

SavvyShop

A Mobile Application
for better shopping management

Midterm Project Team 2

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A. Executive Summary

Application Domain

The majority of people going to supermarkets shop from a list based on needed items. Some make multiple lists because they complete their grocery shopping at various stores. The lists may be written on paper, but in our observations, a great many people today use the notepad application on a smartphone or tablet. Our project involved following and observing the habits and behaviors of three shoppers during their weekly trip to the supermarket.

Data Collection Methods

We accompanied three shoppers to the supermarket while they performed their weekly grocery shopping. While observing, we inquired about their habits and behaviors. For example we wanted to know how they make their lists, whether price is important when choosing items, if there is a particular budget that must be adhered to, etc. We also wanted to know if they shopped only from their list or if they purchased any items that weren't on the list, and if they did buy extra items why they did so. The route chosen through the market was also of interest to us. The data collected gave us insights into the way people manage their shopping lists and what is important to them when shopping. Each of our shoppers had a preferred supermarket, but some were willing to go to another nearby store if they would save money. One shopper needed to maintain a specific budget and was unwilling to deviate from that amount. Each shopper used his/her smart device to manage the shopping list and updated it throughout the week as s/he noticed something was needed. Another of our shoppers collaborated on his list with his roommates and shared the cost of the weekly shopping with them. In two instances, our shoppers picked up additional items that were not on their list. In one case, a sale tag displayed on the shelf caught the shopper's attention. In the other instance, an item was suggested to the shopper by another patron.

Data Analysis and Design Ideas

For each contextual interview we developed five work models (flow, artifact, physical, sequence, and cultural). These models helped us discover the main areas of focus for the project, which are list management, budget management, price comparison, and shopping route efficiency.

Creating storyboards, visioning, and creating a user environment model helped us to further refine our focus and develop our low-fidelity prototype. In this, we focused mainly on list management and budget management, which also lend to price comparison capabilities, but we added some "functionality" for route efficiency.

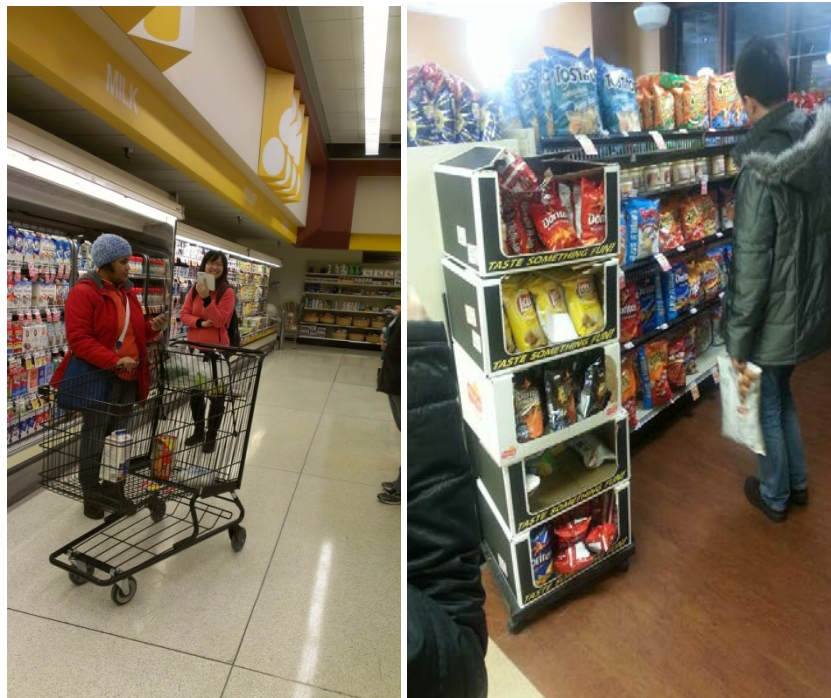
Evaluation

After we completed our low-fidelity prototype, we performed a few internal walkthroughs as a group to ensure the functionalities were appropriate. From the low-fidelity prototype, we developed an interactive, high-fidelity prototype. Each of our three original shoppers was shown the interactive prototype and was asked to give feedback on it.

B. Project Scope

Fieldwork Setting

The team members set up their ethnographic study in the field. The team members directly observed the users directly in the field. The users were studied in their regular spaces of shopping and were studied with natural behaviors and interactions.



Existing Systems

The existing systems were studied to enhance shopping. The available mobile applications in the market were studied. Various physical projects that help in enhancing shopping were studied. The list has been detailed in Appendix 3

Stakeholders

The primary stakeholders of this application are regular shoppers, including people who make the primary grocery shopping decisions and those who have little time to invest in the shopping process, housewives, budget conscious shoppers, including those who tend to look for sales or offers and show a difference in behavior, such as buying more than intended, and those motivated by shopping through technology (i.e. smart device users). Secondary stakeholders include those who fund the shopping and those dependent on the primary shopper (i.e. children, spouse/partner, and roommates).

C. Field work Activity and Data Collected

Methods Used

The design team videotaped, took notes and one of the members interacted with the users as a think aloud protocol was tried to be achieved to think what they were thinking. A few questions were asked and a simple task was taken on site. A naturalistic interview also formed a part of the process. The format of the method used can be found in Appendix 1.

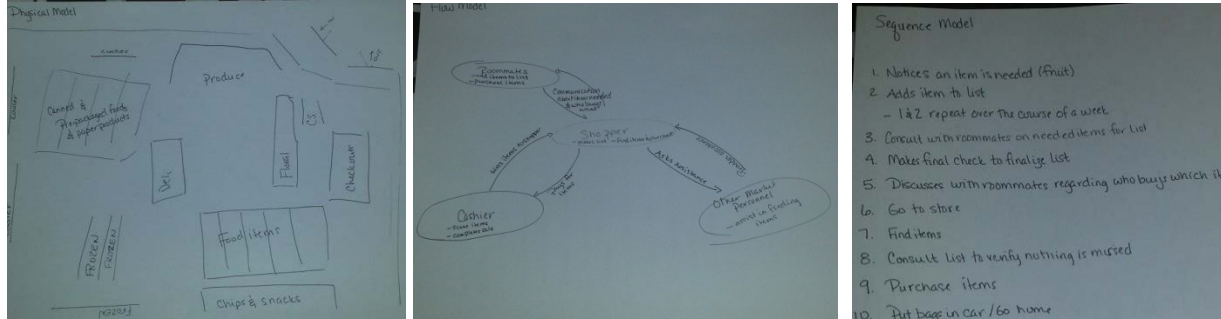
Data Collected

The data collected was raw in the form of video and notes from the user site. The data was converted to useful data by collecting useful user quotes from the video and insights were collected from the user data taken in the form of team notes. These were further organized and analysed with the help of work models.

