

DePaul University
Human-Computer Interaction Capstone Project
HCI 594

Environmental and Wildlife Impact Application



Full Project (Design Document)
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Abstract

Over the last few decades, our environment has been becoming increasingly exposed to a number of threats and problems. In this paper, we investigated some of these issues and brought a technical solution for people who would like to alter their habits to learn how to adapt more eco friendly lifestyle. We evaluated few environmental applications, interviewed potential users who have grown concerns about the Earth harming impact of their lifestyles and shadowed them while they used one of the competitor applications. By asking them to rank environmental issues based on their severity, we discovered that global warming, overpopulation and pollution were some of the most common issues on the top of the list. We also found that public's consumerism and lack of motivation is playing a significant role in contributing to these issues.

Based on most common application features requested by our interviewees we constructed an affinity diagram, where we listed all features ranked from least to most preferable by the group we interviewed. We also listed main issues that hinder the well being of our environment.

In order to best raise awareness among people, educate them on concerns around environmental well being and motivate them to take action, we came up with an interactive application we named "Ecoguru".

Key words: *eco friendly, environment, environmental awareness, environmental concerns, climate change, recycling, user experience, environmentally conscious, overpopulation, natural resource depletion*

Introduction/Topic Overview

Our environment is constantly changing and making ourselves more aware of the problems we are facing that are evolving around our ecosystems has never been more important. With the increasing climate change we have become more vulnerable to natural disasters, extinction of species occupying our planet and this could just be a beginning of environmental crisis affecting us. People have faced poor environmental conditions throughout history. However, what we think of as environmental problems became more common and obvious with industrialization and urbanization. "In the

United States, air and water pollution from factories and dense urban living conditions attracted growing attention throughout the last century, and by the 1960s became recognized as significant problems” (Dunlap, 2012)

We have some well-documented global changes these days. Increasing concentrations of carbon dioxide in the atmosphere is one of them, followed by alterations in the biogeochemistry of the global nitrogen cycle and ongoing land use/land cover change (Vitousek, 1994). These changes are likely to produce significant consequences that are harmful to our ecosystems.

Today, “environmental damage” is an ubiquitous but a hazy concept. Through our study we want to uncover common global issues of the environment, raise awareness among people and bring them together to help each other in their adoption of environmentally friendly lifestyle. Our aim is to design an application for anyone who is concerned about the issues of pollution, wildlife extinction, climate change, oil spills, natural resource depletion, deforestation, ozone layer depletion just to name a few. The app will enable users to access information about these issues in their area or anywhere around the world. Users would have updates on how their lifestyles impact the environment and how they can help by tracking their daily activities. In addition, they will be able to get friends involved in the cause and form groups of environmentalists around their area to socialize and organize events to help the cause. We have evaluated number of similar applications and came to a conclusion that to make this app different and perhaps even build up on existing interfaces already out in use, we would focus on more social interaction and personalization. We also noticed the apps we looked at didn’t have many local events tied to the app subjects. For example, Eco Challenge app has many fun visual ways to educate users and provide calculator to analyze their lifestyles, although they do not have many tips and events that would specifically help them based on their results. If a user buys a lot of plastic bottles and calculator shows them how that affects the environment, having a display of articles and events such as “beach cleanup event” or “park cleanup event” to show them how many bottles are laying around our recreational areas may be even more helpful. We will also look at better ways to connect friends and public to this cause to involve more people. We also thought about some smart ways and incentives for motivating people to take action and help our environment.

Goals

Goal: Protect the environment both locally and globally from some harmful effects of daily human activities. Give users a better view of their lifestyle and the impact they make on the environment while giving them ideas and solutions to live with a more environmentally conscious mindset.

Measure: Do users feel more informed and inspired to retain an environmentally friendly lifestyle? Can they learn something new about ecosystems of interests

through fun activities? To measure this, we will conduct two different testing sessions and one will be to focus on how long they remain using the app prototype to keep finding more information. After the testing we will ask them if they felt more inspired to commit their time in contributing to their environment. This will help us understand if the organization of the content and the interactive system was engaging enough to encourage users to come back for more information.

Can users find the type of news they are looking for? Can they search a specific category and tips based upon their interests or areas they want to work on? To measure this we will conduct our second testing session. In this session we will focus on the architecture and navigational elements and time the users on how long it takes them to perform a task.

Goal: Motivate people to be a part of this matter and get them involved. Provide means of forming groups with similar concerns and views, so they can motivate their peer group to also get involved in becoming more environmentally conscious.

Measure: Do users get a better idea of how they can improve their lives for environmental cause? Is the flow of using calculator, tips, and social activities intuitive and engaging enough to continue investing time in the cause? We will measure this by surveying prototype testers.

Methods

Method: Competitor Analysis

Goal: To evaluate the impact of existing apps in the industry to decide and determine if it meets users expectations for finding information that are relevant to this topic. Pinpoint our key factors that separate us from our competitors. Interview environmental activists and enthusiasts to find out what the most widely used applications are, what they like about them and what they dislike about them. Determine competitor's strengths and weaknesses based on this data and analyze their user experience patterns and strategies.

Procedure & Analysis

Through our research in mobile apps industry, we evaluated four of the most common used environmental apps:

1. EcoChallenge: an app full of helpful info graphics, carbon footprint calculators

and challenges about the environmental subject of choice.

2. Noah's Project: an app to document, explore and follow wildlife around people's area.
3. #Climate: an app that helps users to discover and share actions through facebook and twitter that they can take against climate change
4. Oroeco: an app that helps users to explore their personal climate impacts.

As a team of two students we closely evaluated and tested two apps per person, although searched for any additional applications for inspiration. Some of these include JouleBug, Ecosia, goodpoints, and Ripple. The competitive analysis and research took us close to a week with ongoing exploration throughout following weeks.

In order to get some insights from these apps, we listed the most outstanding features, their target audience, competitive advantages as well as their weaknesses. We chose to test features of EcoChallenge by shadowing potential users while they were navigating through the app. (see section: finding/results)

Method: Interviews

Goal: Gathering a feedback on a live product. Exploring the reasons behind using the products that are related to this topic. Quantifying results from qualitative research (contextual Inquiry and interviews). The potential users who will be interviewed will range from environmental activists around the area and volunteers who like to travel to help the cause as well as residents and natives of areas that get mostly impacted by the issues such as pollution, wildlife extinction, climate change, and oil spills. We will give out our surveys after each testing session to ask them about the emotional response toward the application and the effectiveness of the navigational system. We will also conduct very short interviews when showing Mid-Fi prototypes to 3-5 people to get an idea of first response.

Procedure & Analysis

Participants: We recruited 4 people from different groups of age, gender, level of education and cultural backgrounds. They would consist of people who are interested to learn more about environmental issues and the impact their daily habits make. In other words, people who have grown a concern for our planet and would like to learn how they can help to save it. The main reason to interview these people is their high

enthusiasm for helping our ecosystems. Our participants do not need to be experienced environmentalists, but they need to have passion for helping their ecosystems, spread the word on how to help and become involved in helping. We asked them beforehand about the importance of environmental issues for them. (see appendix: screener question in the interview)

Before we proceeded through our interviews, we asked the participants about their permission to be audio recorded. Then, we handed them the consent form to sign it (see appendix: consent form).

Each team member conducted two interviews. Two interviews were conducted in person. And two were conducted online. We explained to each one of our participants the purpose of our study. Then, they signed the consent form and we started the recording.

Through our interviews, we sought to answer the following questions

- a) Research/business questions: to explore the reasons behind using the products that are related to this topic.
- b) Design questions : to help us in designing the suggested application/website.
- c) Response to current apps: observing the user while they are interacting with one of our competitor products

After conducting the interviews, our team got together in person to go through the participants' answers. Then, we discussed the answers to find common themes among participants answers. Our meeting led us to the second method(Affinity diagram) of this study .

Method: Affinity diagram

Goal: The main goal of this method was to organize our collected data from the interviews and shadowing efforts to understand the big picture of user needs and priorities. We wanted to group data into their natural relationship for analysis and reviews. We also organized our notes and insights from our contextual inquiries to begin brainstorming solutions.

Procedure & Analysis

After we organized our collected user data, we met to carry out few brainstorming sessions. These sessions would last roughly half an hour. We both started sketching ideas to put to the table and discuss their benefits.

