

INFO 3450, A5 Group, Section 203 Group 14

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**Project Title:** FoodSaver

**Project Statement:** Our primary project objective is to minimize the amount of food waste on campus. Cornell has fourteen dining halls and food waste is a prevalent problem among college students who feel pressured to get the most out of their meal plan by filling up their plates, and they subsequently leave half of it untouched. Many students, such as freshmen and students living on West Campus, are required to buy a standard dining plan, often times more than students wanted or needed out of a dining plan. Minimizing food waste can lead to direct benefits for the environment and economic advantages for the university, and also lessen the burden on dining hall employees who are tasked with managing the large amount of leftovers produced by students after each meal. Thus, the outcome from this project could produce multiple benefits contributing towards a more sustainable and conscientious campus culture.

## **Part 1: Run the usability test**

Our first goal of the usability test study was to examine the user flow to see if buttons are intuitive and easy to navigate. Our other two goals were to see if the user was satisfied with the product overall and understood the function of each task as well as to evaluate if the tasks made sense to the user and if the tutorials provided enough information for them to complete the tasks in one try.

We had four users participate in our usability tests, all of whom have lived or currently live on West Campus and have participated in an unlimited meal plan at Cornell. They frequently eat at the All You Can Eat dining halls on campus at least three times a week for both lunch and dinner, making them our prime demographic for this app. Our first participant is a senior government major and has lived on West Campus for the last two years. Our second participant is a sophomore Hotel Administration major and currently lives on West Campus in Becker House. Our third participant is currently a junior studying Industrial and Labor Relations and lived on West Campus in Becker House last year. Our fourth participant is currently a senior majoring in government. This is his third year living on West Campus, and he has an unlimited meal plan.



*Figure 1: Conducting our pilot usability test session*

These usability test sessions took place in Duffield Atrium from 9pm to 10pm on Sunday night. Each session lasted around ten minutes long, where the two note takers were sitting on either side of the participant while the facilitator sat across from them at a square table (Figure 1).

During each session, we first gave the participants an introduction of the study we were conducting and the project we were working on. We emphasized that we were evaluating how well the app is designed rather than their competence and gave them the informed consent form to fill out. Afterwards, we asked them our introduction questions to get to know their eating habits and how they currently feel about food waste on campus. We then started with the tasks for each participant. We gave them a total of four tasks, each one pertaining to a different feature of our app. The first task required the user to write a review for a particular food item using our rate and review feature. The second task required the user to create a leftover pickup request for their food item using our leftover pickup feature. The third task required the user to locate a compost bin from their current location to their destination using our compost bin locator feature. The last task required the user to open the compost bin and find their standing on the leaderboard

using our compost bin opener feature. After they completed all four tasks, we asked some concluding questions about the intuition of all features, high and low satisfaction parts, overall navigation of the product, and their general thoughts after using the app. We then ended the session by thanking our participants for their time and telling them to let us know if they had any questions or concerns in the future.

## **Part 2: Analyze the data**

### **Participant 1:**

**Task 1** - Write a 5-star review for cilantro lime pork chop in Rose House and post it on the Food Reviews page.

**Effectiveness (success rate):** Complete

**Satisfaction:** At first I was frustrated because I did not see the Rate and Review button, but after I found the button I was satisfied with the ‘writing a review’ feature

### **Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes
2	Yes

**Learnability:** Yes, the user was able to complete the task in the first time it was assigned

**Task 2** - Create a leftover pickup request for a quarter serving of cilantro lime pork chop and choose to pick it up at Keeton House at 10:02PM.

**Effectiveness (success rate):** Complete

**Satisfaction:** I was dissatisfied with this task because I did not recognize the icon for ‘leftover pickup’ on the tab bar. Additionally, I noticed the ‘frequent retrievals’ section before I could find the ‘start new request’ button

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes
2	Yes

**Learnability:** Yes, the user was able to complete the task in the first time it was assigned

**Task 3** - Locate the nearest compost bin starting from your current location at Physical Sciences Building to Olin Library.

