MoveOn Initial Prototype Evaluation — Team Pollux

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Moving is complicated and stressful. Coordinating how to quickly sell or gift items the mover is not taking with them can bring unnecessary stress to an already stressful situation. This product aims to create an efficient workflow to unburden the mover in the task of selling or gifting items. There are solutions in the marketplace that allow people to buy/sell/trade (Craigslist, OfferUp, Facebook Marketplace, eBay). None of those solutions are well-suited to the task of selling multiple items in one transaction and including a timed element to the pickup. In this paper we will introduce our solution to this problem, and show our prototype of this solution. We will also discuss our planned usability tests and heuristic tests that will inform us on how to improve our design further.

Introduction

MoveOn is a cloud based application/website to help facilitate the sale and gifting of one's belongings in preparation of moving to a new living space. The website will allow users to list their belongings they need to get rid of, and other users can schedule a time to pick up and purchase those belongings. This will relieve stress to someone that is moving because they know that their belongings will be removed by the necessary deadline. Most people that are moving are willing to part with their belongings at a reduced price, so this reduced price will be the benefit and incentive for buyers.

Our users' core usability problem is: How can an individual efficiently coordinate the logistics involved in selling/distributing all the possessions they won't take with them when moving from one home to another?

The target audience for MoveOn will be anyone that is planning on moving soon and anyone that is in the need of any consumer goods. With our app the user will be able to post the items that they are looking to get rid of, they will be able to select a date they need the item picked up by. The other end of the app will be another user that wishes to receive the item, this user will select the item and choose what time and date they wish to pick that item. The user could be an 18-year-old that is switching apartments or moving out on their own for the first time, a military family of 5 that is changing duty stations, or even an empty nest couple that is downsizing from their single-family home to a retirement community. The user who will be looking to receive the item could be anyone that is in search of any item, this app is for any consumer.

This project has merit because of its ability to serve a variety of users. It could be used by graduating college students who are transitioning into a new life stage, newlyweds who would like to get rid of their previous belongings to obtain something new, families moving, and by the remaining friends and family members of a person who has passed away.

Some planned affordances:
- Scheduling and reserving items for future pick up times
- Option to give friends and family access prior to the general public
- Ability to view all sales items by the same seller
- Search filters including the ability to search locally to support the community

- Ability to post and search for Yard/Garage/Estate sales
- Communication via text messaging within the application
- Ratings and reviews for buyers and sellers

There are many marketplace options available to consumers, but many of them are plagued with problems such as malicious uses and poor user experiences. MoveOn aims to fix those issues for the buyers, while also specifically catering to those that are in the stressful situation of moving. Ultimately, we aim to create a marketplace that is easy and fun to use for buyers and sellers alike.

New Learnings for Week 7

Prototype Summary and Revisions

Overview of the Prototype / Key Features

Our prototype aims to capture the two most common and most important features of a marketplace application: Searching for goods to buy and posting goods to be sold. To make the prototype feel like a more full experience, we included features to log in and to create a new account, as well as message and video call the owner of an item to be purchased.

While those features are the primary focus, the screens were developed with the intention of extending the functionality in the future. As an example, the home screen layout includes a section of "New Listings" that in a future iteration will be clickable, leading to the post page for the listing. However, currently those portions of the layout are not interactable.

Prototype Screens

Common Screen Features

MoveOn Logo

The MoveOn Logo is located at the top of every screen with the exception of the Start Screen. The Start Screen instead has a larger version of the logo located more centrally on the screen.

Navigation Bar

The Navigation bar is located on every screen with the exception of the Start Screen, Login Screen, and Create Account screen. This tool consists of four buttons. The Home button will bring the user to the Home Screen, the Mail button will bring the user to the messages inbox, the Shopping Cart button will bring the user to a screen to pay for goods they have reserved, and the Account button will bring the user to the Account details and settings screen.

For the purpose of the prototype, only the Home button is functional as the other screens have not been included in this prototype.

