"iBuy"

Design Review
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BY

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1 <u>Introduction:</u>

1.1 *Project Overview:*

People in their everyday lives make use of the back of old envelopes torn pieces of paper, or the occasional magnet equipped post-it note, stuck to the refrigerator. This has been the way of the grocery shopping list for many years. Whatever the case may be, this tried and true method of making up and keeping track of the dreaded "Grocery Shopping List", has some fundamental flaws. Among them are, the kids who forget to write down what they have finished, the person assigned to go shopping forgets the list at home, or even the misinterpretation of the handwritten notes. These problems have been dealt with for many years, and with the onset of the phone application era, it would benefit users to have a list application directly on their mobile phones as well as their home computers. This application will allow people, to manage the list of their choice from home or on the go, and will ensure that users are never without their shopping list again.

1.2 *Project Goals:*

Our goal is to design and build a versatile grocery shopping list management application. To achieve this goal, we have the following subgoals:

1. Create a simple yet powerful interface for both home and cellular phone use.
2. Implement features desired by the user base.
3. Surpass the short-comings of the traditional grocery list.
4. Take advantage of new cloud based technologies available through the internet.

1.3 *Functional highlights:*

These features will be part of the iBuy application and further explained in our User/Task Profiles section on the next page.

Basic Features:
- Create, delete, and edit individual lists.
- Add, cross off, or edit items from each list.
- Sorting items on list by categories.

Advanced Features:
- Cloud Functionality
  - Same data is viewable/editable across both platforms
- Reporting Mechanisms

User Interface:
- Desktop application on any computer (Windows or Mac).
- Android application on any portable, internet enabled device.

2 <u>User/Task Profiles:</u>

We used a free online survey service to create and execute our surveys. Due to the limitations of free access we had to split our questions among two separate survey parts (See Appendix). We ended up with about 45 surveys being fully completed by friends, families, and acquaintances of our team members. Our survey population varied in age group so we got a good test pool for analysis (See Figure 0). All statistics used are up-to-date as of March 27, 2012.
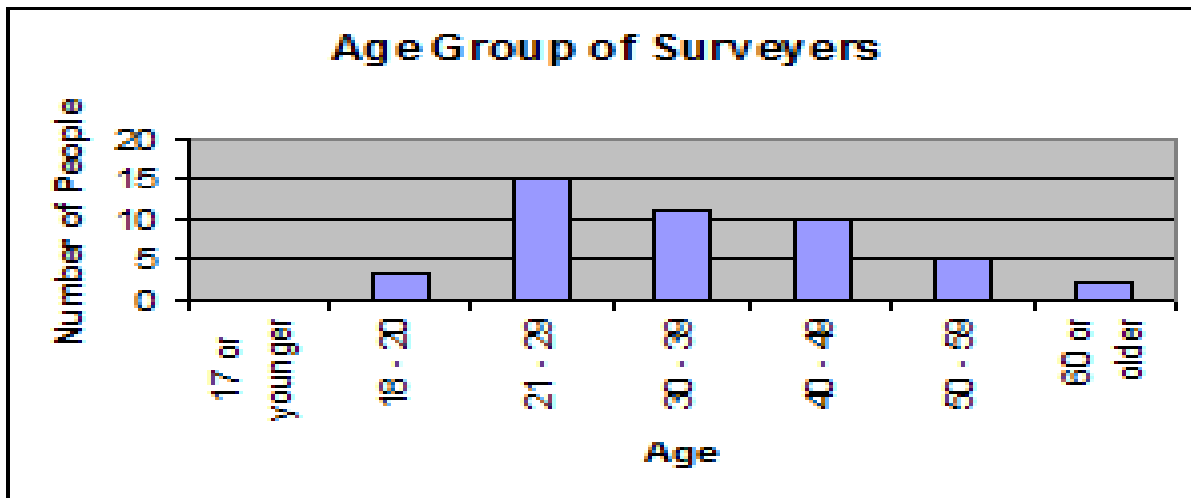