**Effectiveness (success rate):** Complete

**Satisfaction:** I was satisfied with this task because the feature of this app was similar to the layout of google maps, however I was confused about the functionality of the navigation arrow. I did not know if I should click on the arrow/when I had arrived at my destination

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes, the user was able to complete the task in the first time it was assigned

**Task 4** - Open the compost bin and find your standing on the leaderboard after composting.

**Effectiveness (success rate):** Complete

**Satisfaction:** I was dissatisfied with this task because although I was able to easily find my standing on the leaderboard I felt that I did not understand the logistics of the task/correlation of reducing food waste on campus

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes, the user was able to complete the task in the first time it was assigned

**Participant 2:**

**Task 1** - Write a 5-star review for cilantro lime pork chop in Rose House and post it on the Food Reviews page.

**Effectiveness (success rate):** Complete

**Satisfaction:** User was initially unsatisfied because she could not identify a review button right away on the Food Reviews page, but grew to be more satisfied after scrolling down the page

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes

**Learnability:** Yes

**Task 2** - Create a leftover pickup request for a quarter serving of cilantro lime pork chop and choose to pick it up at Keeton House at 10:02PM.

**Effectiveness (success rate):** Complete

**Satisfaction:** User was overall satisfied with the navigation of the task and successfully completed it

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes
2	Yes

**Learnability:** Yes

**Task 3** - Locate the nearest compost bin starting from your current location at Physical Sciences Building to Olin Library.

**Effectiveness (success rate):** Complete

**Satisfaction:** User was initially confused if there was an added functionality to navigate to the closest compost bin because the locate button's functionality was immediately clear.

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes
2	Yes

**Learnability:** Yes

**Task 4** - Open the compost bin and find your standing on the leaderboard after composting.

**Effectiveness (success rate):** Complete

**Satisfaction:** User was able to navigate to the open compost bin and remarked that she was especially satisfied by the leadership display and content organization

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes

**Participant 3:**

**Task 1** - Write a 5-star review for cilantro lime pork chop in Rose House and post it on the Food Reviews page.

**Effectiveness (success rate):** Complete

**Satisfaction:** At first, the user was a bit overwhelmed by the page since there was so much text, causing him to be slightly dissatisfied. However, after he saw the “Rate and Review” button, he was able to recover from hesitation and ended up satisfied with the results. The participant stated that he would have been more satisfied had the page been more simplified and less text-heavy.

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes

**Task 2** - Create a leftover pickup request for a quarter serving of cilantro lime pork chop and choose to pick it up at Keeton House at 10:02PM.

**Effectiveness (success rate):** Complete

**Satisfaction:** The user was a bit dissatisfied at first when he was not sure how to complete the task. However, after receiving the instructions again, he was able to figure out how to find the feature and successfully completed the task. After successfully completing the task, the participant said he was satisfied with the overall flow of the feature.

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes

**Learnability:** No, the user failed on the first attempt and had to be given the instructions again to complete the task.

**Task 3** - Locate the nearest compost bin starting from your current location at Physical Sciences Building to Olin Library.

**Effectiveness (success rate):** Complete

**Satisfaction:** The user was slightly dissatisfied with this feature because he was unsure of what to click on once the map showed up in order to advance to the next page of navigation. Additionally, he was unsure when the task was completed and continued tapping other icons even after the task had been completed.

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes

**Task 4 -** Open the compost bin and find your standing on the leaderboard after composting.

**Effectiveness (success rate):** Complete

**Satisfaction:** The user was very satisfied with this feature and was pleasantly surprised that there was a leaderboard. He was also satisfied with how the leaderboard looked aesthetically and how his username was highlighted and easy to find.

**Error Rate and Recoverability:**

Error Count	Recoverability
0	N/A

**Learnability:** Yes

**Participant 4:**

**Task 1 -** Write a 5-star review for cilantro lime pork chop in Rose House and post it on the Food Reviews page.

**Effectiveness (success rate):** Complete

**Satisfaction :** The user initially thought that the “Rate and Review” page was the first page after search, rather than the overall reviews page that showed everyone else’s reviews. He tried to tap the stars to provide his own rating but then realized that he first had to click the “Rate and Review” button. He expressed a little bit of frustration because of this error, but recovered quickly and finished the rest of the task without an issue.

