Assignment 3f: Design Refinement Report (4.5%). Students prepare a report documenting their process to refine their design. While there is significant overlap in the content between the report and prior assignments, the report should incorporate the feedback received from the course staff and any revisions made to the design.

The submission for this assignment is a pdf document that contains:

1) **Title**. Short and creative title capturing the key idea of the project.

2) **Team**. The name of the members of the team and their role in the design research effort (or their contributions).

3) **Problem & Solution**. An overview of the problem being tackled and a concise description of the proposed solution. This section is a revised version of the "Problem & Solution" section of the previous report based on the scope of the final design and the considerations taken up until this assignment.

4) **Initial Paper Prototype**. Description of the original paper prototype and the primary tasks as a baseline for the iterations that followed.

5) **Testing Process**. Description of the testing process, including methods and participants. The description should include a retrospective discussion of how the design process was refined.

6) **Testing Results**. Summary of the results of the paper prototype testing and refinement. What was learned about each version of the prototype? What changes were made as a result of the heuristic evaluation and usability testing?.

7) **Final Paper Prototype**. Final version of the paper prototype with a description of critical aspects of the design and how the prototype supports the two primary tasks.

8) **Design Mockup**. Description of the higher fidelity mockup, how it supports the two tasks, and a discussion of any changes that were necessary to increase the fidelity of the design.

9) **Discussion**. Reflection of the project and discussion of the results. For example:

- What was learned from the process of iterative design?
- How did the process shape the final design?
- How have the tasks changed as a result of the design process?
- Could more iterations help the design?

10) **Appendix**. Supplementary material with additional details on the design process, including instructions or task descriptions that were used in the tests and critical incidents.

The report should be 8 pages maximum (not counting images or the appendix). Grading will be based on the content of the report (3.5%) and clarity/presentation (1%).

Assignment 3f: Design Refinement Report

1. Title: reJoy

2. Team: David Liu, Eugine Szeto, Shanelle Roman, and Valentine Quadrat all contributed to prototyping, user testing, and design refinement. All members participated in brainstorming and sketching sessions.

3. Problem and Solution

Overview of the Problem

In in our consumer-driven world, humans often collect an overabundance of stuff. Marie Kondo, the author of The Magic Art of Tidying Up, has inspired a revolution in cleaning and surrounding oneself with things that give one joy. What has not received as much attention is what to do with the items one no longer wants or needs. The worst case scenario is that the items get trashed and the cycle of buying new goods and then trashing them continues.

With hundreds of thousands of pounds of items trashed during college move-outs across the US every year, we are focusing on tackling this problem in the context of university campuses. Facilitating a second life for used goods in a university campus community increases the likelihood that someone at a similar life stage in terms of classes, trends, and social events would find them useful.

"Salvaging reusable items from NYU's dumpster"
https://lifehacker.com/college-move-out-what-to-do-with-all-that-perfectly-go-475873365

Proposed Solution

Our proposed solution is a mobile app for university students that provides a fast and easy process for selling used books and clothing. The app allows the user to quickly input basic information on an item he or she wants to sell, get a code associated with the item, and then use the code to drop the item off in a secure box on campus. Our system then sells the item on the user's behalf by leveraging social discovery features.

4. Initial Paper Prototype

The original prototype for our proposed solution was an app built using Balsamiq and a reJoy drop off bin made from a cardboard box. The prototype is designed to accomplish the following tasks.

PRIMARY TASKS

Task #1: Coordinating Item Transfer

Our mobile app and dropbox address the hassle of the buyer and seller messaging back and forth to coordinate location and time for item transfer. The seller simply inputs some key details about the article of clothing or book, takes a few photos, and then follows our simple instructions on how to drop the item off at a reJoy box. Steps include putting the article of clothing into a ziplock bag (no bag needed for a book), printing out a QR code, and taping it onto the ziplock bag (or book). The app then presents a map showing where the nearest reJoy box is. The seller is able to drop off the item on his/her own time. At the reJoy box, the seller scans the QR code and then deposits the item.

Task #2: Item Discovery

Our second key task regards discovering second-hand items that the buyer would like to purchase. We approach this task by creating a social experience in the form of a newsfeed that allows the buyer to see items that his/her friends have just purchased or looked at. We believe that focusing only on books and clothes will allow users to more easily find items they are looking for.

