ENSE 405 – Designing Apps for Learning & Collaboration

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Final Project Report

2021 ENSE 405 Project

Recycle Smart

Submitted by

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This project is an original work of mine and it has not been submitted to any other course or project.

Submitted to

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Business need/opportunity

The lack of relevant information about recycling is not being consumed enough resulting in poor recycling habits around the world. The lack of proper of recycling habits results in overflow in landfills, increase of pollution, and destruction of natural habitats. The application I plan to develop focuses on providing the user with the relevant knowledge of recycling in a form of a mobile application. This way users can learn about recycling materials, recycling symbols and locate nearby recycling centers/disposal centers locally. With the relevant knowledge and the tools provided in this application it will help establish and strengthen the user's recycling habit.

Reflections on project planning

United Nation's Sustainable Development Goal

I have chosen United Nations Sustainability Goal 12, Responsible consumption, and production because of personal interest to gain more knowledge on the topics of recycling. The topics I am interested in relates to the sub goals of the initiative of responsible consumption and production. Sub goal 12.5 which relates to reduction of waste generation through prevention, reduction, recycling, and reuse; and sub goal 12.8 which relates to ensuring that people everywhere have relevant information and awareness of sustainable development and lifestyles in harmony with nature. The combination of these two sub goals is what I believe are essential building blocks in creating a good recycling habit. A good recycling habit in which every individual in a community can conform to will greatly impact the world. Although recycling does not connect the community together, the activity of recycling is a community effort if we wish to sustain our life and natural habitats on earth, in essence it connects the community.

Community Research and Understanding

The community of responsible consumption and production is no more than individuals playing their part to achieve a common goal. The community needs are for relevant information and knowledge on sustainable development relating to the topics of recyclability. The technology out on the market today provides information on recycling material and utility which allow the user to know where to recycle their materials locally. Other technologies implement the method of gamification, this allows the user to learn through some game. This provides interaction to gain knowledge on recycling. The other type of gamification is through a point system by recycling specific kinds of recyclables.

North Star Customer & Carryover Customers

The north star customer for this project are students ranging from elementary to university. I have chosen this group as north star customers because in this generation most students from elementary to university have access to some sort of mobile devices and knowledge about technology where they can navigate and use mobile application efficiently. Furthermore, establishing recycling habit at a younger age should be easier for them to carry out and strengthen while they mature. The carry over customer are parents/teachers. I have chosen them as carry over customers they can help teach and provide further knowledge on the topics.

Assumptions Made and Constraints Uncovered

The constraints for this project are allowing offline use for searching recyclables, this can be slightly mitigated using a caching which will allow the user to access previously search recyclables. Constraints on the available items that the user can search for, since the information is being pulled from Waste Wizard/ReCollect API, I do not have control over the

content the API provides. The constraint of time to design and develop the application, the time frame to complete the application is around two to three months.

Initial & Evolution of my Technology Stack

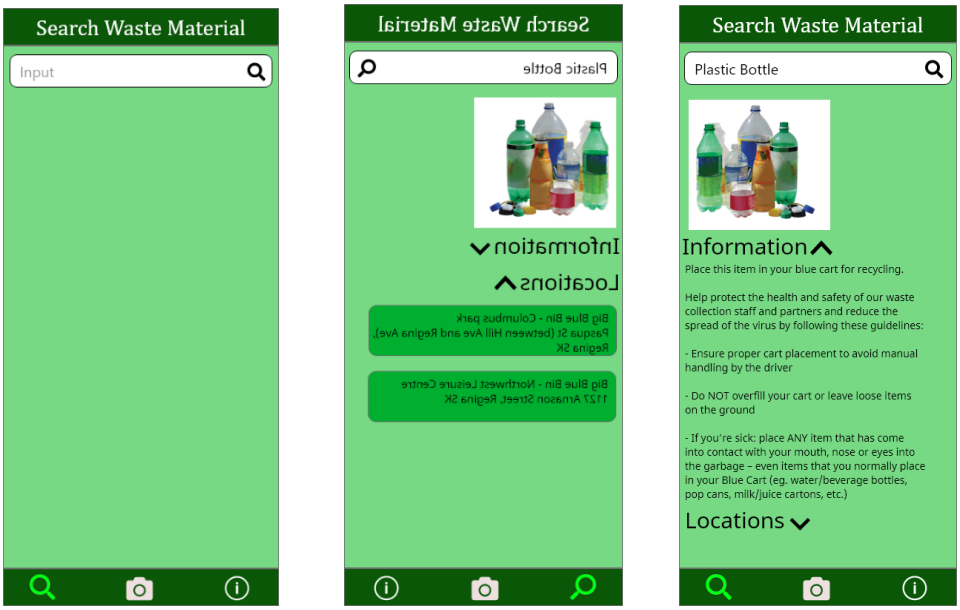
The technology stack I chose to make this application is Ionic SDK framework to allow one source of code to cater to both Android and iOS devices, Angular frontend, Node Js backend, and MySQL database.

