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Project Design

Introduction

The idea of being able to convert waste materials into new materials and objects is something that the majority of the consumers support. On the other hand, the recyclability of a material depends on its ability to reacquire the properties of its original state, and this makes each product have different recycling instructions, symbols, and processes.

What studies have shown over the years, is that there is a big gap between the desire of recycling and the real process, indeed we can notice that yearly only less than ten percent of the words waste is properly recycled. Therefore, I believe that the recycling process should be addressed as a complex process that needs to be studied, understood, and innovated in order to be successfully effectuated.

Furthermore, research shows that the recycling process faces problems that vary from having a poorly trained staff with a lack of expertise in the field, to having a very high percentage of contaminated recycling bins that end up being thrown into landfills. When addressing the problem of having a very high percentage of contamination of the recycling bins, we can deduce that it is caused by wrong categorized or contaminated items, and it is the result of the lack of education on how to properly dispose from the consumer point of view. Indeed because most recycling items have special instructions, symbols, and processes the vast majority of consumers are not well educated on these.

Solution Approach

In order to help reduce the number of contaminated recycling bins, consumer awareness is needed. In fact, based on a study conducted by the Carton Council of North America, 73% of Americans consider that they could be more knowledgeable about how to properly dispose of waste. This is why not only consumer awareness is needed, but also consumer education. Indeed,

in order to help solve this problem, I will be creating an easily accessible tool that would serve as a recycling 101 educator, as well as a recycling encyclopedia.

This tool consists of an iOS app, that would provide the user with a friendly interface to either learn about recycling or to do a search on how to recycle a specific product. Furthermore, the user would have the option to manually search or scan a product's barcode in order to get the recycling instructions, or the user would also be able to learn some basic recycling information and knowledge on the most common and most used recycling symbols, a reminder of the most common mistakes when recycling, and a Miami-Dade county map with important recycling locations.

The goal of this app is to provide the user with a tool that would help them build a better judgment on the moment of classifying an item and disposing it in a recycling bin, that hopefully would help reduce the amount of contaminated recycling bins in South Miami.

Analysis approach

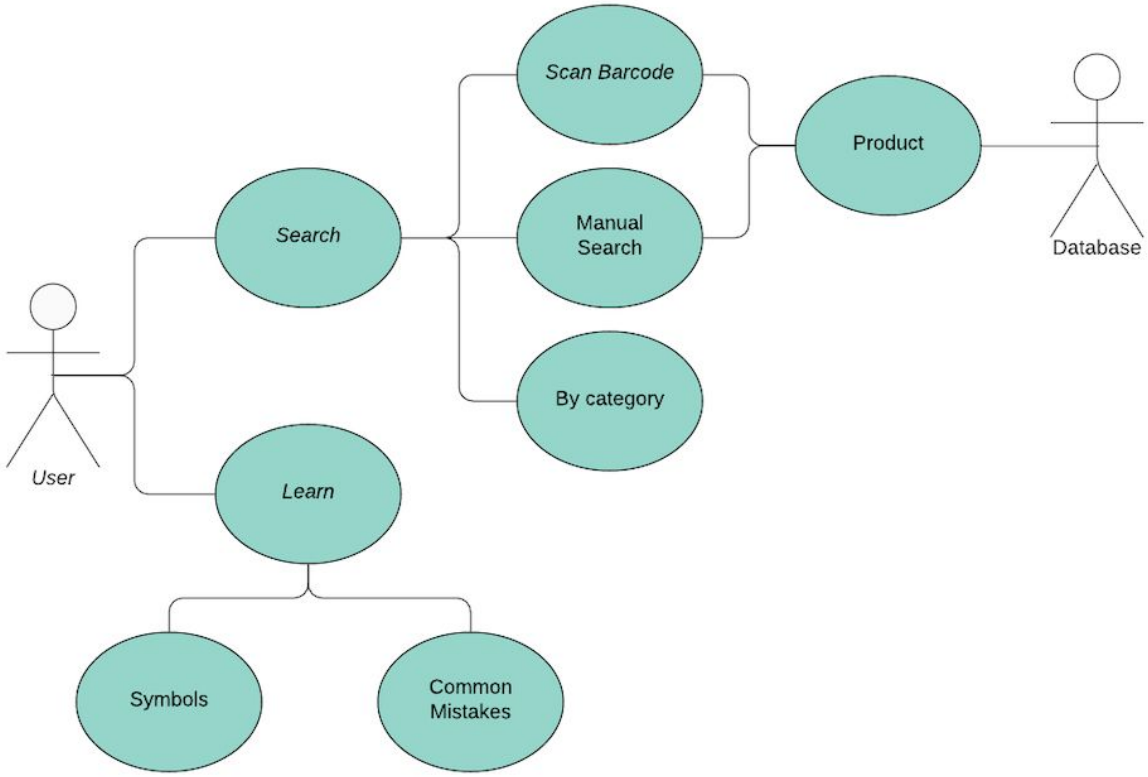
I believe that recycling is a process that everyone should not only support but also should be educated on and actively participate in. Even though throughout my entire life I tried to actively recycle, I faced many times the question: Can I recycle this product? or How should I recycle this?, and every time I had to use my judgment to answer it. Additionally, by noticing the huge negative impact that contaminated recycling bins have, and how this lack of knowledge goes back to the daily lack of recycling knowledge questions, I realized that an accessible consulting recycling tool was needed.

