

Final Report

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Project URL: <https://swap-pal.firebaseioapp.com>
GitHub URL: <https://github.com/Nikhila259/SwapPal>

Problem:

Currently, there is no application that allows members of Northeastern University community that allows the members to swap items within the community. There exists a Facebook Group (Northeastern Marketplace), that deals with selling and buying items. But, so far, there isn't a system in place to swap items apart from external websites or attending meet-ups. Some of the sites and meet-ups that support swapping are: Boston Craigslist, Swap Madness, and Revere Swap N Shop.

Though there are existing systems in place, our system will address the following issues:

- **Trust**
Since the target users are members of our university, it facilitates trust as it is a small knit community. Also the swaps can take place on-campus as the members are familiar with the location. Furthermore, it is futile to post fake items as the swaps and purchases are done in person.
- **In the case of meet-ups, the user does not have prior knowledge of all the items available.**
Before deciding on swapping an item, the user can browse through all the available items on the web app based on his/her needs. In the case of swap, the user is aware of what item to bring in order to make a deal.
- **The past behavior and identity of the users is unknown in Facebook groups.**
In our web app, each user is given a profile which contains a trust score that is based on the ratings given by other users on the basis of past transactions.
- **Old posts are not taken down**
In our web app, once the swapping transaction is finished by users, our system will take down the post from search list, then mark the posts as history for users.

Users

For Swap Pal, we have identified the following stakeholders who will be invested in our system:

1. Primary Stakeholders:
 - Northeastern .edu account holder who wants to obtain an item.
 - Northeastern .edu account holder who has an item to swap.
2. Secondary Stakeholders:
 - Northeastern .edu account holder who is related to one of the Primary Stakeholders.
 - Individual who is not associated with Northeastern but is related to one of the Primary Stakeholders.
3. Tertiary Stakeholders:
 - Northeastern University
 - Northeastern Marketplace
 - Free and for sale
 - Swap Madness

Tasks

Scenario 1 - Creating a Post

You are Anna. You need an airbed and you are willing to swap your blender for the airbed. Your task is to use a new website “Swap Pal” to achieve this goal.

Scenario 2 – Searching & Contact

You are Ed. You urgently need a blender. You have an airbed. Your task is to obtain a blender using a new website, ‘Swap Pal’ to achieve this goal, without creating a post

Scenario 3 – Finish transaction and review

You're Anna. You are happy with the airbed you got, now take down your post

Design

Swap Pal lets you get what you want for what you already have. The final design of our Swap Pal application has a landing page which gives information what the application is about, the users and also how the whole process of swap works.

Landing page

In order to help our users to have a better onboarding experience, we implemented a landing page with a brief description about our website and an instruction in steps to show how it works.



Swap Pal

Swap with trust

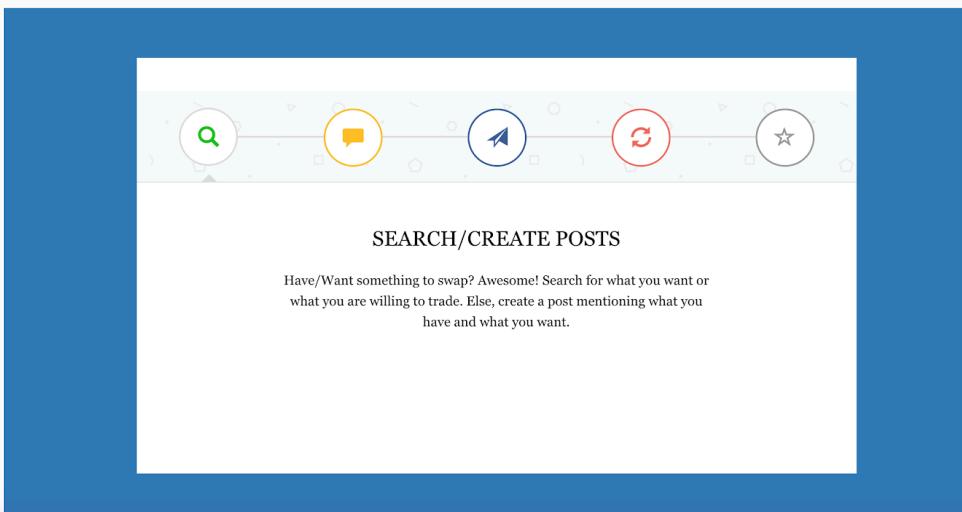
Swap Pal is an online platform that enables members of the Northeastern Community to swap their unwanted/unused stuff for something they need.

Ready to find your Swap Pal?

