GNG1103

University of Ottawa: Faculty of Engineering

Project Deliverable D: Design Criteria and Target Specifications

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Group 4

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Abstract

The previous deliverable was about the design criteria that the app needed to have. From that and the other apps' benchmarking, each group member used the needs and came up with an app idea. The group then used these ideas and made one idea for the app to be pitched to the customer. This report also benchmarks the app concept to a few other competitors in the market.

Introduction

The group wishes to create an application that scans objects and identifies where they should go regarding recycling/garbage. Specifically, the recycling bin that they belong to. In this deliverable, the group members demonstrate their concept designs, and the group will determine the best parts of each member's design. Using this, the group will coordinate and collaborate to create a group design, ultimately creating the ideal design. The group will then perform benchmarking to ensure the final product is better than its counterparts already on the market.

Group Design

The group app, called Sort it!, will include a home page, a sorting and game page, a calendar, a rewards page, a help page with a tutorial and FAQ and an options page.

Home Page

The home page is what will open up when the user first opens the app. It will have a background and the app name, as well as a few buttons. The different buttons will bring the user to the various pages. The most prominent button is the "START" button to go to the sorting page. There is also a button for the rewards page, the calendar page, the options page and the help page. The background can be a custom one, which can be unlocked. The rewards market/ Achievements section will go further in-depth. The concept image is given in figure 1.3.

Sorting Page

The sorting page is the main page of the app. It is where the scanning and the mini happen. The concept user interface will look like figure 1.1. The user will first open the app to scan their objects. Once the item is scanned, the app will render three boxes that read “cans,” “paper,” and “plastic.” The user will then drag their scanned object to one of the boxes. If the user drags the object to the correct box, then they will get one coin. If the user drags it to the incorrect box, then the two incorrect boxes will turn red, and the correct one will turn green. The user will not get any coins for incorrectly sorting. The user can keep sorting until they have sorted everything, and then they can hit a finish button to either go to the rewards page or the back to the home page.

Calendar

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.

Rewards Market/ Achievements

In the rewards market, the user will be able to purchase colourful backgrounds for the home page and the game. Also, the user will be able to see their achievements they’ve gained for successive daily logins (streaks) as well as their total scans to date.

Options

Here, the user will adjust some simple settings such as volume control and their bins’ colours.

Tutorials

Here the user can learn about recycling. There will be an FAQ where the user can get their questions answered and information about recycling in their area. There will be links to useful videos where the user can educate themselves about recycling and why it is crucial.

Figure 1.1 - 1.4: Images are numbered clockwise starting from the top left.
Figure 1.1: Sorting Page.
Figure 1.2: Calendar.
Figure 1.3: Home Page.
Figure 1.4: Rewards Market.

Ammar's Concept

The design for the app proposed by Ammar can be broken down into four subsections; the homepage, the tutorial, the sorting page and the rewards page.

Home page

The home page is a simple page that has a few buttons. The buttons are options for the user to click on. There will be one large "recycle" button, which is the main button, there will be a "rewards" button for the user to go to their rewards progress page, a "help" button for a tutorial and FAQ and an "options" button for the user to change some settings. Figure 1 shows the home page design.

Sorting page

After clicking the button, the user will be brought to this page. This page is where the bulk of the app is. It starts by asking the user to scan all objects. Then there will be some trivia questions that will give the user some points (such as cleaning something before recycling). After the questions, the app will play a small game that starts. There will be all the scanned objects floating in the middle on this page, and there will be trash bins on the edge of the screen (See figure 2.2). The user will have to drag the floating trash into the correct container to get points. Proper sorting will give points, partial incorrect (IE putting metal in the garbage) will not provide points, but lousy sorting (IE a metal hammer in paper recycling) will give negative points. The game ends when everything has been sorted. After the game, the user will get a report of all the objects they sorted. If something is sorted incorrectly, then the correct place to put said item would be displayed. The game's objective is to make the user want to use the app while getting knowledge of sorting trash. The process of the sorting page is given in figure 2.3.

Tutorial Page

If the user clicks on the help button, then there will be two buttons that pop up. One will say "tutorial," and the other will say "FAQ." The FAQ button will bring the user to a page where people can help other users (a forum). The tutorial button will start a tutorial for the user. The first time the user opens the app, a tutorial will be automatically created, but if the user wants to do it again, they can click it. The tutorial will take the user to the scanning page where they scan something. The app will frequently pause to display text and explain how to scan something. The tutorial will then go to the game page, where there will be a few prescanned things already floating. The app will then explain the different bins, such as paper recycling or metallic recycling bins. The tutorial will then play a mini-game with the user. After the game and the end screen are done, the tutorial will explain the rewards system, after which the tutorial is done, and the user will be back to the home screen.