The initial design for this application is a three-tab application which will have three functionalities. The first function is the searching function allowing the user to search more recyclables and receive information on how to dispose of the item through bins or locally through recycling/waste disposal centers through google maps. This function uses the Waste Wizard/ReCollect API and will have a caching mechanism to store previous searches using MySQL in tandem with a Node Js backend.

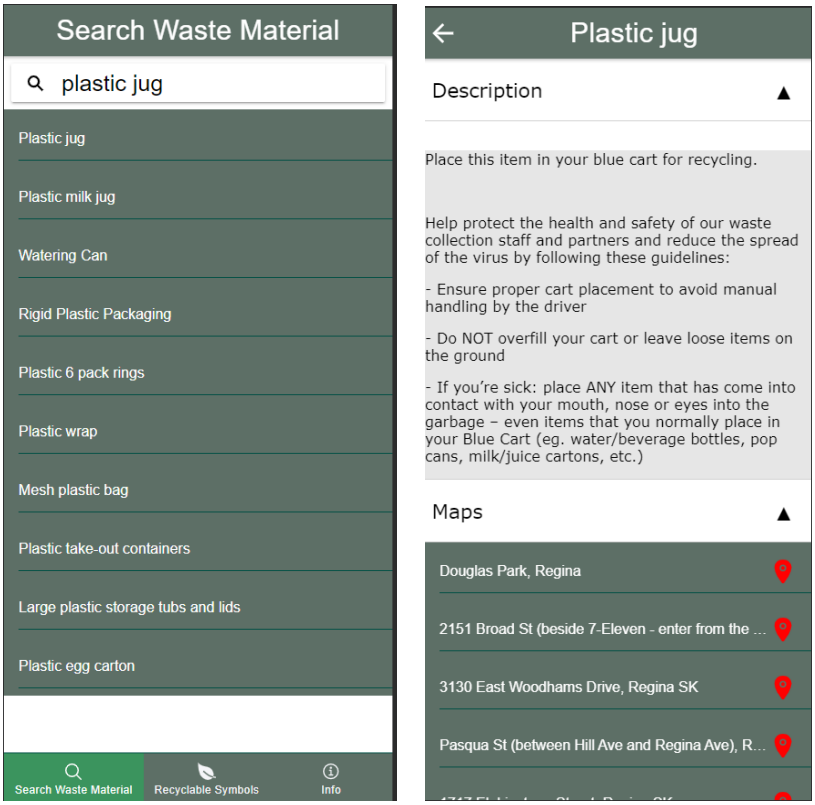
The second functionality was initially a scanning functionality which would allow the user to scan recyclables symbols to receive some information about the material. The plan was to use Open CV template matching to match a symbol from the database to the detected/captured image. Unfortunately, with time running short combined with my slow understanding I could not implement this functionality and opted to make a static page which displays information of recyclable symbols one through 7.

The last functionality I implemented is a general information page which is static page that has information about the sustainable development goal, what this application provides, and quick information on general recyclables/non-recyclables.

Pictures of Key Experiences



This is initial prototype for the searching function. This is a key activity that the user can experience as it provides the user to search recyclables. These show the local recycling centers or bins near the user and general knowledge of some safety protocols.



This prototype evolved into the MVP product, which has a suggestive search, locations are ordered from closest to furthest locations, and the color scheme is easier on the eyes. The key experiences here are the suggestive search allowing the user to pick from partial words and the experience and google maps experience.

Figure 1 Prototype

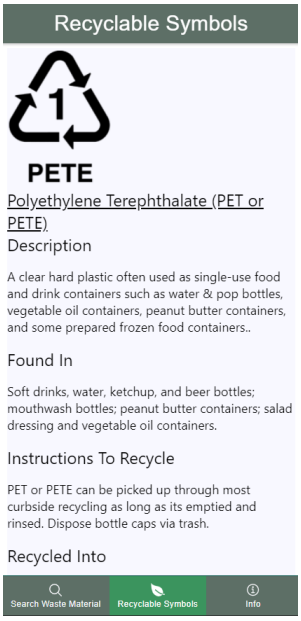


Figure 2 MVP product

Figure 1. This is the initial prototype scanning experience; this shows the details page of a successful scan.

Figure 2. This is the MVP product that I have opted to develop a static page with information on all recyclable symbols 1 to 7 instead of the scanning experience.