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes

### Learnability Yes

**Task 2** - Create a leftover pickup request for a quarter serving of cilantro lime pork chop and choose to pick it up at Keeton House at 10:02PM.

### Effectiveness (success rate): Complete

**Satisfaction:** The user was able to navigate to the Leftover Pickup tab quickly and efficiently. However, he wasn't sure if he should start a new request or not, and he had to look to the facilitator for confirmation that what he was doing was right. He was a little confused about whether or not he completed the task successfully, and was unsure if he had to take a screenshot of the confirmation request or if it would be automatically saved on the app. Overall, the user was satisfied with the task, and though he stumbled a little bit along the way he was able to successfully complete it.

### Error Rate and Recoverability:

Error Count	Recoverability
1	Yes
2	Yes
3	Yes

### Learnability: Yes

**Task 3** - Locate the nearest compost bin starting from your current location at Physical Sciences Building to Olin Library.

### Effectiveness (success rate): Complete

**Satisfaction:** The user was overall satisfied with the task, but he expressed some confusion regarding which buttons were clickable, and he was unsure if he finished the

task or not. Specifically, he was not sure what to click after entering his destination (Olin Library), and he wasn't sure if successfully arrived at the compost bin.

**Error Rate and Recoverability:**

Error Count	Recoverability
1	Yes
2	Yes

**Learnability:** Yes

**Task 4** - Open the compost bin and find your standing on the leaderboard after composting.

**Effectiveness (success rate):** Complete

**Satisfaction:** The user expressed that the directions for this task were straightforward, and he was able to navigate through the screens with relative ease and efficiency.

