

# **W14 Report (Project Part II): Usability Study Report**

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## **Evaluation and Analysis Results (3~4 pages)**

### **a) Topic:**

For this project, the interface is Save-On-Foods and the human need is to create and share grocery lists online. Currently, the Save-On-Foods website does not allow users to easily create and share a grocery list. We propose a feature that allows users to easily view and share lists online.

### **b) Evaluation Goals:**

1. To what extent are users able to view and use the list feature throughout their shopping workflow?
2. To what extent are users able to collaborate with others on their shopping lists?

### **c) Summary of evaluation:**

Five users were used as subjects for this evaluation who had varied levels of experiences with online grocery shopping. Some subjects were part of the Mini-Project evaluation, whereas some subjects were new users to the interface. Users will be observed and tasked to follow specific instructions in order to use the “My Lists” feature created in our medium fidelity prototype on Figma. Before the observation, users must provide consent on their participation in the study and their consent on being recorded (Appendix B.2).

First, they will be asked a set of preliminary questions regarding their experience in grocery shopping. An example includes asking the user to rate their prior experience from 1 (not experienced) to 5 (very experienced) with both online shopping and grocery shopping platforms. Appendix A.3 contains the comprehensive list of pre-observation questions. Second, the user will start the evaluation by finding the “My Lists” feature on the prototype. Then, they are asked to identify the number of items in a certain list and identify the collaborators who added a certain item to a list. Next, users are asked to add and delete items from various lists, as well as adding list items to their cart to simulate the checkout process. Users will also be tasked with creating a new list, renaming lists, and deleting lists to simulate modifying lists. Lastly, the user will be tasked to share their list. Detailed instructions can be found in Appendix A.3.

The evaluation will be observed through screen-sharing and users will be asked to think aloud during each step of their ordering process. A coding sheet (Appendix A.3) will be used by observers to gather qualitative and quantitative data, like the time taken and observations. Each user will have two observers – one to facilitate the study and one to complete the coding sheet. After the observation process, the user will be asked a set of questions via a semi-structured interview to evaluate their experience. The post observation interview questions can be found in Appendix A.3. The data collected from the coding sheets and interview questions will be compiled and analyzed through techniques like affinity diagrams and quantitative analysis.

### **d) Evaluation Rationale (Step 2):**

To maintain consistency and to better identify user improvements on the website, we opted to simulate the evaluation and protocol of the Mini-Project as closely as possible. Our first evaluation technique was direct observation using the think-aloud method as it yields both quantitative (e.g., time taken for each step) and qualitative data (e.g., direct quotes from the user) via a coding sheet.

Additionally, this method can help us collect objective (e.g., time taken for each step) and subjective data (e.g., user's emotions), enabling us to draw richer conclusions.

For our second evaluation method, we chose individual, semi-structured interviews. We want to probe beyond observations and gain deeper insights into the user's thoughts and feelings after the experience. This approach provides the flexibility to inquire about interesting or unique occurrences in the experience that may not be captured by observations or a survey.

In terms of goals, it was very important to ensure the goals captured findability, convenience, and collaboration. From the original Save-On-Foods website, it was identified that these areas needed improvement and our team wanted to further explore these areas in the medium fidelity prototype.

We conducted the evaluation through a remote session using a video conferencing tool, with 10 minutes allocated for both pre- and post-observation interviews and 10 minutes for direct observation. This approach is reasonable and sustainable, and it allows us to ask questions about both the user's personal background and experience, recognizing the diversity of our users' living situations and shopping habits. We will delete all recordings once the analysis is complete, and recording this data will give us the opportunity for further analysis if needed.

#### **e) Prototyping Rationale (Step 3):**

Our medium fidelity prototype aims to enhance the user experience of grocery list management by focusing on the findability of essential features and the discoverability of new collaborative tools. The primary scope of the prototype is to streamline the process of adding items to lists, editing lists, viewing lists, and to implement features like list sharing and collaborative editing.

We have chosen to use Figma as our design platform to create a website that closely resembles the original Save-On-Foods site, ensuring a familiar user experience. This choice allows for the prototype to resemble the visual realism of a realistic implementation and to provide a consistent visual appearance with the existing website. It provides users with a clear sense of the interface layout and navigation elements, focusing on user-interactable elements such as buttons and icons which help address the evaluations goals.