[Start Swapping!](#)

How It Works

How It Works



Post Listing Page

The post listing page has a search bar which lets the user search for what they want or search for what they have (other's wishlist). The page displays a list of posts created by any registered user of Swap Pal. The results are filtered based on the search text entered by the users. Each post on the post listing page has a title which is a link to the post details page, the post author information and also his/her ratings based on their previous transactions and also lists out the authors wishlist.

The screenshot shows a search results page for 'Swap Pal'. At the top, there's a search bar with placeholder text 'What you want?'. Below it, a dropdown menu says 'What you want?' and 'Others wish-list'. The main area displays six items:

- Google Pixel**: Julian rated it 5 stars. Wishlist items: desktop, kindle.
- Air Jordon 1**: James rated it 5 stars. Wishlist item: blender.
- 50 year's desk**: Elsa rated it 4 stars. Wishlist item: airbed.
- Blender for Swap**: Anna rated it 5 stars. Wishlist items: iphone, airbed.
- Iphone 5**: Anna rated it 5 stars. Wishlist item: bag.
- Awesome Matress**: Edward rated it 5 stars.

When there are no results found for any of the request an appropriate message is displayed to the user that there are 'No results found! Why not create your own post' as shown below. Giving a hint to the user that he/she could create their own post and wait for people to respond.

The screenshot shows a search results page for 'Swap Pal'. The search bar contains the word 'blanket'. The main message is 'No Results Found.' followed by a link 'Why not [create your own post?](#)'.

Create Post Page

The user can create a post by clicking on the create post link on the header of any page or also follow the link *create your own post?* as shown in the above picture. The user is redirected to the create post page where the user has to fill in a form. The fields are what do you have?, description, add images by clicking on the plus sign, the users can specify the location of the swap with the switch. The user is given an option to either import the wishlist from the profile or add new items into the wishlist for the particular post. On clicking on the create post button the user is redirected to his/her profile where they could see the new post under the your posts tab. The post is also added to post list page.

Swap Pal

What you want? Search for...

Upload pictures

blender2.png added
blender1.png

What do you have?

blender

Description

blah blah blah

Would you like to swap on-campus?

Import wishlist from your profile

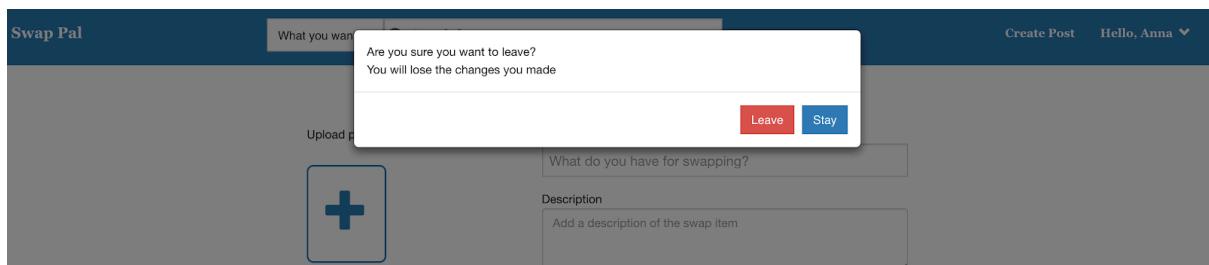
Chair Table Lamp

Enter item name ×

Add More

Post

If the user at any point while creating a post accidentally clicks on any other button or link he/she is alerted with a popup to let them know that they might lose the data they filled in if they leave the page as shown below.



Profile Page

Each user has a profile page where he/she can view the posts they posted, the posts that are in the transactions and the history of transactions. Each user also has a wishlist, which they can modify (add or remove) any time. The user ratings with the number of reviews given is also displayed on the profile page.

In the your posts tab, the user can see a list of posts he/she have posted with also an option to edit or delete any post. The user can start any transaction by entering the other swappers email and sending him an invitation by clicking on the Send Invitation button. This would connect the two users and the post is moved to the in transaction tab.

Welcome Back!
Anna
★ ★ ★ ★ ★ (1)

Your Post In Transaction History Wish List

Blender for Swap Edit Delete
Enter Yours Swapper's Email to Start Transaction Send Invitation

iPhone 5 Edit Delete
Enter Yours Swapper's Email to Start Transaction Send Invitation

Each post in the in-transaction tab has a complete button and a cancel button. The user can cancel the deal anytime by clicking on the cancel button corresponding to the post, this would remove the post from the in-transaction tab and add the post to the your posts tab making it open to deals. The complete button indicates that the swap is complete and the user is given a review popup window to rate his/her experience swapping with the other user.