5. Testing Process


Usability Test Protocol Applied to All Three Usability Tests

We first explained to our participant the testing procedures -- that the user would be completing tasks and we would not be able to answer questions, that we were there to get a better understanding of the product, and that he/she can withdraw from the test anytime. We emphasized that we are evaluating the interface, not the participant. We also asked the participant to speak aloud his/her thoughts through the whole process. We then gave the user two scenarios and asked him/her to complete a task.

<u>Participant 1</u>

The participant is a Yale undergraduate, and we conducted the test in his suite common room. He's an international third-year student from Thailand studying economics and mathematics. His exposure to

mobile applications is standard. He fits the demographic of our target audience, and the dorm environment is where we imagine our users would be using our product.

Participant 2

The participant is a Yale undergraduate, and we conducted the test in her apartment living room. She is a fourth-year undergraduate from Singapore. She is studying history. She rates her mobile use as extremely high. She fits the demographic of our target audience, and off-campus housing is an environment where we imagine users would be using our product.

Participant 3

The participant is a Yale undergraduate junior from Connecticut studying mechanical engineering and economics. We conducted the test in his dorm suite common room. He rates his mobile use as standard. He fits the demographic of our target audience, and the dorm environment is where we imagine users would be using our product.

Protocol Refinement Process

Over the course of the usability testing process, we changed our protocol slightly with each new participant. Initially, we focused on getting general user feedback as they completed the two tasks. However, as we engaged more testers, we began to ask more targeted questions as they completed the tasks. For example, if one user complained about the meaning of "offer" on one screen, we asked the next participant some more targeted questions when he or she reached the updated version of the screen to ascertain that the modifications were well-received.

6. Testing Results

Summary

Overall, we found that we needed to give more explanatory text throughout the application. We thus added many clarification features that were well-received by the participants.

Heuristic Evaluation Revisions Overview:

We resolved Help & Documentation issues by adding a photo tips section to the photo upload page. We also incorporated a welcome guide on the sell process for first-time users. To address User Control & Freedom navigation issues, we added missing home and back buttons. We also made the "sell" button more visible on the home page. To provide an update on System Status, we added a confirmation screen to the app for when the user drops off an item in a reJoy box. In terms of usability blemishes, we fixed the inconsistency in the number of quality categories on item details pages. We also added more inclusive sizing, such as XS and XL, to the item details sell page.

Usability Test #1 Revisions Overview:

We clarified "Optional: include a link" on the sell item details page by adding a question mark button providing more information. We fleshed out the photo tips section by writing out guidelines on how to take a good photo. We eliminated the confusing crosses present in the uploaded photo squares. We

clarified the meaning of “offer” by rephrasing it as “Our offer for your item”. We fixed a typo on the QR code page of text. On the item information sell page, we included a button allowing the user to edit payment and shipping information on his/her user account. On item purchase, we added a message to let the user know that an email confirmation has been sent.