Figure 0 - Age Group of Survey Takers

2.1 *Evaluating our User Model:*

2.1.1 Target Audience:

Our original target audience was adults (ages 18+). From our surveys, we managed to collect responses from many adults of different ages and figure out which group is ideal for iBuy. We've determined working class adults from ages 18 to 65 to be our best target audience because, most of our survey takers who were above age 65 don't use their computers and phones for this type chore, or even for common everyday tasks, like email. The working class tag for adults is used because it was also shown that a total of 81.8% of users work: 31.8% work 1-39 hours a week and 50.0% work at or more than 40 hours a week.

We've discovered that 49.1% of our target audience own an Android or iPhone smartphone device and 50.0% of them own a cell phone. 95.3% of our target audience also said that they always carry their phone on hand when shopping. This means that about 50% percent of our target audience will have a device on hand capable of using the mobile version of iBuy when they're shopping. We also discovered that 97.7% of our audience own a computer, meaning that a desktop version of iBuy is essential to have for the other half of users who may not own a smartphone.

2.1.2 User Trends

The following list shows which tasks which were most common on a particular device using data gathered from our survey and graphed in Figure 1. A task is more common on a device if the difference between percentages is greater than 25%.

Most Common Tasks on Phone
- Texting (100.0%)
- Scheduling (84.8%)

Most Common Tasks on Computer
- Internet Browsing (93%)
- Email (90.7%)
- Shopping (94.6%)
- Social Media/Networking (~87.85)

Most Common Tasks on Both
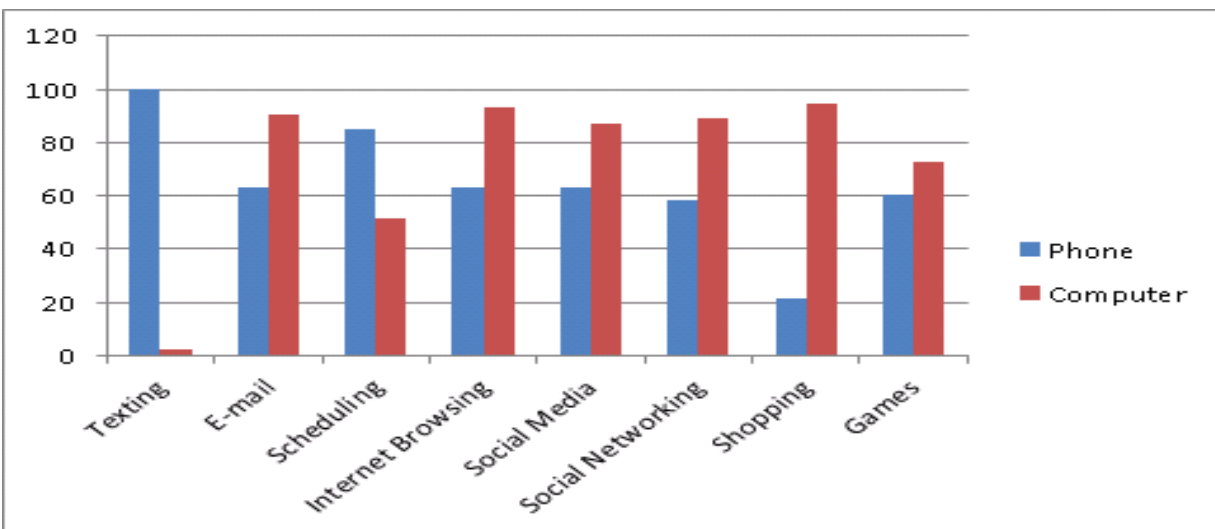- Games (12.1% difference)

Figure 1 - What Features are used by Technologies

iBuy is an application that provides shopping and scheduling features. From the "Most Common Tasks" results, we found that users are split on these tasks, and would prefer to use their computer for shopping and their phone for scheduling. This means that the list management component of iBuy should be developed more thoroughly on the phone over the computer.