Welcome Back!
Anna
★ ★ ★ ★ ★ (1)

Your Post In Transaction History Wish List

EarPhone Swapper: Jerry Cancel Complete

Review

How was your experience with Edward?

★ ★ ★ ★ ★

Leave Comment

Cancel Submit

Once the transaction is complete the post is moved to the history tab with the swapper details and the date the swap displayed corresponding to each post.

Swap Pal

What you want? Search for...

Create Post Hello, Anna ▾



Welcome Back!
Anna


Your Post In Transaction History Wish List

HCI book	Swapper: Jack	10-16-2018
Head phone	Swapper: Bobby	9-24-2018

The Post Details page

The post details page contains images, description about the item, the contact details of the owner as well as his/her wishlist. The users can also report the post in case of non-equivalent values for example, if the post owner needs an macbook for an old wooden chair or if the post is fake. The user reporting a post has to enter the reason for reporting on the report popup window.

Swap Pal

What you want? Search for...

Create Post Hello, Anna ▾

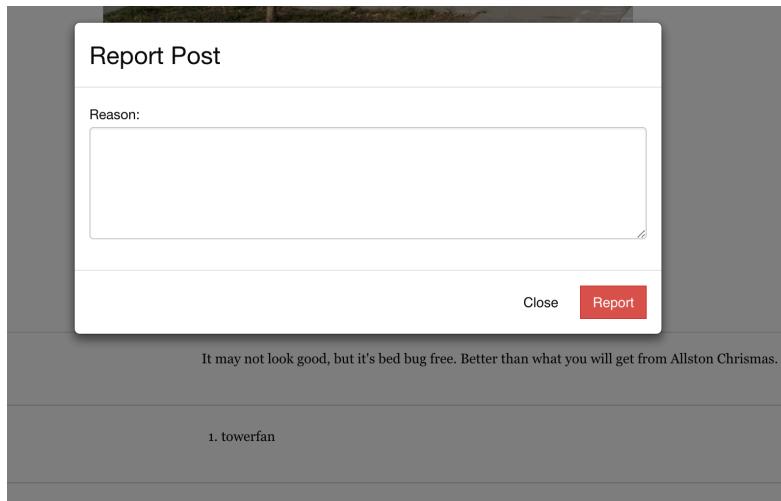
Awesome Mattress
Edward: 




Description	It may not look good, but it's bed bug free. Better than what you will get from Allston Chrismas.
Wishlist	1. towerfan
Contact Info	ed@husky.neu.edu

Remember! An Invitation Code connects you with Anna to ensure a smooth transaction. Ask for the Invitation Code before doing any transaction.

Report this Post



Login Page

The login page is a simple form with only two fields: the husky email ID and the password. If the user hasn't registered with Swap Pal before, they can register by clicking on the *Not a user?* link, which would redirect them to the register page.

Username

Password

[Forgot Password?](#)

[Login](#) [Not a User?](#)

If the user does not remember the password, they could click on the forgot password link on the login page, which would display a popup window asking them for the email address to which a reset password email would be sent.

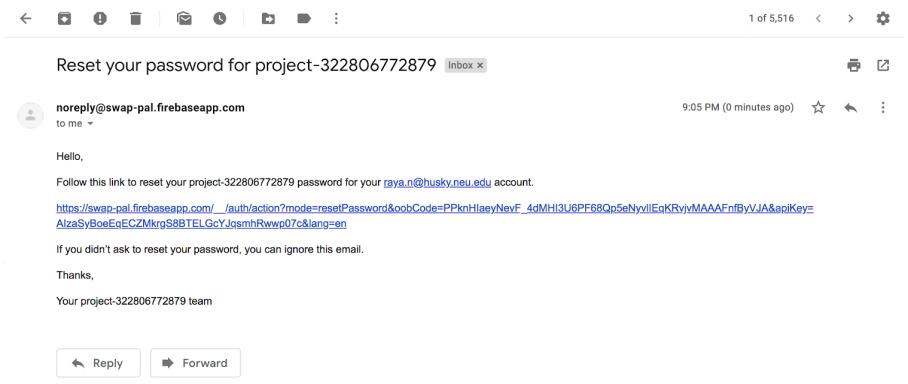
Password Reset

Email

Usern
Enter

Please enter your husky email!

Close Send Email



Register Page

The user can register by entering the username, husky email address, password and re-enter password for verification. Each field has validations to give the user information while filling the register form.

The paper prototype is a registration form with the following fields and validation messages:

- First Name:** "Enter your first name"
- Username:** "Husky Email" (Validation: "Please enter your husky email")
- Password:** "Enter your password" (Validation: "Please enter a valid password of atleast 6 characters!")
- Re-enter Password:** "Re-enter your password" (Validation: "Please re-enter your password!")