Indeed, I believe that by providing a friendly user interface with recycling information and searcher, the user would be able to quickly answer this question and have a day to day tool that would help improve their recycling habits and their knowledge on the topic.

Additionally, I believe that the most efficient way to provide this tool to the consumer is through an app because it is a very accessible format that would provide a quick response, and the interface can be very friendly. Moreover, when needed to search for a product, an app would be

the fastest and most comfortable way to get an answer. By including a barcode scanner, the user would be able to have a faster and most comfortable way to search.

Use Cases Design



Through this app, the user would be able to either search for information about a product or learn some recycling 101.

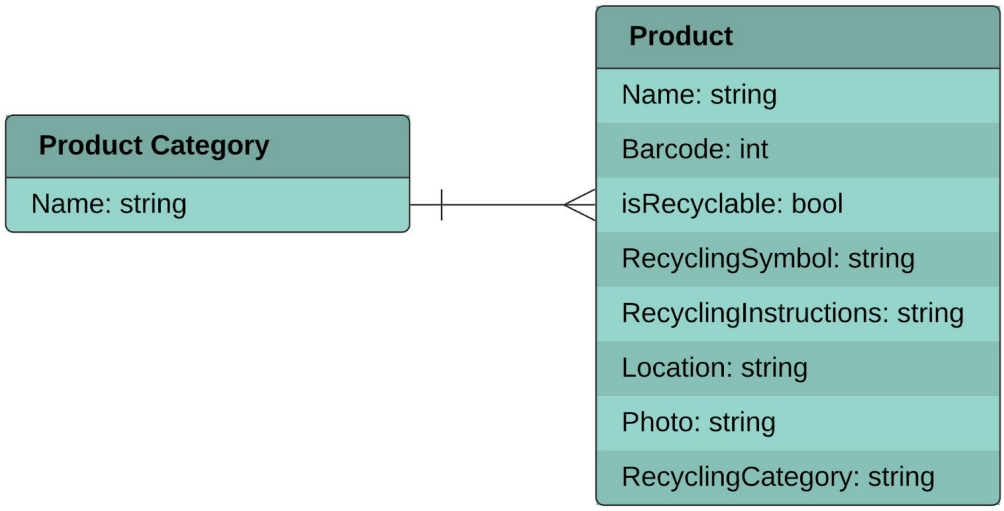
If the user wants to search for a product: they can either search based on a barcode scanner or it can manually search. For the barcode scanner, the user would use their camera's phone to scan the product's barcode, and if found the product recycling information would be displayed. If the user decides to manually search for a product, this search can either be by the product name, product category, recycling symbol, or recycling category. Depending on the user's search input the recycling information for the input search would be returned. These searches would be using a database that includes eight attributes, and a vast majority of products.

