Engineering Design - GNG 1103 [C]

Project Deliverable H
VR/AR for Recycling

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Section C03 – Group 11

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Abstract

The product was further developed to complete the final prototype. After changes were implemented into the previous prototype, the product was tested again, and further improvements have been planned. The changes to the last prototype are described in this deliverable and future changes are outlined. Like the last prototype, the final improvements to the product will be improvements to the sorting system and the website.

Introduction

The project team has updated the app based on recent feedback for the previous prototype. The feedback focused on improving the looks and usage to encompass more items. The majority of these changes pertained to the aesthetics and variability of the app. This prototype includes an app with an improved user interface, manual sorting search bar and categories, and AR scanning. For the website, features include manual sorting features, a map with various recycling plant locations, a sorting game, a chat forum, and educational links to trusted sources on recycling news.

This third prototype aims to polish all remaining aspects to produce a working app with all necessary components. Improvements made mostly focused on enlarging visual components, such as the search bar, and expanding existing features such as the AR database and options available for manual sorting.

In this deliverable, the third prototype of the app and website were further developed, the test plans for functionality were repeated and adjusted accordingly, and the improved version was shown to potential users and the client. This deliverable explains the changes made on the third prototype and their impact, as well as how the changes correspond to the received feedback from the second prototype. Finally, the test plan will be elaborated upon along with plans for any minor adjustments for the final product before design day.

Prototype III: Updates and Changes

App
Main Screen and Button Layout

For the final prototype, a few changes were made to the main screen of the app. The background was returned to a single, solid colour as feedback received indicated issues with reading the title screen. A darker blue was used in the foreground to stand out against the light blue background. Additionally, a recycling icon was added to the middle of the screen to provide more detail and something to look at.

The button layout only had a few changes to correspond to other changes made throughout the app. One change made was the button colours as to match the changes made to the title and recycling symbol as it helps to stand out from the background. The final change made to the main screen was the right-most button, previously named as "SOCIAL" was renamed as "LEARNING" to better define the work that was done. This button will redirect the user to a page with links to trusted sources on recycling and recent news and a link to the created website.
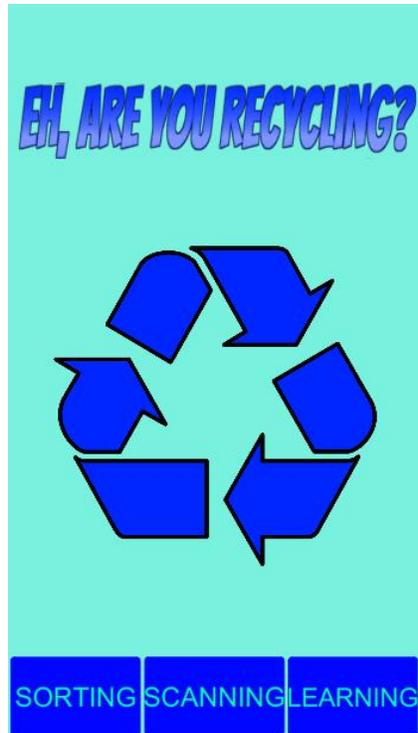
Figure 1: Home Page of App

Search Menu/Manual Sorting
For the final prototype, a handful of key updates were made to the Search Menu and Manual Sorting components. Most of these changes pertained to the aesthetics of the components and implementing some of the feedback specified in the previous prototype.

The box below the search bar was enlarged so that more possible options from the database could be displayed as the user begins to type their item and the larger space also allowed for the error message to print out nicely. Additionally, the search bar has been modified to only output suggestions after the first two letters have been typed into the search bar (figure 2). Additionally, the search bar no longer presents suggestions when gibberish is typed into the search bar (figure 3). These additions will help the users better find items that match what they want to recycle. Additionally, the database was updated to include many more common household items.
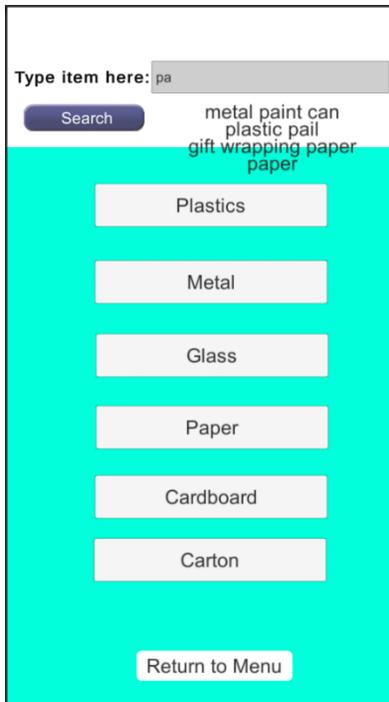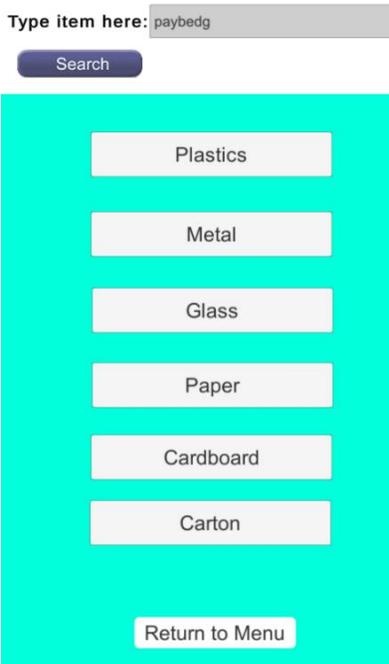
Figure 2: Search Bar Dropdown