At the bottom is a blue "Register" button.

Paper Prototype Evaluation

The major issues we found during our paper prototype evaluation were:

- There was confusion with the search functionality, the users were confused what to search for. They were confused if they had to search for what they need or what they have to offer?
- One of the users, clicked on complete transaction button right after clicking on the send invitation button.
- Users wanted to edit a post after posting it
- One of the users pointed out to adding another option on create post page which lets the user add information if he/she wants to swap on-campus or off-campus.
- Users weren't clear about the wishlist

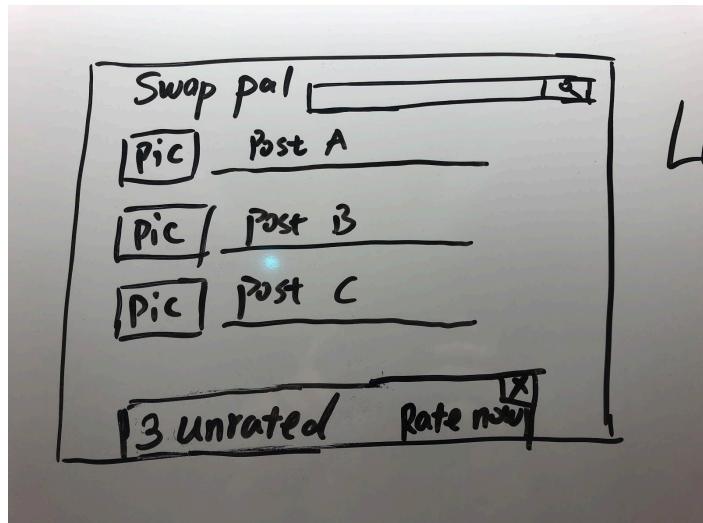
Design decisions taken after paper prototype evaluation

- To improve the understanding of the search functionality, we have added a dropdown next to the search bar giving options for the user to search by what they have and search in other's wishlist. This would make it easier for the users to characterize their search.

- In order to prevent a user from clicking on the complete transaction button right after the send invitation button, the post should be moved to the transactions tab with a cancel and complete buttons.
- Each post in the user profile page under the posts tab will have an edit button corresponding to the post to let the users edit their post.
- Add a switch on the create post page with options swap on-campus and swap off-campus to let the users give information about where they would like the transaction to happen.

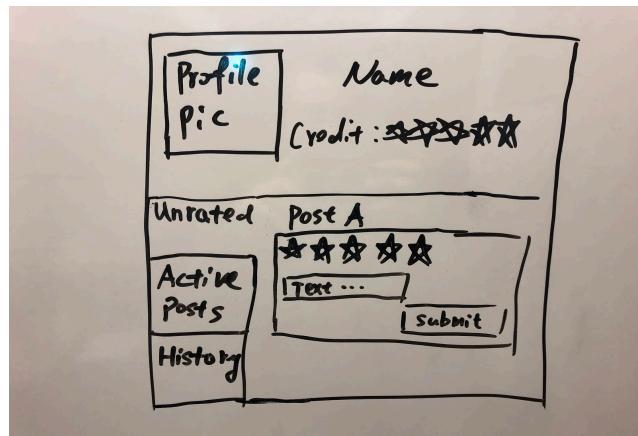
Design alternatives for review window

Design 1



This was our first approach. We thought to make a small rating banner at the bottom of the screen with an option to close the banner. The rating banner would also display the number of unrated posts. Once user logs in the website, the rating banner would pop up from the bottom, user could click on the banner, then a pop-up appears, looking similar to Design 3 but it has a close button to dismiss the pop-up. The different part from Design 3 is this banner would not block any user's operation on the platform, user can even close the banner any time by clicking the cross button.

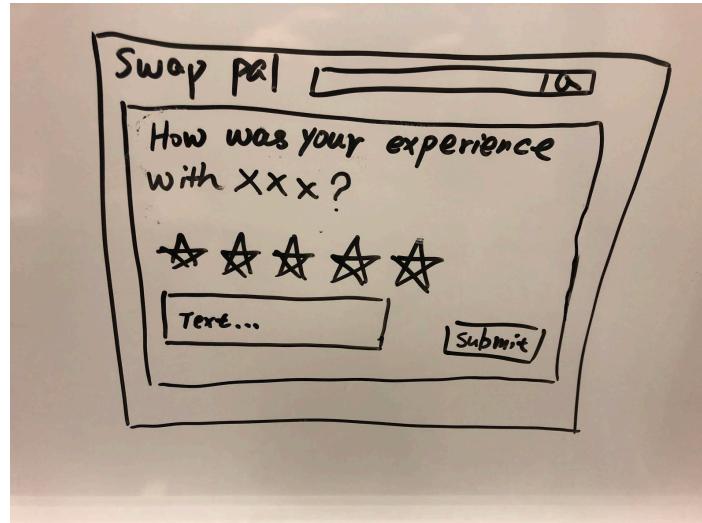
Design 2



This was our second approach. We thought of placing the rating process in the User Profile page. In order to rate their transaction, the user would have to first go to their

Profile page, click on Unrated tab. There, they will be presented with a list of unrated posts, which they can choose to rate or not.