If the user wants to learn some recycling 101: the user would be able to access information about the most used recycling symbols, with its recycling instructions, the most common mistakes when recycling, so a basic reminder of what to do or not to do, and it would display Miami-Dade recycling locations, dividing into specific categories.

Database Design

For this project, I will be using a database that includes eight attributes. The attributes are the product's category, name, barcode, a simple yes or no if it can be recycled, and if applicable the recycling symbol, the instructions on how to recycle it, locations where to recycle it, and a picture of the product. The products will be divided into six recycling main categories which are: paper and cardboard, aluminum, glass, plastic, electronics, and others.

The database will be created based mainly on the Miami-Dade County "Recycle Right A to Z" list, which includes the product name, recycling instructions, and if applicable specific locations of where this product can be recycled. I will be adding the recycling symbol, photo, and barcode. Please find below a database design diagram, as well as an example of how the database would look like and how it would be filled out.



Product Category	Name	Barcode	isRecyclabe	Recycling Symbol	Recycling Instructions	Location	Photo	Recycling Category
Aereosol Can	Lysol Professional Disinfectant Spray	36241760755	FALSE	NA	NA	Na	lyson.png	Other
Aluminum cans	Diet Coke	49000074895	TRUE	alu	Dispose on recycle bin	Na	dietcoke.png	Aluminum
Aseptic containers	Cashew Milk Unsweetened	744473915156	TRUE	21PAP	Dispose on recycle bin	Na	cashew.png	Paper and Cardboard

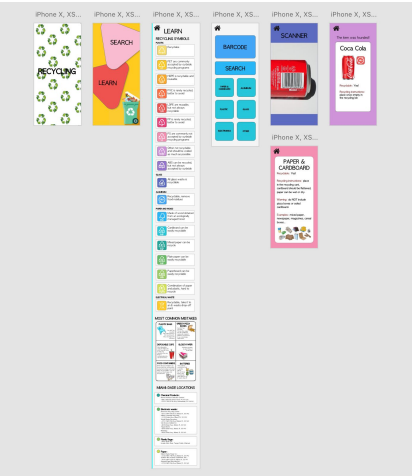
UI Design

The UI Design shows a draft of how the app would look like. For this design, the framework was built with iPhone X, XS, and 11 Pro, in mind and includes the main screens that the user would be interacting with, as well as a search barcode example and main category search example.

When opening the app, the first screen has the logo and would be shown for 2 seconds, automatically this screen would transition to the home screen which includes two buttons, one for searching and one for learning.

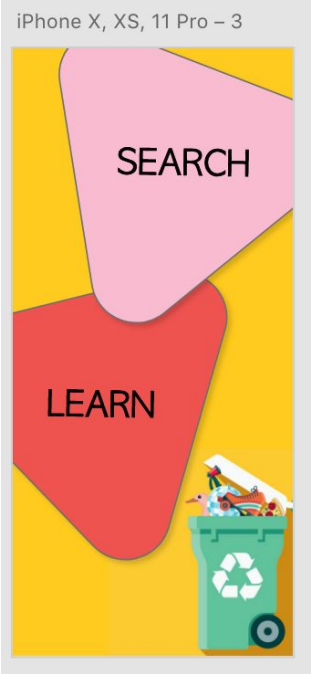
When searching, the user would have the option to choose from a series of buttons, these include the search using a product barcode, the manual search, or each general category search. When clicking on the barcode search, the user would have to enable the camera to scan the product barcode, and if recognized, the products recycling information would pop up. When manually looking, the user would input the search and if found the recycling information would be shown. If the user just wants to search a general category, when clicking on one, the general information about this would be shown.