Rewards

The user will get points when using the app. The more points they accumulate, the higher they can rank. There will be a leader board, and the users will be ranked amongst the people in their city. More points equal a higher position on the leaderboard. The users can also use their points to get points multipliers and get even more points when playing the sorting game to rank higher.

Options

The button will bring the user to an options page to change their settings like their bins, the game volume and other similar settings.

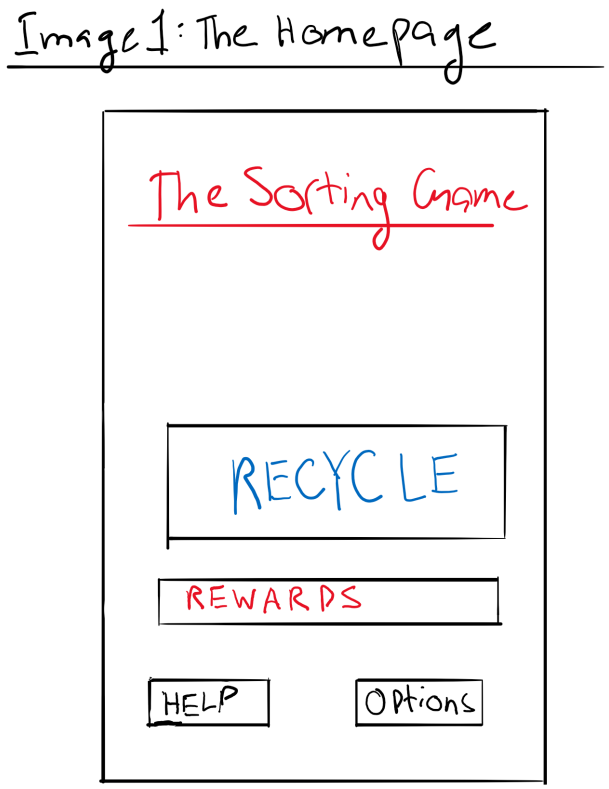

Figure 2.1 Home screen of Ammar's Concept

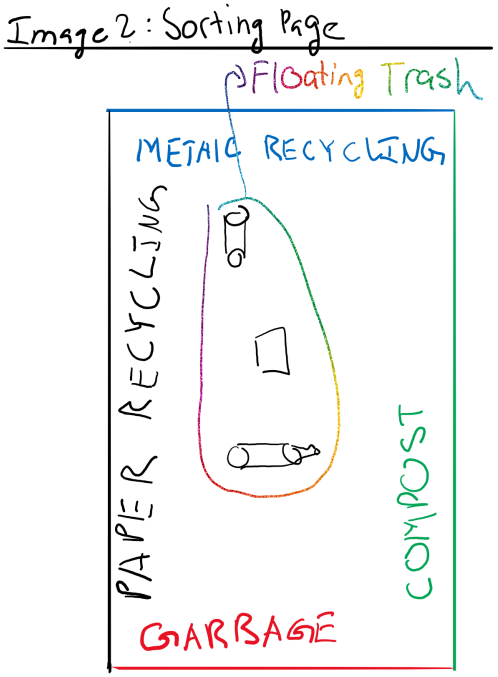

Figure 2.2. The game screen of Ammar's Concept

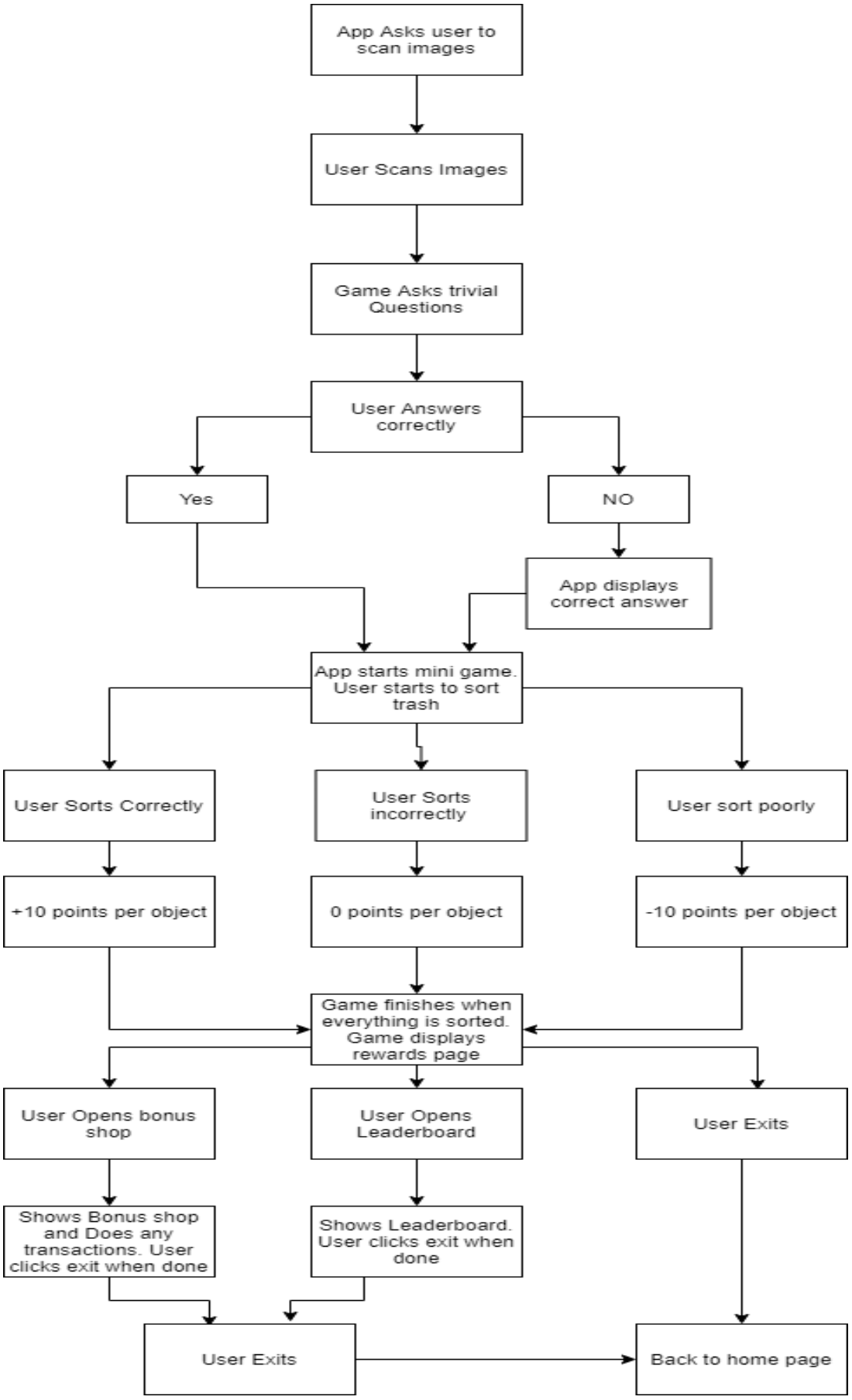

Figure 2.3: Flow chart of Ammar's mini-game Concept

Daniel's Concept

Daniel's design consists of a home page, an information tab, a scanning program and a reward system.

Home Page
The application will welcome the user and present them with three options, a button to learn about recycling, a button to scan your item, and a rewards button, which will be available throughout the program's entirety.

Information Tab
Here, the user will be able to learn more about recycling in their region. Bin colours for different materials, common mistakes made by people, and tips and tricks for recycling will be given. This information will be updated whenever necessary in accordance with the local area.

Sorting Section
The user places an object in front of the camera, and the program detects it. The program identifies the material used or the recycling symbol on the item. Then the user will guess where the object should go. If the user chooses the correct bin, then the user will gain ten coins. If the user chooses incorrectly, the program will notify them of the correct option and explain why they are placed in that bin.

Rewards System
Throughout the application, the user will be shown their coins count in the top right corner. The user will also be able to access the rewards screen, where they will be able to use their coins. The user can use their coins for raffles and perhaps for other prizes.