Design 3



This was our final approach and we chose this as the best design for our system. When the user logs into their account and if there is some unrated post that is related to the user's transaction, they are prompted to rate their swap experience. This pop-up will block the contents of the Swap Pal web page and force the users to rate their experience before letting them use our system. This is done in order to build a trust system within Swap Pal. We believe that if we give an option for the users to not rate, then many users will just not rate and we will not be able to effectively build a trust system.

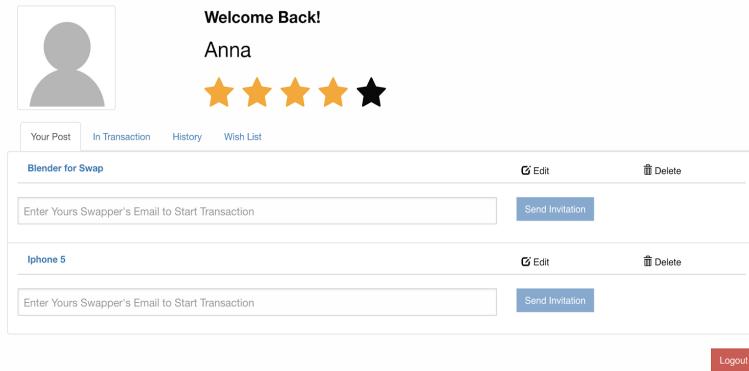
Heuristic Evaluation

The major issues we found after the heuristic evaluation were:

- The logout button was missing
- The users weren't given feedback on click of the *cancel* button in the profile page while cancelling the transaction, the *add more* link under the wishlist tab wasn't implemented, post details page was static and did not show the corresponding post details.
- One suggestion was 'Adding the fields for the name of the user might help as husky email Id's usually don't give you the name of the person'.
- The contact button on the event details page was just going to be turning into an email then why not just have it directly under the item description instead.
- Appropriate validations weren't displayed when the user was registering and also creating a post.

Design decisions taken after heuristic evaluation

- We had the logout button on the profile page only as shown below. There were issues that the users could not find the logout button.



We have added the logout on the header which is available on all pages to give users freedom and control.



- We have added feedback to every user action such as clicking on the add more link shows a textbox to let the user enter wishlist items, clicking on the cancel button of a post removes the post from the in-transaction tab. We have also removed static pages for post details page and generate dynamic post details page for every post.
- We are now required the user to input his/her name when registering for the first time.
- The initial design was a dropdown for selecting if the user would like to swap on-campus or off-campus
- We now show the email ID directly without hiding it behind a button.
- We have added all the required validations on the create post page, register page and login page.

The login form requires a 'Username' (email) and 'Password'. Both fields have red validation messages: 'Please enter your husky email' for the username and 'Please enter your password' for the password. Below the form are 'Forgot Password?' and 'Not a User?' links, and a blue 'Login' button.