D. Work Models

User Activity Models

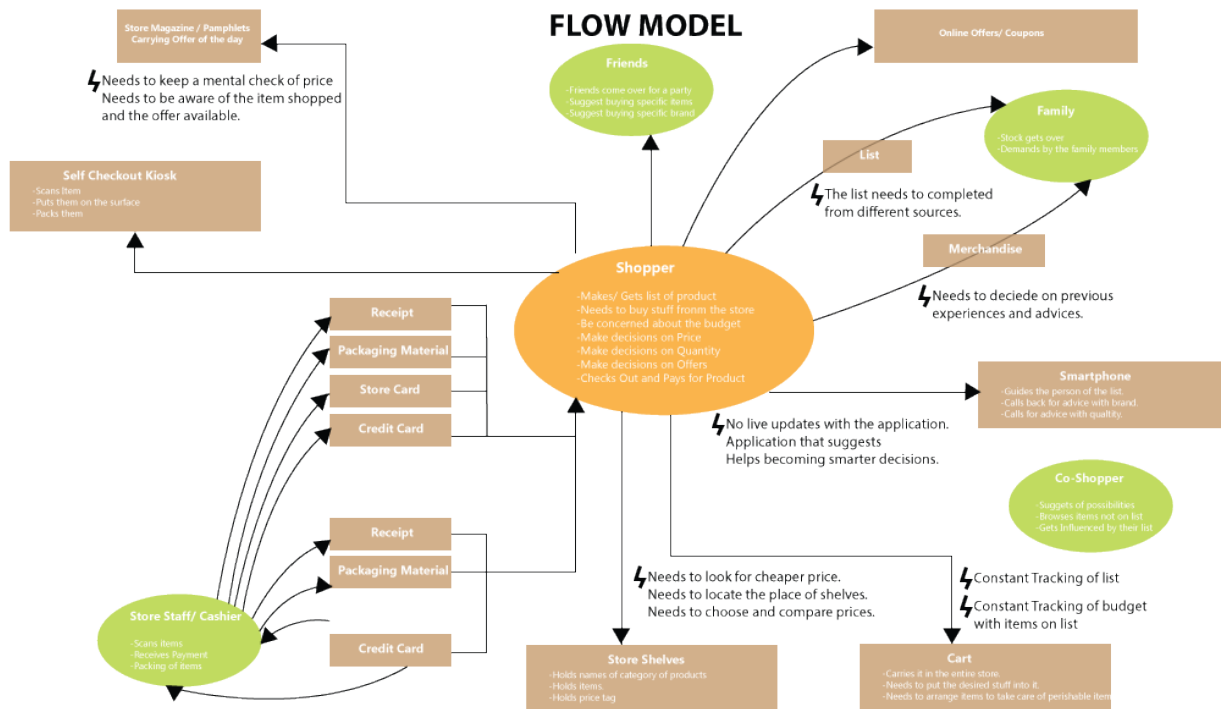
After the field work was being carried out with the users for each user the models were being drawn to understand constraints with different perspectives. These models were to be further consolidated.



Consolidated Activity Models

From each individual contextual interview we created five different work models (artifact, flow, sequence, cultural, and physical). Each of these individual models were consolidated to help us gain a broader view of how potential users shop and the processes they use and steps they take to prepare for their shopping experience.