To simulate the user experience during grocery shopping, we have incorporated fake items and lists that emulate the options available to users and to improve the functionality of the prototype. This approach helps demonstrate the functionality of the application in a realistic context, allowing us to gather valuable feedback and insights during usability testing.

#### **f) Summary of Data, Findings and Analysis (Step 7):**

##### **Qualitative**

We created an affinity diagram (Figure 1) from the quotes and observations gathered through our observations and interviews with the participants. We clustered four groups of positive feedback, and four groups of constructive criticisms:

##### **Positive Feedback**

1. *Useful Collaboration Feature:* Many participants pointed out the usefulness of the collaboration feature, stating that it is a “very good idea.” More specifically, they pointed out that it would

make the process of sharing groceries with other household members (roommates, partner, family, etc.) more convenient. One participant also pointed out that it would be useful for planning an event because one would be able to see the history of who added what item. Another participant expressed that this feature would prevent household members accidentally getting doubles of items. Overall, almost all participants expressed a strong liking of the collaboration feature, and stated similar use cases for it. Since this feature was created by us and not present in the original Save-On-Foods website, this observation was very exciting.

2. *High Findability of the List Feature:* In contrast to the original Save-On-Foods website, users were easily able to find the list feature in our prototype. They expressed that finding the feature was intuitive because of the clear text and icon present directly beside the cart. Overall, users felt significant improvements in the ease of finding the list feature.
3. *Usefulness for those who shop at Save-On-Foods regularly:* Many participants expressed that they would find the list feature useful if they shopped online at Save-On-Foods regularly. One user stated that while it “takes more time” to set the list up, it is “good for repeated purchases” in the long run. While most of our participants prefer to shop in-person, this was still an encouraging finding because we know that the feature would be beneficial to those who do grocery shop online (e.g. those with mobility issues, busy students, or elderly people).
4. *Intuitive/User-Friendly:* Overall, our participants were satisfied with the user-friendliness of our prototype. They expressed a liking for the “clean, modern interface” as well as the straightforward icons. Some consistent terms in this theme were “easy” and “intuitive”.

### **Constructive Criticism**

1. *Confusing process for creating a new list:* One complaint that some participants had was the confusing process of creating a new list. This confusion seemed to be caused mostly by the “expand lists” icon in the dropdown (Figure 2), which is the same icon as the “add list” button after expanding the list (Figure 3). One user pointed out the frustration of having to “click on the button twice” to create a new list, which verifies our hypothesis.
2. *Redundancy of Expanded List View:* Along the similar vein, participants expressed that the expanded list view was a little bit redundant – clicking on the “expand list” icon (Figure 2) would take one to a slightly bigger list containing the same items (Figure 3), which some expressed was “unnecessary” and confusing. One user suggested improving this feature by allowing users to “click into the list without having to click the expand button.”
3. *Confusion of editing quantity after adding items to list:* Another complaint that participants expressed was the confusing order of adding an item to a list before specifying the quantity of that item. Two participants had the same thought that “quantities should come before save.”
4. *Ineffective Feedback:* Lastly, most users expressed some dissatisfaction in receiving feedback while completing various tasks, such as adding an item to cart, changing the quantity of an item, copying the share link, or prompting the participant to confirm deleting an item. Some

participants stated that they would have appreciated a clearer indication that they have completed a task so that they wouldn't need to double check whether they have done it correctly.

### **Quantitative**

We analyzed the quantitative statistics from our participant pool of five people by recording the time taken for each step, as well as calculating the total time taken for the observation. We also recorded the perceived difficulty level from both the observer's perspective (during the observation) and the participant's perspective (in the post-observation interview). Overall, participants took an average of 138.2 seconds (~2 minutes) to complete the observation study. The standard deviation is 34 seconds, and the distribution is relatively uniform (Figure 4). This suggests that our sample results are relatively reliable for generalization. Zooming in, we noticed that the task that took the longest time was checking who added ice cream to the "Bob's Party" list, with an average of 24.8 seconds, which is nearly 20% of the total time (Figure 5). This result is consistent with our qualitative analysis that users were confused by having to click twice to get to the expanded list view. Another interesting finding is that users consistently rated creating a grocery list and adding items to a grocery list as the most difficult tasks – every single participant rated these two tasks as having a difficulty of 2 out of 5, while they consistently rated the other tasks 1 out of 5. This is also in line with our qualitative analysis that creating and adding items to a grocery list was the most confusing part of the process.

