post an item, a user must capture an image of the item and record notes about the item (e.g. couch is missing 1 foot). The posting consumer has the option to state whether they want interested parties to be able to call them, allowing users full control over their privacy settings. Further privacy issues led us to not give physical address or exact location, but rather simple proximity to those looking for items. In addition, users will be able to set designated call times in their profile settings to make sure they do not receive calls from people interested in the item at unwanted times, such as at work or while sleeping. People interested in reusing posted products then browse the listings based on distance from their current location. Interested "receivers" of items will be able to contact "posters" through anonymous calling -- they will never know the poster's phone number. Upon contact, the two parties can negotiate to transfer the item.


Figure 4.4 – Item Giveaway

Figure 4.5 – Image capture

Our third function relates to the concept of recycling. Consumester increases the availability of recycling information by providing a breakdown of information for most products. Items are pulled up via an image capture interface (Figure 4.5) using the phone's built-in camera, a keyboard interface in case of unrecognized items, or a selection of user bookmarked or recently searched items. Each item is then broken down into the item's materials. Our interface shows the user the percentage composition of the items and tells the user which can be recycled. Information is then provided about how to recycle each category and potential disposal options. For example, if a user looks up a computer, our application will recognize that the item must be
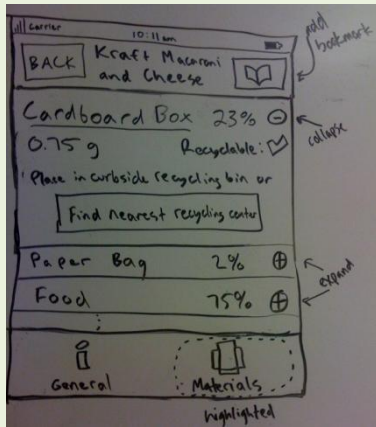
recycled at a specialized center. The materials breakdown has a map button (Figure 4.6) that displays the closest computer recycling center to their location. If this item is one the customer has just purchased and did not have an associated receipt, it can also be added to the tracking data for the customer, as well as bookmarked for quick access.

Figure 4.6 – Specific item breakdown

Scenarios

♻ Annie's Batteries

After months of use, Annie has noticed that the rechargeable batteries in her point-and-shoot Sony digital camera are no longer able to hold a charge. Her batteries are the standard AA size, however they are labeled with symbols unknown to Annie, such as "600mAh" and "NiCd." Annie wishes to dispose of the batteries, but she is unsure whether they can be recycled, and if so, where she should take them to be recycled. Annie opens up her Consumester application on her mobile device. From the home screen, Annie presses "Lookup item" and decides to use the image capture feature. Once Consumester recognizes her rechargeable battery, it presents Annie with a description of the battery. Annie sees that her batteries are indeed recyclable but notices that they must be taken to a specialized recycling center. Annie clicks the button "Find nearest location" button and is presented with a map which shows her location in relation to the closest recycling centers she can take her batteries. Annie clicks on the center closest to her location, and selects "Get directions" in the tooltip. This link redirects to an external directions service like Google Maps or MapQuest.

Annie now knows that her batteries are recyclable. She also knows that she should not simply place them in her normal curbside recycling bin; the batteries must be disposed of at special recycling centers.

♻ Stephen's Couch

Stephen's girlfriend April calls him on Saturday to let him know she is going to pick up a 12 pack of beer for them to enjoy while they watch the Husky football game. Midway through the game, April accidentally spills her beer on Stephen's oldest couch. Stephen wipes the couch repeatedly with a cleaning solution and manages to eliminate the scent of beer. However, a stain persists. Stephen has been considering getting rid of this couch for a while now, and April's spill finally convinces him that it is time. At first Stephen is considering multiple options for how to get rid of his couch. Then he realizes his Consumester application has the perfect solution. He opens up the application and clicks "Give/Find an item." After clicking "Give an item," he then takes a picture of the couch and writes a brief description in the designated entry field. Stephen is sure to mention that beer was spilled on the couch, but if someone just

flips the cushion over then there is no visible stain. He also specifies that he wants any interested parties to be able to contact him via telephone. The next day he receives a call from a woman named Claire looking for a couch that lives 1.5 miles away and is willing to come get the couch that evening with her truck. Stephen gives Claire his address and later that evening the transfer is successful. Stephen is happy that he was able to dispose of his couch without hassle and without adding anything to a local dump.