User Testing

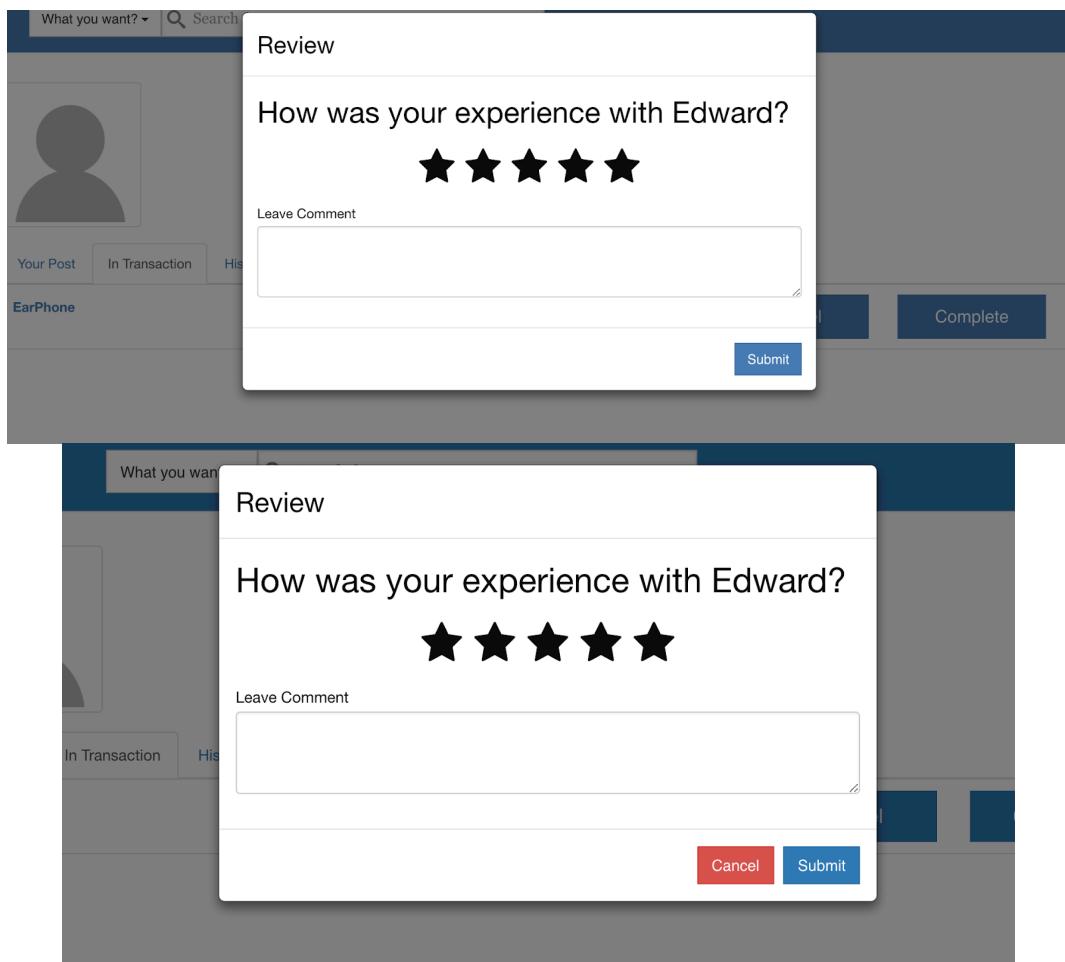
The major issue we found for user testing were

- Review window can not be closed or skipped without submitting it
- The logic of sending invitation is confusing
- Tester prefers to see other user's past review rather than just star rate
- When user was trying to add picture at "Create Post" page, user can upload files other than image

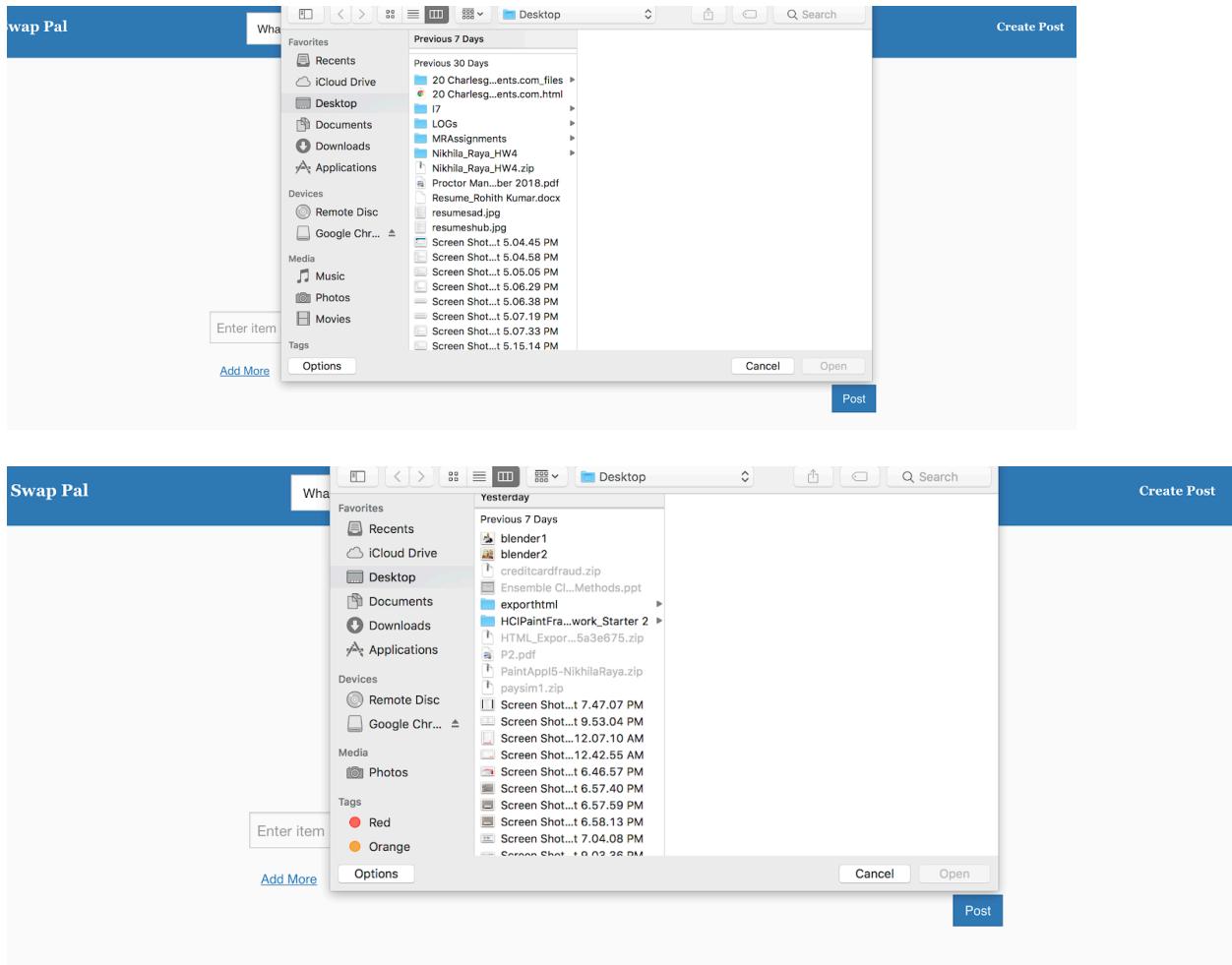
- After user creating a post, user's email did not show on the detailed page
- Users tend to ignore "report" unequal valued posts, mainly because they don't care the match
- No user check "on-campus" button when creating post