Flow Model

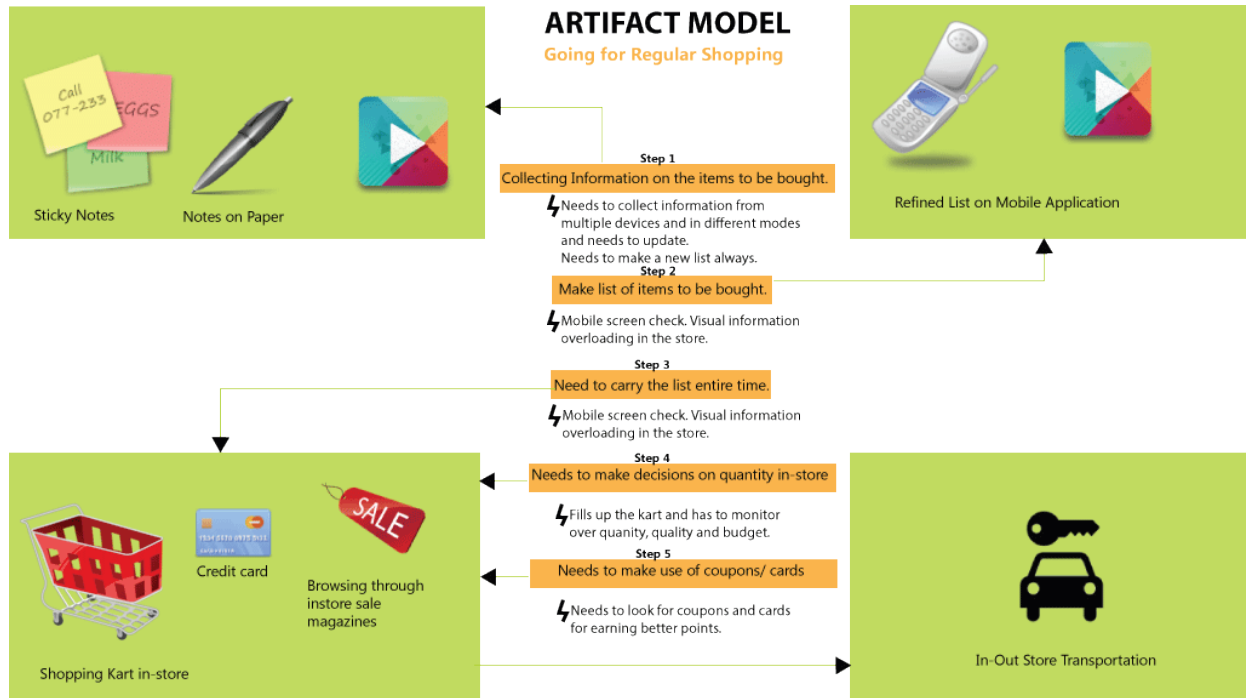


Sequence Model

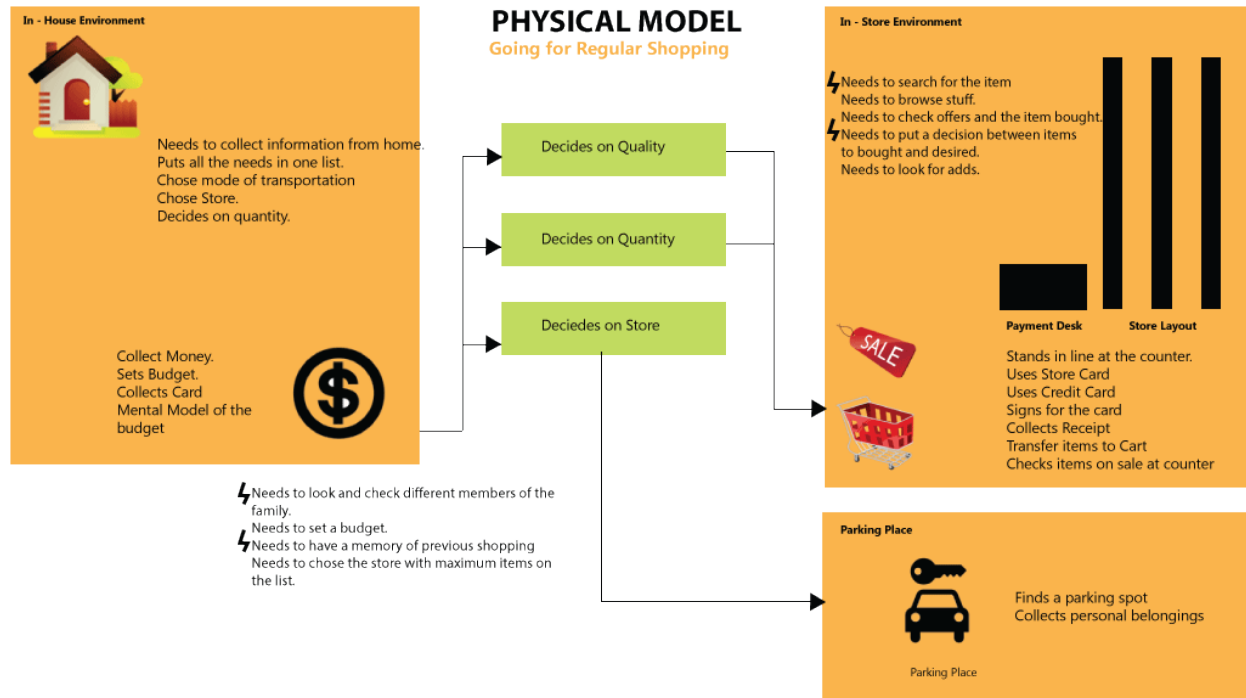
SEQUENCE MODEL

ACTIVITY	INTENT	ABSTRACT STEP
Find out about the need to shop	Discovering the shortage first before the notice of the others. Getting Supplies fast. Provide response to the people who demand the need. Follow a regular routine.	Trigger: Encounters the shortage -Finds out by examining the environment personally. -Someone reports the shortage. -Wants to try something new. Breakdown: Needs to consolidate the list
Finding out the items to be shopped	Getting the right supplies. Finding the right quality/ brand to be shopped. Finding the right quantity to be shopped. Preparing a list of the items. Making a decision of putting the items on the list. Making a mental note of previous shopping.	Trigger: Wants to buy everything without a miss -Makes a note of previous list. -Makes a note of previous experience. Breakdown: Needs to keep a check on buying activity
Choosing a location	Finding maximum things in one place. Finding fresher items Finding cheaper items/ items in offer. Regular shop near to the locality. Getting the right supplies. Finding the right quality/ brand to be shopped.	Trigger: Wants to find a place with discounts and multiple items -Makes a note of previous experience. -Mentally Checks if any offers available. Breakdown: Needs to chose shop with offers and are economic and give greater values
Buying Items	Locating things of choice in the store. Buying things that come first while entering a store. Browsing store layouts. Checking out things off list which are on offer and making a mental note. Locating the item on the list. Checking if the item has special offers. Buying items on list without budget constraints. Checks the shopping kart to check what is bought.	Trigger: Wants to be a smart shopper -Checks whats avaiable on the list -Checks Prices of the brands. -Browses store for offers Breakdown: Needs to decide onself: Has a menbtal load to tally different offers Has a confusion with brands Has to consolidate live activity in store with the list
Billing and Checkout	Choses the smallest line for faster checkout. Picks up any announcements in the form of a store magazine for shopping next time. Checks out small items in counter to find any basic necessities not noted. Uses Store Card and Credit Card to obtain maximum discount.	Trigger: Wants to use Store Card -Swipes Card -Swipes Credit Card which helps gain points

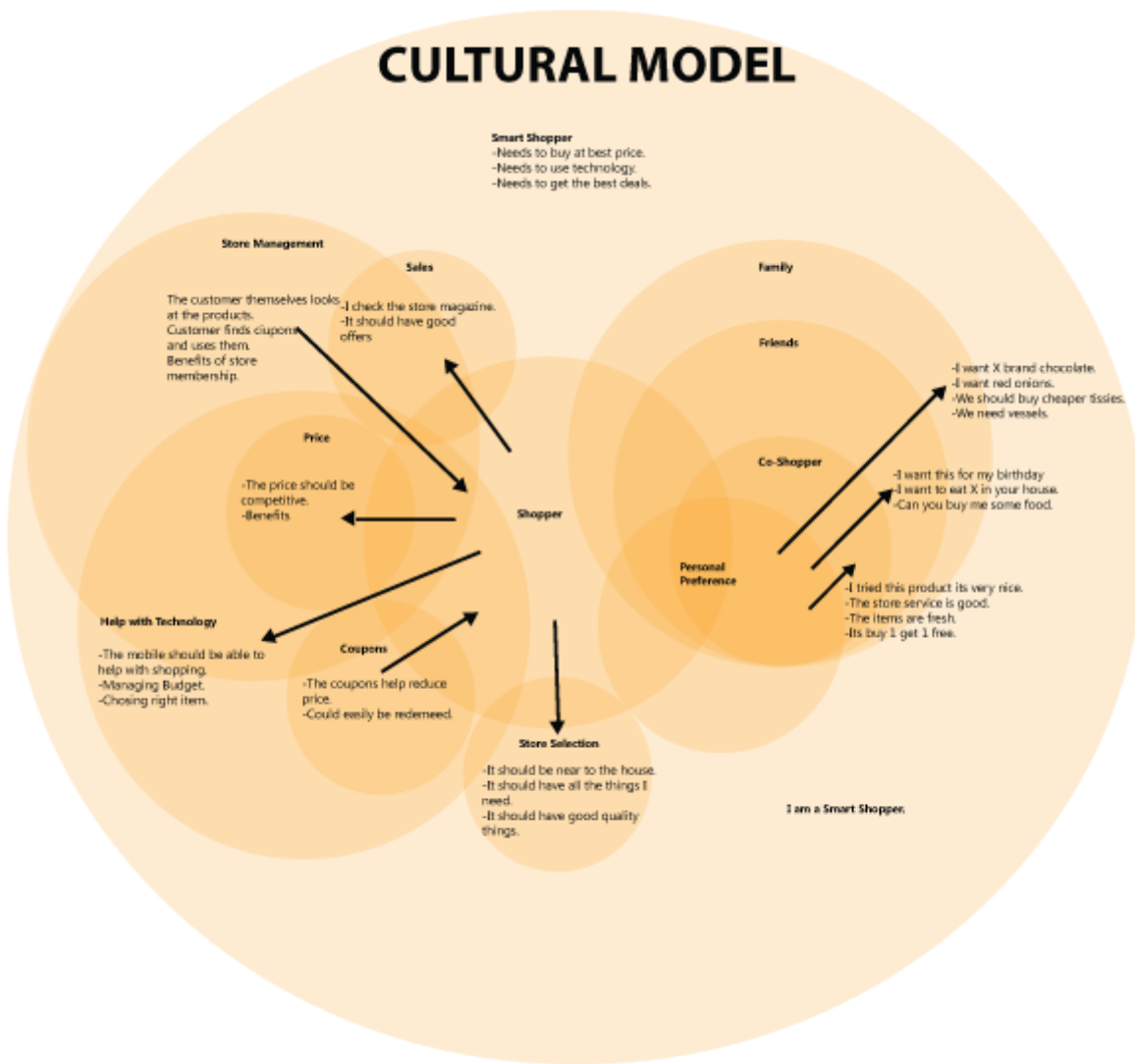
Artifact Model



Physical Model



Cultural Model



Affinity Diagram

Shopping list management			Consideration when purchasing			Where are things located			Time consideration		
I make shopping list	I forget to get something	I consider the price before buying	I compare prices before buying	I consider quantity when choosing	I have limited time to go shopping	I start from the place close to entrance	I didn't notice it before	I have a brief of where are product located	I go to nearby market	I have limit time on my shopping list	
We have our list on sticky note and write on it. Things like, we need to go to the store for a while, we haven't shopping time drive all the way to Sargat.	Yes, because I accidentally noticed this and I think I needed this.	If price noticed first then I will choose the cheaper one.	Yes, I usually get these (Fiber One brownies) but they're not on sale. They're regular price, but they're cheaper in a target. They get price reduced and then they're. I'll probably just go to target.	This package has two times of forks and knives than the other. I have a fork and knife, which is 5 bucks, and I get usually between apples and bananas to take to work. So I usually just get 2 apples and 2 bananas because I come usually.	you go over your list, you go over your budget. I have usually go with my spencer, Mark, so I have impulse buy and	It's the closest place to the entrance, and I can just go in a circle around the store from here.	I didn't know they have this kind of mushroom here. And I discover there are so many things I never notice before.	I have a brief of where are product located. I usually go to my favorite place. Sometimes I don't know the name of the thing but once I see it, I know it.	We get regular stuffs from March nearby our place.	than 45 minutes at a grocery store. If I've been there longer than that, I always come here.	
Yes. But this time, I remember everything I have today.	Forgot to get these (beans)	Yes, this price is really good. It's like in Brazil, I bought one dollar with this powder I can make 20 or 30 for one box.	Yes. The first thing I noticed is the weekly special is \$0.88, which is not the normal price. I don't need one (green pepper), but I would buy them for this price. They're wrinkled up, which is why I won't buy any this time.	I won't 5 days a week, which is 5 bucks, and I get usually between apples and bananas to take to work. So I usually just get 2 apples and 2 bananas because I come usually.		We're convenient.	I don't usually buy the onions. My mother usually buys the onions, so that's why I didn't know where to find them.	I like this one. I have been to other March supermarkets, but this one is convenient to my car, plus it's bigger, and I like that I can get anything I want here.			
I have my shopping list in my phone.		It's like two or three. If it is just for me, I might feel like guilty. But, if this is also for my fiancée, you will feel like okay.	Yes, kind of trying to recall how much I bought before. The sodas are also heavy. I will get it next time with my fiancée. (Taking pictures of the price tag)	I buy apples in the singles because too many come in the bags, and I can't eat that many.			Because I never seen that restaurant before. I've been here for several times.			Usually half an hour	
I make a list on my phone of the things I need.		No, they look nice. But they don't have price.	Last year, they have half of price for soda.	I choose 2 bananas because they're full of sugar, and I get the greatest I can find so they			I think some disposable cups and I am looking them at the first time.			Maybe two or three weeks. I live in downtown. It's far from the store. I usually come here once a week to buy food and drink for the whole week.	
We make the list from last Saturday to last Friday. We have running list. We have same list with the roommate.			Yes, Kroger and Kroger bring out their ads on Thursday. I look at the ads during my break and compare prices then. Generally, I don't go to Kroger because I like the way they do at March. If the lines are too long, then will create an additional hour, even.	I'm really the only one who eats them, so I get the small ones.							
Brazilian vegetable and Pan de muerto powder are in my shopping list. When I come to here, I want to buy southern american food. They have more international food here.										Yes, I don't want to come here once I'm all the way around. I want to be done.	