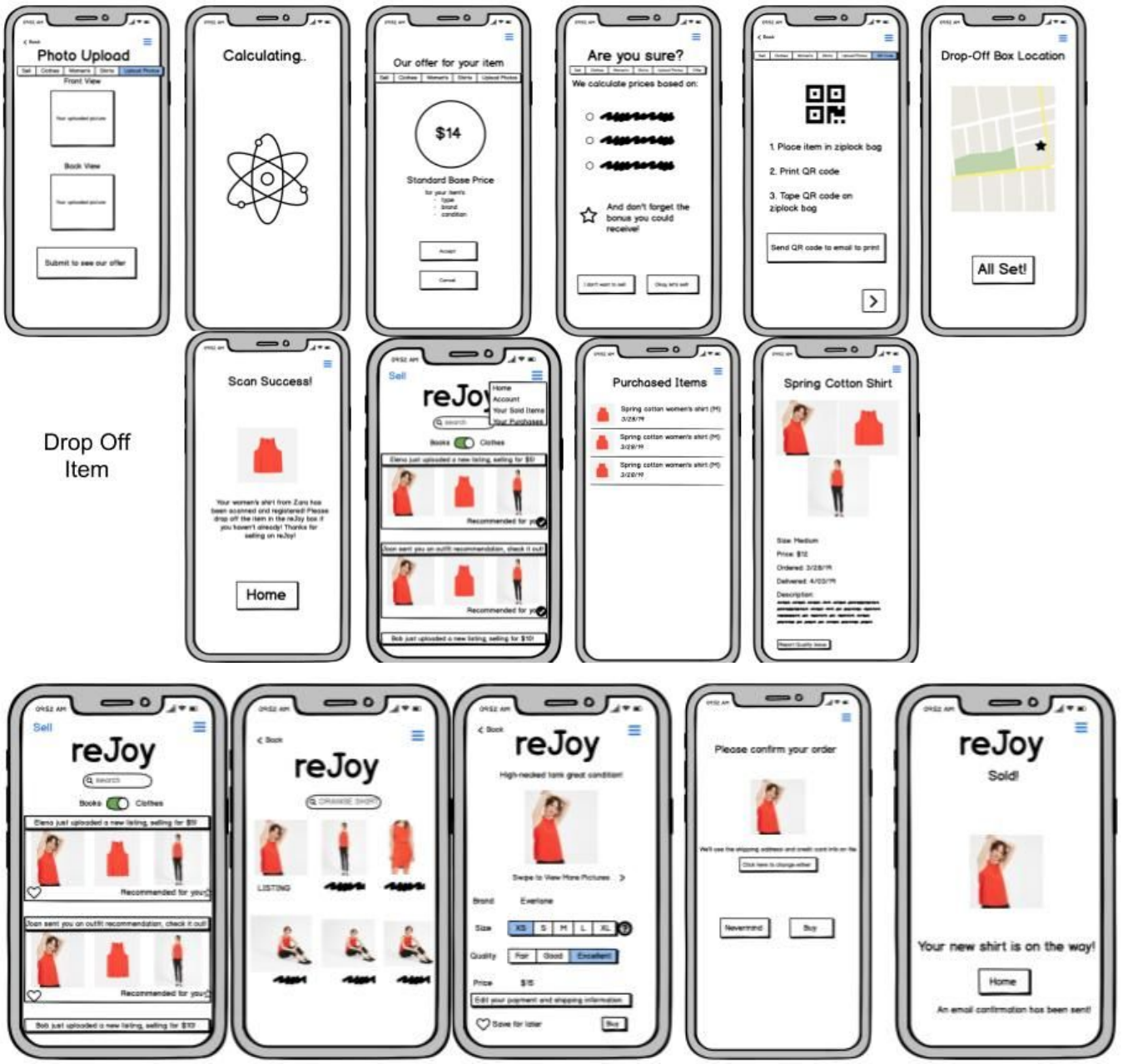
Usability Test #2 Revisions Overview:

We provided a way out of buying by incorporating a page confirming whether the user indeed wants to proceed with purchasing an item. We reduced the number of steps on the first-time selling overview page. On the sell item details page, we provided more information on what the three quality categories mean. We provided more clarity on what the offer price is based on. We also added an intro screen on the dropbox linking the QR code to initiation of the item deposit process.

Usability Test #3 Overview:

We changed the checkmarks in the newsfeed to stars as a result of the user wondering if the checkmarks meant to indicate that he had done something. We clarified the meaning of “good lighting” on the photo tips page by changing the wording to “bright lighting”. On the buying confirmation page, we provided the opportunity to change the shipping address and credit card information from what the user has on file. We also added hearts to item postings to enable a user to save a posting for later viewing.