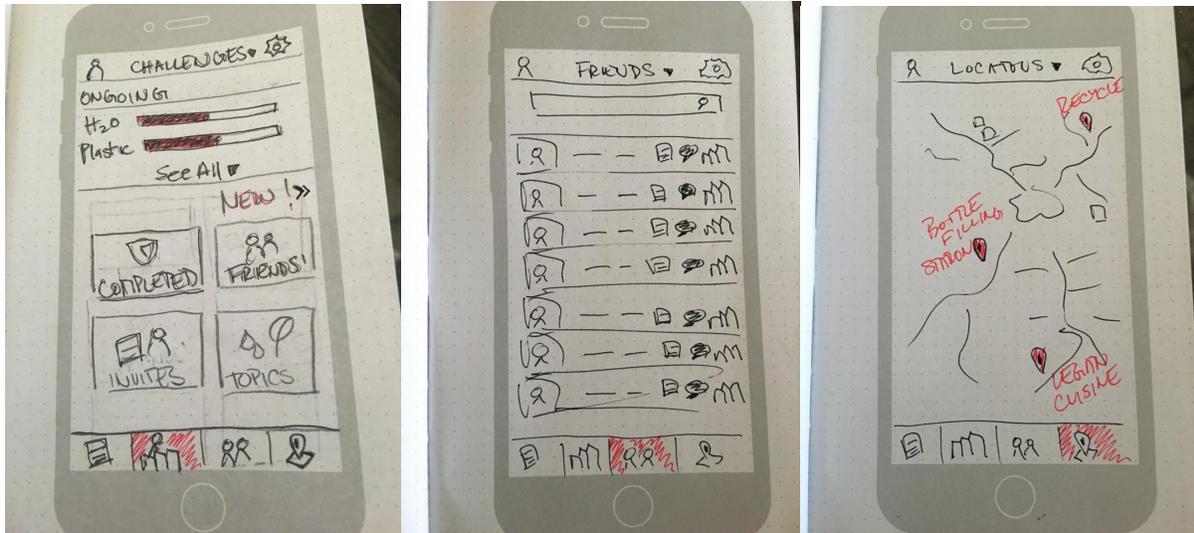
Through this session we came up with number of creative ideas for our potential prototype. While we understood our users and their needs from previous research methods used, we began coming up with solutions to keep them engaged and interested in learning about their environment. This is when we started the next method (prototype) of this study.

Method: Prototype

Goal: Making a web or a mobile app to test the design decisions based on our research (competitive analysis, interviews and affinity diagram).

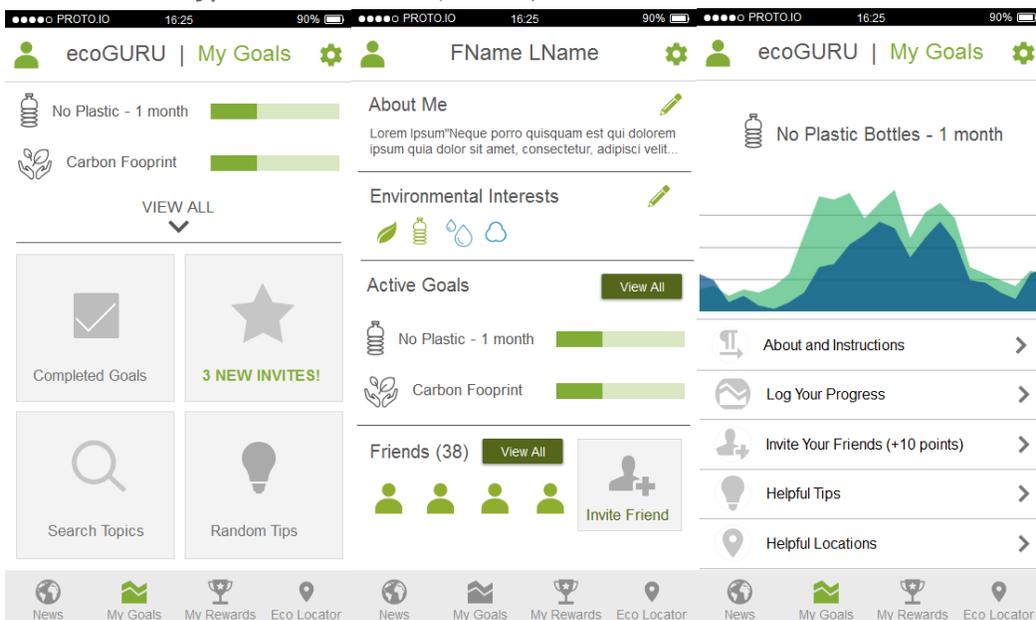
Lo-Fi Prototype: We started off by simply sketching ideas and share them among ourselves to illustrate new functionalities and interface layouts. By starting at the drawing board, we had a lot of flexibility to change, combine and narrow down ideas. Lo-Fi prototyping was useful when we were still going through the process of collecting inspirational findings. Whenever we would see something that would spark a new idea for the app, we took out our piece of paper with a pen and sketched out what was on our mind.

Initial Lo-Fi Prototype Sketches (below)



Mid-Fi Prototype: This is where we moved to a prototyping tool (Proto.io) to mimic the functionalities and get the final layout we decided upon ready for user testing. Adding most prominent interactions to the layout structure helped us to give a better idea on how the final product will behave/function. We did not focus on the aesthetic design and the application's look and feel, the Mid-Fi prototype was solely made for displaying its interactions and test the user process flows.

Mid-Fi Prototype Screenshots (below)



Hi-Fi Prototype: During this prototyping phase, we collected our findings from Mid-Fi usability testing and made necessary edits. We also enhanced the aesthetic design to give a better presentation of the final product look and feel.

Hi-Fi Prototype Screenshots (below)



Procedure & Analysis

After analyzing the data from competitive analysis, interviews and the affinity diagram, we got together to discuss how are we going to use the results to deliver our potential app. In our meeting, we discussed the following points:

- The features that we are going to include in our prototype.
- The name of our app.
- The tool we will use to present the prototype.
- Some ways to motivate people to protect our environment.
- The layout of the prototype (icons , metaphors, etc.)
- The priorities of environmental issues to include in our prototype.

Next, we came to an agreement regarding the points mentioned above. As a team of two students, we started working on the first version of our prototype. We decided in order to improve our prototype, we need to get some insights and feedback. In other

words, we need to test it. Thus, that led us to the last method (Usability Testing) of this study.

Method: Usability Testing

Goal: Determine the efficiency and the quality of the new prototype design. Conduct thorough testing to determine the time it takes end users to perform necessary tasks and find what they are looking for. Get an idea of how to best design and structure the interface for more intuitive user experience through incremental testing.

Procedure & Analysis

To evaluate the design of the mi-fi prototype and measure user's satisfaction we conducted a usability testing after finishing our prototype. We used two methods to conduct the test:

- Online (Mid-fidelity): we posted a class activity on D2l asking our classmates to participate in the study. We had 5 participants; 4 females and 1 male. We measured the efficiency of our prototype by number of clicks for each task.
- In-person (High-Fidelity): After explaining the purpose of the study, we had the participants to sign a consent form (See appendix: consent form in the usability testing) to get their permission to be video recorded. There were 2 male participants. We measured the efficiency of our prototype by number of clicks for each task.

In first method (Mid-fidelity), we gave the participants the following tasks:

1. Check the progress of your goal for eliminating plastic and invite a friend to take up on the challenge.
2. Redeem a reward.
3. Save a random tip to favorites.
4. Check recycling bin locations.
5. Check your new goal invites.

In the second method (High-fidelity), we gave the participants the following tasks:

Task 1: Log in with Facebook.

Task 2: See news and what is going on. Check your friend's invite to eliminate plastic bottles and add this goal to your list.

Task 3: Check your current goals.

Task 4: Check out smart tips. Save a "Fully Raw Vegan Pasta" smart tip to favorites.

Task 5: Check the progress of your goal for eliminating plastic and invite a friend to take up on the challenge.

Task 6: Check your new goal invites.

Task 7: Redeem a reward.

Task 8: Check recycling bin locations.

Then we evaluated the design based on :

- Number of tasks that completed successfully
- Number of steps the participants took to accomplish the task.
- Ease of use of each task (we gave them a scale from 1 - 5 to rate the ease of the task)
- Confusing aspects of our design
- Types of difficulties they faced as participants were proceeding through the tasks.
- Comments and recommendations from our participants about what they like, dislike and recommend to change in our design.

Results and Findings

Describe the major results and findings from the project. Include positive, as well as neutral or negative results and findings—neutral and negative outcomes are just as instructive as positive outcomes, sometimes more. In this section, provide summary descriptions of results. Include raw data here and detailed analysis rather than continuously referring to the Appendices. Also provide a high level description of the system you created with enough detail that we can understand it but not so much detail that it is confusing (including organized readable screenshots may be helpful).

Competitor Analysis

We summarized our competitor analysis results in the following table:

	EcoChallenge	Noah's Project	#Climate	Oroeco
Overview And Profile	App full of helpful info graphics, calculators, and challenges about the environmental subject of choice.	App to document, explore and follow wildlife around their area.	An app that helps users to discover and share actions through facebook and twitter that they can take against climate change	An app that helps users to explore their personal climate impacts.
Target Market	environmentalists, biologists, anyone concerned with environmental issues their lifestyle is contributing to	nature lovers, environmentalists, biologists, anyone who wants to document and learn about their ecosystems	Environmentalists and people who want to make a difference on the environment	Environmentalists and people who want to make a difference on the environment
Major Features	<ul style="list-style-type: none"> -Environmental Calculators -Environmental Challenges -Infographics -Connecting with Friends -Tips and Info on Best Practices 	<ul style="list-style-type: none"> -Identifying Species. -Patches -Missions -Field Guide 	<ul style="list-style-type: none"> -Spreading the environmental news to users -Make users share their actions on the environment through facebook and twitter. -Users can personalize 	<ul style="list-style-type: none"> -Provide personalized tips on how the users can lowers their impacts on the environment -a powerful footprint calculator -Motivate users to collaborate

