GNG1103

University of Ottawa: Faculty of Engineering

Project Deliverable H: Prototype III and Customer Feedback

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Group 4

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Abstract

In the previous deliverable, the second prototype was built, consisting of many of its core features. This deliverable aims to make the third and final prototype consisting of all the app features, most of which are in or close to their final form. The app also was tested by peers and community members who gave valuable feedback for the app.

Introduction

In the previous deliverable, prototype II underwent development and was subject to community feedback to add finishing touches to the final product. The purpose of this deliverable was to continue building off of prototype II and to continue creating more aspects of the application. This deliverable will be divided into three main sections: prototype III, community feedback, and the project's next steps.

Prototype III

This prototype's main focus was to complete the "game" portion of the program, the rewards market, and the help page. This prototype was mode code-intensive as it introduced several new vital aspects to the application. Also, plenty of debugging along the way was completed to ensure all the coding worked.

The Home Screen

The home screen application will be the first screen the user sees when they open the application. Adding on to the previous prototype, the home screen underwent a "coin counter" and a progressive daily reward system and a new button. The new button simply links to the game portion of the application, which was previously expected to be after the user sorts their trash (hence, accessible through the 'Sort Your Trash!' button). The coin counter keeps track of the user's coins. The new currency system will be discussed

further in-depth in ***The Rewards Page*** section. As for the daily progressive reward system, the user must log in every day to increment their rewards. This ‘day’ system is based on when the user claimed their reward, not on the actual time. The user has a ‘day’ (24 hours) to keep their streak once their next reward is available. Refer to figures 1.1 and 1.2 to see the daily reward system and coin counter in action.

The home screen also has new features regarding its background colour; however, these pertain more to ***The Rewards Page*** and discuss in that section.

Further development of the home screen is not required. Overall, the group is content with the home page, and no more changes will be made unless a new idea comes to mind or a change must be made.

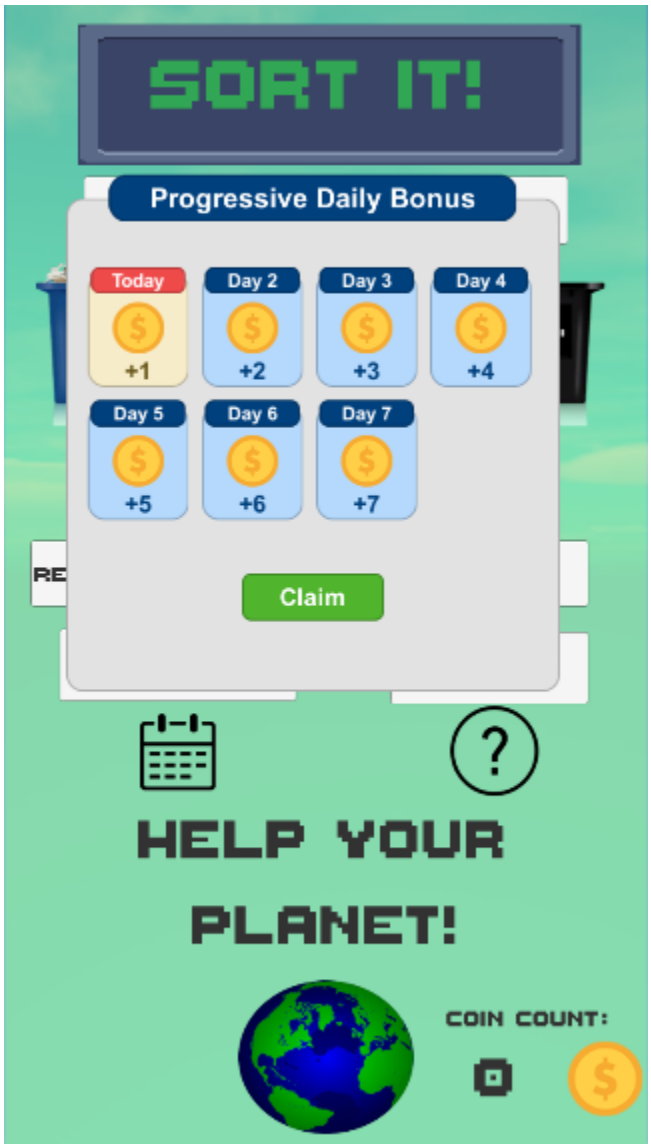

Figure 1.1: Home Page with Daily Bonus (before claim)

Figure 1.2: Home Page with Daily Bonus (after a claim)