E. Requirements and Goals

Goals

The goals of the application were:

- The user should be given freedom.
- The user should not be distracted from the constraints of brand budget and store selection, whichever is a priority.
- The application should suggest better shopping practices however the application should not interfere with the normal shopping behavior of the user.

User Requirements

- The user must be comfortable with using a smartphone.
- The user must understand and be comfortable with using smartphone applications.
- The user must be comfortable and/or willing to use a smartphone to manage grocery shopping lists.
- The user must physically go to a grocery store to complete his/her shopping.

Functional Requirements

- The application will allow the user to manage his/her grocery list.
- The application will allow the user to share his/her list with other users (i.e. spouse, roommates, and children) for more effective list making.
- The application will allow the user to save preferences of their favorite supermarket(s).
- The application will allow the user to compare items on the list at other supermarkets in the area, or other shops in their "favorites."
- The application will allow the user to opt for notification alerts when an item on their list is on sale or available for a lesser price at a "favorite" shop.
- The application will assist the user in budget management by calculating the cost of the items on the list when purchased from the selected supermarket.
- The application will have a scanner so the user can scan an item for price comparison, adding items to the list, and calculating costs.
- The application will contain layouts of supermarkets and will notify the user of the location of items on the list, which will enable the user to quickly and efficiently find

items on their list, especially items not normally purchased or when shopping at an unfamiliar market.

Usability Requirements

Effectiveness

- Must allow the user to manage his/her shopping list
- Must allow users to add items via barcode scanning or manual (text) input
- Must facilitate barcode scanning
- Must allow users select specific supermarkets
- Must allow the user to share his/her shopping list with others, if desired

Efficiency

- Must contain specific market layouts
- Must notify users of the location of items within a particular store
- Must allow multiple users to add/remove items to the same list when shared

Safety

- User account information must be kept secure.
- User lists are kept secure unless the user shares with other users.

Learnability

- The application must be easy to understand intuitive for the user to navigate.

Utility

- Must allow the user to save his/her shopping list(s) in the application for later use and/or sharing

Non-functional Requirements

- Must run on all smartphone operating systems, with the same functionality across the board

User Profiles

Primary Users

- Housewives
- Regular shoppers

- People who take primary decision in the family for shopping.
 - People who invest little time in shopping, who have time constraints
- Budget Shoppers
 - People who look for offers and tend to show a difference in behavior like buying more than desired.
- Motivated buyers who want to go for smart shopping through technology.
 - Smartphone users

Secondary Users

- People who fund the shopping activity.
- People who are dependent on the primary shopper for brand selection and quantity decision.
 - Children
 - Spouse/Partner
- Roommates

Scenarios for the Application

Scenario 1: Budget management

Corbin is a 20 year old full-time college student with a part-time job. He lives in an apartment off campus with two friends who are also students. Like most college students, Corbin and his roommates have very limited incomes and must be sure to budget their money well. In an effort to make their food budgets go further, they decided to share food and the cost of buying groceries. They have busy schedules and don't get much time to discuss and keep a note of items that they need to shop.

Corbin opens the [Savvy Shopper] application on his phone and creates a new shopping list. He adds items to the list by scanning barcodes of items in the apartment, which are running low. He enters non-barcoded items, such as produce or items that aren't in the apartment, by manually typing them in and searching the application. Once he has completed his list. He saves it in the application. He taps the share option, chooses his two roommates from the list of his "shopping buddies," and sends the list to their [Savvy Shopper] accounts.

Once they receive the list, Corbin's roommates review the items and add any necessary items that were missed. Once each of the two completes the list, all three reviews the budget for the

shopping, seeing how much their food bill will cost. They receive alerts that some of their items are on sale at another store in the area. Because this will reduce their shopping costs by more than \$5.00, they decide to purchase the sale items at the other store and complete the rest of their shopping at their normal shop.

Scenario 2: List Sharing for Large Family

Roberta is a stay-at-home mother of three busy teenagers and the wife of business executive who works long hours during the week. Because of their hectic schedules, everyone eats on their own most of the time. Because of this, Roberta must shop for quick, easy to prepare food for her family. She also wants everyone to have what they like, so her food list is usually very long.

To help manage the list and make sure everyone has whatever food items they want each week, Roberta opens the [Savvy Shopper] application and creates a new list just after her shopping trip each week. She then shares the list with her husband and children, who also are [Savvy Shopper] app users. During the week, each person adds to the list whatever they want her to buy during her next grocery shopping trip.