			<p>their own environmental categories</p> <ul style="list-style-type: none"> -Update users with news about the latest causes and news items related to their selected issues 	<p>and compete with their friends and families to save the environment by earn badges</p> <ul style="list-style-type: none"> -Provide some tips to save users' money. At the same time save the environment
<p>Competitive Advantages</p>	<ul style="list-style-type: none"> - It is educational - It is social - Promotes knowledge of user's ecosystems and well as global environments - It is interactive - It gives tips and challenges on ways to change user's lifestyle - It is simple, focusing on one main idea of informing and challenging users to become more environmentally conscious 	<ul style="list-style-type: none"> - It is educational. - It is social. - Promotes knowledge of user's ecosystems. - It is Interactive 	<p>-an outstanding idea It ties together environmental problem and social media</p>	<p>Powerful tool to calculate the user's footprints and motivate them to take actions.</p>

Weaknesses	<ul style="list-style-type: none"> - Once the user accepts the eco challenge per one of the topics of focus, there is no way to keep track throughout the timeframe of the challenge, only upon completion of the challenge - bad user experience to connect to friends, the app shows “friend’s results” although there is no easy way to connect to them 	<ul style="list-style-type: none"> - Local missions are mostly held online. - No tips or lists of communities that help selected wildlife. - No information on how to approach the species. 	Users need facebook account or twitter account to use it	Doesn’t have metrics units
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Interviews

To have a clear vision of what we want to create and get a better understanding, we designed an interview protocol (see appendix) and recruited four participants. We asked the participants two group types of questions. Research questions and design questions. Below are the answers of these questions:

Results and Findings

Research answers:

We listed the most important environmental issues for our participants:

- Pollution
- Global warming
- Overpopulation
- Littering
- Endangered species
- Non Recycled materials
- Defrosting
- Nuclear wars

We also asked our participants about the reasons of why these issues exist. The answers were the following:

- People don't take these issues seriously.
- People lack long-term perspective.
- People lifestyle.
- Governments do nothing.
- Consumerism.
- People disconnect between their lifestyle choices and their impact on the environment.

Next, we asked them about the kinds of information people need in dealing with these issues. The answers were the following:

- Pictures of the environmental impact.
- Informative videos.
- Day to day tips.
- Environmental Articles.

And finally we asked them about how do they think people get motivated to take action against these issues?. The answers were the following:

- Alert systems- Warning.
- The belief that each person is a critical part of the solution
- Real incentives.

Design answers:

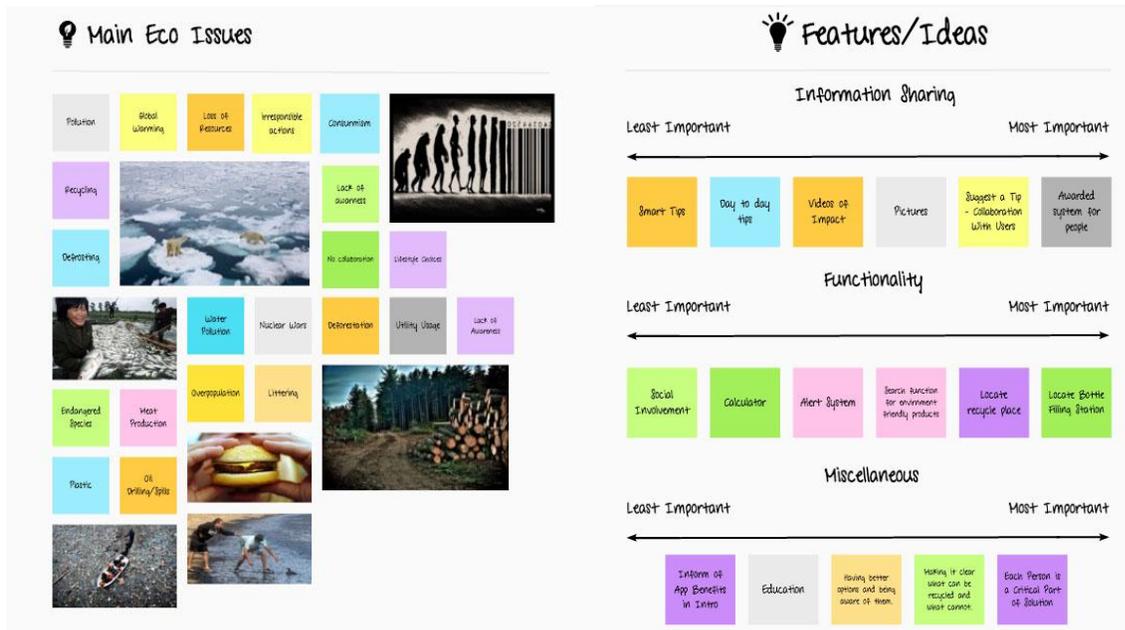
In this part we asked our participants about the type of features they want to have in an Environmental app. The answers were the following:

- Smart tips of how people can reduce their utilities usage
- Reward system for people who want to recycle their trash
- Locations of recycle centers
- Search function for environment friendly products
- News, articles, videos about environmental issues

To organize our data we had to do an affinity diagram.

Affinity diagram

Figure 1



Results and Findings

“Figure 1” shows the result From our brainstorming session. Through this session we came with some ideas and features to include in our app. We came up with the following features:

- Smart and environmental tips feature.
- The feature of inviting people to take up the challenge to protect the environment.
- Recycle locations - feature to locate the nearest recycle center as well as locations of organizations that may be helpful in achieving their environmental goals.
- News about the current environmental issues.

Prototype Results and Findings

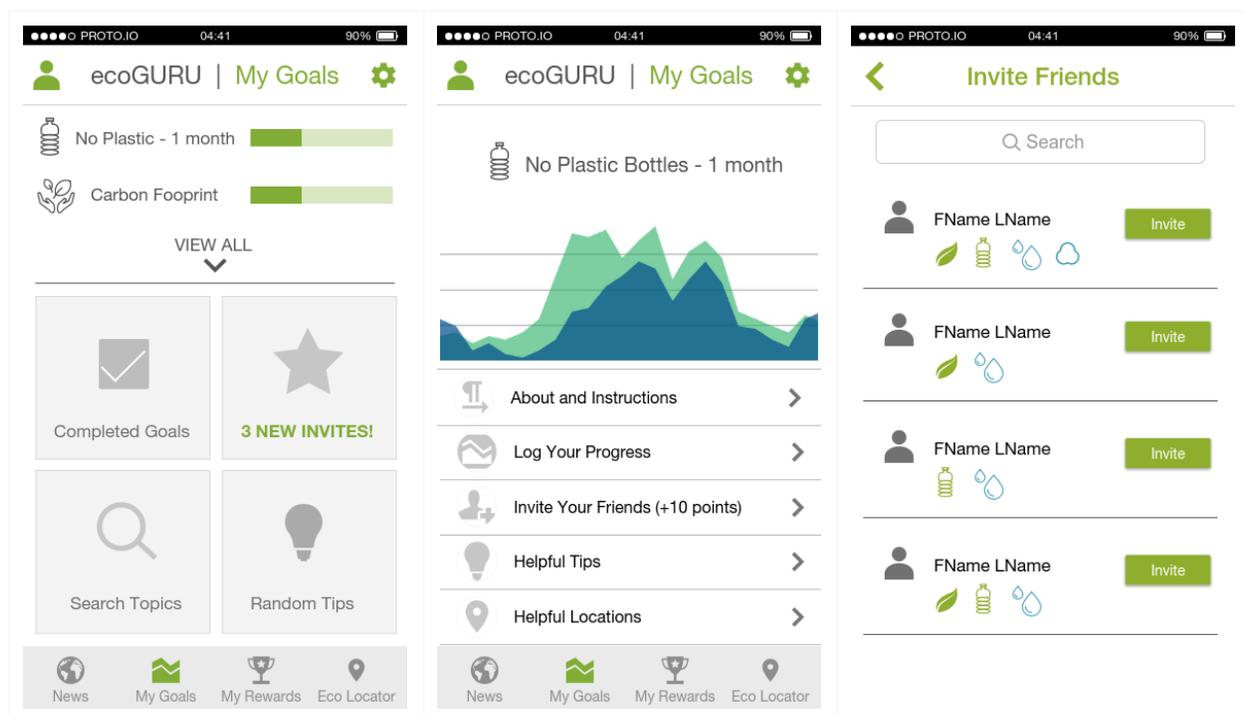
Mid Fidelity Prototype

Link to our Mid-Fi prototype: <https://share.proto.io/l1TETP/>

Phase 1 (Mid fidelity-Conducted online)

After creating the initial version of our prototype based on the gathered data from the interviews, we decided to evaluate the usability of our prototype. We had 5 participants (4 females, 1 male) for our prototype. We listed the results of each task below as well as some comments and feedback from our participants.