**Error Rate and Recoverability:**

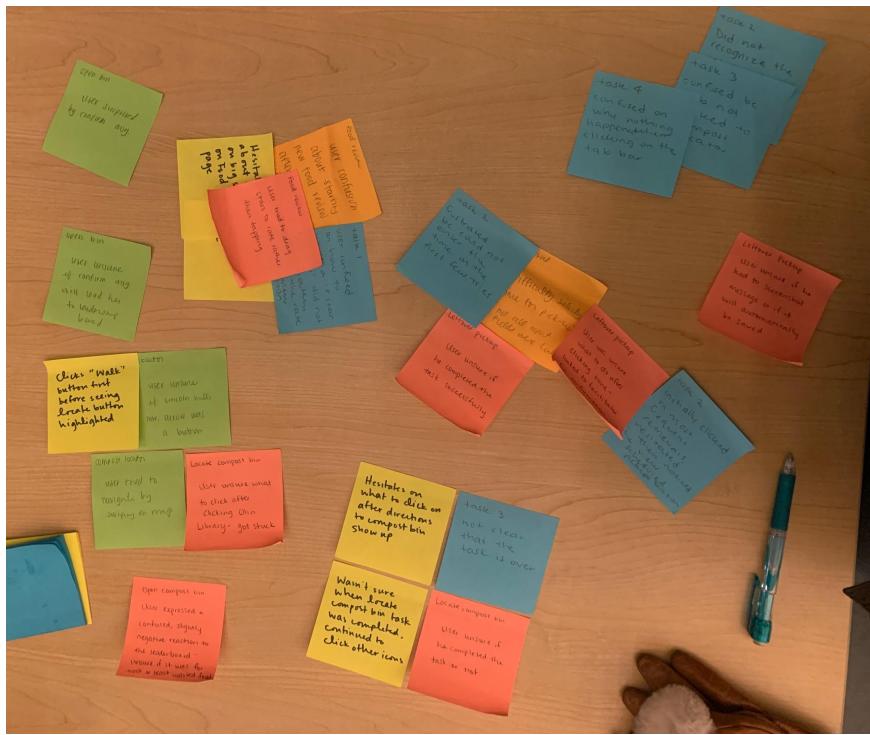
Error Count	Recoverability
0	N/A

**Learnability:** Yes

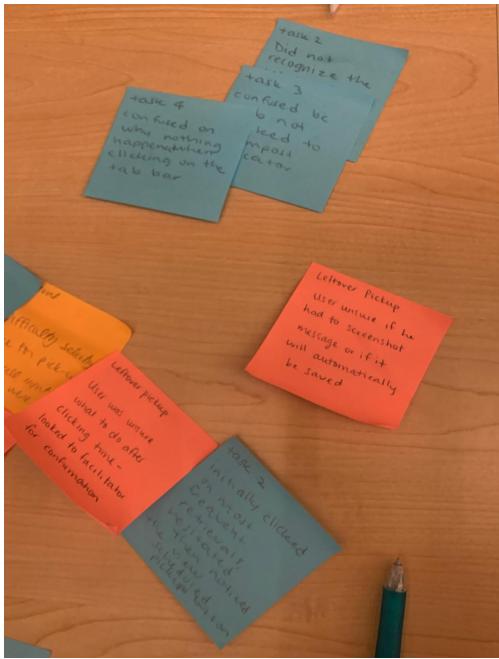
**User testing summary:** After the conclusion of our user testing, we determined several major key findings. Using the metrics system, we concluded that overall, users had high satisfaction with all of the functions of the FoodSaver app, especially the open compost bin function and leftover pickup function. Users experienced at most two error counts while performing one task, and every single occurrence of an error was recoverable and attributable to either unclear button

functionality or system feedback. These key insights were very helpful for our final design iteration, in which we revisited two main functions of the task: the food reviews and compost bin locator. We repositioned the rate and review button for maximum visibility and provided more system feedback in the form of confirmation messages so that users may know when they have reached a compost bin.