Overall, the qualitative and quantitative analysis of our study demonstrates the high findability of the list feature and the promising potential of the list collaboration feature. As well, it has helped us identify room for improvement in making the expanded list view less confusing and providing more helpful feedback during/after completing certain tasks.

### **g) Conclusions (Step 8):**

The positive feedback revealed the usefulness of the collaboration feature, high findability of the list functions, potential benefits for regular Save-On-Foods shoppers, and the overall intuitive and user-friendly design. The results of our study highlights that while users found some tasks in the grocery list creation process confusing, the overall experience was still rated positively. Participants consistently rated other tasks as relatively easy, with a difficulty of 1 out of 5.

However, our study also identified areas that require refinement. These include streamlining the process for creating a new list, minimizing the redundancy of the expanded list view, clarifying the order of adding items and specifying their quantities, and providing more effective feedback during task completion. Participants rated creating a grocery list and adding items to a grocery list as the most difficult tasks, both receiving a difficulty rating of 2 out of 5.

In conclusion, our medium-fidelity prototype has successfully addressed our evaluation goals for our interface as well as some of the key issues found in the original Save-On-Foods list feature, leading to improvements in findability and user-friendliness. The introduction of the collaboration feature and the enhanced list functionality have been well-received by participants.

### **Recommendations and Critique (1 page)**

#### **h) Design Recommendations (Step 9):**

Our main focus was on the findability of the grocery list feature and this was highly validated by all of our participants in our evaluation (A.2 - Figure 1). Our conceptual model closely matched the users' mental models; the list feature is easily accessible just like a pocketbook. The addition of an add to list icon (above the image of an item) improved the efficiency of the interface. Users are able to complete more actions (adding items) with fewer clicks which saves their time and motivates them to continue using the interface. We tried to fix the lack of feedback by including animations or highlighting icons. However, this fix was not validated by most of the participants (A.2 - Figure 1) as the animations were still easy to miss. Since, this is only a medium fidelity prototype (limited time and cost), the animation will just be a placeholder for future iterations where a pop-up message with confirmation button may be a preferred form of feedback.

Our secondary focus is on the community aspect of the grocery list which the original Save-On-Foods website lacked. Compared to the main focus (findability), the community aspect has a more horizontal scope. The user is able to see which items in the list were added by which collaborator and user is able to share the list via a link; however, adding/deleting collaborators and other sharing methods have not been implemented yet. Even though some features are still incomplete, participants were still interested in the collaboration features and could see benefits from using these features (A.2 - Figure 1). These improvements can be implemented in a future prototype.

Overall, the validation received from participants showed that our conceptual models aligned with the users' mental models. Participants' concerns were minor and their constructive criticism will help build a better design in future iterations. Improvements can be implemented in a hi-fi prototype.

#### **i) Critique of process (Step 10):**

During the design process, we created two task examples (based on different conceptual models - pocketbook, community), identified the important requirements for the interface, and made a low fidelity prototype for each of the task examples. Then we did a cognitive walkthrough on both low fidelity prototypes to assess which prototype was a better fit for a user's mental model. This is an effective method when there are limited resources (low fidelity prototype) and limited participants (0 participants needed). We determined that findability of the list (pocketbook conceptual model) is most important, but collaboration (community conceptual model) is also lacking, so we included elements of both conceptual models in our medium fidelity prototype.

For the evaluation process, the quantitative data of time taken per task may not be as relevant or accurate due to the nature of the think aloud observation method. Thinking aloud may subconsciously cause users to take a longer time to complete tasks; therefore, there exists a trade-off between the accuracy of the quantitative data (time taken) and the quality of the qualitative data (thoughts, quotes). Most of the tasks were straightforward so time was not a major concern (unless it was abnormally long), and more emphasis was placed on the collection of qualitative data. However, the time taken can be useful to compare tasks completed on a very high-level between the current evaluation and the Mini-Project evaluation, keeping in mind the trade-offs and limitations. The follow-up interview questions gave more in-depth qualitative data that supported the data from the observations. Likert scale ratings are also collected after the observation which provide more useful quantitative data. Finally, due to the limits of the med-fi prototype, the observation tasks given must be completed in a specific order and the element states (lists, items, collaborators) were hardcoded.