Start Screen

The Start Screen is a simple screen that displays the MoveOn logo and has two interactable buttons: Login and Create Account. Clicking either of these buttons will take the user to the screen corresponding to the name of the button. See Figure 1 below.
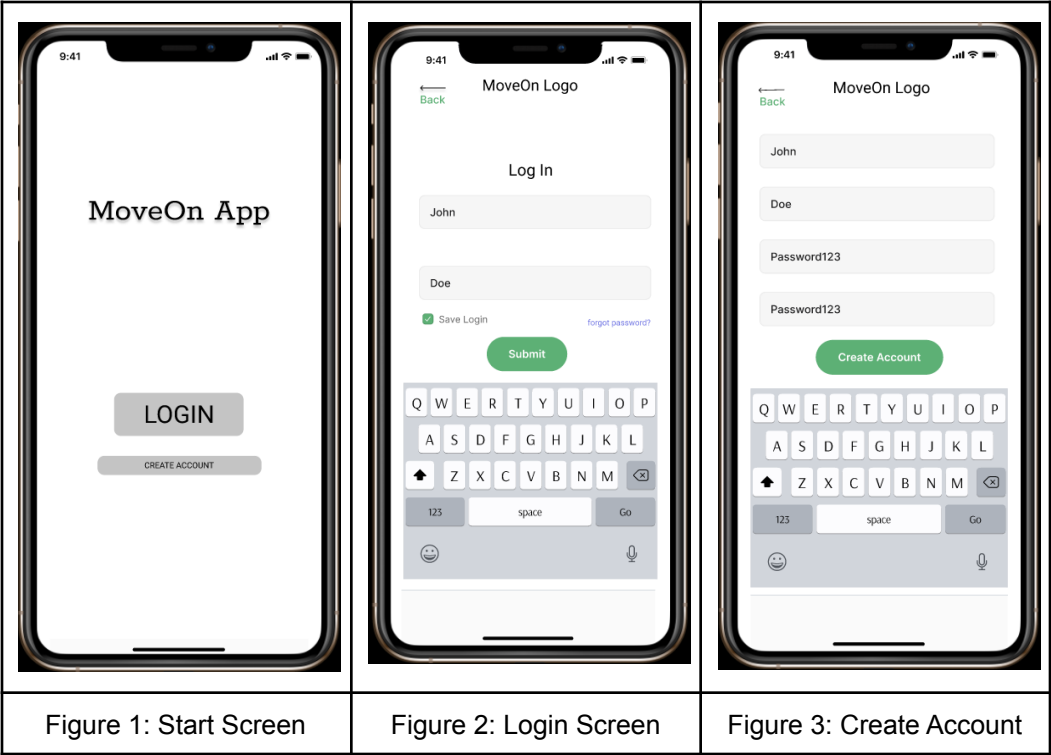
Login Screen

The Login Screen functions as most would expect. It contains a field for entering a username and a field for entering a password. Once those have been entered the user presses a button labeled "Submit" which will send the user's credentials to the server and log them in, sending them to the Home screen. Additionally it includes a checkbox labeled "Save Login" which will cause the application to save the login information so the user does not have to type in the information every time they use the application.

For the purpose of the prototype, the username and password are already filled in and the user simply needs to press the Submit button to advance to the Home screen. See Figure 2 below.

Create Account Screen

The Create Account screen is very similar to the Login screen, but will be used by people that are new to MoveOn. On this screen the user must input more information about themselves, and must type their desired password twice. If the passwords both match, the user can press the "Create Account" button to create a new account with the entered credentials, and will be logged in, sending them to the Home Page.

For the purpose of the prototype, the user information is already filled in and the user only needs to press the Create Account button to advance to the Home Screen

Figure 1: Start Screen	Figure 2: Login Screen	Figure 3: Create Account

Home Screen

The home screen consists of three major sections: Listings, Your Reservations, and Your Listings. The Listings sections displays new listings that have recently been posted in your area, and has a small search box with filters that can be used to search for more listings.

Your Reservations section lists items that the user has agreed to purchase and pickup from the seller at a later date. Each listing in this section has two buttons; one for contacting the seller of the item and one for cancelling the reservation.

Your Listings section lists all of the items that the user has listed for sale, and has a button for adding a new listing.

For the purpose of the prototype, the search filters for price range and condition can be clicked to display a dropdown list of options. Pressing the Search button will take the user to the Search Results screen, while pressing the Add Listing button will take the user to the Create Listing screen. See Figure 4 below.
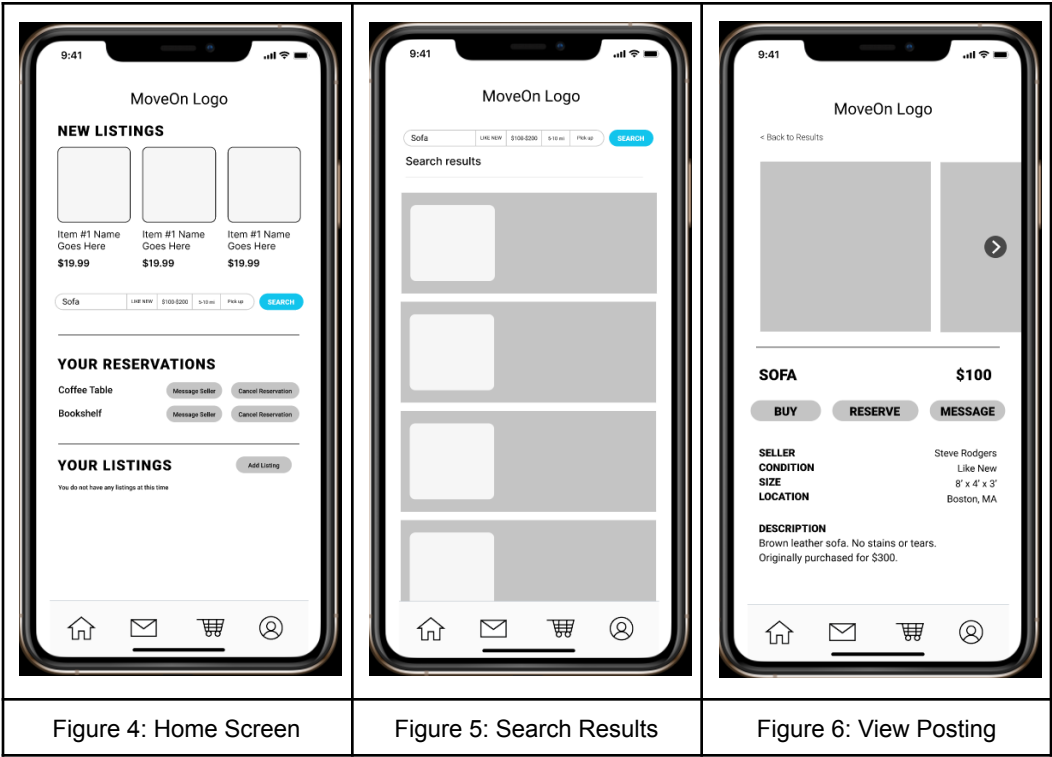
Search Results Screen