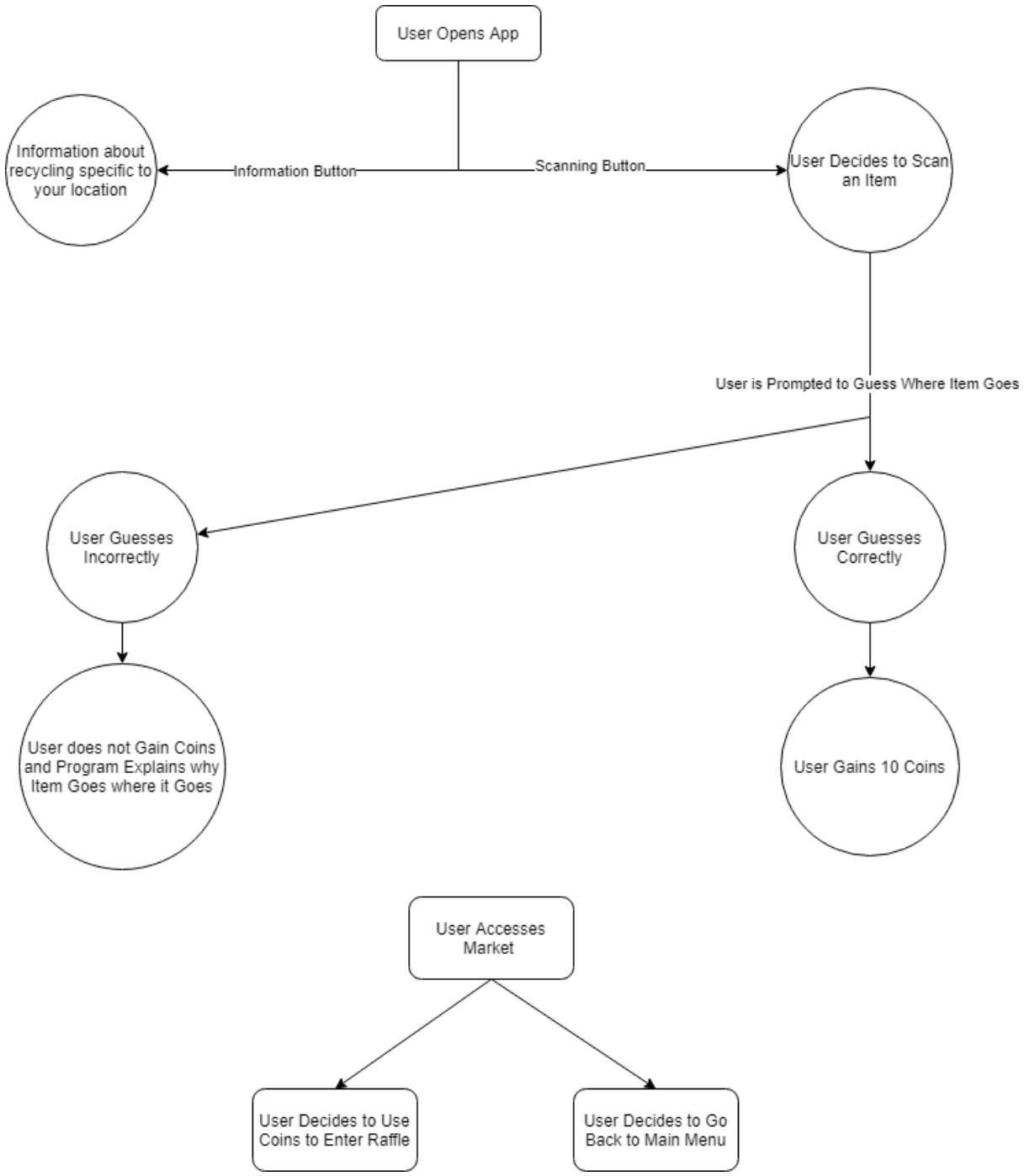

***Figure 3.1*:** Flowchart For Daniel's Design

Kayla's Concept

Kayla's design concept can be split into seven parts: the home screen, my info page, the play page, the recycling info page, the lesson's page, the rewards page and the history page.

Home page

The home page (or title page) will include a series of buttons to help the user navigate different app portions. There will be seven buttons on the page: my info button, a guide button which will provide a tutorial to app users about the basic functions of the app, a play button to bring to a page to scan the item, a recycling info page, a lesson's page, a rewards page and my history page which will allow users to view previously scanned items.

My Info

This page on the app will include the user's basic information, including their names, addresses, and account information. By signing up with our application will allow for a more customized experience among users as they can take full advantage of other app portions.

Play

By pressing the play button, it will allow users to enter the portion of the app that will help them sort their recycling. After taking an image of the picture, the user will be prompted to self-sort their item first (to have the chance to gain reward points) before the correct answer will be displayed on the screen.