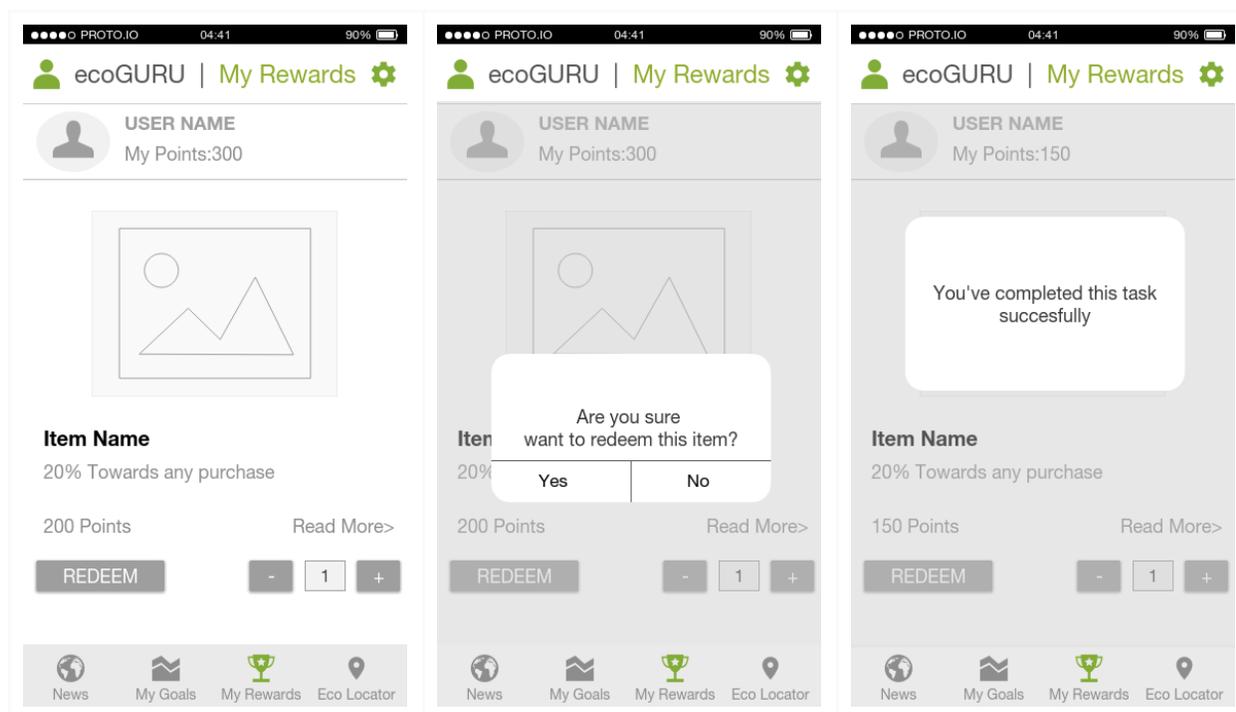
Task 1: Check the progress of your goal for eliminating plastic and invite a friend to take up on the challenge.



Results and findings (positive, neutral, and negative results):

- Completeness: All participants completed this task successfully.
- One participant didn't know what challenge she is supposed to invite her friends to.
- Two participants didn't know that "the goal" was clickable. They recommend to make it like links.
- Took some extra clicks from the participants in general.

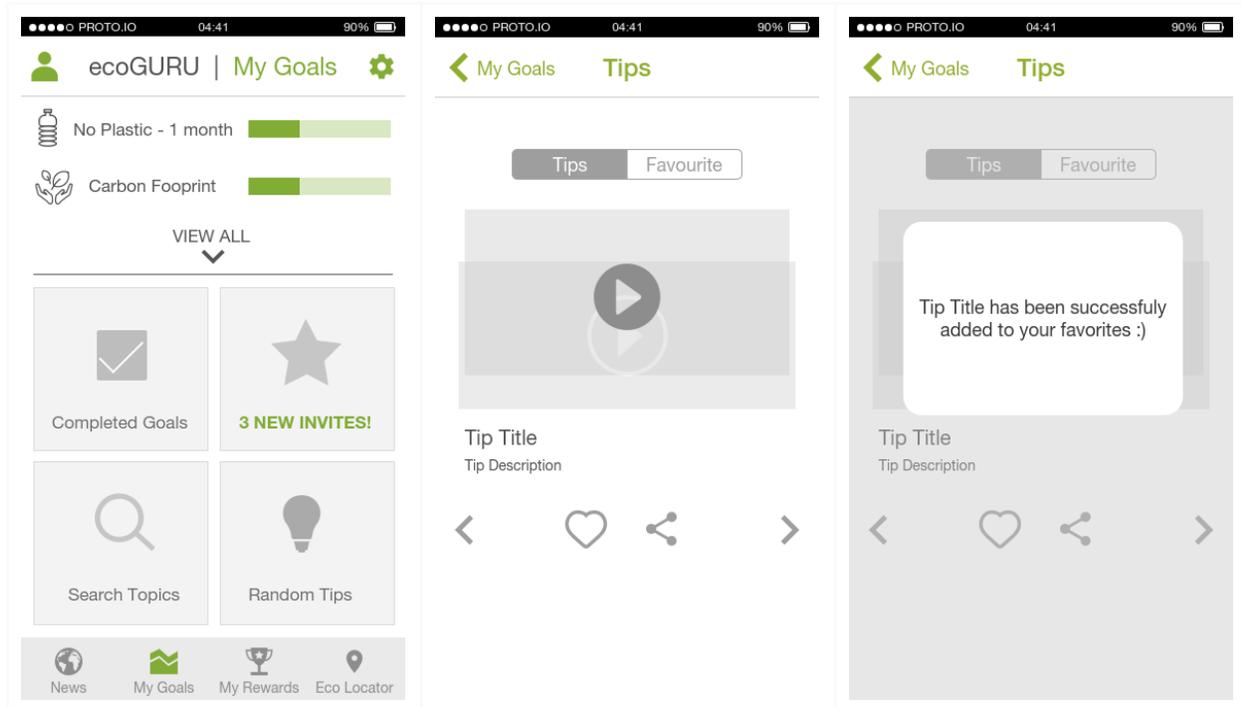
Task 2: Redeem a reward



Results and findings (positive, neutral, and negative results):

- **Completeness:** All participants completed this task successfully.
- All participants completed this task smoothly. It was straightforward and seamless.
- No extra clicks for this task.

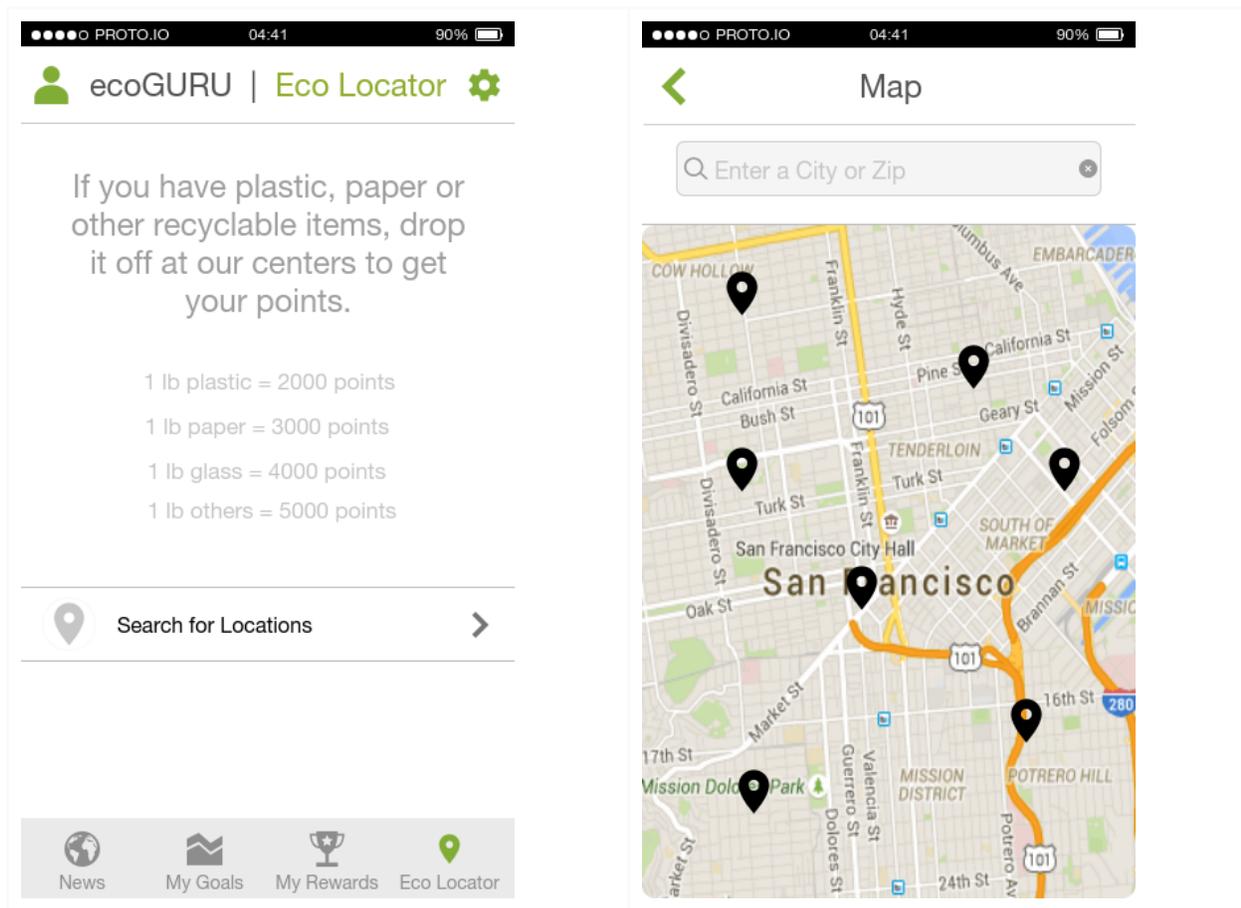
Task 3: Save a random tip to favorites.



