

Title

Swap Pal

Problem

Currently, there is no application that allows members of Northeastern University community to swap items within the community. There exists a Facebook Group (Northeastern Marketplace^[12]), 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 meetups. Some of the sites and meetups that support swapping are: Boston Craigslist^[7], Swap Madness^[6], and Revere Swap N Shop^[14].

Previous Work

We reviewed a paper called "Facebook in Venezuela: Understanding Solidarity Economies in Low-Trust Environments" [5]. In this paper, the researchers discussed about the principles for designing online bartering communities in low-trust environment, and a Facebook group is used as an example here. The researchers introduce suggestions like "Prominent Rule Placement", "Tools for Tracking Offenses", "Buyer/Seller Reviews" and "Real Name Policy" that try to solve overpriced goods, scams, and other forms of economic abuse in Venezuela.

The researchers recommend introducing "Buyer/Seller Reviews" such as Amazon^[1] or eBay^[2], which can enhance trade safety and increase the speed of trades. Though this as an efficient way to evaluate one's honesty, it still not a perfect solution. First, not all users prefer to write their review of their orders. Second, reviews on Amazon or eBay are only for sellers, for swapping, we would like to obtain the trust scores from both people. So, for our system, we are going to use mandatory two-way rating system like Uber^[3], where we request both users to rate each other after trading and the system will provide the trust score according to users' past transaction ratings.

The researchers mentioned that Facebook Groups provides very little information about the identity and past behaviors of the community members, and they believe that "Prominent Rule Placement" is needed to improve security. The administrators of the system need to set up clear rules to guide the users to behave appropriately. The visible placement of rules will alert the new users and reduce inappropriate behaviors between the existing users as well. For our system, there will be an alert window that pops up with user agreements when a user is trying to register. Users must complete reading the agreements to finish the registration process.

The researchers also suggest Real Name Policy as a solution to help with the security issue, but they don't talk about the implementation in details. However, we have a strict restriction on user registration for our system. We'll check the email address used for registration, and only example@husky.neu.edu or example@northeastern.edu will be accepted. This method ensures that the person who is registering for our system is a real person with a real name, so users will feel much more comfortable to trade with each other when using our application.

Furthermore, the researchers mention self-interest behaviors such as fake items, elevated prices would break solidarity values of groups, and a "Tools for Tracking Offenses" allowing administrators and moderators to track and sanction offensive behavior will solve this issue. However, authors don't provide how bad behaviors are documented and what sanctions would apply to user. In our web app, users can flag a post with fake information or extravagant price. After a certain number of flags, that post will be hidden, and the seller will be notified to reduce the price or update information to make their post visible again.

In order to understand the online bartering system, we visited a few websites such as, Swap Madness^[6], Boston Craigslist^[7], letgo^[8], thredUp^[9], OfferUp^[10], and freecycle^[11]. We also visited Facebook groups such as Northeastern Marketplace^[12], and Free & For Sale^[13]. In most of these websites, we observed that there were communication problems, regarding the value of the product and/or the transaction location. The websites also did not offer any moderation of fake posts, which enabled scammers to create multiple fake profiles and post fake items for sale/barter. The posts aren't marked as sold or expired, which makes it difficult for users to ascertain the validity of a post. These factors contributed to the trust issues within the members of these sites. As for our application, we do not only implement the functionality to combine swapping, buying, and selling, but also extend the design principles of online communities, and solve the potential problems listed above. The details for our approaches are discussed in the task section.

User Analysis

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^[12]
 - Free and for sale^[13]
 - Swap Madness^[6]

Personas

The following personas represent our primary and secondary stakeholders:

Anna Stewart

Anna is a 25-year-old graduate student, majoring in Environmental Science, at Northeastern University. Ever since High School, she has been a staunch eco-activist. As such, she is aiming to be consumption-conscious and reduce her ecological footprint. She has volunteered at many environmentally focused non-profit organizations. She is fond of the saying ‘Waste not, want not’, and tries to live by this. She uses the web every day, spending most of her time being active on environmental forums, reading articles regarding environmental science, doing her assignments, etc.