At the top of the Search Results screen is a search bar identical to the one on the Home screen. It has a text box to type into and four filters. Below the search bar are the results of the search listed in a column. Each listing has a space for a photo and an area for a brief description of the item. Clicking on the post will bring the user to the View Listing screen. See Figure 5 below.

View Listing Screen

This screen has many parts to it. At the very top is a "Back to Results" button that will take the user back to the Search Results page. Below that is the Image Reel that can be cycled through to view multiple images of the listing. At the bottom of the screen is the description of the item, along with pertinent information such as the name of the seller, location and condition of the item. There are also three buttons: Buy, Reserve and Message. See Figure 6 Below.

For this prototype only the Message button is functional, and will bring the user to the Message screen to send text messages to the owner of the listing.

Figure 4: Home Screen	Figure 5: Search Results	Figure 6: View Posting

Message Screen

The Message Screen displays the text messages between the current user and another user, in this instance the owner of the sofa for sale. The user can type additional messages into the text box at the bottom of the screen, and can click on the phone button or camera button to start a phone call or video call respectively. Pressing the Back to Product button will return the user to the screen displaying the product last viewed. See Figure 7 below.

Message Screen: Video Call State

The Video Call state displays a Video Chat modal over the Message Screen. This will display the incoming video stream from the user being contacted, and will use the phone's camera to send
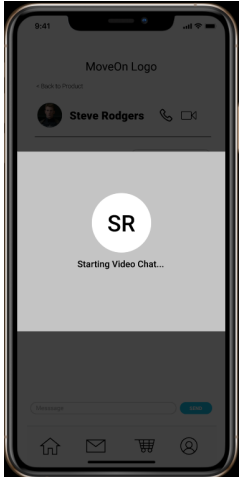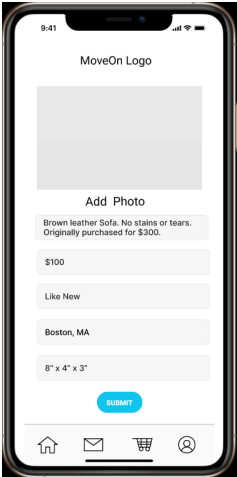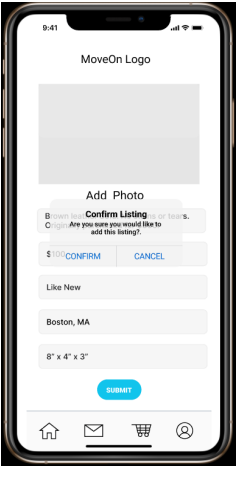
video to the other user as well. Clicking off of the video chat will close the video and bring the user back to the Message Screen's default state. See Figure 8 below.

Create Listing Screen

This screen is for adding new listings to MoveOn. It gives the user the opportunity to upload one or more photos of the item to be sold, along with a description and other important information such as price, location, size, and condition. Once all of the information is entered the user can press Submit which triggers the Confirm Listing state. See Figure 9 below.

Create Listing Screen: Confirm Listing State

The Confirm Listing state shows a confirmation box over the Create Listing Screen. The user can press Confirm to add the listing to the application so others may purchase the item. If the user presses Cancel, it returns the user to the Home screen without adding the listing to the application. See Figure 10 below.

Figure 7: Message Screen	Figure 8: Video Call State	Figure 9: Create Listing	Figure 10: Confirm Listing State

Prototype Scenarios and Tasks

The prototype supports the primary features of a marketplace application: logging in, searching for goods, posting goods, messaging users. These can be used to create a wide variety of scenarios. It can support returning users as well as new users, and buyers as well as sellers.

Tasks

Task #1: A buyer wants to browse the MoveOn platform for a sofa. The buyer will search for a sofa, provide specifics about the cost and condition of the sofa, select a sofa of interest, message the seller.

Task #2: A seller wants to add a new listing for a brown leather sofa. The seller will add enough Quickly listing the item with enough detail to inform the buyers in our marketplace.

Scenarios connected to the Tasks

Buyer Scenario: You are a 20-year old who is moving into their first apartment with a few friends. Between you and your roommates, each person was assigned to bring common items for the new place (kitchen table, sofa, fridge, etc). The apartment won't be ready to move in for

several more weeks, but you're excited to find furniture to match the vibe of your new place and come in under budget.