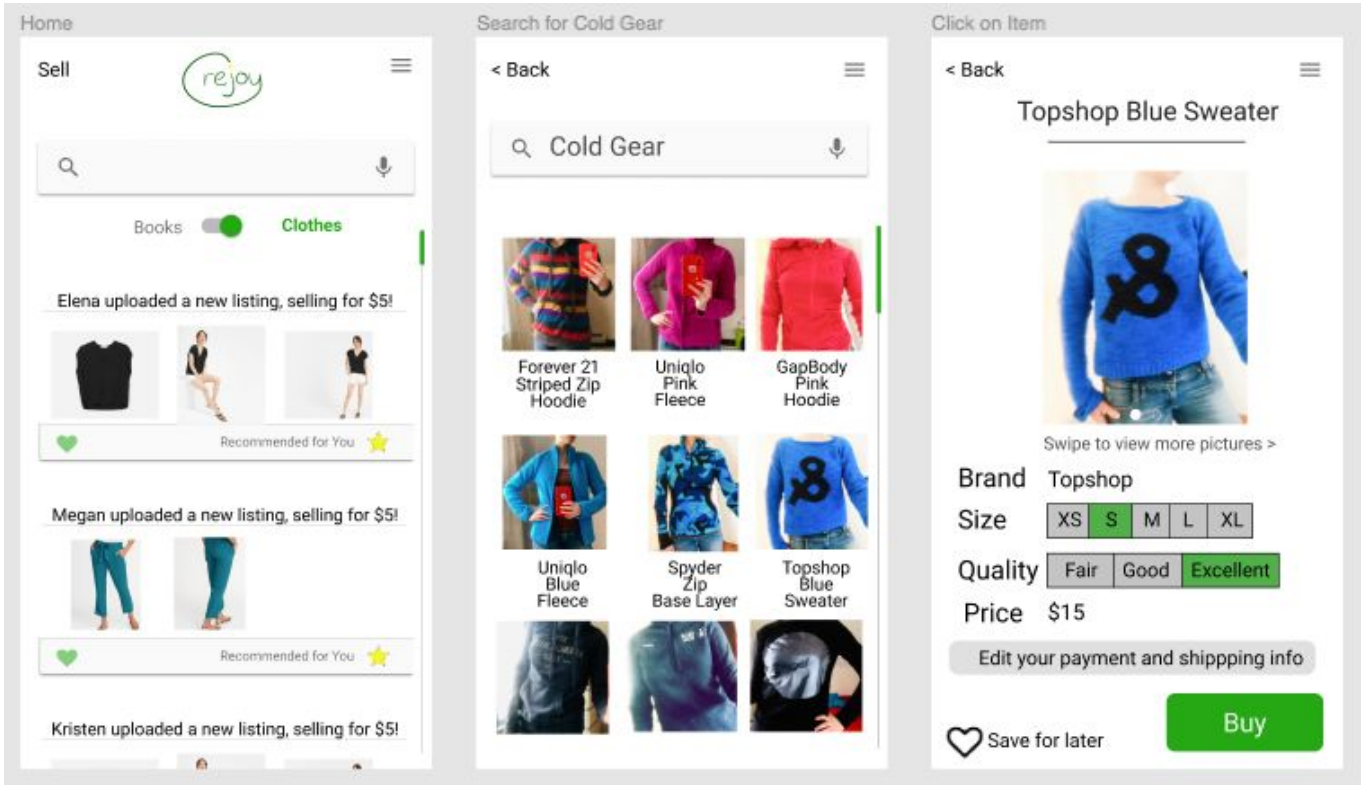
7. Final Paper Prototype

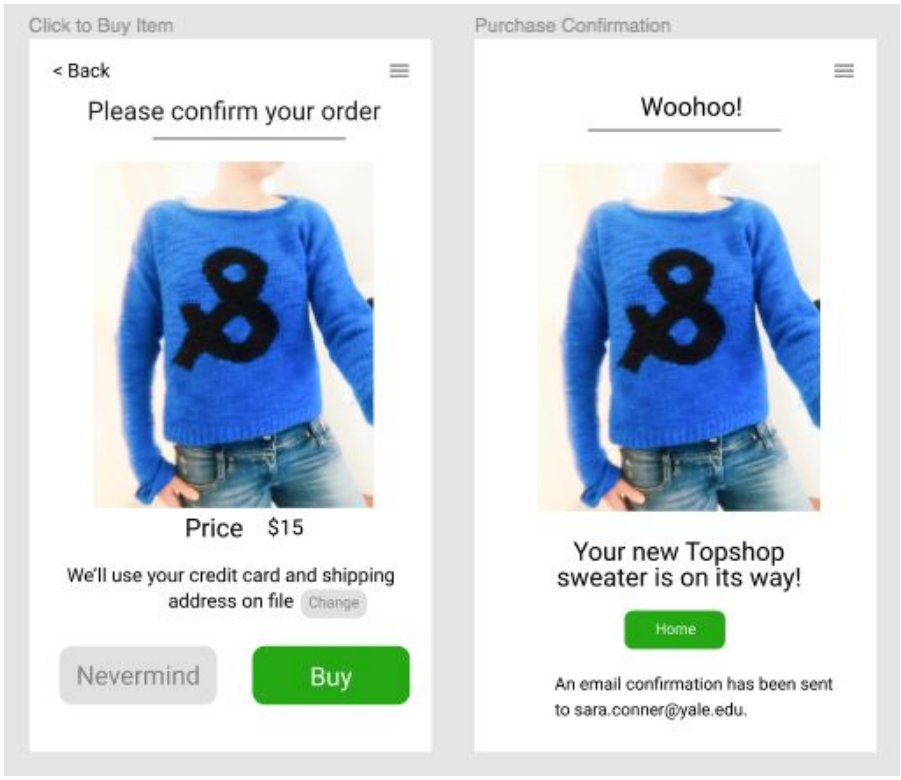


The two most critical aspects of the design included the social shopping feed, which shows friends' recent purchases and recommendations, and the reJoy box. There were no changes in terms of how the user