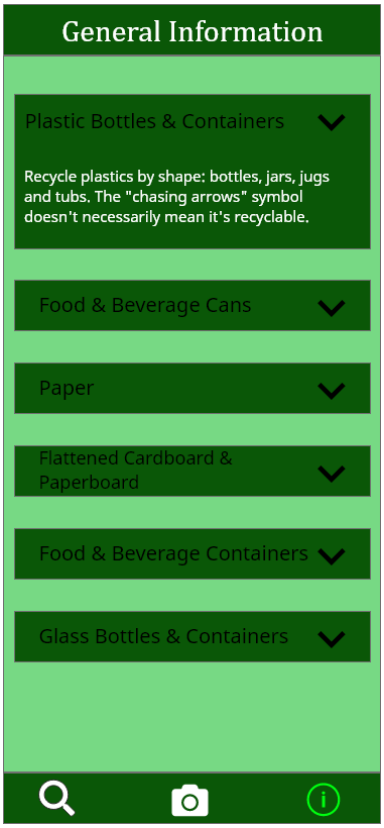


Figure 1 Prototype general info

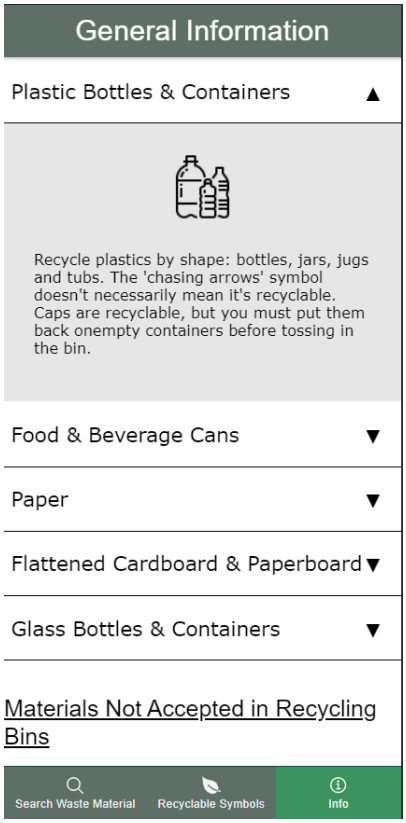


Figure 2 MVP general info

Figure 1 shows the prototype of the general information page which as ease of access information.
Figure 2 shows the MVP of general information page which is like Figure 1 but includes a picture and the color scheme is easier on the eyes.

Reflection

How I felt about this project

I really liked this project as it provides the necessary workflow to develop an application in which I can carry on in industry. These types of classes help introduce fundamental building blocks to successfully develop a working application while taking account of each variable from customers, stakeholders, Golden circle (why, how, what), technology inventory research (what is out there and how do they fill in the community's needs), and community research (experiences and activity).
Development experience was a fun learning experience. I used Adobe XD to develop my midfy/High fidelity prototypes for the first time, I found this experience easy to grasp which I enjoyed exploring different concepts of design.
For implementation I got to learn how to implement a Node Js backend working in tandem with my MySQL backend to communicate with my Angular frontend. I have used Ionic framework SDK and Angular in previous projects which was good to brush up on.

What went well during the project?

Implementation of the first and last functionality was successful. I was able to implement them from a prototype to a working application and I was able to add a little more functionalities/experiences such as the suggestive search bar, ordered google maps implementation using base URL and passing in longitude and latitude.

What did not go well during the project?

The second functionality did not go well during the project as I was unable to implement the scanning functionality, this is the functionality that I found the most interesting and excited to implement. Unfortunately, I am slow to implement with the time constraints I opted into a static web page to output information to the user. This loses its key experience of learning through interactivity.

Software design activities and findings

This application's purpose is to provide users with a search utility and quality information on recyclable items. This relates back to the community orientation of content system, heavily on a library variant. The content on this application will allow the user to locate and learn on the go. In respects to Community of Practice/Digital Habitat this application satisfies the three dimensions, domain, practice, and community. Domain wise this application focuses on the environmental longevity of life and natural habitats on earth as much as possible through common interest within the community. Practice wise the application focuses on forming and enforcing a recycling habit by having a tool that provides relevant information on recyclable materials. This allows the user to not only consume the knowledge but also use it in practice. Community wise the application does not connect the users together rather it

connects them together through the common activity of recycling for the greater good, meaning that everyone is responsible for his or her recyclables.

What would I do the same on future projects?

I would do the same research before diving into implementation. The research gives a good overview on key experiences that users may want in the application, what technologies are out there today and how would you develop to envelop those experience and expand on them.

What I would do differently on future projects?

In future project I would plan better than I did for this project. I was unable to implement to the scanning functionality due to my slowness and time constraints. I would also like to use a different technology stack to expand my learning.

Opportunities and design ideas for future work

Future opportunities and ideas that I would like to implement are the scanning functionality, user input for different user locations, and the idea of gamification into the application. The scanning functionality was one of the intended functions I proposed, I would expand to just scanning a product and retrieving information on it rather than just scanning the recyclable symbol. User input for different locations to allow the user to locate recycling centers in different cities. The idea of gamification was an interesting topic in class where I could implement some point system for the amount you recycle.