## Appendix A

### A.1) Medium Fidelity Prototyping Video Reference

- Please view the video in this [link](#).
- If you would also like to access the prototype directly on Figma, please visit this [link](#).

### A.2) Figures and Tables

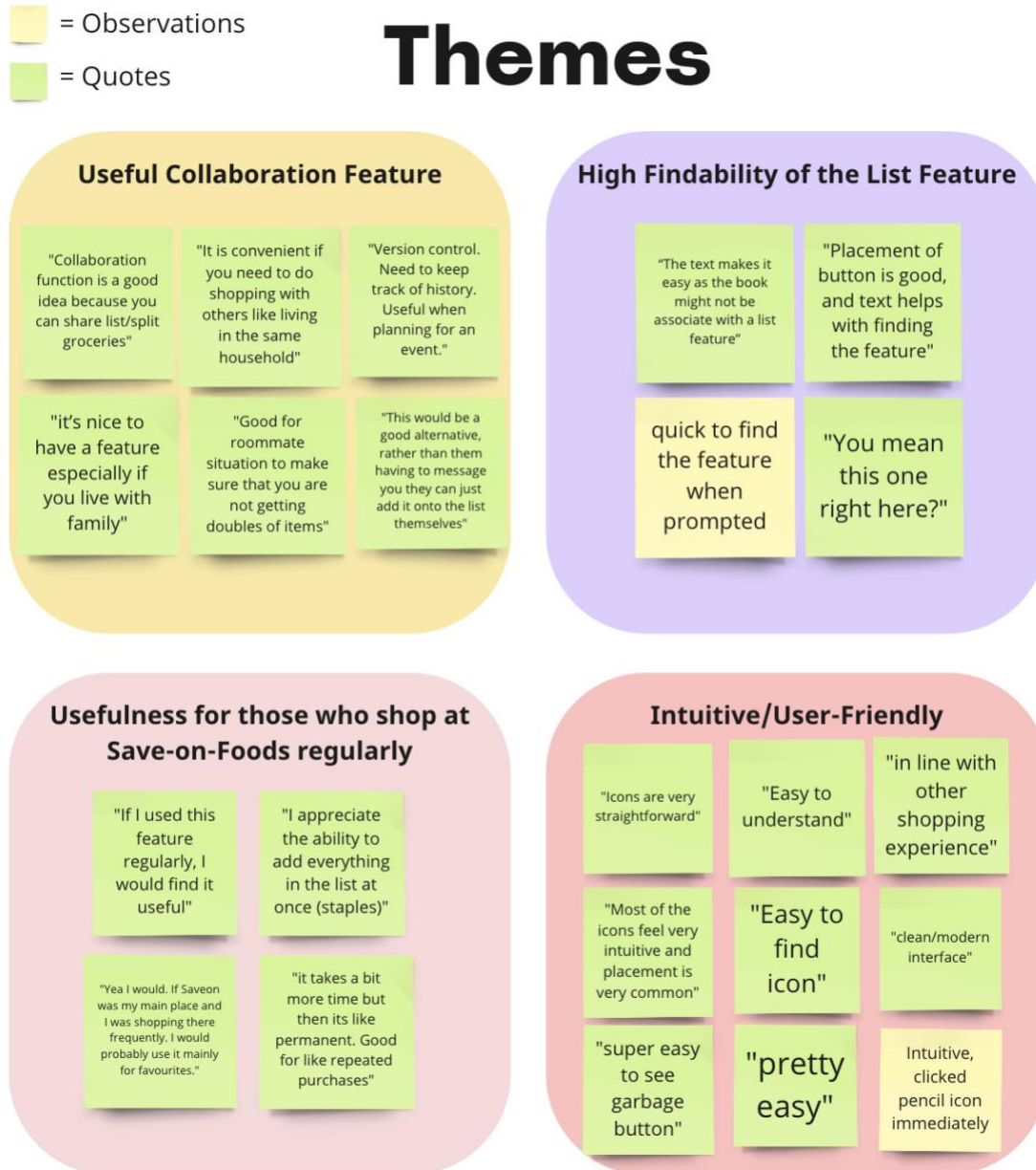


Figure 1: Affinity Diagram (continued on the next page)