accomplishes the two primary tasks from the initial paper prototype.

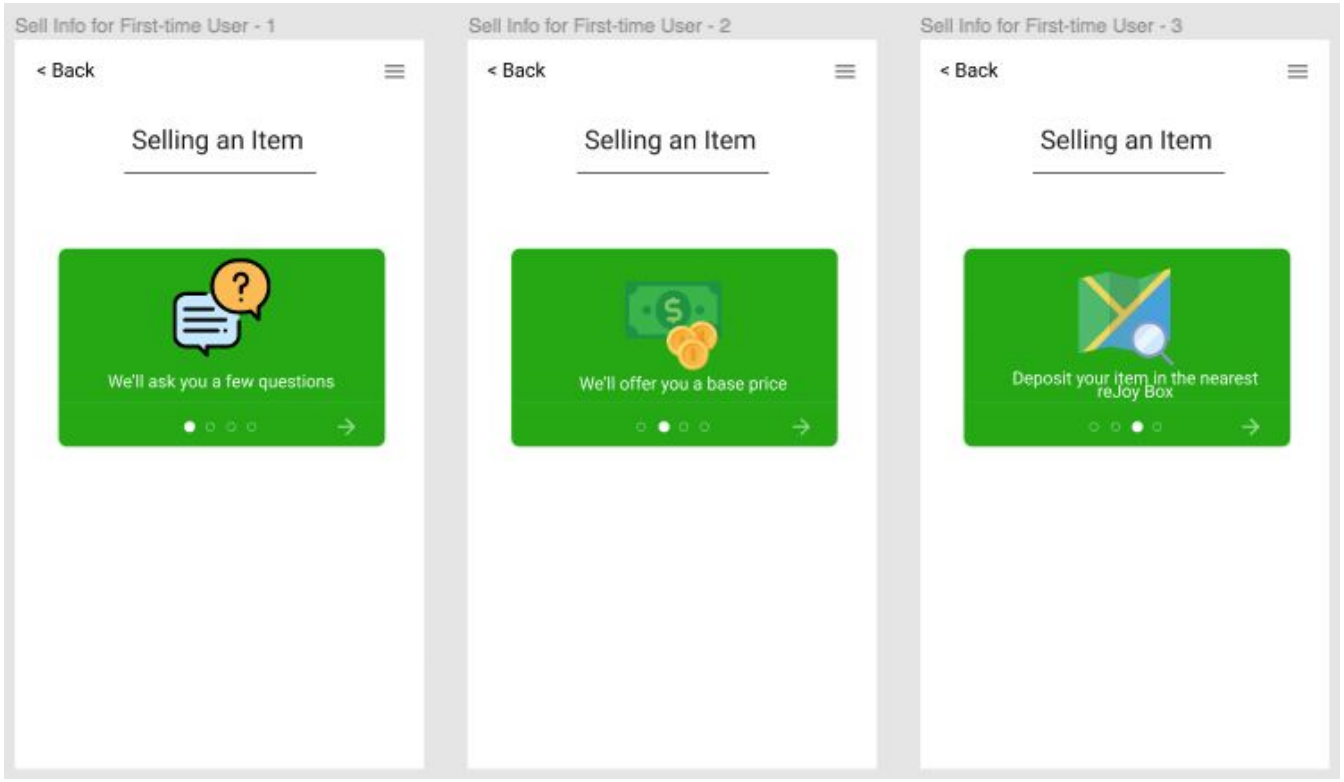
8. Design Mockup

Task #1: Item Discovery





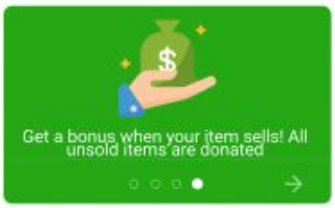
Task #2: Coordinating Item Transfer



Sell Info for First-time User - 4

< Back

Selling an Item



Let's get started!