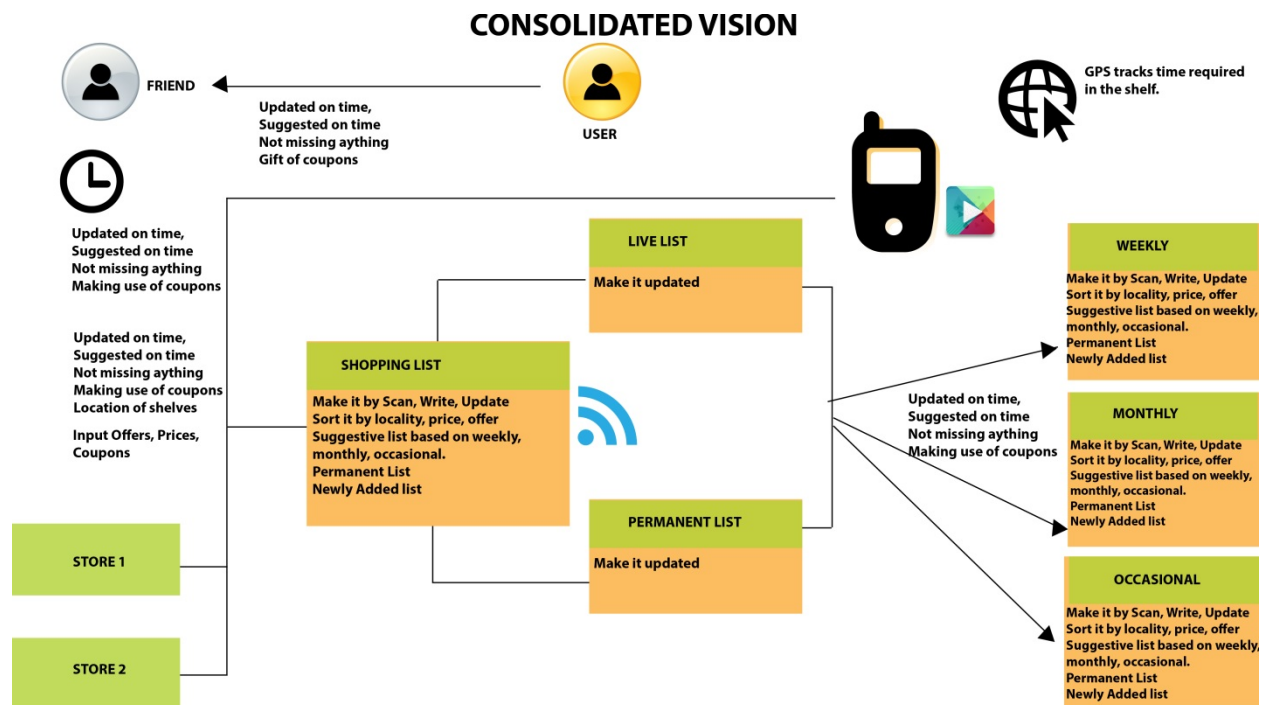
On the morning of her shopping trip, Roberta opens her [Savvy Shopper] application and “unshared” it, so she can prepare for shopping. While budget isn’t a concern for Roberta and her family, she does like to get the best price for items on her list. She uses the price comparison and sale features in the application to see where she can save money. Her children have specific choices in choosing their pencil colors from Crayola, and she needs to get them in particular.

To get the best price, Roberta will have to shop at three different stores. While the stores are relatively close to each other, Roberta doesn’t want to spend that much time store-hopping, and since the overall savings is only a few dollars, she decides to shop only at her favorite super market.

F. Vision and Storyboards

Vision

The vision was derived from the data collected from the user study, activity models drawn and the breakdowns received in the various stages. The user was the central theme of the vision. The consolidated vision which was made after the individual visions of the team members was made. With the advent of smartphone it was tried to achieve help in shopping list management with it. The user shops savvy with his/ her choice to be bound to what he/ she wants. It was thought to give more control to the user and make it easier to manage one with shopping. It was thought to give help with suggestive list

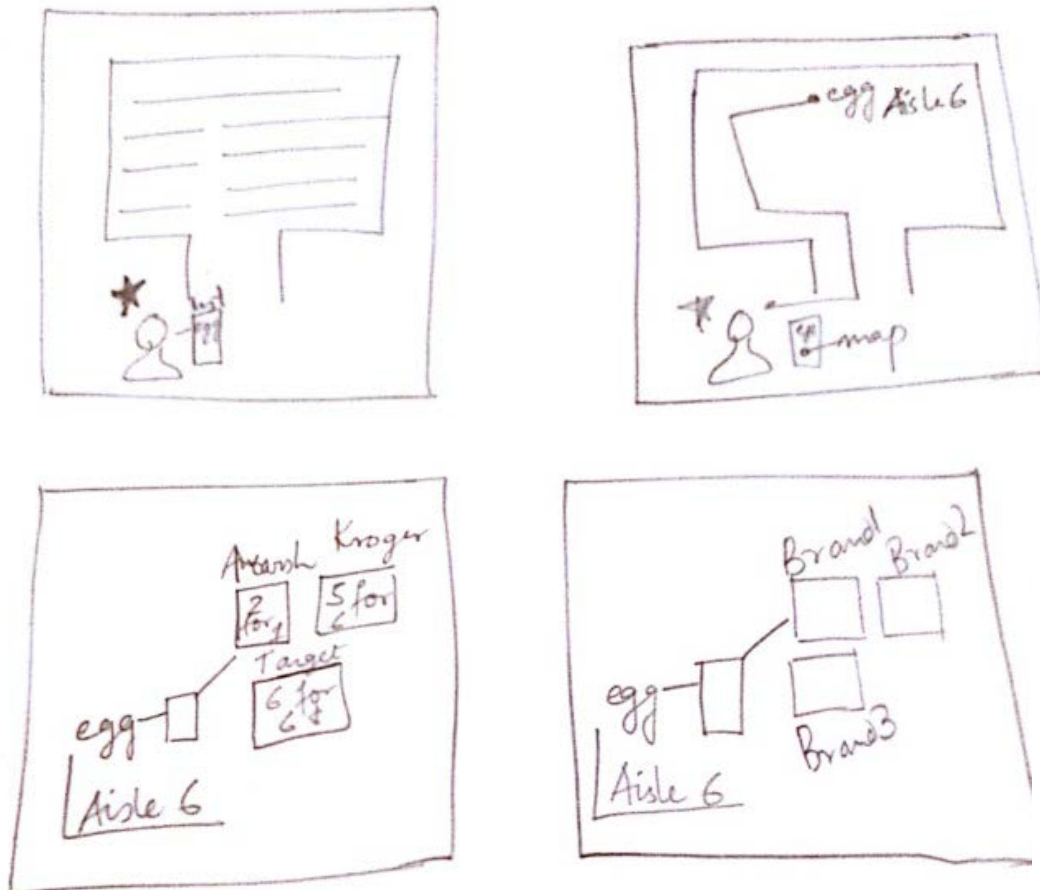


Storyboards

Storyboards were doodled to understand the flow of the application in real context.

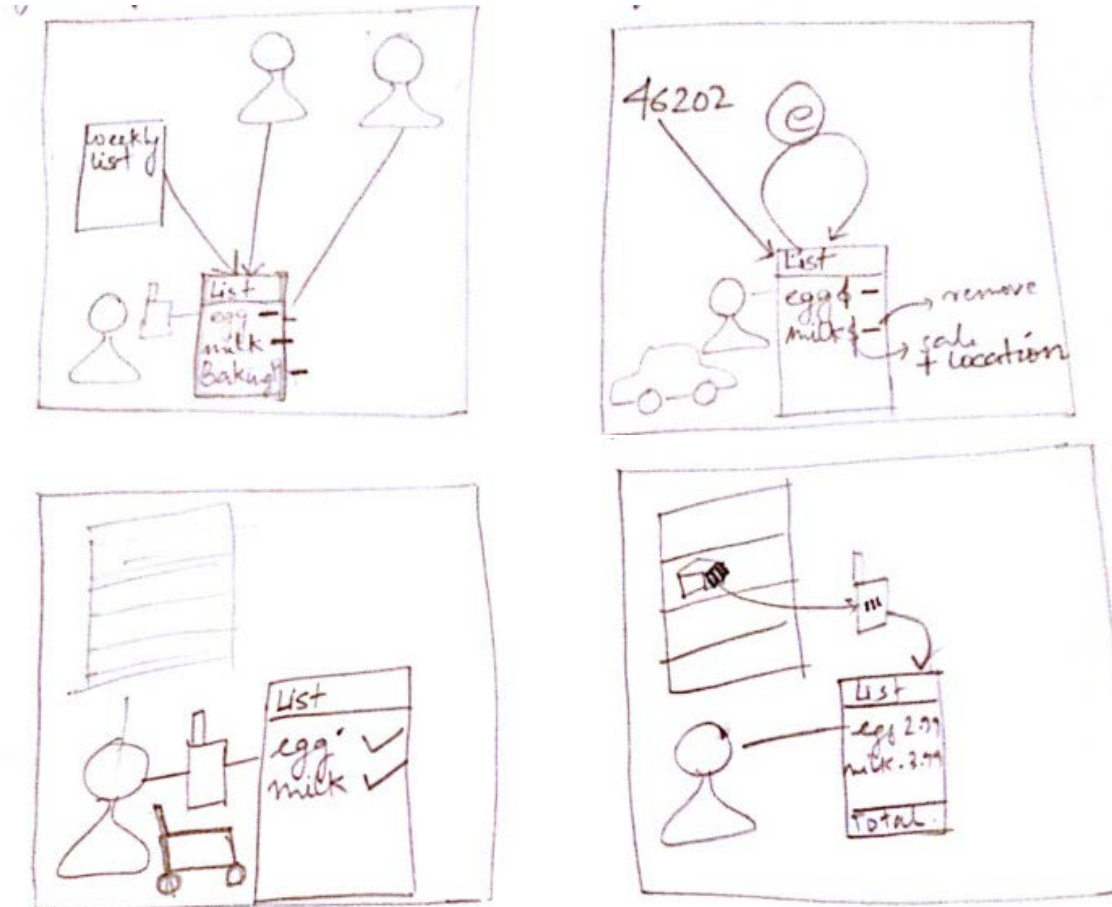
Storyboard 1: Tracking of Place

This storyboard displays the function of the application to track items in a store.