Figure 1: Affinity Diagram (continued from the previous page)

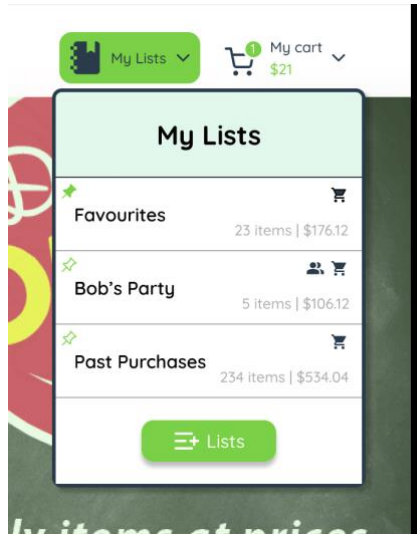


Figure 2: Initial List View

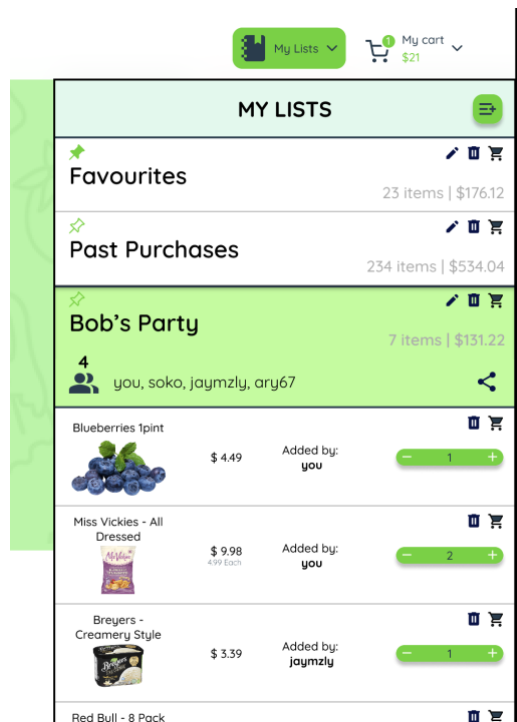


Figure 3: Expanded List View

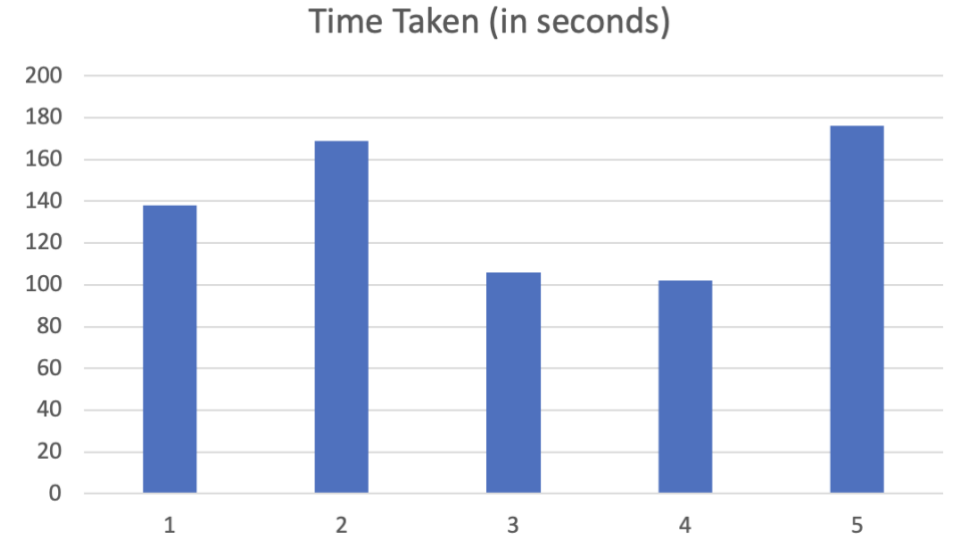


Figure 4: Total Time Taken (in seconds) for each participant

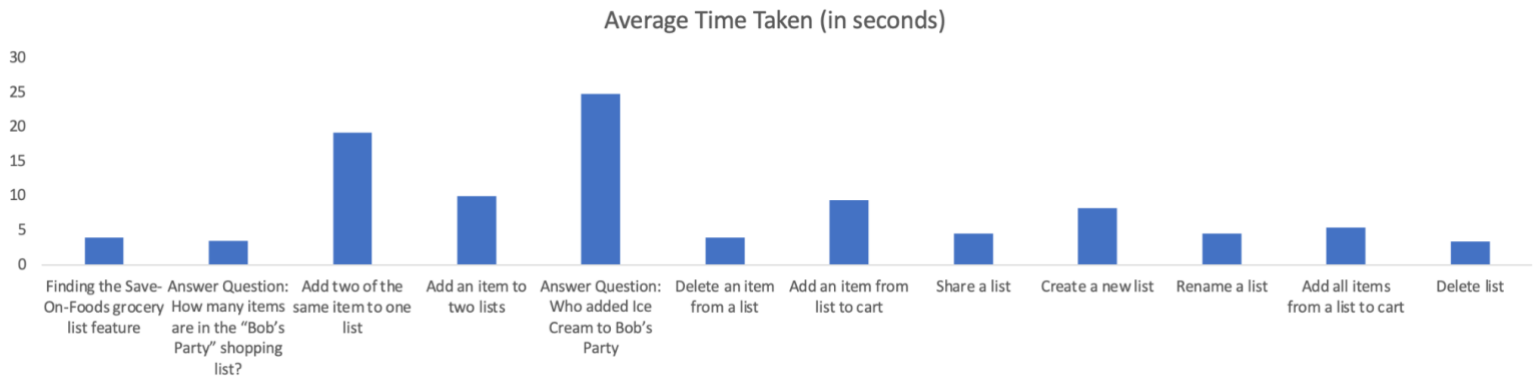


Figure 5: Average Time Taken (in seconds) for each task

### A.3) Evaluation Instruments

In the order below, the following materials are in Appendix A.3) Evaluation Instruments, please view the header of each page:

- Interview Questions
- Instructions for Participants
- Observation Protocol / Coding Sheet

## **Pre-Observation Questions**

() = follow-up questions

1. Describe, in general, the methods you use to shop for groceries.
  - a. (For example, do you go in-person to shop, shop online, etc.)
2. Do you use a grocery list when shopping for groceries? Why?
3. Roughly, how many times a month do you shop for groceries?
4. How do you feel about online-grocery shopping?
5. Rate your experience on online shopping from 1 to 5 (1 = not experienced, 3 = neutral, 5 = very experienced).
6. Rate your experience on online grocery shopping from 1 to 5 (1 = not experienced, 3 = neutral, 5 = very experienced).

## **Post-Observation Questions**

1. Describe how you felt during the ordering process.
2. Rate the difficulty of the following experiences from 1 to 5 (1 = very easy, 3 = neutral, 5 = very difficult) and why?
  - a. How difficult was it to find the grocery list feature?
  - b. How difficult was it to create a grocery list?
  - c. How difficult was it to delete a grocery list?
  - d. How difficult was it to add items to the grocery list?
  - e.. How difficult was it to delete items from the grocery list?
  - f. How difficult was it to add items from the grocery list to your shopping cart?
  - g. How difficult was it to add a collaborator to the list?
  - h.. How difficult was it to determine the items added by a specific collaborator?
3. Would you use this grocery list feature again? Why or why not?
4. How would you compare this experience with creating a grocery list by hand?
5. How useful is the collaboration feature on the list feature? If so, how would you use the collaboration feature in your shopping experience?

## Instructions for Participants

(Post Consent Form and Pre-Observation Questions)

During this entire process, please think out loud. Say whatever comes into mind as you complete a task. This might include what you are looking at, thinking about, doing, and feeling.