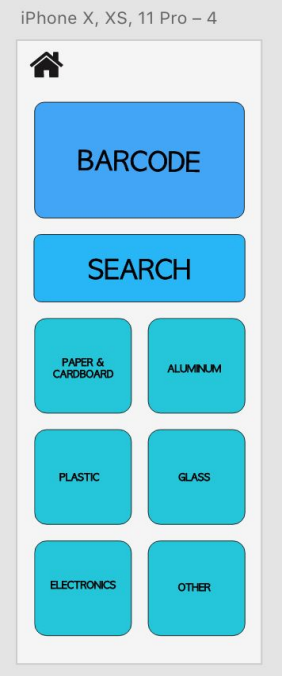
By clicking on the learn button, a single screen would display information about the recycling symbols, a friendly reminder of the most common mistakes, and the user would be able to look in a Miami-Dade map for the recycling locations organized by category. Below, you can find a draft of how this app will look like.

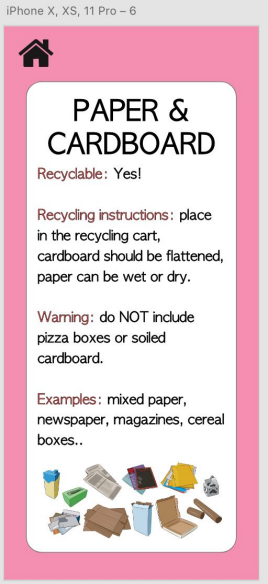


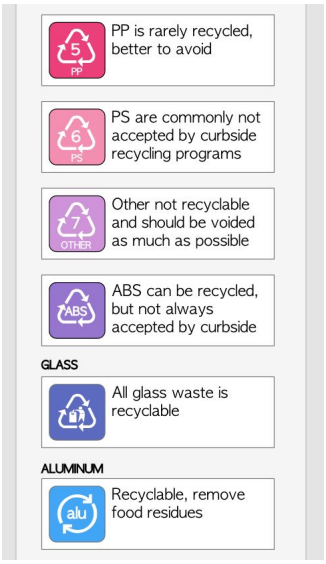
General UI Design :

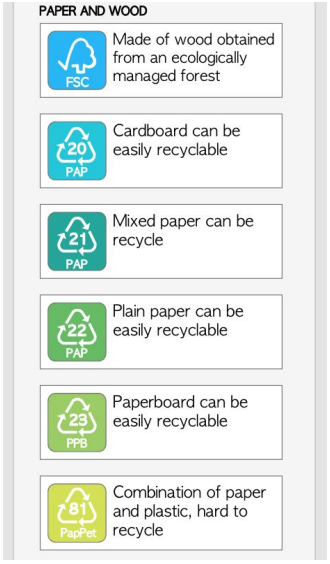
By Screen:

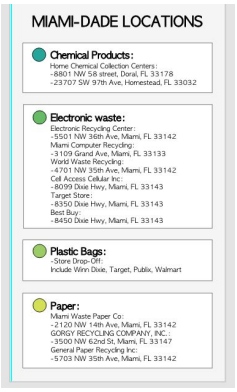












Choices of Technology

I will be implementing this app using Swift, which is a powerful programming language for iOS app development.

I decided to choose this language because, after some research, I learned that this language combines the performance and efficiency of compiled languages with the simplicity and interactivity of popular scripting languages. In fact, it is a language that has a very concise yet expressive syntax, the development time is relatively fast, which is needed for the time frame that I have to develop this project, and is easy to read and write. Another feature of this language that I like is the fact that allows the code flexibility to be extended in the future, therefore I could

in the future add new features to my app. Therefore, Swift is a modern, fast, and powerful language that would allow me to implement all my app goals in the time frame needed.

Conclusion

In conclusion, even though there exist numeros sources to learn how to recycle daily, the general consumer does not properly classify its recyclable items correctly, which leads to a high percentage of contaminated recycling bins that end up in the landfills. That is why, I believe that by creating a friendly tool where people would be able to get specific recycling information, this problem could be reduced. In fact, through this tool users who care about recycling, but not necessarily know how to properly do it, would be able to easily and quickly solve the recurrent questions: How should I recycle this? or Can I recycle this?. Finally, I believe that this app can have a very positive impact on the environment and reduce the percentage of contaminated recycling bins, especially in South Miami.