Seller Scenario: You are an empty nester (your kids are grown and have moved out of the house). You are excited because you've just bought a smaller house in the ideal neighborhood, but you face smoe anxiety because you need to sell or handoff all the items that won't fit in the new, smaller home. A friend referred to you to MoveOn as a great place to sell or giveaway all the items that won't make the move. You're interested to set a date and time for delivery/pickup of the big items and let the app take care of the administrative burden to bundle smaller items to seller or give away to neighbors.

Prototype Revisions

Per our last Protype Review and Evaluation, we did not have any feedback to our prototype in terms of design or functionality. Regardless, we wanted to continue to update and expand our application in preparation for the next module requirements as well as have a more presentable experience for our user testers.

Our first revision was to add more state screens for the filter/search bar. The previous iteration only had two states available that would show a dropdown menu to "select" a filter. Before user testing, we wanted to include two additional states to round out the filter feature. The search bar now includes filters for the item's condition, the price, the distance from the buyer, and if the item can be picked up or dropped off. This was one revision that our peers noted they would have liked to see in the first round of prototypes.

Our second revision was to add additional screens. Though the navigation bar at the bottom was not important for our use of testing for our tasks, it was important to be functional for user discovery. Our navigation bar at the bottom consists of four icons: a house to navigate to the "home" page, an envelope to navigate to a user's messages, a cart icon to show a buyer's current items for purchasing, and a profile icon to open an overlay for the menu. This menu would house the user's profile, their orders, their listed items for sale, and their payment methods. We also included a logout button that would take our users to the login screen. We hope that these additional screens will make the user feel more familiar with the app and have an overall better experience with testing and exploring our ideas for the app and its uses.

Our third revision was added after user testing. As a team we discussed what else we would like to see in our app to add to its value. Chris came up with the idea to have a button on a seller's product page that would link to a similar page as our results page. This new page will list all the items that a specific seller also had listed. We thought this might be interesting to add so that a seller could easily communicate with friends or other interested buyers about what else is available.

Usability Test Plan | Summary and Revisions

Purpose of the Usability Test

The usability test will focus on the qualitative side of evaluation. The goal of this test is to keep the interview open-ended during the in-test phase, allowing the users to peruse through the app and find pros and cons to using the app. Having developed a prototype of screens for the app, we want to use the think-aloud method to gather as much feedback as we can from the participants. We will follow the actual test with some post-test questions afterward, in which we will ask un-biased questions that will give us more direction as to whether they like the app or not. Letting the participants find pros and cons to the app will give us the feedback we need to determine what areas we are doing well and in contrast, what areas we could do better in certain aspects of the

app. These post-interview questions are optional; a tester can decide to ask all of the questions, some of the questions, or none at all, based on the participant's current state.

Two Participants for Two Target Audiences

In terms of participants, we want to test our prototype initially with two types of participants: one being younger and the other being older. The MoveOn app would be popular among college students, since they tend to move frequently and when they graduate, they move again. College students are usually single and live individually, having single-status belongings. Our app focuses on finding users within a close distance to purchase and sell items before a move date, so college is the ideal place for the app to thrive. Therefore, having a younger participant that is currently in college or just moved out of college would be beneficial. For the second participant, we want someone older, maybe someone with a family that owns family-type belongings (different from the young participant). Being part of a family means there's potentially more items that would be sold during a move, which is an important part of our app. Having a large selection of items available for sale is what keeps a marketplace app running, so having these types of users is important for the MoveOn app. These two participants will make a good qualitative evaluation for usability testing.

Usability Summary Recap

The test has been set up, participants briefed, consent obtained, think-aloud method performed, and post-test questions answered. Overall, the usability test performed for our MoveOn app focuses on providing qualitative feedback from the participants while creating a comfortable environment for them to feel as if they are using the app at home. This creates a more realistic situation, providing more accurate results. By using only two participants it saves us a lot of time, as we are still in the prototyping stages of app development. The qualitative feedback that these two diverse participants provide, going through the app as buyer and seller, is more valuable to us at this stage than say a quantitative evaluation where we go through lots of participants but do not ask them to do tasks and scenarios that are as detailed. Planning for this usability test has taught us that every small detail going into the interview makes a difference, whether it is the details that happen during the briefing, or the environment that the participant experiences during the in-test evaluation. Using the think-aloud method for the prototyping stage is valuable since we, the app makers, are biased and already know too much about the app. Being able to experience a new user's thoughts during the interview will help us uncover things we missed. In contrast, it will also give us direction, letting us know what we are doing well so far with the MoveOn prototype. We look forward to acquiring feedback from the participants to make the app even better.