Some analysis on the demographics section of our survey show that about half of the survey takers (61.4%) were men and (38.6%) were women. This means that our interface for iBuy shouldn't be designed to match the user's gender, but should be uniform for all people in our user base. Upon our observation of the survey, we concluded that our target group spends no more than 50% of their earnings on groceries and they fall into 3 groups of spenders (see Figure 2).
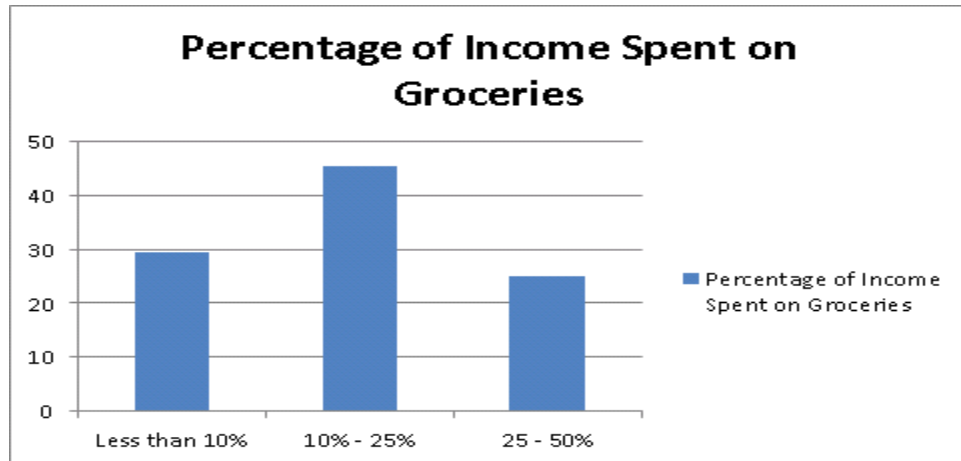
Figure 2 - Percentage of Income Spent on Groceries

This shows that users spend on average 1/4th of their total income on groceries, and without an efficient grocery management tool like iBuy, they could spend up to an extra 25% over their grocery budget.

2.2 *Evaluating Users thoughts on Grocery System Model:*

2.2.1 Relationships

When analyzing our users grocery shopping patterns, we found that there is a close correlation to users having a budget time frame to match their shopping time frame (see Figure 3). Meaning, users who shop weekly are likely to have a weekly budget to match. A weekly shopping timeframe was most common amongst users (69.2%) whereas, 32.6% of users indicated that they have no budget type. Due to an average total of 81.8% of working adults and an average total of 72.1% of users having a budget, it is likely that working class adults have a budget to manage their grocery shopping habits. This means that iBuy will be of great benefit to our target audience.
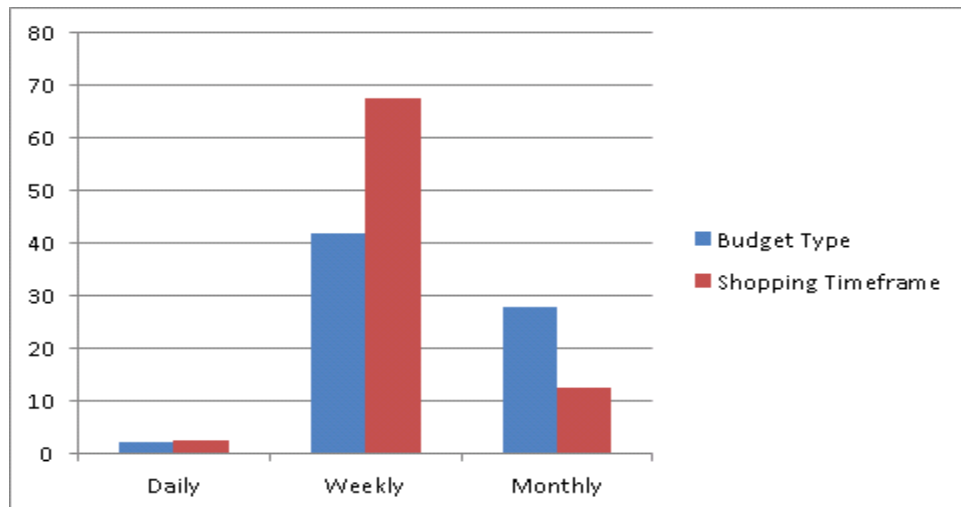