Storyboard 2: List Management

This storyboard displays the function of the application to edit items in a store.



G. Conceptual Design

The list was identified as a primary artifact through the primary studies. This led to further working on the following.

Metaphors and Analogies

Making a list was a common activity found among the users. The users used note taking application on the mobile phones, sticky notes or jotting down what they intended to buy from the store. The users use various analogies to keep a track of the list. The analogies are related to brand, budget, and quantity.

Concepts, Objects, and Operations

The user enters the items on the list. The lists that are being made every time are being stored in the application. The users can import existing lists that have presets like a Party list would import everything that is needed for a party. The user can edit and add according to one's choices. The budget can be set in the settings voluntarily to alert of the amount that would be spent. One can adjust the budget values according to ones need. It also gets updated with the items on the list.

Mapping between the Concepts

The user should be able to compare prices of different items on the list in the different store. On the management of the list on the store the user should be able to easily keep up to his budget with the help of his list. The list should be arranged in a manner that while shopping in a store the user can go around in a linear way to avoid running into the same spot over again and again. The budget concerns should be managed in a way by presetting the budget. The list should showcase if the user goes beyond the expected budget.

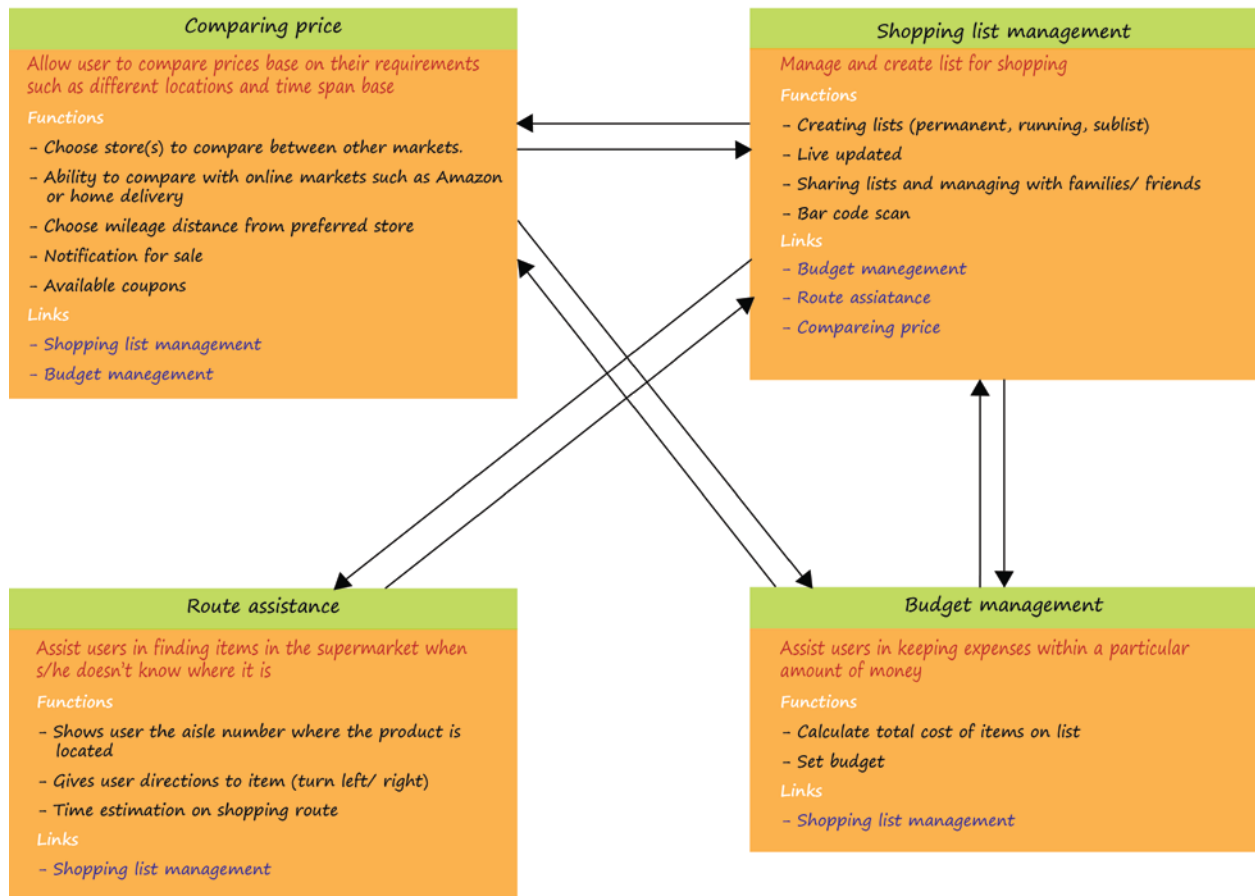
User Environment Design Model (UED)

The User Environment model was chosen to predict the functionality of the application. The model helped to identify the key functionalities of the design for the mobile application. Four key elements were identified that would act as the functionality of the application.

Each element was defined and then was listed with the function that it was vision to fulfill. Then links were identified to find the inter-relationships and relationships between these models.

The models helped in deriving the links that would guide the interface. The links were identified and how they should be inter-related were solved with this model. Corresponding low fidelity prototype used this model for its development.