Results and findings (positive, neutral, and negative results):

- Completeness: All participants completed this task successfully.
- One participants said “It’s out of its place in the goals screen”.
- Two participants thought the news items were tips to add to favourite.They went to news to find it.
- One participant recommended to change the heart icon.Because the heart icon redundant and can be used in different contexts like (Liking a photo)
- The task took some extra clicks from two participants

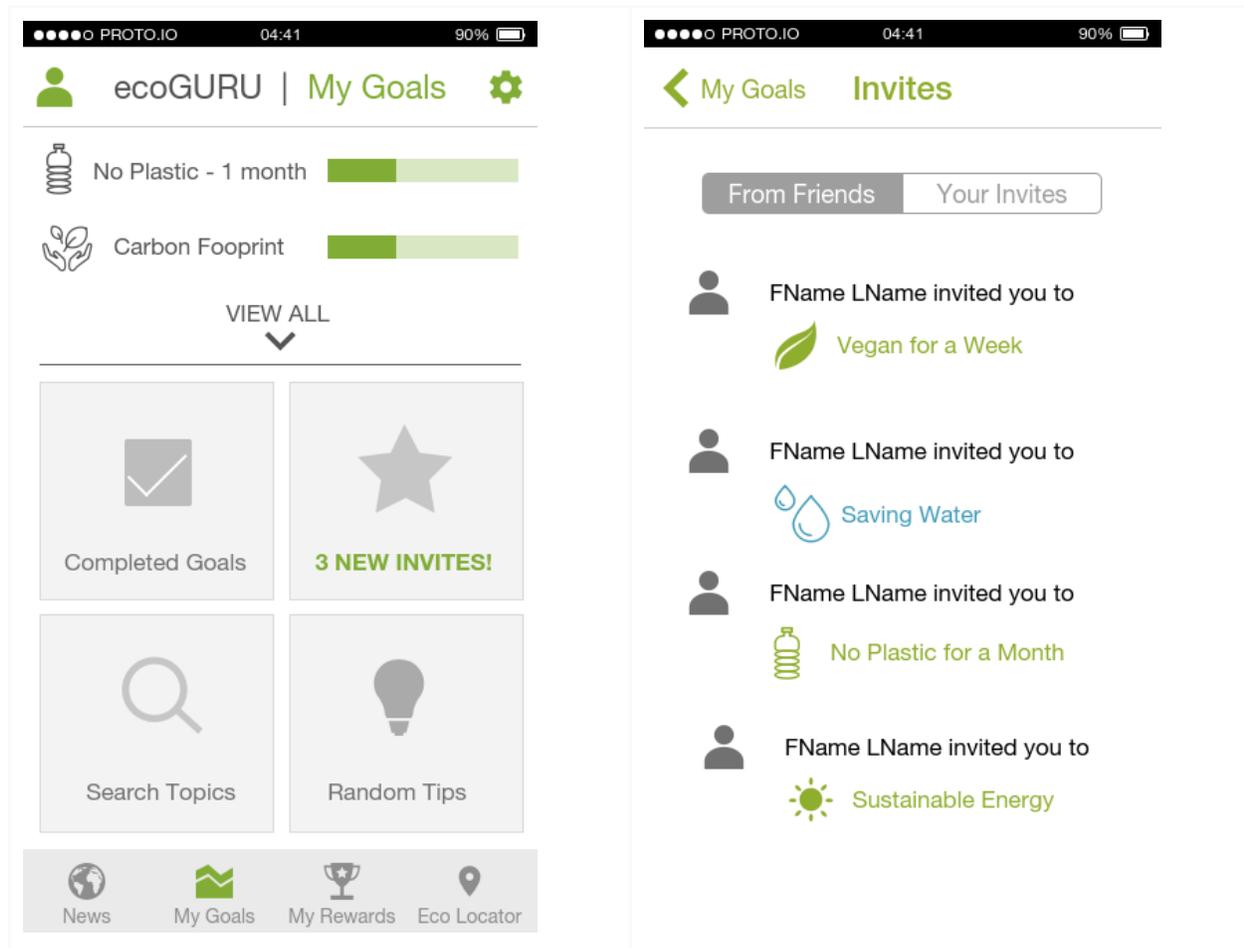
Task 4: Check recycling bin locations.



Results and findings (positive, neutral, and negative results):

- Completeness: All participants completed this task successfully.
- One participants recommended to change “Eco locator” to “Recycling locations”
- One participant wanted to locate the recycle locations around her work not the closest location.
- One participant recommended adding a list view for recycle stations.
- No extra clicks for this task.

Task 5 - Check your new goal invites.



Results and findings (positive, neutral, and negative results):

- Completeness: All participants completed this task successfully.
- One participant said, “New invites seemed out place” in my goals screen. She recommends having it as notifications in the news screen.
- No extra clicks for this task. One participant said she knew where it locates because she saw it in the first task.

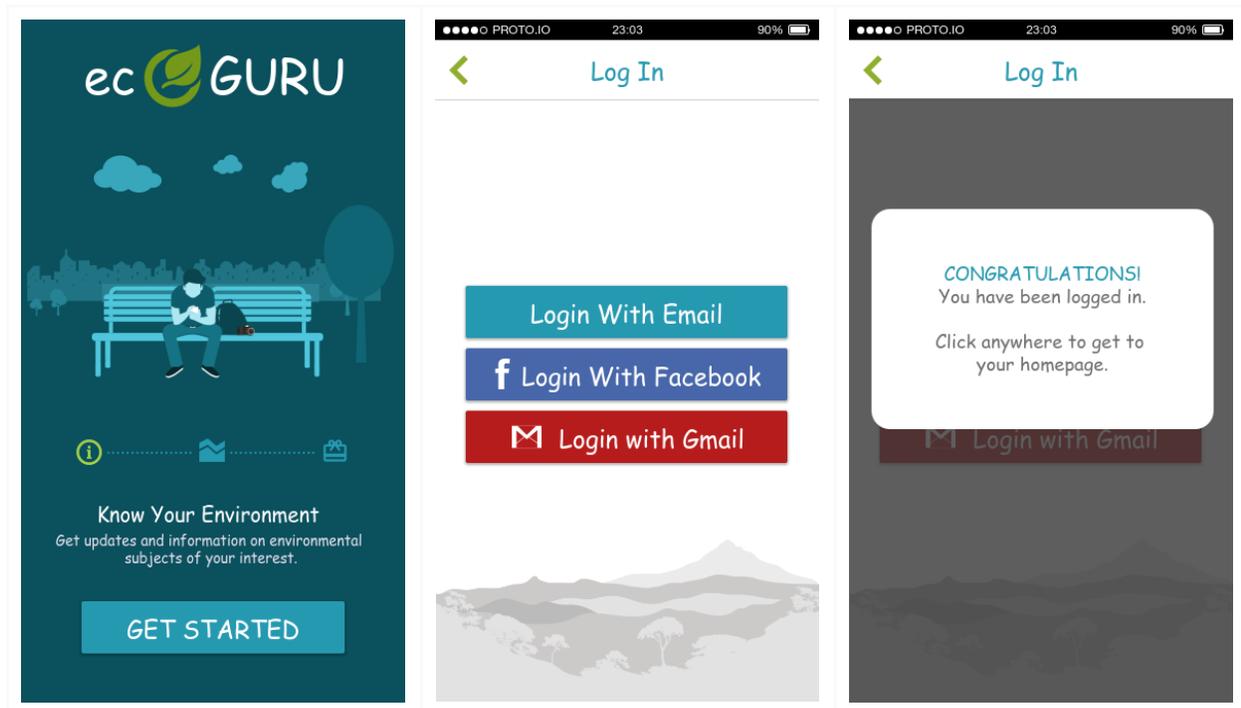
Additional comments:

Overall, the participants liked the visual design. However, one participant found the design is busy and needed larger fonts.

Phase 2 (High fidelity-Conducted in person)

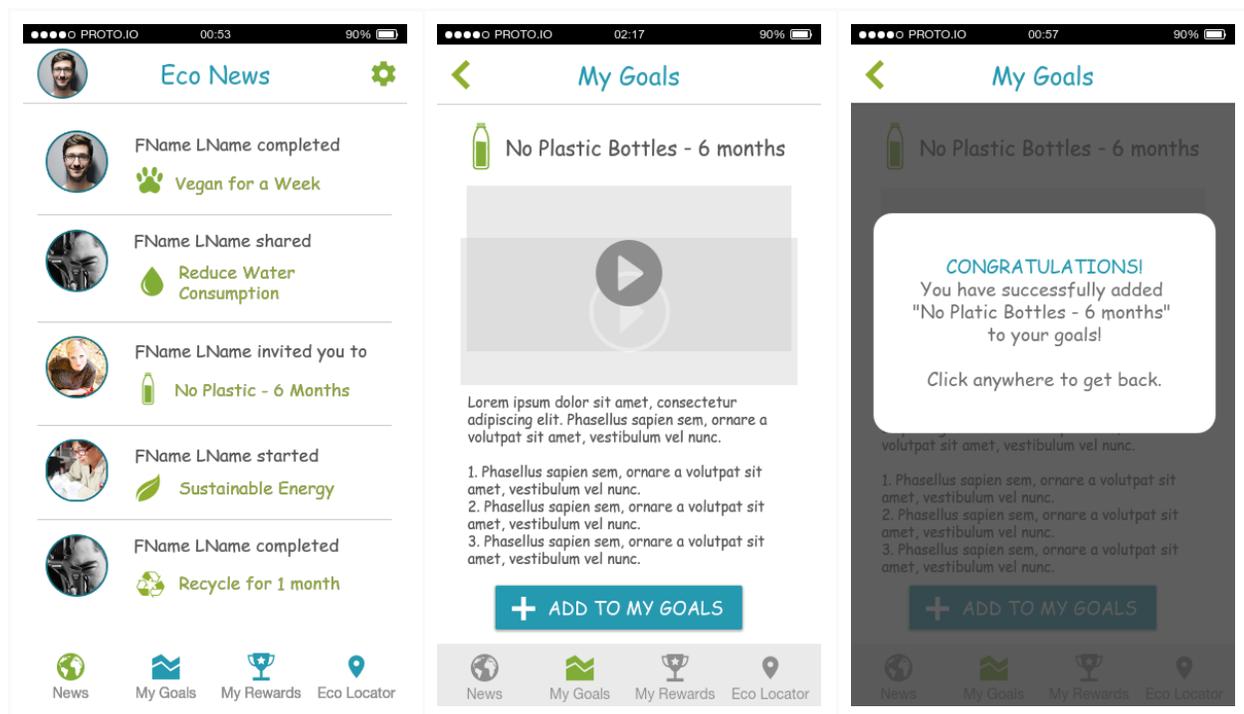
Link to our High-Fi prototype: <https://share.proto.io/PEVHYI/>

Task 1: Log in with Facebook.