Figure 3 - Number of Shoppers with a Budget Type and Shopping Timeframe

As for managing their groceries, we discovered that 64.3% of users manage their expenses from memory and 42.4% use banking tools to help manage expenses. This means that there's about a 50-50 chance of a

user possibly calculating an error in their expenses. 58.5% of users also use their memory to figure out which groceries to buy when shopping. This could again lead to human error, causing the user to further mis-manage their grocery expenses. To alleviate the user's stress in having to manually remember and manage groceries, iBuy can properly manage the user's list alongside their budgets. This would allow the users to save time and money.

2.2.2 User Expectations

iBuy's "list" functionality will closely match the user's expectation on how to manage items. Because 70.7% of our target group was shown to use the traditional hand written list, and an additional 14.6% were shown to use their computers when managing their grocery lists. When organizing their list, users have shown to use these metrics: type of item (50.0%), by store (47.1%), and by importance (26.5%). The sorting metrics will be included in our product, whereas other metrics such as alphabetizing by name, dating the purchase, and price were rarely used, under 10% for all, will not be options.

When a user wants a report, they state their desire for a mechanism to be automatic (for any type of report) over manual (see Figure 4). This shows that the users have personal reasons for not wanting to have to interact with the device too much. So, options where the user asks to create a report will be limited. An option will be available for users to select which reports are on or off as 83.3% of users want control over this.
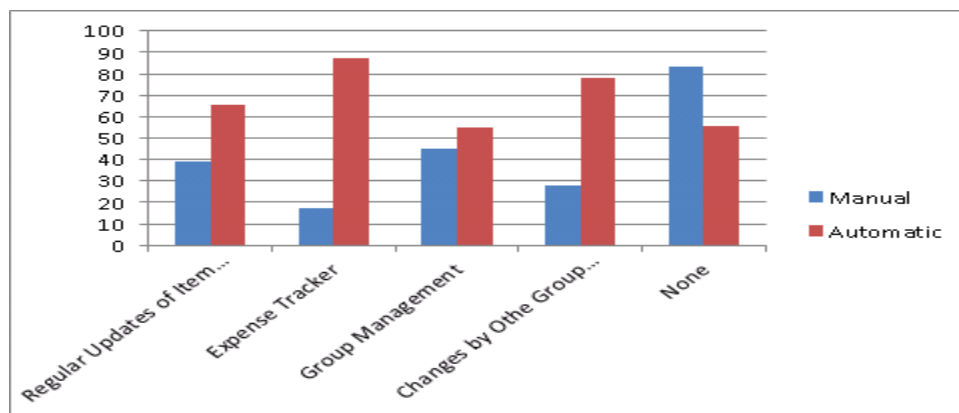

Figure 4 - Percentage of users who what a report generation feature.

We decided to not include any sort of group management system because 88.4% of users don't assign certain people with shopping tasks. We'll also keep our login system simple where one username and password is created per shopper of household. This info can be freely shared by the user to family and friends who wish to participate in the households grocery affairs.