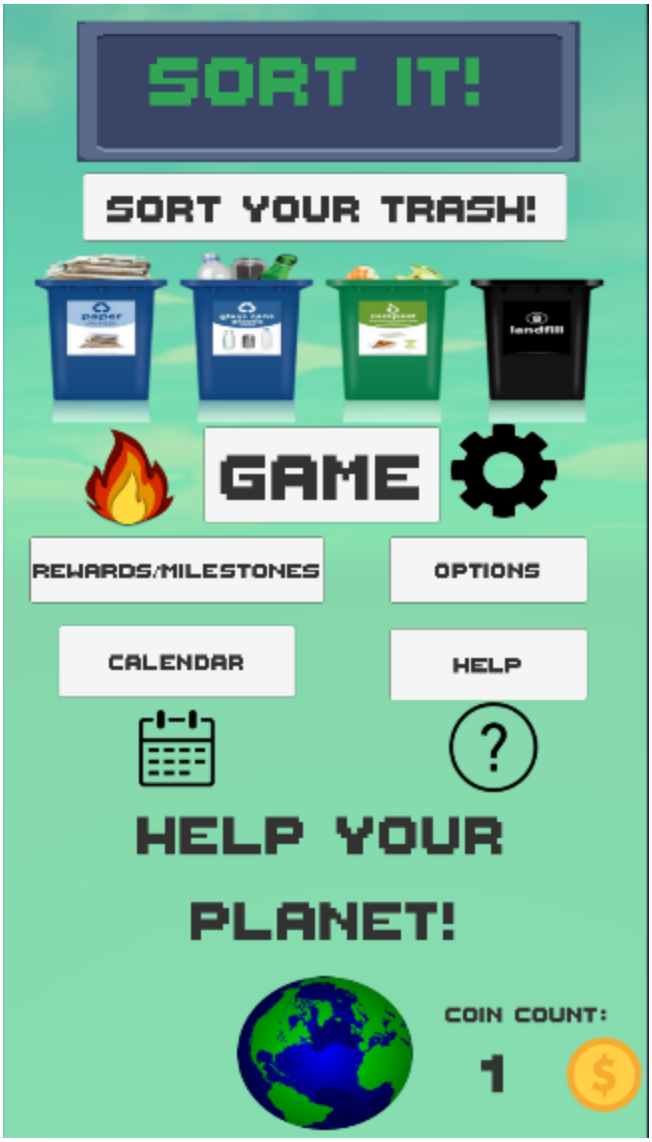

Figure 1.3: Home Page after Collecting Daily Bonus

The Main Screen

The main screen, also known as the AR scanning screen, is the most crucial part of the application. This page will allow users of the app to scan their recycling products and sort their products into the correct recycling bin. Figure 2.1 below demonstrates how the main AR screen of the application will look on Unity. The black background on the screen indicates how the main screen will be using the camera input as the background.

Regarding what needs to be completed for the final design, the app must be tested on the phone. The testing needs to involve multiple items to make sure the app is reliable.