User Environment Design Model



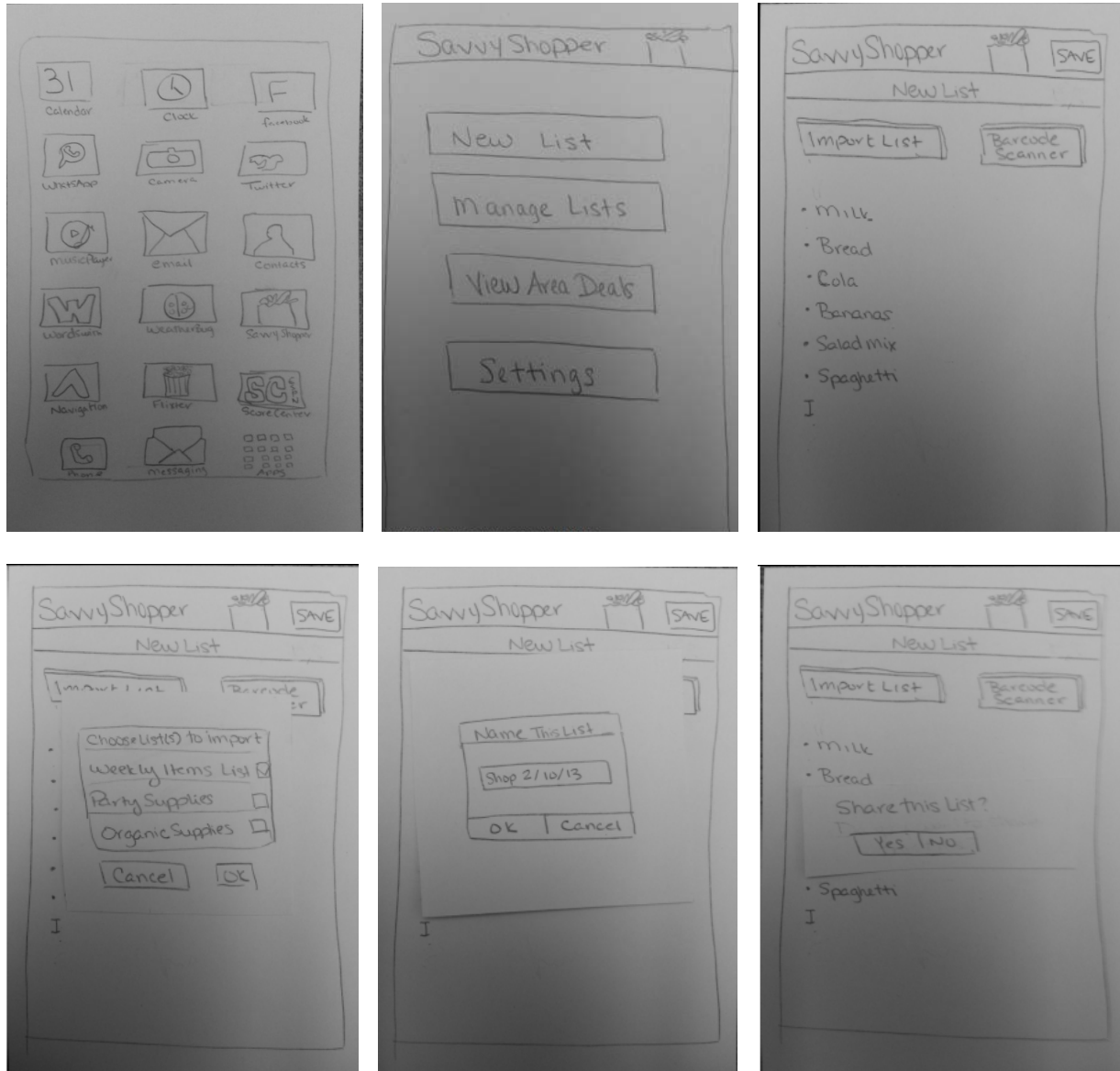
H. The Application- savvyShop

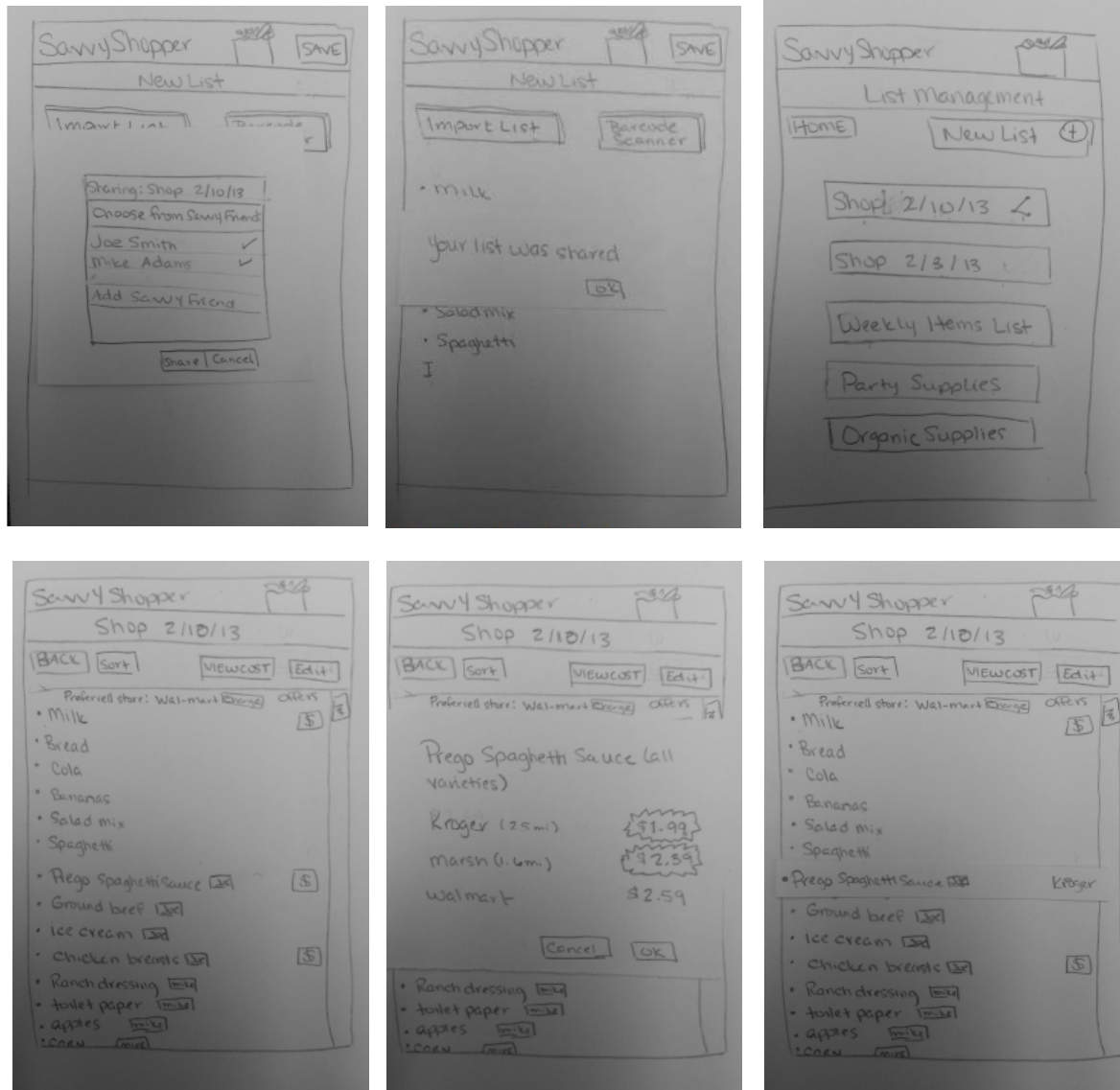
The application was named SavvyShop was designed with all these features:

- Importing lists
- Storing Previous lists
- Sharing with friends
- Locating items in a store
- Compare prices with different stores
- Set preferences with budget