2.2.3 Shopping Events

When collecting data about how often different shopping events occur to users, the frequencies for a given event, show either bell curve or skewed trend (see Figure 5).
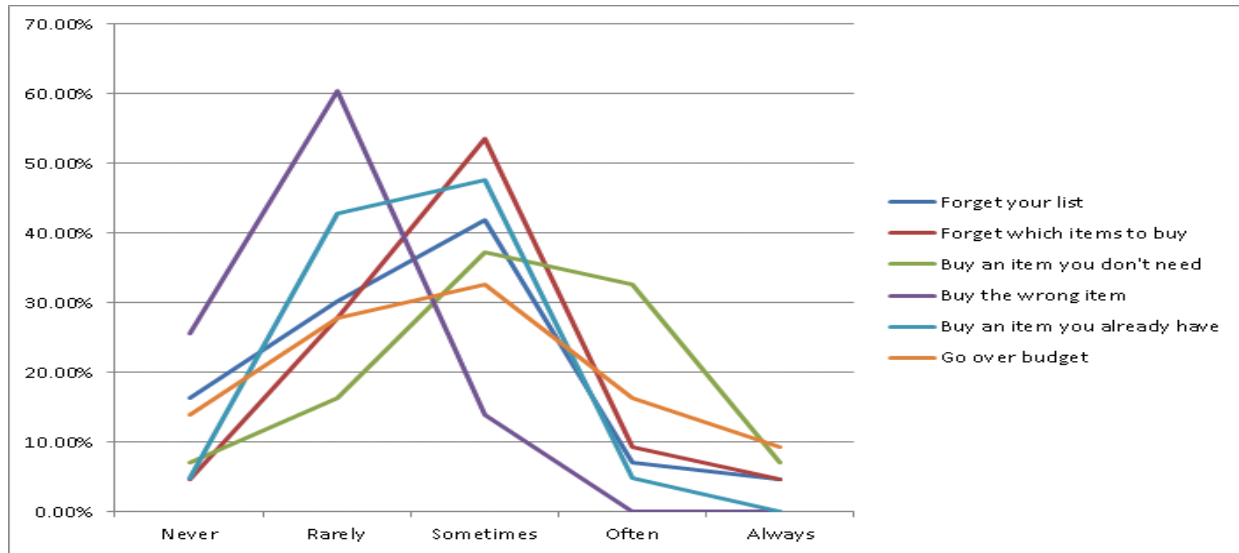
Figure 5 - Bell Graphs of Percentage of Shopping Events that occur to people

Right Skew Trend - Occurs more often for average users
- Buying an item you don't need

Bell Trend - Occurs often for average users
- Forgetting your list
- Forgetting which item to buy
- Going over budget

Left Skew Trend - Occurs less often for average users
- Buying a wrong item
- Immediately returning to store after shopping

Since the "Buying an item you don't need" event occurs the most often, a search feature when viewing your list is essential and will make it easier on the user to tell whether or not something's on the list. This will as an effect help the user avoid "Going over budget" which has been shown to occur sometimes. The "Forgetting something" events that occur sometimes is offset by the fact that our audience is extremely likely to always have their phone on hand and can use the iBuy application on their device to check their lists or items.

3 <u>Functional Specification:</u>

3.1 *Main Functionalities:*

All functionality for the iBuy application has been chosen by analyzing the data that our user groups brought in by taking our iBuy surveys. Each functionality is justified by the data collected.

3.1.1 Login

88.4% responded that they don't assign certain people with shopping tasks, therefore we will have a single login for each household grocery shopper. This includes registration of a username, username and password entry, and an option to keep a user logged in or logged out at all times. This justification led to the decision to include the following features and subfeatures:

- Login
  - Registration
  - Username and Password entry
    - Stay logged in On/Off

3.1.2 Create a List

Creating a list is part of the metaphor of writing a grocery list on a piece of paper before heading off to the grocery store. 70.7% of survey takers responded that they write their shopping lists on paper. This includes the user keeping track of the list by applying a name for each list. This justification led to the decision to include the following feature and subfeature:

- Create a list
  - Name list

3.1.3 View/Modify a List

Adding items on a list is part of the metaphor for writing a grocery list on a piece of paper. 70.7% of survey takers responded that they write their shopping lists on paper.