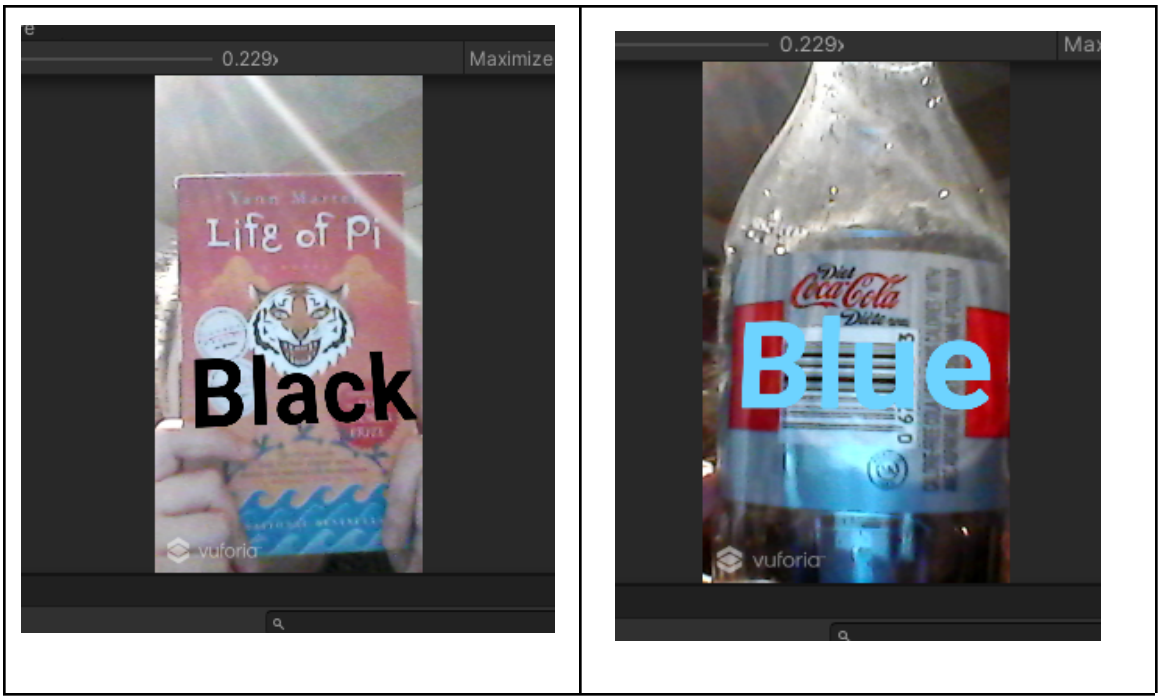

Figure 2.1: The app identifying recyclable materials

The Game Page

The game page is a sorting game and used to learn about what items should go in which bins. In figure 2.2, you can see there are instructions, labelled boxes, a recyclable item and buttons. The game allows the user to drag the object into the correct bin. The item cannot be placed in the incorrect bin. Once the user gets the correct answer, they can go to the next level by clicking the ‘next’ button. If they are finished with the game, they can click the ‘back’ button to go to the home screen.

Regarding what needs to be completed for the final design, the app must be tested on the phone.

Figure 2.2: The Game Page

The Options Page

The options page offers an area where users can input their address and control other essential app functions like volume and language. Illustrated in figure 3, everything in this prototype is new to the app's development and features input boxes for the users' name, address, and save, load, and return to the main screen button.

For prototype III, a volume button was implemented into the system.

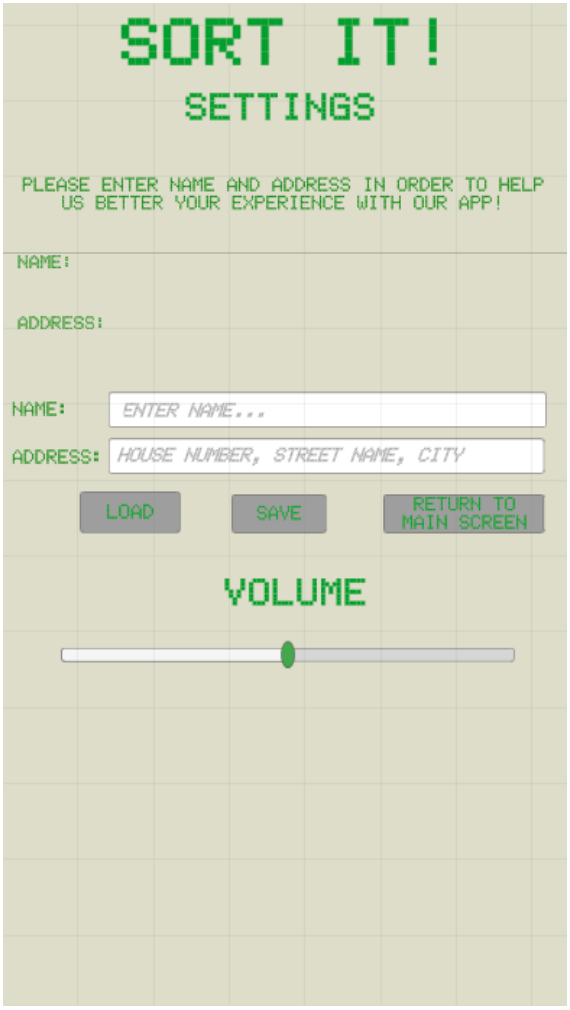

Figure 3. The Options Page

The Calendar Page

The calendar will inform the user of the dates when recycling is being collected in their city/area. The user will manually input their location, and the application will automatically collect data regarding their city's recycling policies. Furthermore, the user can manually input the dates that they deem necessary, and the app can remind them of those too. It features an embedded web feature that displays the Ottawa Collections Calendar site, where users can input their address and get their collection dates in calendar form.

There is nothing that needs to be completed for prototype III, as this page is complete with all features it requires.