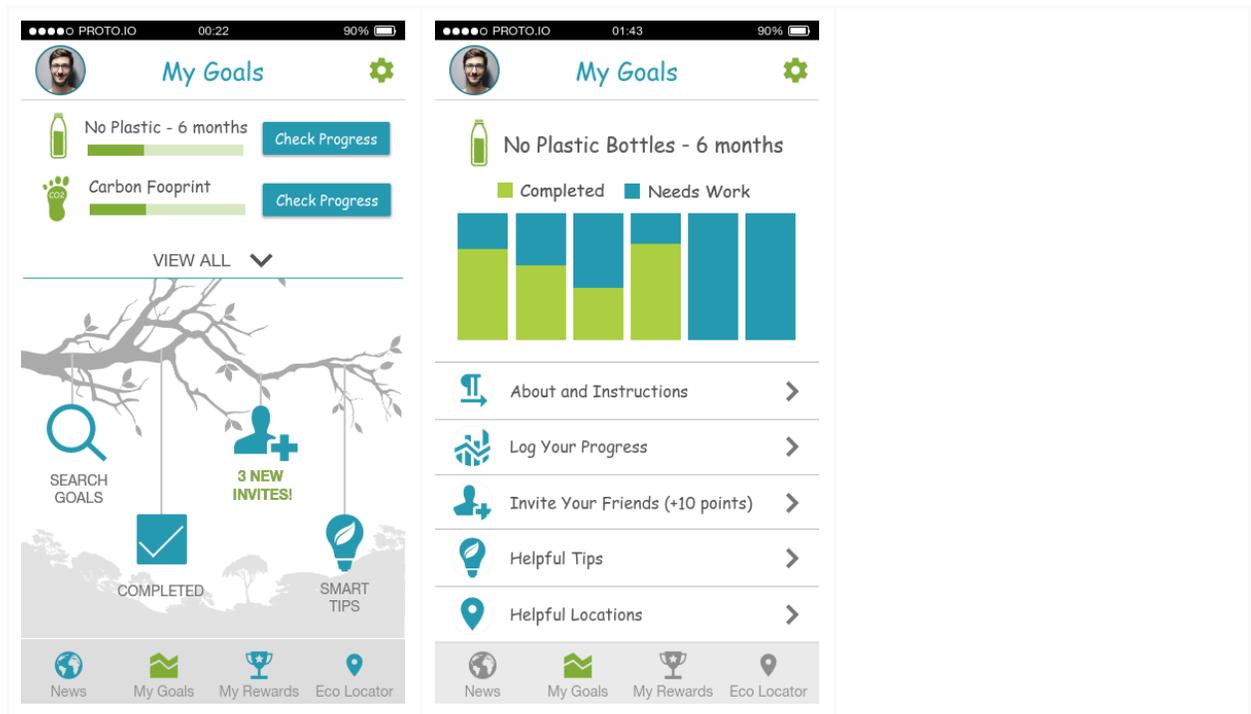
- Completeness: All participants completed this task successfully.
- Efficiency: No additional clicks

Task 2: See news and what is going on. Check your friend's invite to eliminate plastic bottles and add this goal to your list.



- Completeness: All participants completed this task successfully.
- It took one participant a bit of time to notice the "Invite your friend" in the same page as he left quickly after I got my progress.
- Efficiency: No additional clicks

Task 3: Check your current goals.



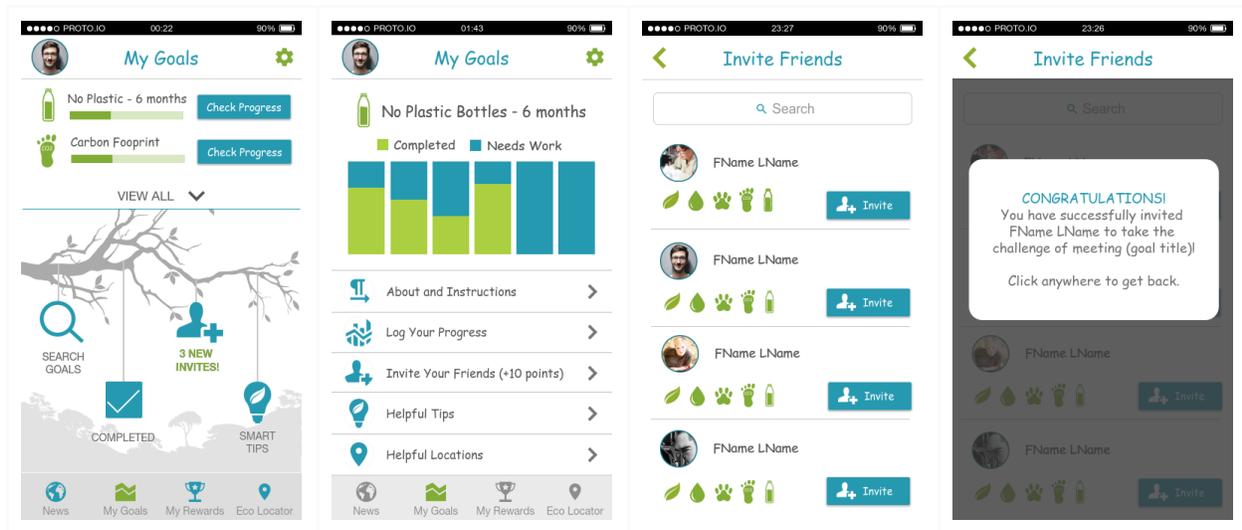
- Completeness: All participants completed this task successfully.
- Straightforward task.
- Efficiency: No additional clicks

Task 4: Check out smart tips. Save "Fully Raw Vegan Pasta" smart tip to favorites.

- Completeness: All participants completed this task successfully.

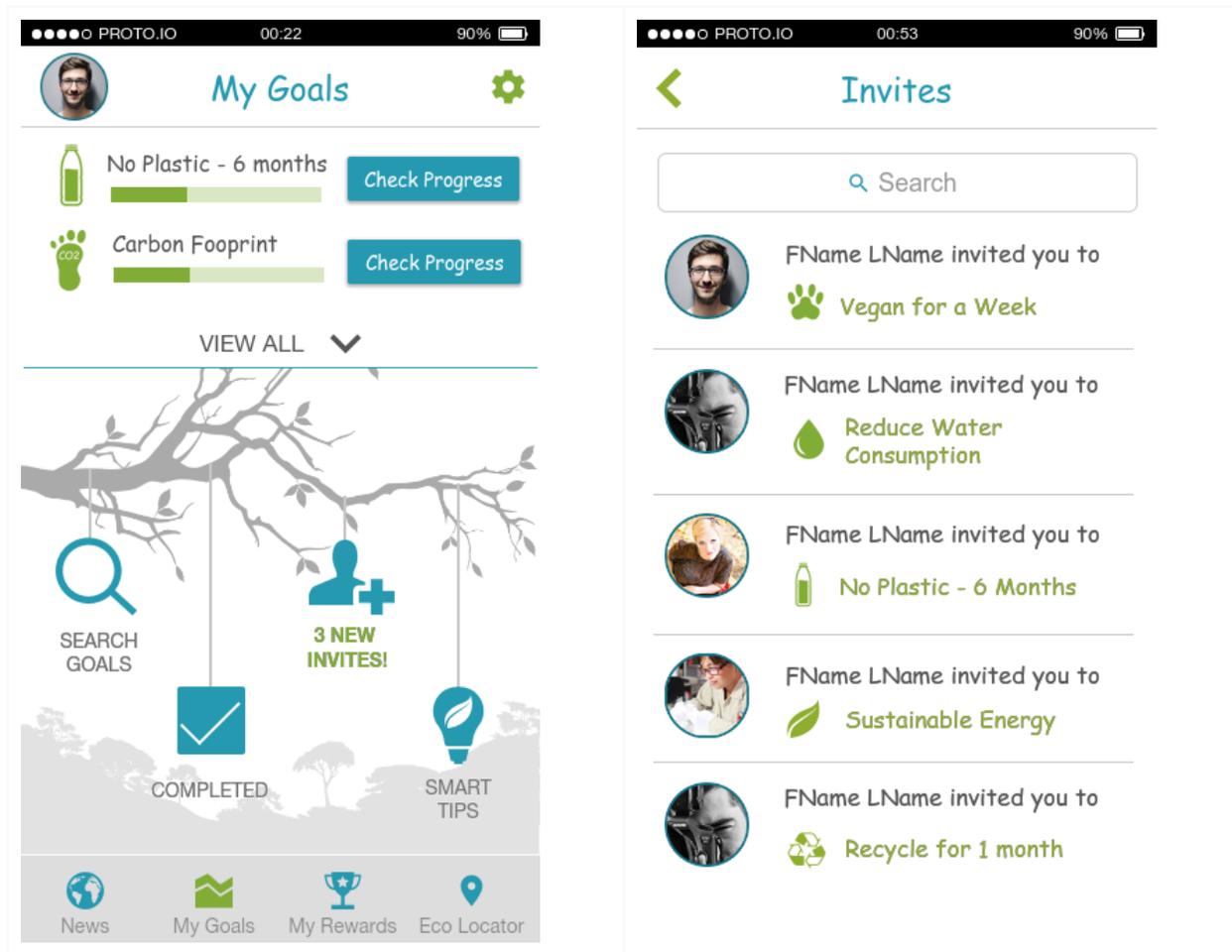
- One participant commented: “It was easy to get to the tips after I recognized that the hanging icons were important, as I ignored them at first when I so the number of invites”
- Efficiency: No additional clicks