Usability Test Revisions

In terms of revisions, we revamped a few aspects of the usability test. For starters, we slightly changed the way in which we wanted to conduct the test. Instead of a totally hands free approach, we added a few questions that were asked during the interview. We kept the interview as close to the think aloud method as possible, but asked questions such as "Would you like to search for an item to buy or buy a new listing?". Asking just a handful of questions like these allows the user to have some direction, giving them a small reminder of the purpose of the app, and therefore giving them a clear idea of where they want to navigate. We kept it unbiased, and made sure these questions were subtle. Secondly, we decided the post-interview questionnaire should be optional. We did not want to overwhelm the participants with too much testing, so for future replications of this test, not all post-test questions need to be asked (or none at all).

Usability Test

Test Participants
- Tiffany
    - Tiffany is a 25 year old asian female from Illinois. She currently works in IT at a large corporate company and just had a move last October after finishing grad school. She has moved four times in the last 10 years, moving from apartment to apartment. The interview was conducted at Tiffany's home on May 15, 2021 She provided consent by signing the created interview consent form.
- Lizzy
    - Dr. Lizzy McStuffins 39 y/o Caucasian Female, Lizzy is currently a major in the United States Air Force. Her profession is a Mental Health Nurse Practitioner. She has been in the medical field for 14 years and in the Air force for 12 years. Due to her years in the Air Force, she has moved 7 times in those years. She provided consent by signing the created interview consent form.

How Consent was Obtained
Our study participants provided their consent via a verbal consent after the interviewer read the text of the consent form (see Appendix). The interview only moved forward if the subject verbally consented to participate in our study.

Order of Tests and Tasks
The testers were presented with multiple tasks to complete. The first task was to act as a buyer and attempt to navigate from the home screen all the way to calling the seller with the video chat feature. The next task was navigating from the home screen, to messaging a buyer. After these tasks were completed, we moved on to the next task which was acting as a buyer and selecting an item to purchase. The final task was acting as a seller and uploading a photo for a product to sell.

As for the details on parts of the app we would like to test, we want to focus on two scenarios: the user is using the app as a buyer or seller. The MoveOn app is a marketplace app for users that want to either get rid of belongings because they need to move, or they want to purchase used belongings for cheap from people who are moving. Part of the app focuses on listing items that sellers are getting rid of before a certain move date. This portion of the app is what the buyer sees, perusing through different item listings, being able to filter for specific items and so on. The other part of the app is what the seller sees. When a user wants to sell items on the app, they peruse through the screens that allow them to add items to their for sale listing, and keep track of buyers that have contacted them to set up a purchase price and date. As for the two scenarios we would like to test, the first involves contact between the buyer and seller. In other words, we would like to have the participant navigate through the app as a buyer and then as the seller for instance. This allows for two tasks to be performed: the task of navigating to in-app messaging/video calling. We want to see if the user, whether they are a buyer or seller, can navigate through the app all the way to the contact buttons. As a seller, they would navigate to the in-app messaging screen per the items that buyers are interested in buying. As a buyer, they would navigate to the "reservations" section of the app, selecting which seller to message. There is more interaction for the buyer role in this task since the buyer must select more buttons and icons to navigate to in-app messaging. Lastly, the user should be able to understand the in-app messaging options (both texting and video call functions). By having the user navigate through the app towards in-app messaging as both a buyer and a seller, they accomplish two different tasks. The buyer route experiences search filters, scrolling through items, selecting items for more details, and finally in-app messaging. The seller route experiences screens involving posting listings for items and navigating towards the messaging screens. To clarify, when the user is a seller, they will be provided photos of items to post onto the app, where they will enter the details themselves. Furthermore, there will already be a pseudo-buyer ready to contact them for the sake of the test. The buyer role involves searching for any item listed on the app and contacting that seller.

How Long the Tests Took

Lizzy completed all the tasks and was also able to explore some of the other features the app had to offer in 24 minutes. Tiffany completed all the tasks in 35 minutes.

Primary Research Method - Think Aloud Method

The primary research method used for this test will be the think-aloud method. Since this usability test is a qualitative evaluation, we want the participants to feel for themselves what it is like to navigate through the app. We will take notes and record the audio of the in-test execution phase. Having the participants think out loud as they navigate through the app allows us to have a free willed testing environment. Since we are in the prototype stage, there can be many changes after the usability test is performed. We want to gather as much undiscovered information that we can from the users. Having them talk through navigating the app will give us insight as to what areas of the app take longer to navigate through, what questions they have when speaking out loud that confuses them or makes them enjoy the app, and so on. Most importantly, we want the participants to feel comfortable during the test, so that they act natural as if they were using the app at home for the first time. To create this environment, we will not be video recording them. Instead, we will take an audio recording for the entirety of the usability test and take handwritten notes on their verbal think-aloud responses. The detailed tasks from the two scenarios of being a buyer and seller are sufficient material for the participant to engage fully and provide feedback for us to take back to our post-test analysis.