Figure 3: Gibberish in Search Bar

The manual sorting pages were updated with new visuals and every section within the sorting menu was completed with images along with coloured text to help users determine which bins

certain items go into (figure 4). Every button was tested to ensure that the user can return to the sorting menu after arriving at a page.

Figure 4: Manual Sorting Page - Carton

AR Sorting
In the third prototype the AR camera was integrated into the rest of the app and is now accessible from the title page. A return button was added to the AR camera and the database was expanded further.

Website
Few adjustments were made to the website for prototype 3. The minor changes that were made mostly expanded the manual sorting database and adjusted the presentation, so some information was clearer.

The most significant change to the prototype is the addition of a second map that includes locations of waste bins on the University of Ottawa's Campus (figure 5) and the change of the format of special recycling locations map (figure 6).
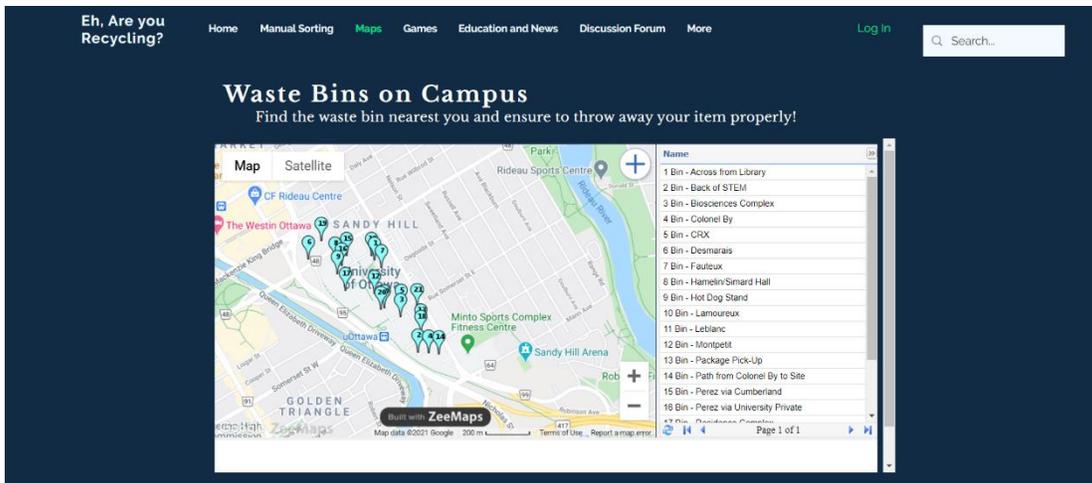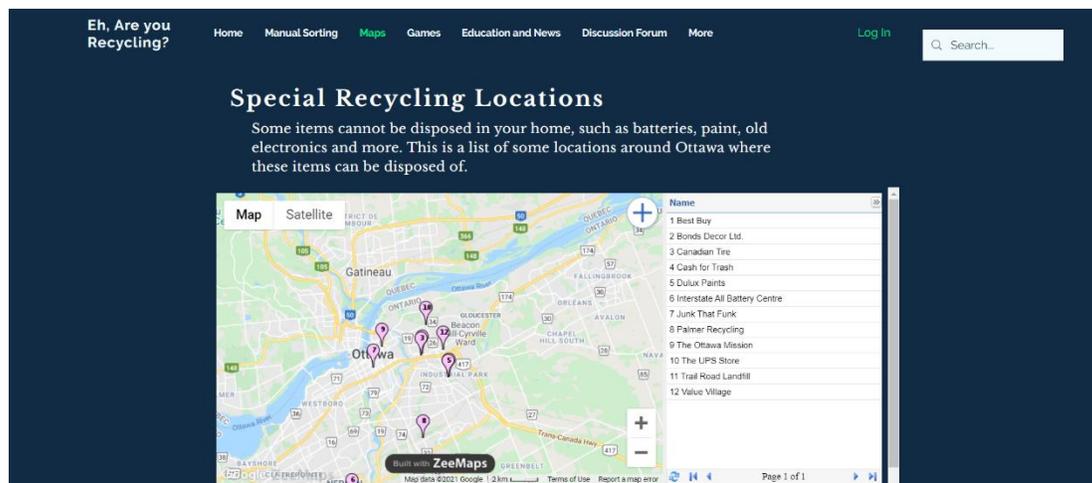
Figure 5: Waste Bins on Campus Map