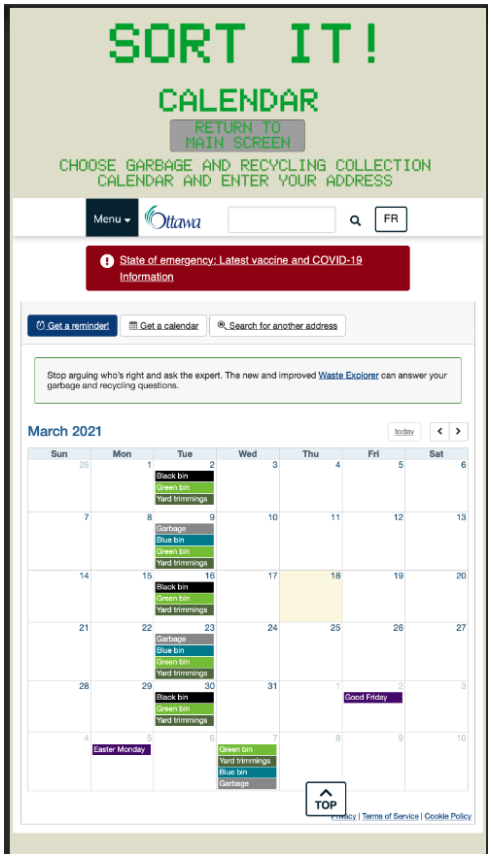

Figure 4: Calendar Page

The Rewards Page

The Rewards Page has implemented a lot of new features. Firstly, now users can immerse themselves in the new currency system. This system uses coins, which can be gained from daily logins (discussed in ***The Home Screen*** section), from milestones (to be discussed soon), and from getting the correct answer in the game. The user can use these coins to purchase new backgrounds for the home screen. The buttons that the user uses in the rewards page update with the user's coin count to ensure the user does not purchase background with insufficient coins. Refer to Figures 5.1 and 5.2 to see the buttons and new background.

Figure 5.1: Rewards Page with Insufficient Coins

Figure 5.2: Rewards Page with Sufficient Coins

Now, let's buy the purple background, the buy button for blue will deactivate, but the buy now button for red will stay enabled. Then, we will equip the purple background, which will allow the restore to the default button. Refer to Figures 5.3 and 5.4.

Figure 5.3: Rewards Page Following the Purchase of a Purple Background

Figure 5.4: Rewards Page Following the Equipping of a Purple Background

Now, we can revisit the home page and see the changes!

Figure 5.5: Home Screen Equipped with a Purple Background

As for the milestones, these have been coded; however, they have not been tested sufficiently to test their functionality. After a milestone has been reached, a checkmark will appear above the milestone shown in Figure 5.6. After the completion of a milestone, the user will earn coins equivalent to the milestone. For example, a milestone of 15 items scanned will provide 15 coins.

Figure 5.6: Rewards Market with Milestones Completed

The Help Page

The help page is a page that will offer answers to simple questions that the user might have. There is a button on the home screen that will lead to the help page. The help page has a few questions and answers to those questions (as seen in figure 6.1), but that is not its final form. The next iteration of the help page (for the final product) will have subpages for each app section. When the user first opens the help page, they will see buttons that contain the name of the other main pages, such as “rewards” or “game.” If the user clicks on these buttons, there will be questions and answers for those sections to help the user. These pages will also have a back button that will lead to the central help page. That is the plan for the help page.

Figure 6.1: Preliminary Design for the Help Page

Testing

The testing phase is one of the most critical parts of prototyping. The main tests completed to see if the application was functioning were determining if it worked on the Unity device and if it worked on a mobile device of both IOS and Android. The Unity run's stopping criteria were whether the buttons functioned correctly (as they were scripted) and if the screen placement was good. If the AR camera background performed correctly, the mobile devices' stopping criteria were if the buttons worked on the device, if the application layout worked on a device of any screen and if it worked on both platforms.

Regarding the testing results, there was not sufficient time left to put the application through testing on a device that was not a phone. The application was tested on the Unity software, but there was insufficient time to compile and send it to a phone. The Unity software can identify recyclable materials by adding recyclable types to the front of the object.

Feedback

Feedback for prototype II consisted of two main types: expert feedback and general feedback. Expert feedback was received from an expert who has extensive knowledge and experience in coding applications. Feedback was used to discern how the application looked from an engineering perspective. The general feedback was received from the application's customers as well as future users of the app. This feedback was used to gather feedback on the user experience, whether it followed, and what the customer wants to be developed.

Expert Feedback

The expert feedback received for prototype III consisted of feedback about its overall aesthetic and the buttons and pages' function. First, the expert explained how they were not a fan of the page's overall aesthetics and how they would make the colours less harsh on the eyes. They also explained how the application should consist of uniformity throughout the pages. Other feedback received described how the tutorial and help page are synonymous, and only one should be chosen to get developed further. We were also warned to be cautious about implementing a different language throughout the application, as it might not be feasible for us to follow through.

In response to this feedback, changes were implemented in both this prototype and for the following one. Our group has decided to look over the application's overall aesthetics and cut out the help page from our development.

Other Feedback

The general feedback was received from both future application users and the customer, teaching assistants and the professor. Feedback received from the teaching assistants and professor was to add the text on top or the bottom of the screen instead of the object's top. The customer had positive feedback about our design and maintained that he had nothing to say about it.

Conclusion

For this prototype, we could continue to build off the previous features discussed in the last deliverable. We received a lot of input from many people, including experts, general users and the client. All of the feedback received will be taken into account when developing the final prototype.