Categorizing an item on a list will create an easier search method for iBuy users. 50.0% of our user group categorize their list items by type of items, 47.1% of our user group categorize their list items by store, and 26.5% of our user group categorize their list items by importance. These were the top three ways our user group categorized their lists, therefore, iBuy will have all three of these features available.

Removing items off of a list will allow people to not end up buying items that they don't need. Looking at Figure 5, buying an item you don't need occurs more often then not for average users.

Crossing-off an item on a list is also part of the metaphor for writing a list on a piece of paper, because when a user buys an item they tend to mark it on the paper so that they know they have bought that item and have not forgotten it. Looking at Figure 5, forgetting which item to buy occurs often for average users.

Searching for an item on a list will make it easier for people to find items on their lists while shopping. Looking at Figure 5, forgetting which item to buy occurs often for average users. These justifications led to the decision to include the following features and subfeatures:

- View/Modify a list
  - Change list name
  - Add item to a list
    - Name item
    - Item Category
      - By type of item

- By store
- By importance
  - Delete an item on list
  - Cross-off an item on list
  - Search for item on list

3.1.4 Delete a List

Deleting a list is part of the metaphor of have a grocery list on a piece of paper and 70.7% of survey takers responded that they write their shopping lists on paper. When users are all done shopping and don't need a list anymore they would throw away the piece of paper, therefore, being able to delete a list will be like throwing away a list. This justification led to the decision to include the following feature:
- Delete a list

3.1.5 Application Options

Application options will include turning notifications for adding/modifying/deleting a list and report generation on or off.

When a list is added, modified, or deleted there will be the option of having a notification for each of these events. 77.8% of survey takers would like automatic reports of changes made by other group members. The options for these notifications will be vibration, screen message, and/or text message. This is because 48.8% replied that the best alert was vibration, 46.5% replied that the best alert was message on the screen, and 100.0% replied that they use the texting feature on their cell phone.

There will be two types of report generation available to be on or off. These include: a report that records popular items bought and a report that tracks a user's expenses. The "popular items bought" report will be one of the features because 65.2% of user group replied that they would like an automatic update of item statistics. The "expense tracker" report will be one of the features because 87.0% of user group replied that they would like an automatic expense tracker. The "expense tracker" report will have reports about expenses from the last shopping trip and weekly expenses. This is because 41.9% of user group have a weekly grocery shopping budget and 67.5% of them go grocery shopping weekly. These justifications led to the decision to include the following features and subfeatures:
- Application Options
  - Adding/Modifying/Deleting a list
    - Notification On/Off
      - Vibration
      - Screen message
      - Text
  - Report generation On/Off
    - Popular items bought report
      - Item suggestion for list
    - Expense tracker
      - By last shopping trip
      - By last week

3.2 *Task Performance Specification*

Time will be allowed (in seconds) for iBuy application users to navigate through a given task. First-time users and iBuy-familiar users, or users that have used the iBuy application previously, are expected to navigate through task at different paces. In general, first-time users are expected to take more time to complete tasks than iBuy-familiar users.

In the performance estimates, there will be extra time allowed (in seconds) for the users to navigate through the screens, search through lists, and search through items in lists. There will also be extra time allowed (in seconds) when deleting a list or an item on a list to navigate through a confirmation. Additionally, the times shown should be modified to include user login (i.e. +15 seconds) when the user needs to log into the application before performing tasks.

3.2.1 First-Time User Task Performance Specification

This section describes performance for first-time iBuy application users, and allows extra time to accommodate learning and errors.