Design decisions taken after User Testing

- After user testing, we received complaints about the review window can not be closed or skipped without submitting it. So we finally decide to add a cancel button on the review window to give the user full freedom to decide whether submitting the review or not, instead of forcing the user to take the review question. We realized that forcing users to do something and not providing them with other options may not be the best way to build trust. The following is our final design for review window.



- We will try to implement in-app communication in the future, so that users can start transaction once they finished negotiation. It's also easy to prevent user jumping between pages, and allow system to bind the relationship between users and posts.
- We will add functionality to lookup user's past review in the future.
- We made changes in the code so that user can only upload image.



- We made code changes to fix the "email disappeared" bug

Contact Info

Remember! An Invitation Code connects you with Anna to ensure a smooth transaction. Ask for the Invitation Code before doing any transaction.

Contact Info

anna@husky.neu.edu

Remember! An Invitation Code connects you with Anna to ensure a smooth transaction. Ask for the Invitation Code before doing any transaction.

- We will keep the button for "report" on detail page, and "on-campus" on create post page, so that user may need to these functionalities in the future.

Implementation

- Swap Pal is a web based application, we used Angular and Bootstrap for front-end and Firebase for back-end. The user registration is tied to the back-end database, and the rest of the workflow are happening on front-end, since the

purpose of this project is mainly focusing on User Interface and User Experience design.

- The major reason we choose to implement a web app is based on our technical background. All team members took Web Development course before, so everyone can contribute to the project.
- The other important reason is web app doesn't have any device limitation or require any extra installation for others to evaluate and test our project, which also simplify the user testing process. For example, if we implement an IOS app then only user with an IOS devices can run and test our project.
- Github is used for version control, and we have code review process involved.
- Slack is used for team communication.
- The first version of prototype was implemented as static pages, so TAs and other students encountered some difficulties when trying to complete the three user testing tasks we gave to them due to the lack of data updates and feedback from our system. In order to maximize the user experience, we spent large amount of time to change all pages to dynamic in the later version.
- For our sample data and images, we intentionally using images of second hand goods to simulate real life situation. We used firebase storage to store images when any user creates a post.
- No in-app communication tool is implemented, since this project is mainly focusing on User Interface and User Experience design, so we spent more time designing the search and swap function.

Evaluation

Learnings from User Testing:

Our evaluation is a combination of Formative User Testing and Qualitative Evaluation. We recruited 7 users to perform user testing of our system. We provided the same briefing and tasks that was in our paper prototype. Before letting the users test our system, we showed them our landing page and asked them to take a minute to go through the *How It Works* section so that they have an idea on how to use our system. Most of our interviews were informal and some were held remotely.