Edward Dunn

Edward (prefers to be called Ed) is 21-year-old undergraduate student, majoring in Computer Science, at Northeastern University. He is passionate about computers and aims to start up his own company after graduating from Northeastern. He loves to host coding/gaming marathons at home. He is a typical broke college student who looks for ways he can get things for second hand and cheap. He is an experienced computer user and spends every day on his laptop or smartphone, doing assignments, coding personal projects, learning new concepts, playing games, etc.

Elsa Stewart

Elsa is Anna’s elder sister. She is in her mid-30’s, working at a prestigious law firm in Manhattan, New York. She has never studied in Northeastern University. She is in Boston to visit her little sister. Elsa doesn’t share Anna’s passion for the environment but she is supportive Anna’s beliefs.

James Flynn

James is 22-year-old undergraduate student, majoring in Psychology, at Northeastern University. He is doing his co-op under a reputed psychologist. He is Ed’s best friend and knows him from his high school days. He is working in Boston and is Ed’s roommate as well. As he loves to observe people, he is tolerant of Ed hosting his marathons at home.

Task Analysis

Hierarchical Task Analysis (HTA) for posting

1. Open the web application
 - 1.1. Open the web browser on computer or mobile devices.
 - 1.2. Type the URL into the address bar and press enter.
2. Login
 - 2.1. Click the Login button on the top right corner.
 - 2.2. Enter username and password, click login.

3. Post
 - 3.1. Click the “Post” tag to be brought to posting page.
 - 3.2. Enter title for the post.
 - 3.3. Upload image(s).
 - 3.4. Enter descriptions for item.
 - 3.5. Enter wish list for swapping.
 - 3.6. Click submit.

Hierarchical Task Analysis (HTA) for Searching

1. Open the web application
 - 1.1. Open the web browser on computer or mobile devices.
 - 1.2. Type the URL into the address bar and press Enter.
2. Search desired item
 - 2.1. Type keyword in search bar
 - 2.2. Click "Search" button
3. Browse item
 - 3.1. Go through items on search result list
 - 3.2. Click name or image of an item
 - 3.3. Browse item details, such as, images, description, price, etc.
 - 3.4. Browse user details (If user needs information of post author)
 - 3.4.1. Click post author’s avatar or name
 - 3.4.2. Login (If user did not log in, a login window appears)
 - 3.4.2.1. Enter username and user password
 - 3.4.2.2. Click login
 - 3.4.3. Browse user information, such as, user history, user rating score, etc.
 - 3.5. If user doesn't like the item or provider, go back to Step 3.1 or Step 2
 - 3.6. If user is curious of the item, click "Contact Post Author" and go to the Communication Task

Hierarchical Task Analysis (HTA) for Communication

1. Post responder starts conversation
 - 1.1. Click "Contact Post Author", then post responder will get post author's email address.
 - 1.2. Write email to post author.
2. Post responder and post author negotiate (offline contact via email)
 - 2.1. Poster author receives emails from post responder.
 - 2.2. Post responder and post author negotiate swap items and price differences.

3. Post author sends an invitation.
 - 3.1. Go to the item details page.
 - 3.2. Input post responder's email address in the textbox next to the "Send Invitation" button.
 - 3.3. Click "Send Invitation".
4. Post responder accepts the invitation.
 - 4.1. Open the invitation email. If interested, go to step 4.1.1. Else, go to step 4.1.2
 - 4.1.1. Click the URL within the email, and the invitation has been accepted.
 - 4.1.2. Ignore it.

Hierarchical Task Analysis (HTA) for reviewing.