**Task:** There is a grocery list feature on the Save-On-Foods website. We would like you to follow the instructions below. Please refrain from asking questions about how to complete the task and try to complete the tasks on your own to the best of your abilities. If you are particularly stuck, we can offer assistance.

1. Find and open “My Lists” feature on Save-On-Foods
2. Question: How many items are in the “Bob’s Party” shopping list?
  - Answer: 5
3. Add **two** Miss Vickies - All Dressed chips to the list named “Bob’s Party”
4. Add Blueberries 1pint to the list named “Favourites” and “Bob’s Party”
5. Question: Can you tell me who added Ice Cream to ‘Bob’s Party’?”
  - Answer: Jaymzly
6. Delete item Blueberries 1pint from “Bob’s Party”
7. Add Miss Vickies - All Dressed from “Bob’s Party” to cart
8. Share the “Bob’s Party”
9. Create a new list named “Dinner”
10. Rename “Bob’s Party” to “Joe’s Party”
11. Add all items from “Favorites” list to cart
12. Delete a list named “Joe’s Party”

## Appendix A.2 Observation Protocol / Coding Sheet

Participant ID: \_\_\_\_\_

Date: \_\_\_\_\_

Observer: \_\_\_\_\_

Topic: Save-On-Foods: List & Collaborate

Start Time: \_\_\_\_\_

End Time: \_\_\_\_\_

Total Time: \_\_\_\_\_

Pre-Observation Questions	Notes
Describe the methods you use to shop for groceries (i.e., in-person, online, etc.)	
Do you use a grocery list when shopping for groceries?	
Roughly, how many times a month do you shop for groceries?	
How do you feel about online-grocery shopping?	

Experience ratings of the following (1 = not experienced, 3 = neutral, 5 = very experienced):
Participant's perceived experience on online shopping: / 5
Participant's perceived experience on online grocery shopping: / 5

Tasks	Notes	Observations / Relevant Quotes
Find and open the "My Lists" feature on Save-On-Foods	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Answer Question: How many items are in the "Bob's Party" shopping list?	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No  Correct answer? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Add two of the same item to one list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	

# Appendix A.2 Observation Protocol / Coding Sheet

	Time:	Very easy   1   2   3   4   5   Very difficult
Add an item to two lists	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Answer Question: Who added Ice Cream to Bob's Party	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No  Correct answer? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Delete an item from a list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Add an item from list to cart	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Share a list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult

## Appendix A.2 Observation Protocol / Coding Sheet

Create a new list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Rename a list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Add all items from a list to cart	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult
Delete list	Asked for Assistance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	Time:	Very easy   1   2   3   4   5   Very difficult

### Other Comments:

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### Post Observation Questions

### Notes

Describe how you felt during the ordering process.

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## Appendix A.2 Observation Protocol / Coding Sheet

Rate the difficulty of the following experiences from 1 to 5 (1 = very easy, 3 = neutral, 5 = very difficult) and why?		
How difficult was it to find the grocery list feature? Why?	/5	
How difficult was it to create the grocery list? Why?	/5	
How difficult was it to delete a grocery list?	/5	
How difficult was it to add items to the grocery list? Why?	/5	
How difficult was it to delete items from the grocery list? Why?	/5	
How difficult was it to add items from the grocery list to your shopping cart? Why?	/5	
How difficult was it to add a collaborator to the list?	/5	
How difficult was it to determine the items added by a specific collaborator?	/5	

Post Observation Questions	Notes
Would you use this grocery list feature again? Why or why not?	
How would you compare this experience with creating a grocery list by hand?	
How useful is the collaboration feature on the list feature? If so, how would you use the collaboration feature in your shopping experience?	

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## Contributions

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Please summarize the individual contributions of each member and the total number of hours they worked last week.

Name	Contribution (1 or 2 sentences)	Work hours
Cici Bai	Usability Study, Summary of Data, Findings & Analysis, Figures, Tables	15 hours
Roger Huang	Usability Study, Design Recommendations and Critique	15 hours
Vanessa Lee	Usability Study, Evaluation & Rationale, Appendix Materials	15 hours
Sasha Sokolov	Usability Study, Med-fi Prototype (Figma), Video Submission	15 hours
Kevin Zhu	Usability Study, Prototyping Rationale, Conclusions	15 hours