♻ Jake's Trash

Jake's neighbor Cecilia mentions that the amount of trash she has seen on the sidewalk in their neighborhood has been increasing since she moved in eight months ago. Jake realizes that his trash has been increasing also and he is not sure why. Jake remembers that he used the receipt recognition feature of his Consumester application to document all of the materials for the items he purchased, so he opens the Consumester application and clicks on Consumption Tracking. He enters the date range from a month ago until today and instantly sees a list of the total amount of each material he bought in that range. He then clicks on itemized, where he instantly gets a comprehensive list of each item. He notices an inordinate amount of beverages, frozen pizzas, and various snack foods. The birthday party he threw for a friend two weeks ago suddenly comes flooding back into his memory. He looks at the itemized breakdown and realizes he bought too many individually packaged snacks and beverages in small containers instead of large ones. The next time Jake has a party he makes a conscious effort to buy recyclable products, and products without excess packaging.

Scenario Analysis

To formulate these scenarios, we took our existing tasks and walked through them as if the user had the assistance of our application. This allowed us to demonstrate exactly how the user would be helped through this task with our service. Using these new scenarios, we were able to double-check our designs to make sure they would suite the user when needed. This was a highly-effective error checking utility because it required us to perfect our design to suite these particular tasks.

Appendix

Revised Tasks

♻ Disposing a battery (easy)

After months of use, Annie has noticed that the rechargeable batteries in her point-and-shoot Sony digital camera are no longer able to hold a charge. Her batteries are the standard AA size; however they are labeled with symbols unknown to Annie, such as "600mAh" and "NiCd." Annie wishes to dispose of the batteries, but she is unsure whether they can be recycled, and if so, where she should take them to be recycled. Annie looks up the proper method of disposing batteries because she wants to take the environmentally-friendly route. If they are indeed recyclable, Annie needs to find the nearest recycling location and figure out how to get there.

The recycling practices of certain items, such as batteries and other electronics, are often unknown or inconvenient to look up. Additionally, the effort required to determine the best recycling procedure for an item can outweigh the consumer's desire to recycle the item properly. However, if recycling information for an individual item was easily available, we believe people would take the proper steps to dispose of the item in the environmentally correct manner.

♻ Giving away an item (moderate)

Stephen recently got a brand new 4-person couch. The new couch will fit perfectly in his living room as long as he gets rid of his current couch. The current couch is in decent condition (just a few scattered wine stains) and is still very usable. Stephen is considering multiple options for how to get rid of his old couch. He considers borrowing his friend Mike's truck and taking it to the dump or simply giving it to one of his friends. After asking a few of his friends and finding no takers, he decides to post it for free on Craigslist. He gets a few responses, but all interested customers live over 15 miles away and none of the interested customers are willing to drive to Stephen's house to pick up the couch. Stephen has no desire to go through the hassle of borrowing his friend's truck and driving the couch a long distance, after all he isn't receiving any money for it and the dump is just ten minutes away. Ideally, Stephen wants to find someone who will take the couch that lives nearby so the transfer is as hassle free as possible.

Consumers often have items they no longer need, but are also still usable. Often it is not convenient to find someone who wants the usable item, so they take the convenient route and throw it away, rather than reusing it. Consumers are often not conscious about the demand for their item within a local proximity. This leads them to miss out on possible convenient opportunities to give away a usable item and avoid unneeded garbage.

♻ Tracking consumption habits (difficult)

Jake's neighbor Cecilia mentions that the amount of trash she has seen on the sidewalk in their neighborhood has been increasing since she moved in eight months ago. Jake realizes that his trash has been increasing also, and looks through all of his receipts to find the reason. After arduously digging through multiple receipts, he notices that he has bought twice as many non-recyclable items during this month than the same time last year. He sets a goal to reduce his non-recyclable waste by 40% over the next year and needs to keep track of his purchases in order to figure out which products are producing the most waste, such as Easy Mac cups.

People do not often track how much waste they generate, and this lack of attention can cause an increase and negligence over time. Alice and Rick provided an example of this, saying the only reason they found a water leak is because of an increase in their water bill. Comparing consumption through the tracking of purchases over previous months can lead to increased awareness of individual consumption habits, the formation of goals, and self pressure to improve.