1. Login (5 seconds or less)
   - Registration (20 seconds or less)
   - Username and Password entry (15 seconds or less)
     - Stay logged in On/Off (17 seconds or less)
2. Create a list (10 seconds or less)
   - Name list (15 seconds or less)
3. View/Modify a list (10 seconds or less)
   - Change list name (15 seconds or less)
   - Add item to a list (15 seconds or less)
     - Name item (20 seconds or less)
     - Item Category (20 seconds or less)
       - By type of item (22 seconds or less)
       - By store (22 seconds or less)
       - By importance (22 seconds or less)
   - Delete an item on list (20 seconds or less)
   - Cross-off an item on list (15 seconds or less)
   - Search for item on list (20 seconds or less)
4. Delete a list (12 seconds or less)
5. Application Options (10 seconds or less)
   - Adding/Modifying/Deleting a list
     - Notification On/Off (15 seconds or less)
       - Vibration
       - Screen message
       - Text
   - Report generation On/Off (15 seconds or less)
     - Popular items bought report
       - Item suggestion for list
     - Expense tracker
       - By last shopping trip
       - By last week

3.2.2 iBuy-Familiar User Task Performance Specification
This section describes performance for iBuy application users that have completed these tasks at least once.

1. Login (5 seconds or less)
   - Registration (15 seconds or less)
   - Username and Password entry (10 seconds or less)
     - Stay logged in On/Off (12 seconds or less)
2. Create a list (5 seconds or less)
   - Name list (10 seconds or less)
3. View/Modify a list (5 seconds or less)
   - Change list name (10 seconds or less)
   - Add item to a list (10 seconds or less)
     - Name item (15 seconds or less)
     - Item Category (15 seconds or less)
       - By type of item (17 seconds or less)
       - By store (17 seconds or less)
       - By importance (17 seconds or less)
   - Delete an item on list (12 seconds or less)
   - Cross-off an item on list (10 seconds or less)
   - Search for item on list (15 seconds or less)
4. Delete a list (7 seconds or less)
5. Application Options (5 seconds or less)
   - Adding/Modifying/Deleting a list
     - Notification On/Off (10 seconds or less)
       - Vibration
       - Screen message
       - Text
   - Report generation On/Off (10 seconds or less)
     - Popular items bought report
       - Item suggestion for list
     - Expense tracker
       - By last shopping trip
       - By last week

3.2.3 Functionality Time Estimate Justification

Function	Justification of Time Estimate
Household login	This allows a user time to select the username and password fields
Registration	This allows a user time to select the registration option, enter a username and password, and allows the system time to check for availability and create a record of their account
Username and Password entry	This allows a user time to select the username and password fields, then enter their login information
Stay logged in	This allows a user time to select the username and password fields, then enter their login information, then select a checkbox to determine whether the application keeps them logged in or not
Create a list	This allows a user time to select the 'create' option

Name list	This allows a user time to 'create' and type a name for a list
View/Modify a list	This allows a user time to find and select a list to view and/or modify
Change list name	This allows a user time to select a list and enter a new name
Add item to a list	This allows a user time to select a list and add a new item
Item category	This allows a user time to select an item from a list then select the 'set category' option
By type of item	This allows a user time to select an item from a list, select the 'set category' option and choose or enter an item type
By store	This allows a user time to select an item from a list, select the 'set category' option and choose or enter a store name
By importance	This allows a user time to select an item from a list, select the 'set category' option and choose or enter a level of importance
Name item	This allows a user time to select a list, add an item and enter a name for it
Delete an item	This allows a user time to select a list, find an item, delete it and confirm that they want to delete the item selected.
Cross-off an item	This allows a user time to select a list, find an item and select the cross-off option
Search for item	This allows a user time to select a list, select a search option and enter an item name
Delete a list	This allows a user time to select a list to delete and confirm that they want to delete it
Application options	This allows a user time to select the application options button
Notifications on/off	This allows a user time to select the options button, then select a check box to turn notifications on or off (add 2 seconds for selecting sub-options)
Report generation on/off	This allows a user time to select the options button, then select a check box to enable or disable report generation (add 2 seconds for selecting sub-options)

4 <u>Appendix</u>

A. iBuy Survey Part I

This section collects basic info about you and helps us understand our type of audience.

All survey and interview participant information will be kept anonymous and will only be used for iBuy application research.