Task 5: Check the progress of your goal for eliminating plastic and invite a friend to take up on the challenge.



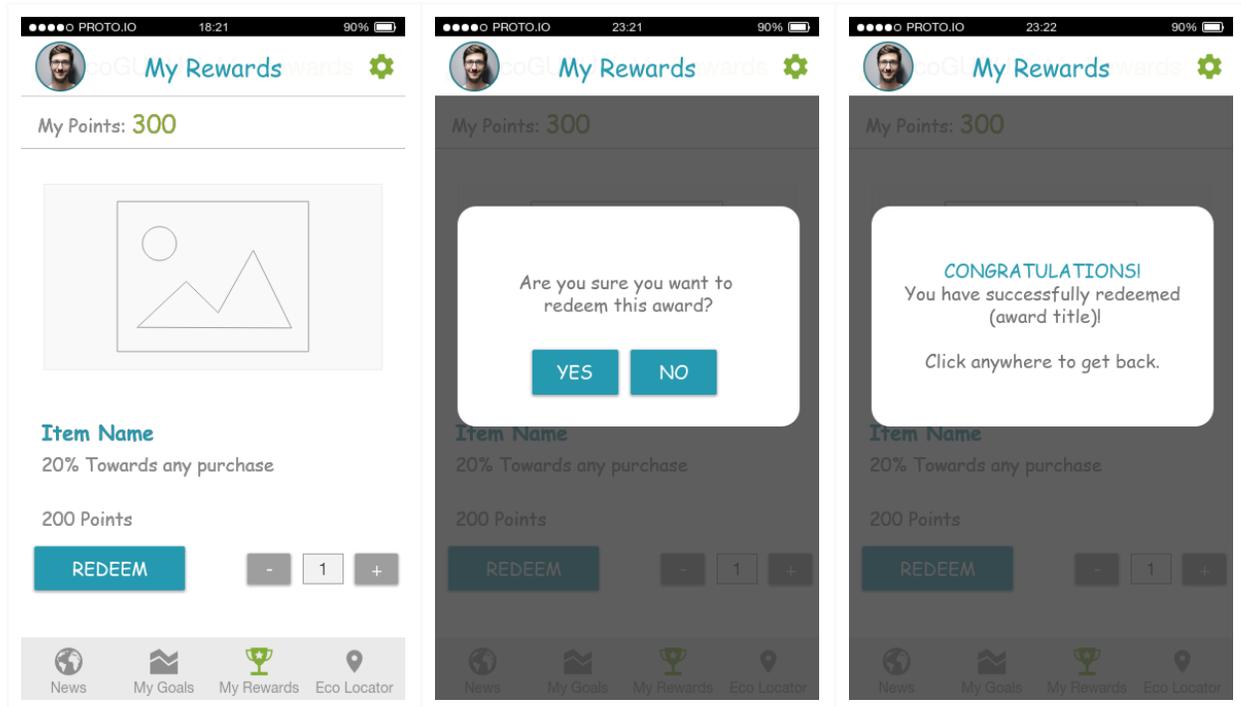
- Completeness: All participants completed this task successfully.
- Checked the progress successfully.
- Efficiency: No additional clicks

Task 6: Check your new goal invites.



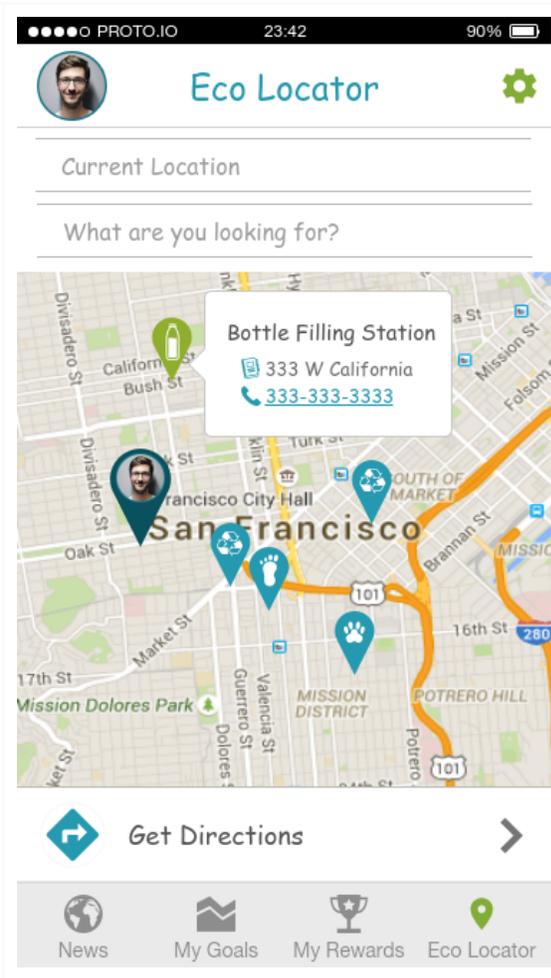
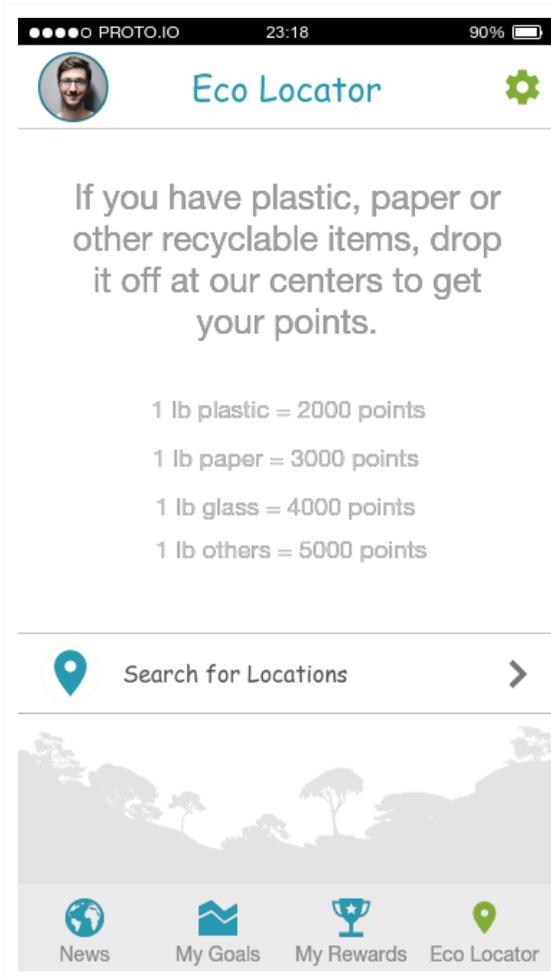
- Completeness: All participants completed this task successfully.
- One participant said “that was easy as the red number made me look at it, the moment I landed on the goals tap.
- Efficiency: No additional clicks.

Task 7: Redeem a reward.



- Completeness: All participants completed this task successfully.
- The task was straightforward .
- Efficiency: No additional clicks

Task 8: Check recycling bin locations.



- Completeness: Completed with difficulty
- One participant said “It didn’t connect ecoguru with recycling bin at first.
- Efficiency: No additional clicks

Additional comments:

The think the interface is appealing and straightforward. It is easy to understand. . However, they can see how this could become an interesting App once everything is complete in more sophisticated way.

One participant said “this App would be much more useful if it had a better description of goals/purpose/objectives. It needs more background explanations. It seems easy to navigate and I envision more interest once it is built out completely”.

Conclusion

Environmental problems are potential threats we can't turn a blind eye on. Human beings played significant role in these environmental issues. We realized that a lot of species are in danger, because of people lifestyle and irresponsible behavior of humanity. We wanted to take actions against these environmental issues and motivate people to be a critical part of our solution. We came up with a technical solution to do so. We created an app called "ecoGURU". We believe that this app can motivate our users through social interaction, informative videos and instructions/smart tips on how to improve, daily tracking of their impact on environment, locating helpful organizations and products with the aid of our eco locator and being able to collect rewards while using our point system. As we conducted our testing sessions, we discovered the app was easy to use and understand, visually appealing, and motivating. Our testers have expressed that they would like to see the idea come to life one day and would become more interested while using its interface. We have invested most of our time to focus on the structure and functionality of our app, but we would like to take it further by implementing actual environmental training plans and seeing how the final product could change its users' daily habits and aid them in becoming more environmentally conscious if brought to life.