1. Open the web application
 - 1.1. Open the web browser on computer or mobile devices.
 - 1.2. Type the URL into the address bar and press enter.
2. Login
 - 2.1. Click the Login button on the top right corner.
 - 2.2. Enter username and password, click login.
3. Review
 - 3.1. After the post author marks the post as sold, a review window should pop up.
 - 3.2. If the post is marked as "In progress" and has expired, then at the time of login, both the post author and post responder are prompted to review by the review pop-up window. (A review window only pops up when there are any unreviewed transactions)
 - 3.3. Rating
 - 3.3.1. Click stars to rate the other user. (1-5 stars)
 - 3.3.2. Click "No, thanks". (Our system will automatically give the other user 5 stars, and the transaction is marked as reviewed)

Problem Scenario Analysis

Anna's sister, Elsa, has come to Boston to visit her. Anna realizes that she does not have a spare mattress for Elsa. Since Elsa is planning to visit Anna now and then throughout the year, Since the room that Anna stays in is quite small, she thinks of buying an airbed that Elsa could use when she comes over. This way, when Elsa goes back to NY, she can fold up and store the airbed, freeing up the space in her room. But, Anna being consumption-conscious, decides that she will check out Swap Pal, instead of buying a new airbed. On Swap Pal, she cannot find anyone offering an airbed. So, she decides to post a request to swap as she has a blender that she hardly uses, so, she decides to swap the blender for an airbed.

Ed is hosting a coding marathon at his house. There are about 5 – 6 people coming over. But, to his dismay, he finds that his blender is not working anymore. He checks the prices of blenders online and sees that it is either expensive or will be delivered after the coding marathon. He decides to check out Swap Pal. He keys in Blender in the search bar and finds Anna's post. He sees that Anna is accepting an airbed in exchange for her blender. He remembers that he has an airbed that he had bought when he had just moved into the apartment. Now that he had a proper mattress, he had packed up the airbed and stored it somewhere. He decides to contact Anna to see if she would agree to swap her blender for his airbed.

Anna receives a notification that someone is interested in her post. She contacts Ed via email. Ed and Anna are satisfied with each other's offer. They decide on a place and time to meet. Now, Anna must confirm her deal with Ed and this can be done via a confirmation URL that Anna generates on Swap Pal in her account. She now chooses Ed's email as the person whom she is going to swap with. The confirmation URL is sent to Ed and once Ed clicks on the URL, the post is marked as "In progress" as there is an ongoing deal between Anna and Ed.

Now, Anna and Ed have met each other and swapped their items successfully. After Anna reaches home, she immediately logs in to Swap Pal and takes down her post. A pop-up appears asking her if she would be willing to rate the transaction. She gives a 5-star rating to Ed. Ed logs in to Swap Pal after couple of weeks. As the post is marked as sold, a pop-up appears asking him if he would be willing to rate the transaction. He clicks cancel as he is in a hurry to browse for something. Since Ed didn't give any rating, the system automatically gives Anna 5-stars as there is no bad rating given.

Effects on Secondary Stakeholders

Whenever Elsa visits Anna, she has a sturdy airbed to use. Ed's coding marathon was a success, everyone had plenty to eat and drink. James, being Ed's roommate, uses the blender often as well. He is impressed that Ed got the blender for free, while exchanging something that he didn't use anyway.

Usability requirements

Efficiency

We would like to test the efficiency of the search functionality in our web application. In the existing systems, the older posts are not taken down which leads to the listing of the unavailable deals to the user. In our webapp, each post has a lifespan of 10 days which can be renewed and made visible based on the poster's choice which ensures that the system only lists the available deals for a user search. For example, there are 10 posts related to an iPhone out of which 5 of them are unavailable or expired and the other 5 are available deals. In our system, the search function lists down only the 5 available deals which makes it more efficient as this prevents the user from checking each post and scrolling down till he/she finds the appropriate available deal.

Error prevention

Another usability heuristic we would like to check for is error prevention. Our web app will provide a careful design to prevent different error-prone scenarios. For example, when the user tries to report a post which he/she thinks is inappropriate either due to the suggested price being listed high or suspecting the post to be fake, the application checks for them and presents the user with a confirmation popup before they commit to the action. Another scenario would be, if the user is filling up a form to post an item and he/she accidentally clicks the cancel or close button. In this case, the user is prompted that he/she would lose data they have already entered this prevents the user from losing information since he/she accidentally exits the application.

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