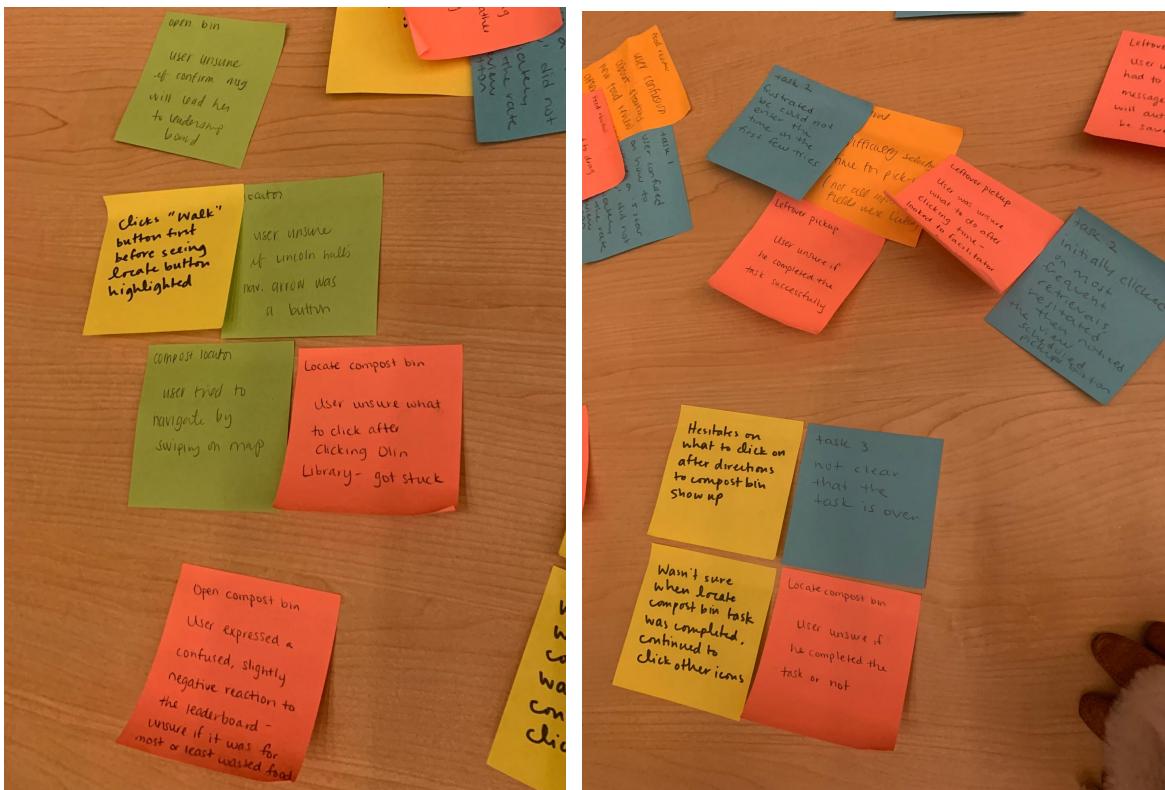
### Affinity Diagram Overview



UPI's Identified for task 2: Meal retrieval



### UPI's identified for task 3: Locate Compost Bin



### Design Problem 1: Confusion regarding completion of locating compost bin feature

**Description:** Participants were unsure what to do after entering the information to locate the compost bin and after clicking the start button. Several users expressed confusion and were stuck on the task; a few had to reach out to the facilitator for help or confirmation that they completed the task successfully.

**Severity Level:** 3- Serious

**Solution:** A pop-up should state that the user has arrived at their destination after start and navigation.

**Cost of Implementation:** 2- Medium

**Cost-Importance Ratio:** 1.5

**Design Problem 2:** Confusion regarding functionality of navigation arrow icon on the compost bin locator task

**Description:** It is not clear whether or not the navigation arrow icon is actionable or not, leading users to guess what should be clicked on in order to successfully complete the task.

**Severity Level:** 2- Minor

**Solution:** Next to the navigation arrow, include the word “Start” as well as change the color of the icon to green.

**Cost of Implementation:** 1- Easy

**Cost-Importance Ratio:** 2

**Design Problem 3:** Confusion regarding where to start writing a review

**Description:** When users searched up a food, they were generally unsure whether they landed on the existing review page that included the overall rating and reviews, or if they landed on the “Rate and Review” page that they could fill out themselves.

**Severity Level:** 2- Minor

**Solution:** Display button for writing a new review should be in a more prominent and visible location at the top of the screen, above the start of the review page.

**Cost of Implementation:** 2- Medium

**Cost-Importance Ratio:** 1

**Design Problem 4:** Unclear button label for leftover pickup's confirmation message

**Description:** Users were confused whether the pin would be automatically saved or if they should screenshot the pin to use later.

**Severity Level:** 2-Minor

**Solution:** Rename “Ok” button of confirmation message to “Next” to convey that their information will be carried over to the subsequent page.

**Cost of Implementation:** 1- Easy

**Cost-Importance Ratio:** 2

**Design Problem 5:** Lack of visibility for button to start a new leftover pickup request

**Description:** Some users were confused about whether or not they should choose from the “frequent meal retrieval” options or if they should start a new request.

**Severity Level:** 1- Cosmetic

**Solution:** Increase size of option buttons to allow users to start a new pick up order or view existing orders in order to increase visibility and draw user attention.

**Cost of Implementation:** 1- Easy

**Cost-Importance Ratio:** 1

## **Part 3: Apply the changes and improve the design**

*Improved Figma prototype link:*

<https://www.figma.com/file/hPqgZbsk3sn03EHzY8sNwZ/A4-Prototype?node-id=0%3A1>

*Before & After movie link:*

<https://drive.google.com/file/d/1si-2eOE-YVvKwODYguzaBkaWLU22-GCf/view?usp=sharing>

**Design Improvement 1:** A pop-up stating that the user has arrived at their destination after using the compost bin locator feature.