Secondary Research Method (optional) - Post-Interview Questionnaire

The secondary research method used for this test is adding post-test questions afterwards. There will not be a plethora of questions, since this is not the focus of the qualitative usability test, but we would like to ask a few unbiased, generic questions that allow the user to recap their experience while using the app. The reason for adding questions at the end is because as the user is going through the app they are preoccupied, so they might not get to say out loud all their thoughts and remarks on the pros and cons of using the app. The participants will be asked a few questions regarding their experience with the app. One question would involve whether they like the interface, whether the app is easy or difficult to navigate through. Another question would ask what they think about how the features and text are laid out in the app. A pair of questions would be what part of the app do they like most and least. We want to avoid asking questions about specific features or screens, since this results in a yes or no response, which is not as detailed and helpful for post-test analysis. One question to ask is what is one thing the participant would change about the app and why. This question gives us insight on how we can change our app from a fresh perspective. The participant has used the app for both main functions buyer and seller, so they should have a good idea of what they would like changed. This type of question leads the participant to engage in providing feedback, instead of having a question like "Is there anything else you want to add?", in which the participant would be directed towards a yes or no response.

Questions Asked (you)

What kind of phone do you use?
Do you have an account with the MoveOn App?
Can you pretend to be a buyer and message a seller?
Can you be a seller and message a buyer?
Would you like to search for an item to buy or buy a new listing?

How Sessions were Recorded

In terms of pre-test details, we should focus on giving a briefing followed by obtaining consent from the participants. During the briefing, we want to stay neutral, discuss what scenarios and

tasks are going to be performed by the participant. We need to moderate the test lightly, as this test involves the think-aloud method, we want to brief the participant with all the tools and information they need to go through the app on their time and their pace, having the purpose and goals of the test clearly laid out for them already. We want to make it clear to them that whatever they say will not offend us, and that we welcome all types of feedback and will be changing the design based on participant feedback. As for the recording, we took an audio recording for the entirety of the usability test and made handwritten notes on their verbal think-aloud responses. This was done verbally while recorded on an audio recorder. There was no video recording since we want the environment to be as comfortable as possible. By recording the audio, consent is still obtained. An iPhone was used during the interview with Lizzy and a Mac sound recorder was used in the interview with Tiffany.

Post-Test Interview for Lizzy (optional)

1. How do you like the interface/Is the app easy or difficult to navigate through?
I really enjoyed the simplicity of the app even though I could not complete the 2nd tasks.
2. What do you think about how the features and text are laid out in the app?
It is easy to navigate and pretty straightforward to use.
3. What do you like most about the app?
I liked the home screen and the ability to see so much information from new listings, your reservations and all the quick connect icons.
4. What do you like least about the app?
I could not actually see what a completed purchase looked like.
5. What was one thing you would change about the app and why?
I wish I could go back to the previous page. This feature was not on all screens, I just like the ability to go back to the previous page without having to start over.

Post-Test Interview for Tiffany (optional)

1. How do you like the interface/Is the app easy or difficult to navigate through?
The interface was clean and easy to follow. The app was easy to navigate through assuming the photo upload is integrated into the app.
2. What do you think about how the features and text are laid out in the app?
The text is laid out nicely, there is not a lot of text and it does not make the app seem overwhelming. The features are clean, they seem intuitive.
3. What do you like most about the app?
I like the design of the app. The buttons are clear and obvious and the sections for each thing are divided well.
4. What do you like least about the app?
The section to upload a photo to sell.
5. What was one thing you would change about the app and why?
Adding an "add photo" button. There was no section or pop up to add the photo. I would add a user friendly interaction with the empty box to confirm a photo was uploaded to the app.

Heuristic Evaluation Plan

Heuristic Evaluation Summary

The two experts listed below each performed a heuristic evaluation of the prototype. The evaluation analyzed two scenarios, a buyer searching for a couch to purchase, and a seller looking to post a new item for sale. During the evaluations the experts focused on three specific Nielson Principles as heuristics: Principle #2 Match between system and the real world, Principle #3 User control and freedom, and Principle #8 Aesthetic and minimalist design.

Heuristic Evaluation Revisions

There were no significant changes made to the Heuristic Evaluation Plan when compared to the previous report. All feedback regarding the previous report and the heuristic evaluation plan indicated that the plan was ready to move forward.

Description of Two Experts Who Conducted Reviews

Kevin Neiger. Kevin is a detail-oriented person whose expertise will lend itself to great specifics in our reporting. Kevin is currently planning an interstate move, he'll draw on that experience to play the role of seller and buyer to execute the tasks inside this heuristic review.

Chris Mosier. As a professional instructional designer, Chris has an eye for detail and designing from the perspective of another person. He will channel that empathy to play the role the users described as he executes their tasks within a given scenario.

Heuristic Evaluation Process

Tasks Experts will complete for the Heuristic Review

Task #1: A buyer wants to browse the MoveOn platform for a sofa. The buyer will search for a sofa, provide specifics about the cost and condition of the sofa, select a sofa of interest, message the seller.

Task #2: A seller wants to add a new listing for a brown leather sofa. The seller will add enough Quickly listing the item with enough detail to inform the buyers in our marketplace.

Scenarios connected to the Tasks

Buyer Scenario: You are a 20-year old who is moving into their first apartment with a few friends. Between you and your roommates, each person was assigned to bring common items for the new place (kitchen table, sofa, fridge, etc). The apartment won't be ready to move in for several more weeks, but you're excited to find furniture to match the vibe of your new place and come in under budget.