Sell Books or Clothes

< Back

Selling an Item

Books

Clothes

Sell Clothes - Select Gender

< Back

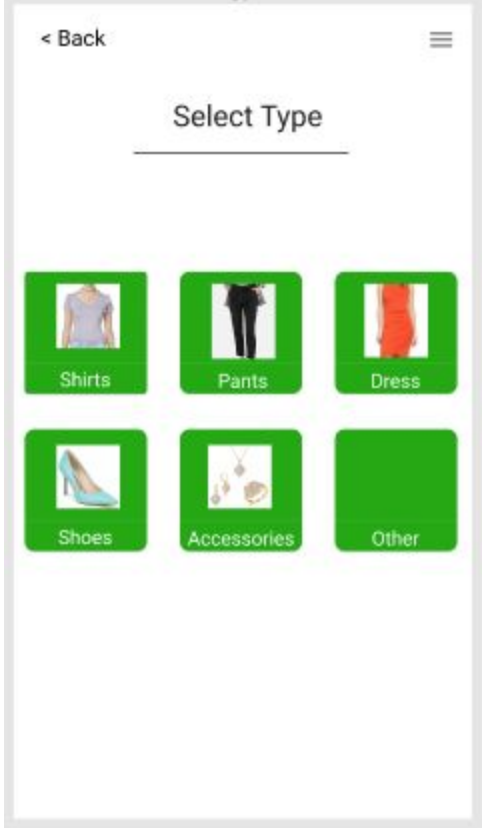
Choose Gender

Women

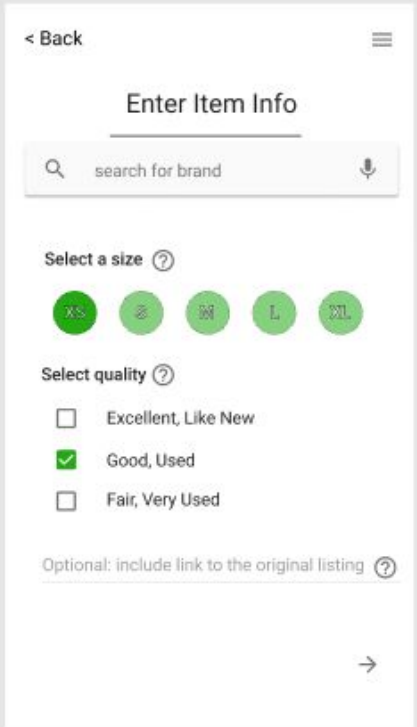
Men

Unisex

Sell Clothes - Select Type



Sell Clothes - Form



Upload Photos

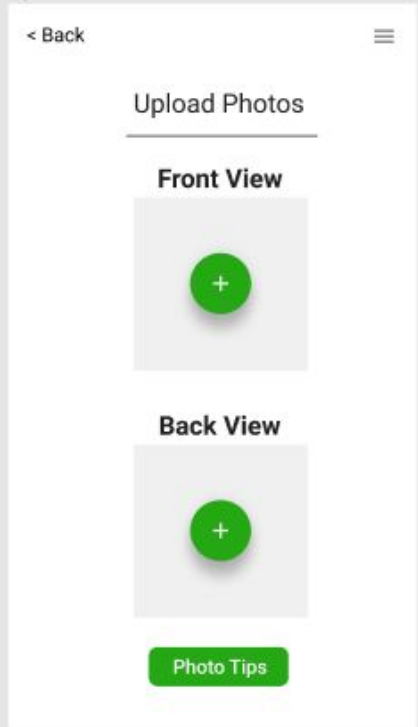
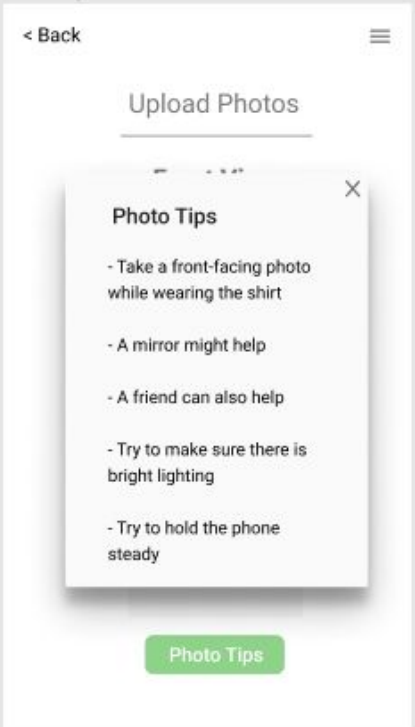