Our group incorporated this design improvement into our final Figma prototype because we observed that almost all of the users that participated in our usability testing session did not realize when they had completed the assigned task to “locate the nearest compost bin starting from your current location at Physical Sciences Building to Olin Library.” In our usability testing sessions, participants would go through the task until it was completed, however, they expressed that they were unsure if they had achieved the intended goal. This was evident through both explicit statements such as, “That’s it?”, or body language such as looking to the facilitator for confirmation. To address this uncertainty, we created a new screen in our Figma prototype that includes a pop-up notification that is captioned “Arrived,” below this the pop-up states, “You have arrived at the compost bin located in Lincoln Hall!” Below this is a button with blue text saying “Okay.” Once the user taps the “Okay” button they are redirected back to the page with directions from the Physical Sciences Building to Lincoln Hall to Olin Library, from here the user can then either exit the app or use the tab bar to start a new task. This solution is a significant improvement over the previous user experience because it will decrease the user’s confusion regarding whether or not they have successfully completed the task. Also, for students

who are new to campus or unfamiliar with the names of certain buildings, this “Arrival” notification will enable students to feel confident that they have navigated to the correct building.

**Design Improvement 2:** Include the word “Start” next to the navigation arrow as well as change the color of the icon to green to indicate actionability.

This design improvement was implemented in response to user confusion regarding the navigation arrow located in the lower right hand corner of the screen next to the name of the nearest compost bin. During our usability testing sessions it appeared that users were uncertain of what button they should click to continue through the navigation process. To indicate that the arrow button represented the next step in the navigation process we changed several factors. First, we inserted a green button that matched the color scheme of our Figma, in the lower right corner next to the listing of the nearest compost bin located in Lincoln Hall. Next, we changed the original arrow from solid black to a white arrow outlined in black. We believe the combination of both of these elements will make the button appear more prominent from the background as well as make it more clear to users that they need to hit this button to start their navigation journey. To make it even more clear that we want users to tap this button, we included the word “Start” in white text, next to the white arrow to indicate that in order to receive their desired directions, users must click this button to proceed. This solution is a significant improvement over the previous user experience because users will now automatically understand that they must hit the start/arrow button in order to proceed to the next step.

**Design Improvement 3:** The “Leave a Review” button should be placed nearer the top of the screen for easier visibility.

This design response was implemented due to an overall reaction we received from our user testers when trying to complete the task of writing a new food review. During our user testing, the user would complete this task by first searching up the type of food (in this case, “cilantro lime pork chop”) and the dining hall location, and then they would be taken to a review page that contained all of the previous reviews and the overall rating of the food out of 5 stars. If the user scrolled to the bottom of the screen, they would see a button entitled “Rate and Review,” which they would have to click on in order to be taken to a new page to leave their own rating and review of the food. Once they hit submit, they will be taken back to the original review page, where they will see their original review was added. During our user testing, some of our users hesitated when they tried to find the “Rate and Review” button since it was located at the bottom of the screen, while others expressed frustration through their body language and verbal cues. Another one of our users thought that the original review page was where he was meant to leave a review, so he tried to tap the overall star rating in order to leave his own rating. Based on these users’ interactions, we decided to rename the “Rate and Review” button to “Leave a Review” in order to more clearly indicate its purpose, and we also moved this button to the top of the screen and enlarged it in order to increase usability. In addition, we strengthened the visual designs (such as by adding pictures) without changing the functionality of the feature in order to provide a higher level of sophistication to the app and a more streamlined user experience.

## **Part 4: Team members' contributions**

Lisa LaBarbera: Took notes throughout the usability test session and also aided in facilitation.

Completed high-fidelity design improvements to the Figma prototype and helped to improve visual design inconsistencies through all screens. Helped to create and edit the “Before & After” movie, assisted in affinity diagramming, aided in documenting user metrics testing and helped to write out the major design problems.

Samantha Muscarella: Took notes throughout the usability test session and analyzed the data using the metrics and goals from A4. Implemented design improvements to the Figma Prototype for the compost bin locator feature and helped to create the “Before & After” movie.

Katie Shum: Took notes throughout the usability test session for Participant 3 and analyzed the data using the metrics we developed in A4. Summarized the usability test session and session protocol. Assisted with creating the affinity diagram and identifying UDPs.

Yunyun Wang: Analyzed and documented one of the participant’s user testing notes with respect to the metrics system that we developed in A4. Assisted with the making of the Figma video illustrating the major design problems we identified and developments that we incorporated into this last design iteration.