Seller Scenario: You are an empty nester (your kids are grown and have moved out of the house). You are excited because you've just bought a smaller house in the ideal neighborhood, but you face some anxiety because you need to sell or handoff all the items that won't fit in the new, smaller home. A friend referred to you to MoveOn as a great place to sell or giveaway all the items that won't make the move. You're interested to set a date and time for delivery/pickup of the big items and let the app take care of the administrative burden to bundle smaller items to seller or give away to neighbors.

Specific Heuristics used by the reviewers

Our team will be using Jacob Nielsen's 10 general principles for interaction design [1]. These will be our guide as our experts conduct their heuristic review. Of the 10 general principles that new send out lines we will focus on 3 for our review.

Nielson Principle #2 match between system in the real world

We want to ensure the terms and text on-screen in our MoveOn interface reflect our user's language choices. Our mobile app will operate with the constraint of limited space for text. When users search for an item, we need to efficiently choose a small number of words to convey nuanced features like filtering the search results based on various criteria. We want that criteria to match the language of our users.

Nielson Principle #3 User control and freedom.

Through all the various tasks that a buyer or seller may conduct on our platform (listing items, searching for items to purchase, messaging to arrange the purchase of an item), we want to ensure users can quickly and easily navigate the platform. Our goal will be to have key areas of

the platform (search results, seller listings, and the home screen) are clearly labeled, discoverable, and easy to access.

      Nielson Principle #8 Aesthetic and minimalist design
      Staying true to Nielsen's 8th principle is very important to our team. We want to ensure the UI focuses on just the essential actions for buyers and sellers. The expert review will look for elements that distract from the core tasks. If buyers can quickly message sellers and make purchases, those buyers will tell others about their success on our platform and draw more users to our platform. Positive user experiences will help us reach the critical mass of buyers and sellers to make our marketplace successful.

Steps in the Review Process
      Working independently, each expert conducted the following steps.
1. Review the 3 heuristic principles that we are evaluating (3 Nielson principles noted above)
2. Read scenario for buyer.
3. Complete task #1 (buyer browse for sofa) using prototype developed Figma
4. Log any issues in google sheet
5. Read scenario for seller
6. Complete task #2 (seller list sofa)
7. Log any issues in google sheet
8. Log any additional issues in google sheet
9.
10.

Documentation of Heuristics review
      Our team's two experts will document their findings in a Google spreadsheet that is inside our team's project folder.
      Step 1: Each expert conducts an independent review
      Using a template we have designed in Google sheets. To ensure the heuristic reviews are independent, the experts will log their issues in separate spreadsheets, so they do not see each other's results. The spreadsheet will allow them to document any usability issues they find and assess the severity of those usability issues.
      LINK TO TEMPLATE FOR HEURISTIC REVIEW

Figure 11. Screenshot from google sheet template for our experts Heuristic review

Criteria documented in our review template
- Title of Usability Problem
- short description
- screen #
- Name of Expert
- Frequency of the usability problem (experts will chose from a standardize list of criteria: Rarely, Sometimes, Often)
- Impact of the usability problem (experts will chose from a standardize list of criteria: No impact, User can continue with workaround, Stops user)
- Persistence of the usability problem (experts will chose from a standardize list of criteria: Rarely, Sometimes, All the time)
- Assessed Severity (experts will chose from a standardize list of criteria:
    - 0 = No Problem,
    - 1 = Cosmetic Problem Only,

- ○ 2 = Minor Usability Problem,
- ○ 3 = Major Usability Problem,
- ○ 4 = Usability Catastrophe [2]

Step 2: Prioritizing the list

The two experts will meet to discuss the usability problems discovered. The two experts will share their findings and build a new spreadsheet that consolidates their work. As the experts share their findings, any instances where they both have the same issue will be noted and consolidated into one entry in the new master list. Then the list of usability problems will be prioritized. The experts will use the initial severity ranking of each item to assign a numerical ranking (1- highest priority, 2 - second highest, etc). Their rankings will be entered in the last column on the right-hand column in the master sheet.

Consolidating the data between both evaluators

After each expert conducted their review, the two reviewers met to discuss their results. Each expert shared their findings, the lists were merged, ranked and prioritized. The reviewers evaluated each finding based on three criteria: The frequency of the usability problem, impact of the usability problem, and the persistence of the usability problem.

The reviewers selected any issue that met the threshold of a "Major Usability Problem" to document in this report.

Evaluation Results - Overview

Several critical issues were revealed from our Heuristic reviews and usability tests. This exercise was incredibly helpful to give us insight into where to devote our resources to improve our product. The most notable critical issue uncovered in usability testing was the inability to "add a photo" to an item the seller is selling. This issue is covered in greater detail below in the section "Evaluation Results - Usability Test". Our heuristic reviews uncovered several issues, most notably the absence of a key finding from our user research in module 4. This critical issue ("Log in with trusted third party") is discussed in more detail in the next section.