Figure 6: Special Recyclables Locations Map

The change of the initial special recycling locations map was made to maintain consistency between the maps and the addition of the waste bin map was made because the client showed an interest in the concept. It is isolated to the campus because Mr. Bouchard is an alumnus of the university and is enthusiastic about increasing recycling on campus and this will encourage student use of the website and app. The University of Ottawa campus was chosen as a trial location, but in the future the map will be expanded to include other parts of the city and even other cities within Ontario and Canada.

Test Plan

After completing previous deliverables and prototypes, the final prototype has been created. The third prototype was shown to more users for further feedback on the functionality of the product as well as the aesthetics for final adjustments before the final design.
The subtasks for the development of the final prototype have been distributed evenly through the members of the group to ensure the product is finished on time.

Why are we doing these tests?

Testing the prototypes is an important aspect of the design process for multiple reasons. It can show the faults in the product and areas where further development is needed and it can be shown to the client and potential users for feedback about aspects that should be added, removed, improved, or changed. Continuous prototyping also allows the creators to continue to gain a better understanding of the software and materials that are being used for the final product, after initially learning the software for the first prototype. The improvements are completed much faster because the initial learning stages are over. The final prototype should contain all features planned for the product and there should be few changes made after completing this prototype for the final product.

What is the test objective and what is the prototype description?

The testing of the third prototype has been done with the purpose to find the few flaws that still exist so they can be changed for the final product. The tests for both the app and website are being tested on overall functionality and aesthetics rather than regarding features that should be added or removed to ensure the small improvements based on feedback can be made.

What is the test?

The lasts tests to be conducted focus on the functionality of the prototype with its existing abilities and the aesthetics of the product. Some key tests to ensure the prototype operates as desired include:

- Is the app easily navigated? Is the website easily navigated?
- Can the AR recognize items with and without bar codes?
- Does the search function work on the app? The website?
- Can the manual sorting mechanic guide the user to the correct item?
- Can the app be accessed on all platforms? If not, which ones are available?
- How are the aesthetics of the product?

Tests will be conducted by allowing family members and friends to try the second prototype and provide feedback. This testing is more focused on improving the functions with some final small changes.

How will the results be used?

The results from these tests will be used to help improve upon functional aspects of the prototype and to improve the look of the product. The results of the testing will indicate the small weaknesses in the product that can be fixed for the final design.

When is the testing happening and how long will it take?

Testing will occur over a day to allow multiple people to try the product at a time that it is convenient for them. The tests will likely take less than an hour for each person and feedback should be received immediately after or during. Testing will occur early enough to prepare our practice presentation on Monday.

Feedback and Analysis

The final prototype was tested by a group of users to acquire more feedback and improve the last prototype before the final product is presented at Design Day.

App

Minimal additional feedback was returned with the final prototype of the app. While some feedback from the previous prototype was present once more, it was unfortunately not within the time constraints or knowledge of the workers to incorporate the feedback in the design. Some additional feedback was as follows:

- On the phone the app had two bars of uncoloured space that wasn't used

The feedback was mainly on a presentation error that doesn't detract from the app but could improve the appearance. In future trials this will be addressed since the error seems to be in the aspect ratio chosen in unity. Unimplemented Feedback from previous installments will also be attempted to install in future like the ability to search for bar code numbers in the manual search bar.

Website

There is minimal feedback regarding the final prototype of the website. The only feedback that was received regarding the website is the following:

- Add information about users being able to add locations on the maps themselves

There is a new function where users can add locations to either map by clicking the '+' symbol in the top right corner, the current prototype does not have any information about how users can add locations and to improve this, instructions will be added below both maps.

Conclusion

Testing of the final prototype has been done and the feedback has been acknowledged and small changes for the final product have been planned. The third prototype improved the sorting functions of the app and the website's map features have been expanded upon. The manual sorting has also been improved on in both the app and website by having a better search bar and improving presentation through aesthetics.

Wrike Screenshot

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=6Tw9wvBv0S41Zyy2NkVmmzVJJo2IJflX%7CIE2DGNJSGE3DMLSTGE3A