I. Page Design and Prototype Pages

Low-Fidelity Prototype





Internal Evaluation

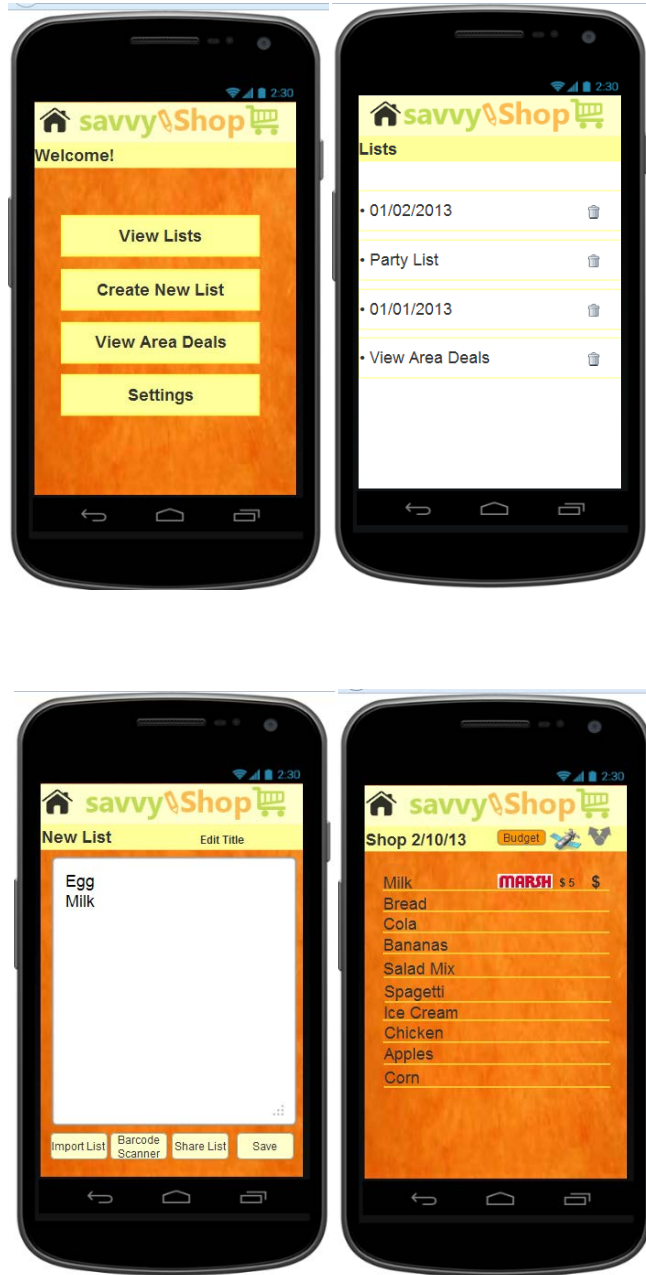
The internal evaluation was conducted with the users.

- After creating a new list, it shows a series of dialogue box such as sharing and rename the list. We found this is a way that forces users to edit title and share with friend. Thus, in high-fidelity prototype, we isolated those function as buttons. Users can edit these functions as they want.
- For price comparison, it only showed name of store without letting users now how far the store is. From users' point of views, they would judge if they are choose the cheaper price or not mainly by the distance to the store.

High-Fidelity Prototype

The high fidelity prototype was developed using Axure and can be found at:

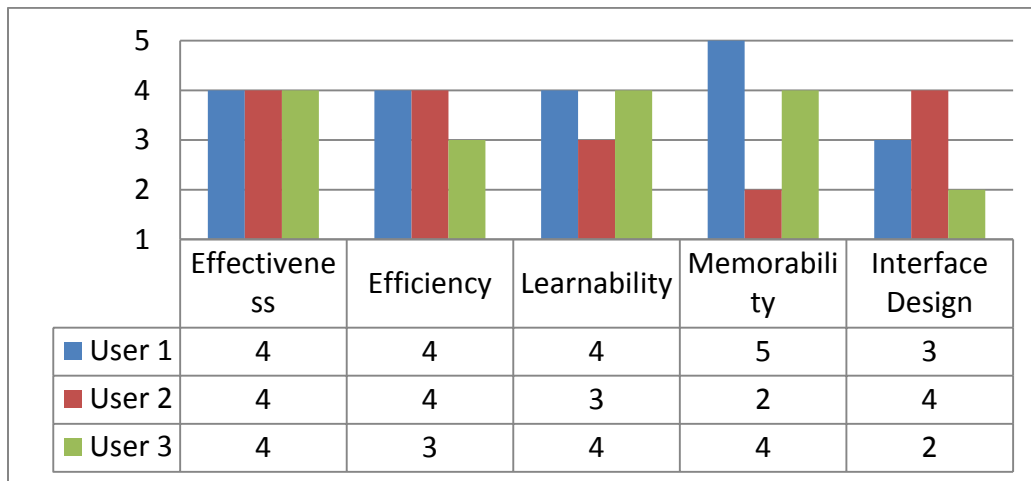
<http://share.axure.com/C7DIGH/Frame.html>



J. User Feedback

After developing high-fidelity prototype, we interview three users to get some feedback. We had five questions to investigate effectiveness, efficiency, learnability, memorability and interface

design. For these questions, we used 5 points Likert scale. Five score represents strongly agree and one score shows strongly disagree. Three users think that Savvy Shop has effectiveness, efficiency and learnability. Among these three items, Savvy Shop got more than three points for average. However, one user is not satisfied with the memorability and the other one is not satisfied with the interface design. The interface design needs to be more aesthetics in order to appeal users.



We designed six interview questions to get text descriptions about Savvy Shop from users. These questions are as following. Detail responses are in the appendices. They all regard Savvy Shop as useful application. It provides users a better way to manage their shopping lists. However, there are some aspects we can improve Savvy Shop. From users' feedback, there some functions they can perform mentally thus it doesn't need to integrate in the system. As for sharing list, they usually share with family or roommate. Thus, it doesn't need to connect to the contact list. The most unique part for Savvy Shop is the store navigation function. It is very useful for users to get items they usually don't buy. To conclude, Savvy Shop can help users manage shopping lists in easier way and do shopping in ease. Two of three users would recommend Savvy Shop to others. The feedback is listed in Appendix2.

Do you think this application will be useful?

What do you think is the problem?

What do you think makes it different?

Can you tell me a scenario or concept where this can be used?

Would you like to integrate something else to it?

Would you recommend this to someone?

K. Appendices

Appendix 1

User Study was conducted in the field in a uniform format for all the users. The following script was followed:

Keep the voice record on while the user is shopping. There was constant notes and observation during the entire session.

The following questions were to be asked/ tasks to be done:

Task1

Ask her to buy something else from her regular buying stuff.

Ask the following questions in the following words:

Extremely likely, likely, don't know, sometimes, never

- Do you use your previous experience in the same store to shop? Like where the vegetables and fruits are located.
- Do you look at labels in a store?
- What do you prefer choosing by brand or price?
- How much time do you expect to spend in a store?
- Do you end up spending more time or less?
- How often while searching for some time; you end up buying up something useful?
- How often while searching for some time; you end up buying up something useful?

Appendix 2

a. Do you think this application will be useful?

U1: I think it is very useful

U2: Yes, this application helps me to plan such as providing prices of items in my list.

U3: Yes it is useful. Makes me easy to keep a note of all my lists and I think it is more of a store where I have all my lists.

b. What do you think is the problem?

U1: It would solve the problem of knowing what the competing stores are doing if you haven't had time to look through the ads. It compares prices. That's a pretty good thing. And it solves the problem of having to write down a list. You don't need a pen and paper.

U2: Linking to contact list is kind of cumbersome since I usually share with the same people.

U3: I think it requires too much work. I think I can do some of these mentally.

c. What do you think makes it different?

U1: Nothing

U2: The navigation helps me to find the item I am unfamiliar with. But the interface is not appealing like real GPS with road name. It would be better to provide aisle number in the map so that I can compare to the aisle number on signs. Or showing where the cashier location is, so that I can find the relative location without looking at my mobile phone all the way to the right aisle.

U3: Like when I have time; for shopping then it is useful. This makes my shopping more organized.

d. Can you tell me a scenario or concept where this can be used?

U1: N/A

U2: Busy husband and wife don't have too much time to manage a shopping list

U3: Like when my friends and me go for shopping together for an event or a party.

e. Would you like to integrate something else to it?

U1: Nothing I can think of

U2: Don't know how to delete an item on list after it was saved.

U3: May be you can add on some preset lists. Like when I go for Sams club may be your application has preset lists with all the items; which I can of course edit

f. Would you recommend this to someone?

U1: Sure, like I recommend other apps I like.

U2: No. The interface design is not attractive enough.

U3: I would recommend it; but more for social shopping then personal shopping

Appendix 3

Brandscaping: Worlds of Experience in Retail Design

Google Play

<http://fmcg-marketing.blogspot.com/>

<http://www.retailmarketingblog.com/>