Photo Tips



Upload Front Photo

< Back

Upload Photos

Front View

Photo Library

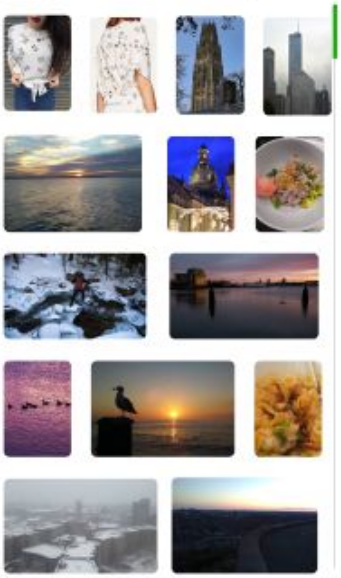
Open Camera

Photo Tips

Photo Library Upload

< Back

Photo Library



Front Photo Uploaded

< Back

Upload Photos

Front View

Back View

Photo Tips

Upload Back Photo

< Back

Upload Photos

Back View

Photo Library

Open Camera

Photo Tips

Photo Library Upload

< Back

Photo Library

Both Photos Uploaded

< Back

Upload Photos

Front View

Back View

Submit to see our offer

Calculating

< Back

Calculating...

Offer for Item

Our Offer for Your Item

$9.25
Base

+ $3.20 possible bonus upon sale to another reJoy member

Based on your item's:
- type
- brand
- condition

ACCEPT

CANCEL

Confirmation Screen If User Clicked Cancel

Are you sure?

We calculated the offer based on:

- Historical prices of that brand and clothing type weighted by recency

- The link you may have included in the details to look at how this article is priced in other markets.

Cancel

Sell!

Sell Code with Instructions

Item Code

43728

1. Place item in a bag (ziplock or plastic bags work).

2. Write that number clearly on a piece of paper and place it in the bag.

3. Seal bag securely.

Cancel

Sell!

Dropoff Location

Drop Off Box Location

500 College Street, New Haven

Type the previous code on the reJoy box interface and drop in the bag!

Home

Arrive at reJoy Box
r

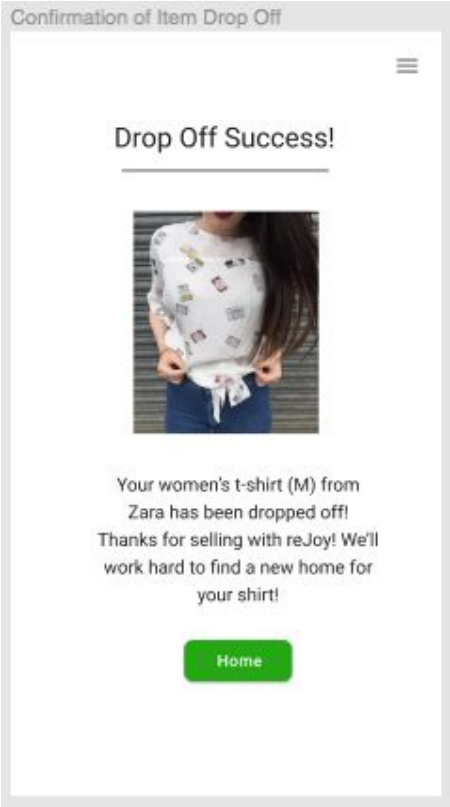
Welcome Screen

Type item code into keypad

System recognizes item associated with the code and invites item deposit.

Box displays confirmation that the item was deposited. Payment is sent to the user's account.