For Formative User Testing, based on the usability metrics that we measured, we found out the following:

- All the users were able to complete their tasks.
- The users took an average of 5-6 minutes to complete their tasks.
- Most users got stuck while trying to complete the third task, which required them to send an invitation code. Many could not locate this immediately and were confused about the purpose of this.
- On an average, users took a minute to find the invitation code.
- The users were quite happy with their swaps. They did raise some points that they were concerned about while swapping (like fake items, price mismatch, etc.). But overall, our system helped them connect to other students to swap and they found it to be a less nerve-racking experience to meet other students rather than complete outsiders.

For Qualitative Evaluation, we gave the users a free reign to use the system however they want, provided that they want to make a swap or are thinking about it. We decided to go freestyle here because we wanted to see how exactly is our system used in real world. We observed that the users, more or less, followed the expected path. Some of the interesting observations that we came across were:

- Users did not report posts of unequal values. Except for two, others just chose to ignore such posts.
- None of the users cared about the on campus swap option.
- We were pretty sure that the users would be comfortable swapping within the college community. When we asked the users, many actually were comfortable to swapping because everyone belonged to the same university. Some were of the opinion that they might even be their classmates. This put them in a comfort zone.
- We were concerned about the privacy issues of displaying the email ID directly on the post details page. But, none of the users cared about that. When asked about this, they were surprised that this was even an issue as they are used to getting anyone's name or email in Northeastern's husky account in gmail. So, it was not a concern for them.
- When people were stuck with finding invitation code, for some reason, they began to use the search bar in our page. We had to explain that the search bar was to search for posts.
- Some users wanted to see the post author's past review comments. We had to explain the downfalls of showing the reviews (As expected, no one wanted the post authors to know that they had bad-mouthed them in a previous review).

Usability Problems and Solutions:

In our evaluation, we found that some of our users were getting stuck with sending an Invitation Code. Though we have explained what it is in landing page and in the post details page, the main idea behind it seems to be difficult to comprehend. We realized this shortcoming towards the end of our user testing and couldn't fix it in our final design. The best way to overcome this is to create an in-app communication system so that the system knows which users are communicating. Within that communication system, we can ask the users to connect to each other if they want to swap after they talk to each other. This way, the users are connected within our system without the need for an Invitation Code.

Also, in our registration page, we did not provide any way for them to enter their wishlist, which is populated in the profile page. For now, we have provided the same wishlist on everyone's page.

Currently, there is no functionality to add a profile pic on the user's profile. In the future, we want to provide a button, under the image placeholder in the profile page, which will allow the users to upload the image.

During our user evaluation, the users brought to our attention that our review modal was not dynamic for the user who is not a post author. That user was still asked to rate the blender instead of whatever post that they were swapping for. If we had more time, we would make this modal dynamic.

Reflection

Iterative design process learnings:

- Designing user-centric computer interfaces.
We were unaware that there is so much more to designing a user interface than just making the UI look pretty. There were so many underlying concepts that went into designing the UIs. There was a whole design process to develop a good UI. We went through all this and we realized that our UI is still not perfect!
- Experimentation.
User Prototyping, Ethnography and User Testing gave us a lot of insights on how our system can be improved. It was fun and interesting to see how users interpret the software in their own way, which is usually different from the way we envisioned at first.
- Critiquing the UIs.
As computer science students, we are used to having difficult UIs to navigate. For example, command prompt/terminal. We didn't really pay attention to the shortcomings in the way information was presented to us as long as we could get the information. While going through the design process, we came to the realization that UI plays an important role in keeping the users invested in our system.
- Users are complicated.
Users are always right. Users are not always right. We encountered this contradiction in our project. During our paper prototyping, the users suggested having pop-ups in so many places. For example, provide a pop-up to import wishlist in Create Posts page. Now, these are the users who use pop-up blockers on their browsers, proving that they don't want to see pop-ups!
- Social Element is difficult to implement and test.
In our project, social element plays an important role when it comes to building trust. We had users who wanted to rate someone poorly or report someone's post just because they could. Granted, this was just a test scenario. But it is difficult to evaluate if a user's review is sincere or if they have genuinely come across a post that needs to be reported.

What would we have done differently?

- In-app communication
Our Invitation Code was a complete failure. Instead of implementing this, we should have implemented and prototyped an in-app communication system, which would have been much easier for the users to understand.
- Implement our search bar with the ability to search by categories.
We should have included categories that the posts belong to to make the search easier for the users. Now, the users have to be quite specific about what they want. For example, "Nike Sneakers" would not show up if the users search for "Shoes". Having a category would have helped. We should have prototyped this as well.