Evaluation Results - Heuristic Review

Top four heuristic problems identified

Critical Problem #1 - First screen is a login screen, adding an extra action to get to browsing items

The Screen #1 (the Start Screen) has two related critical issues. As a buyer, it was discovered that the user has to log in or create an account before browsing items. This is not in keeping with Nielson Principle #8 Aesthetic and minimalist design. It adds a non-essential step in the buyer process.

Insights / Design recommendation for Critical Problem #1

The workflow for a buyer to browse can be streamlined. We discussed adding a button to screen #1 for "just start browsing". We also discussed allowing buyers to browse without logging in, but then when the buyer takes an action that requires the platform to know who they are (messaging or making a purchase), we would direct the user to login with a message like, "hey you're not logged in. please log in to make your purchase."

Critical Problem #2 - Missing login with trusted third party

In our user research, we identified a key insight that users want trusted third party auentication systems (apple, facebook, google) to reduce the bots, scammers and trolls who might abuse the platform. Our Screen #1 (the Start Screen), does not contain this option.

Insights / Design recommendation for Critical Problem #2

Our prototype should be updated to include third party login features. Our team will add "log in Apple, Google, or Facebook" capabilities to Screen #1 (Start Screen).

Critical Problem #3 Seller unclear where to find sold items

In the seller role, I opened up the app to find a listing of what items had been sold, but still needed to be picked up. I had sold a nice end table, but forgot who the buyer was and when they were coming to pick up. When I opened the home screen I saw the words "Your Reservations" and didn't understand what it was. This violated Nielson Principle #2 match between systems in the real world.

Insights / Design recommendation for Critical Problem #3

More detail needs to be included to deliberately show the seller their listings. After a team discussion of this issue, it was determined that we will make a revision to Screen #4 (Home Page). The sold items for a seller will be added to the "Your Listings" section.

It was also proposed that we would add a new section to the home page labeled "Recent transactions". This idea was discussed and we tabled it for the moment.

Critical Problem #4 - Missing labels on form fields to add a listing

When selling an item the user must open the add listing page. The prototype has all of the fields filled in, however there are no labels indicating what information should be placed in each field. If the user were to open the page of the actual application, designed after this prototype, the fields would all be blank and the user would not know what each field is for. This can be quite confusing for the user, and presents an unnecessary hurdle to posting a new item for sale.

Insights / Design recommendation for Critical Problem #4

There are a number of possible solutions to fixing this problem. The first, and most straightforward, is to include labels for each of the fields, indicating what sorts of information should be entered. In addition to this, the field that indicated the condition of the item could be turned into a dropdown menu.

Another solution would be to prefill the fields with text that indicates what sorts of information should be entered. This prefilled text should be noticeably different from the text the user inputs, most likely by making the text a lighter shade of grey, rather than black.

Evaluation Results - Usability Test

Top three usability problems identified

Critical Problem #1

The first critical problem that has been identified in the usability evaluation is when the user was assigned the task of adding a picture of the item that they wish to sell. The error was encountered on the List item page of the app. The user started at the start screen and chose the login option after that they arrived at the home screen. The user selected add listing and here is where this problem was encountered. When the user tried to add a photo, no option could be accessed from this page.

Insights / Design recommendation for Critical Problem #1

The recommendation to fix this critical problem could be granting access to the user's camera phone or even having access to the phone's photo library. With having access to the camera, the user could take pictures with their phone then add them directly or allow the app access to their photo library and select photos already stored on their phone.

Critical Problem #2

Critical problem #2 occured when the user navigated to the individual product screen, the user got frustrated with the task of selecting an item they wish to purchase. Here on the individual product screen there is a buy button and when clicking that button, nothing happened. They couldn't complete the task when they believed that this button would achieve that task..

Insights / Design recommendation for Critical Problem #2

The solution to this problem would be when selecting the buy button an alert can pop up asking to confirm that the item will be added to the cart. When we enter the cart the newly added item will be there with a checkout option to complete the transaction.

Critical Problem #3

The user also found a critical problem when assigned the task, message a seller about their product. On the Home screen the user saw that they had items listed under their Reservations section. In this section there is a button to message the seller. The user thought that this would complete their task and when they clicked on the button nothing happened.

Insights / Design recommendation for Critical Problem #3

A solution to this problem will be when the user is on the Home page, in the Reservations section and selects this button it will navigate them to the message screen to communicate with the seller. Making this button functional will allow the user to complete the task that was assigned and make a more enjoyable user experience.

Critical Problem #4

The user found a critical problem when assigned the task to add an item/listing. The "confirm listing" pop-up that appears is transparent, meaning that the user can see through the pop-up, seeing the screen behind it. This caused the text in the pop-up to overlap with the text in the screen, making it difficult to read.

Insights / Design recommendation for Critical Problem #4

A solution to this problem is to make the "confirm listing" pop-up have a solid background fill instead of a transparent one. This will make the pop-up legible, therefore making it easy to read for the users.

References

[1] Nielsen Norman Group. Apr. 24, 1994; Updated Nov. 15, 2020. "10 Usability Heuristics for User Interface Design",https://www.nngroup.com/articles/ten-usability-heuristics/

[2] Nielsen, Jacob. November 1, 1994. "Severity Ratings for Usability Problems", https://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/