Mobile app screen upon successful drop off



Support for Two Primary Tasks

Task #1: Coordinating Item Transfer

For coordinating item transfer, the user follows the same process as with the final prototype except for the reJoy box. We eliminated the QR code scanning system and replaced it with a keypad with which the user inputs the item code received during the item selling process in the app. This change eliminates the need to print and tape a QR code legibly onto the item, thereby streamlining the process. We also learned during usability testing that QR codes can sometimes be used mindlessly out in the real-world and thus would potentially require a bit of a learning curve if our system relied on them. We added a higher-fidelity screen to our prototype and also elevated the system using another large box.

Task #2: Item Discovery

Previously, our prototype only had a newsfeed showing items that the app believes the user may be interested in. There was also a search bar for specific items. Although this process did not change, our second user test suggested that we should demonstrate the search capabilities. She was concerned about discovering a specific item if it was not highly ranked on the home feed.Thus, we added a screen to our prototype to demonstrate our search feature.

Key Changes for Higher-Fidelity Design

For the higher fidelity prototype, we created a consistent design language for this new iteration. We used a green color scheme throughout our prototype because it recalls the environmental consciousness we want to inspire in our product. We broke down our getting started guide from one page to several pages with graphics to make the information more digestible. We also created a logo for the application, which is below.

On feedback from the instructor, we standardized primary font size throughout the app to be size 16. We added more screens to the upload photos process to smooth the transition from one page to the next. We also clarified that the “+$3.20” on the “Our Offer for Your Item” screen is the possible bonus the user would receive if reJoy manages to sell the item to another user.

9. Discussion

From the process of iterative design, we learned that the diversity of thought gained from exposing our mockups to multiple people helps us identify issues that we could not see ourselves. One example of this is the theme of needing more initial guidance on using the application. Since we designed the application ourselves, we were already familiar with how things are expected to work. The usability tests surfaced such baked-in assumptions. We also learned that minimizing the number of steps or taking streamlining to the max can actually have a detrimental effect. This was evident in our buyer flow when the buyer felt unsettled by the fact that the transaction took place too quickly. The user preferred to have a confirmation page to verify information before proceeding with the purchase. After the first iteration, we added a line to tell the user that an email receipt has been sent. But as we continued with our tests, we realized that we needed to add more pages so that the user can verify the information regarding their purchase. In addition, we learned how important system status updates are for the user. Users noted that after they dropped their item into the box, they wanted a confirmation that the action was registered.

From our test results, we decided to make two key changes to the flow of the coordinating item transfer task. The first is we replaced the QR code component of the selling process. The QR code requires the user to access a printer, have scissors, and have strong tape. Users during testing lumbered through the process of cutting and taping the code onto the bag containing their item. Due to this friction, we opted to use a code instead that the user inputs directly onto a keypad (ATM-style) on the reJoy box. The second change is that we added steps to our buyer flow to confirm details of the intended purchase such that the user feels more at ease in terms of knowing that all the details are correct.

More iterations of testing would help because in the past tests, we had users click the ‘print’ button during the selling process and handed them a sheet of paper with the QR code representing the sheet they printed. Then we handed them scissors and tape for taping the QR code onto the bag. We realized that we should have designed our experiment in such a way that the user has to actually do these things himself including actually going to the printer, printing it out, finding scissors, etc. We realized during our post-usability test conversations with one of our users that that process may actually be the biggest obstacle in the use flow. In fact, we could even have taken it a step further by having users walk to an actual location to drop off their item in a reJoy box. That way we could get data on, for example, what locations are considered too far to be convenient, how visible and easy to spot the box is, and how dropoff integrates into a university student user’s day.

10. Appendix

We had two main tasks for the users: 1. Sell a t-shirt through our platform and 2. Buy an item through our platform.

For the seller flow task, since the test users generally did not have anything on the spot that they would like to sell, we handed them a t-shirt and told them that they would like to sell that item. For the buyer

flow, since our mockup feed was not scrollable and did not actually have a long list of items, we told our test user that he was interested in a specific item present on our feed.

Since we felt the account creation pages of our application would be quite standard, we did not make mockups for account creation or adding payment info. During usability testing, we had to inform our test users that they had already made an account and inputted payment information, as well as their default shipping address.

To depict messages communicated by our low-fidelity reJoy box, we used post-it notes that we swapped in as our test users interacted with the box.