1. Gender

● Male   ● Female

2. Age

● 17 or younger

● 18-20

● 21-29

● 30-39

● 40-49

● 50-59

● 60 or older

3. Highest Level of Education

● Less than high school degree

● High school degree or equivalent (e.g., GED)

● Some college but no degree

● Associate's degree

● Bachelor's degree

● Graduate degree

4. Employment Status

● Employed, working 1-39 hours per week

● Employed, working 40 or more hours per week

● Not employed, looking for work

● Not employed, NOT looking for work

● Retired

● Disabled, not able to work

5. Percentage of Income Spent on Groceries

● Less than 10%

● 10% - 25%

● 25% - 50%

● 50% - 75%

● More than 75%

Technology

6. What type of phone do you own? (check all that apply)

☐ Android   ☐ iPhone   ☐ Cell   ☐ Home   ☐ None

7. How often do you carry your phone (when going shopping)?

● Never   ● Not Often   ● Often   ● Always   ● N/A

8. Do you own a computer?

● Yes   ● No

9. What do you use these technologies for? (check all that apply)

	Phone	Computer
Texting	☐	☐
E-mail	☐	☐
Scheduling (calender, clock, etc.)	☐	☐
Internet	☐	☐
Social Media (Youtube, Music, etc.)	☐	☐
Social Networking (Facebook, Myspace, etc.)	☐	☐
Shopping	☐	☐
Games	☐	☐

Other (please specify)

B. iBuy Survey Part II

With wireless networks and on-the-go computing so common in this age, we wish to create a better way of keeping track of groceries than traditional archaic methods like a stickynote. iBuy will enable you to manage items on either a computer or Android device, anytime and anywhere. You can also involve friends and family on different shopping lists (large or small). Statistics such as quantity of purchases by whom and expenses will also let users take charge of how to better manage their budget.

All survey and interview participant information will be kept anonymous and will only be used for iBuy application research.

10. How often do you go grocery shopping?

● Daily

● Twice a Week

● Weekly

● Monthly

Other (please specify)

11. What type of budget do you have for grocery shopping? (check all that apply)

☐ Daily

☐ Weekly

☐ Monthly

☐ Yearly

☐ None

12. How do you manage grocery expenses? (Check all that apply)

☐ Memory

☐ Other Person(s) Manage for You

☐ File Management of Receipts

☐ Check Balancing (by Hand)

☐ Check Balancing (Online)

Other (please specify)

13. How do you currently keep track of groceries needed? (check all that apply)

☐ List on Paper

☐ List on Computer

☐ Memory

☐ Nothing Used

Other (please specify)

14. How many people do you shop for (including yourself, if applicable)?

● 0   ● 1   ● 2   ● 3   ● 4   ● 5 or more

15. Are certain person(s) assigned grocery shopping tasks?

●   Yes   ● No

Other (please specify)

16. What formats do you use to create your grocery list? (Check all that apply)

☐ Alphabetical

☐ Price

☐ Type of Items

☐ Store

☐ Importance

☐ Who's buying what

☐ Date

Other (please specify)

17. How often do these events occur to you when shopping?

	Never	Rarely	Sometimes	Often	Always
Forget your list (Select Never if N/A)	●	●	●	●	●
Forget which items to buy	●	●	●	●	●
Buy an item you don't need	●	●	●	●	●
Buy the wrong item	●	●	●	●	●
Buy an item you already have	●	●	●	●	●
Go over budget	●	●	●	●	●
Immediately return to store after shopping	●	●	●	●	●

18. Desired Reports from a Grocery Management System? (Check all that apply)

	Manual	Automatic
Regular Updates of Item Statistics	☐	☐
Expense Tracker	☐	☐
Group Membership Management	☐	☐
Changes made by Other Group Members	☐	☐
None	☐	☐

Other (please specify)

19. What type of effect best alerts you to new notices? (Check all that apply)

☐ Sound

☐ Vibration

☐ Message on Screen

☐ Symbol on Screen

☐ Lights

☐ None