References

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Vitousek, P. M. (1994). Beyond global warming: ecology and global change. *Ecology*, 75(7), 1861-1876.

Appendices

Appendix A

Environmental and Wildlife Impact Application- Individual Interview Protocol

Background information

Questions we need to answer :

- a) Research/business questions: to explore the reasons behind using the products that are related to this topic.
- b) Design questions : to help us in designing the suggested application/website.
- c) Response to current apps: observing the user while they are interacting with one of our competitor products

➤ Research/business question

Is the information provided by the current environmental applications/websites accurate, helpful and easy to find?

Are the features of the current apps enough and useful?

➤ Design questions

What are the features that people are looking for in environmental apps/websites?

What type of information that people are looking forward to seeing in environmental apps/websites?

➤ Response to current apps (competitor app/website)

➤ Was the information offered in the app/website helpful?

➤ Was it easy to navigate through the app/website?

➤ What did you like about the app/website, what would you change?

1. Target audience. This application will not be designed for experienced biologists, scientists or environmentalists. These people already know the problems we are facing and what they need to do to avoid them. The app is going to focus on people who have grown a concern for our planet and would like to learn how they can help to save it or how they can get their friends involved. For example a person who has never recycled and would like to know the idea behind recycling. How does it help? How does he/she affect the environment by buying plastic bottled water every day instead of refilling her bottle?

2. Find your audience. What are some ways you might recruit interview participants?

Ex. Meetups, environmental organizations, parks, conferences

3. Create a screener. Interview participants would preferably already have an interest in learning about ways to help the environment. They do not need to be experienced environmentalists, but they need to have passion for helping their ecosystems, spread the word on how to help and become involved in helping.

Consent Form

Principal Researchers: Ibrahim Altweim, Klara Jarolimova

Institution: College of Computing and Digital Media, DePaul University, USA

Faculty Advisor: Sheena Erete

We are conducting an interviews focusing on the development of an environmental application. The app is designed for people who are concerned about the ongoing and evolving environmental issues (Pollution, climate change..etc). We want to raise awareness of how our users' daily decisions may impact their ecosystems and help them to learn ways they can obtain a better control over their path towards developing more eco friendly lifestyles. In addition, we want to discover some problems that encounter people -on daily basis- that is related to our environment and what they need to make their lifestyle more environment-friendly.

Thus, we are asking you to be in the interview because you are concerned of our environment. The interview will take 10-12 minutes of your time. The interview will be audio recorded. We will use the recording only for the purpose of designing the proposed environmental application. Your information will be confidential. Your participation is voluntary, which means you can choose not to participate. If you feel uncomfortable with us doing so, please say so and we will stop. There will be no negative consequences if you choose not to participate or change your mind after we begin.

- I understand that all data gathered during the interview will be kept confidential.
- I understand that my participation is voluntary and I may leave the interview at any time.
- I understand that all gathered data will be used only for the purpose of this study.

You may keep this information for your records.

Signature: _____

Printed Name: _____

Date: _____

Introduction

Hello, my name is _____ and I am a graduate student at DePaul University. I am working with a group of other graduate students. We are doing a class project to better understand what people need within the environmental app that we are going to design and what type of information they need the most. In the beginning, we would like for you to think about this more as a friendly conversation than a question-and-answer session. We will start out asking you some questions about your background information regarding the environment. Then, we want to learn your style dealing with the overall environment and how to access information related to that topic. Finally, we want to learn about your experiences and thoughts dealing with environment apps/websites. Your responses will be completely confidential, and only for informational purposes. You may stop the interview or leave at any time. There are no right or wrong answers to my questions. We want to listen to what you have to say. We would appreciate your consent before proceeding. Any questions before I begin?

Warm-up questions: [Background information]

1. On a scale from 1 to 5 (1 is very important), how important to you is the environment?

2. What are the major environmental issues these days ?

3. Why do you think these issues exist ?

4. Do you think people lifestyle may impact the environment?

Okay, now I would like to get an idea about the type of information you think may be useful for people who care about the environment

1. Among these environmental issues (Pollution, Littering, Global Warming, Overpopulation, Endangered species), can you list the most important issue to the least important?

- a.
- b.
- c.
- d.
- e.

2. What type of information people need to deal with these issues (articles, tips, videos)?

3. How do you think people lifestyle plays a role in this issue?

4. How do you think people get motivated in dealing with such an issue?

Now, I would like to ask you about your experiences and thoughts dealing with environment apps/websites

1. Can you name some apps/websites you have used regarding this issue, if any?

2. What did you like about this app/websites, if any?

3. If you could add ONLY 3 features to the existing app/website, what would it be?

Demographics

1. Where are you from?

2. What is your age?

3. Male/female

4. Highest level of education

5. What is your job?

Wrap-up

Do you have any questions about our research study or the questions I asked you? Is there anything else that you would like to share with me today?

That was all the questions that I had prepared for this interview, thank you so much for your time. Your responses are an integral part of our study, and as a reminder they will be kept completely confidential. Thank you again for taking the time to speak with me.

Appendix B

Usability Testing Script

Moderator's Script

1. Preparation

Web browser is open to prototype page.

2. Start Script

Introduction

Thank you, _____, for taking the time to help us conduct this study today. My name is _____, and I'm going to be walking you through the session. I am a graduate student in HCI at DePaul University and will be conducting today's session. You are here today to help us test the prototype of our environmental application. The main goal for today's session is testing our prototype functionality. We hope to get some insights to improve our potential app functionality.

At first, we want to ensure you understand that we are testing the prototype, not you. Be aware that, there are no wrong actions. We are interested to know if the prototype is working properly and clearly for the people who use it. This session may take approximately 15-20 minutes. If you have any questions as we go along, please ask me. However, I may not answer them right away as part of the study includes observing users during challenging elements of tasks. However, if you still have questions when we are finished, I will be more than happy to answer them. Also, if you'd like to take a break at any point, just let me know. Additionally, you are free to opt out at any time you'd like.

With your permission, we will record this usability test session for the purpose of improving our application. This permission keeps your rights as a volunteer and your information will only be seen by the people who work on this study. Before we get started, I would like to ask you to sign a consent form which allows us to use the information we learn from today's session.

Sign a Consent Form

Do you have any questions before we begin?

Instructions:

Now I'm going to ask you to try doing some specific tasks. I will read each task out loud. Then, I'll be asking you a few questions after each task. Please try to think out loud as you go along. You may not know what to do directly. That is ok, we want to observe how you complete the task.

While you work on completing the tasks, I ask you that: say what you are thinking and what you are trying to do. Express your thoughts as you move through the app.

End script

Tasks to be completed during this test. Read the directions for the participant at the beginning of each task.

Start the recording

Task 1:

Log in with Facebook.

Task 2:

See news and what is going on. Check your friend's invite to eliminate plastic bottles and add this

goal to your list.

Task 3:

Check your current goals.

Task 4:

Check out smart tips. Save "Fully Raw Vegan Pasta" smart tip to favorites.

Task 5:

Check the progress of your goal for eliminating plastic and invite a friend to take up on the challenge.

Task 6:

Check your new goal invites.

Task 7:

Redeem a reward.

Task 8:

Check recycling bin locations.

Log Sheet

Participant Name: _____

Task 1:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 2:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 3:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 4:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 5:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 6:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 7:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Task 8:

Post-task Questions:

- What did you like about it?
- What needs to be improved?

Completion (complete easily/complete with difficulty/fail):

Notes (errors, participant's quotes, participant's behaviors, etc.):

Ok, before the end of this session, we would like to get some insightful feedback about our app. Please take your time to explore the app.

Wrap-up Questions:

- What did you like about the app?
- Would you have any recommendations about the overall design?

Thank you for participating with us today. Your information will be very helpful in improving the usability of our app. Do you have additional questions or comments for us?

Consent Form

Institution: School of Computing, DePaul University, USA

Researchers: Ibrahim Altweim, Klara Jarolimova

Faculty Advisor: Sheena Erete

The main purpose of this session is to evaluate the design of our prototype. We would like to figure out if users can achieve the included tasks seamlessly and in a timely manner. We are also aiming to determine the design's weaknesses. Based on feedback acquired from the session, we hope to get a better idea of how to improve the design to meet the end users' expectations. There are no right or wrong answers to this test. Its sole purpose is to get enough information to make sufficient design decisions while enhancing and improving the app's overall usability.

This observation will take approximately 15 minutes of your time. Any information you provide will be confidential. This usability test session will be recorded for the purpose of improving the overall design. A moderator will observe you and take some notes regarding your experience. Also, you may opt out anytime for any reason.

If you have any questions after today, please contact:

Ibrahim Altweim: ialtwaim@gmail.com

Klara Jarolimova: kjarolim@gmail.com

Please sign below to indicate that you have read and understand the information in this form and that any questions you might have about this session have been answered.

Date_____ Test Moderator Name: _____

I, _____, have read and understand the study and acknowledge the above information.

Participant Signature _____