Recycling Info

The recycling info page will bring up a user-tailored calendar that will display collection dates for all bins (according to their address) and specialized item drop-off locations, dates, and special notices.

Lessons

The lessons page will include various courses for the app users to take that will involve both video lessons and short quizzes, which can be used to complete different modules and gain reward points.

Rewards

While using the app, the user will gain reward points by completing different tasks and putting their reward points towards different prizes available through the app.

History

On this page, users will access the images and sorting past items scanned through the app.

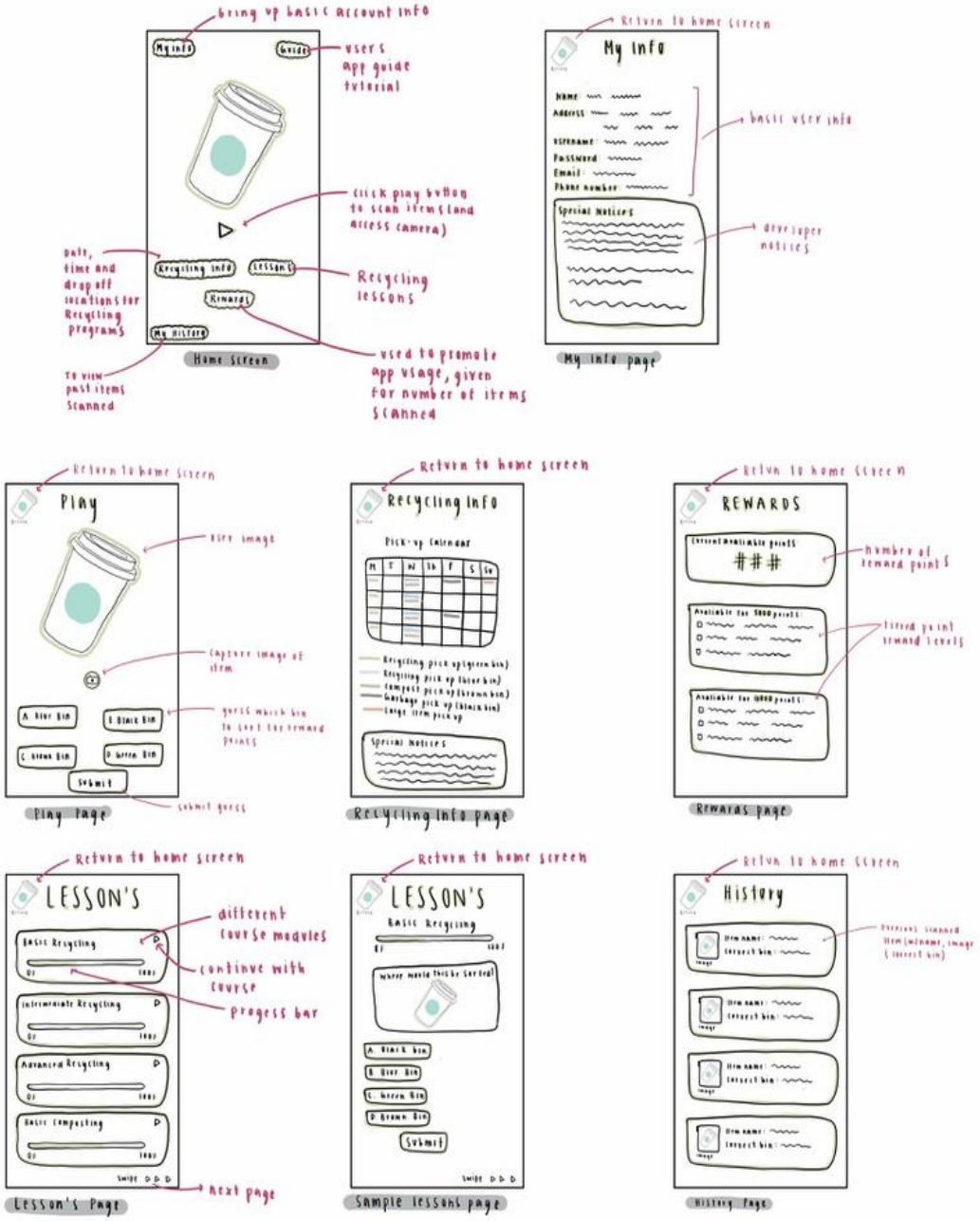

Figure 4.1. Mock-up of Kayla's Design Concept

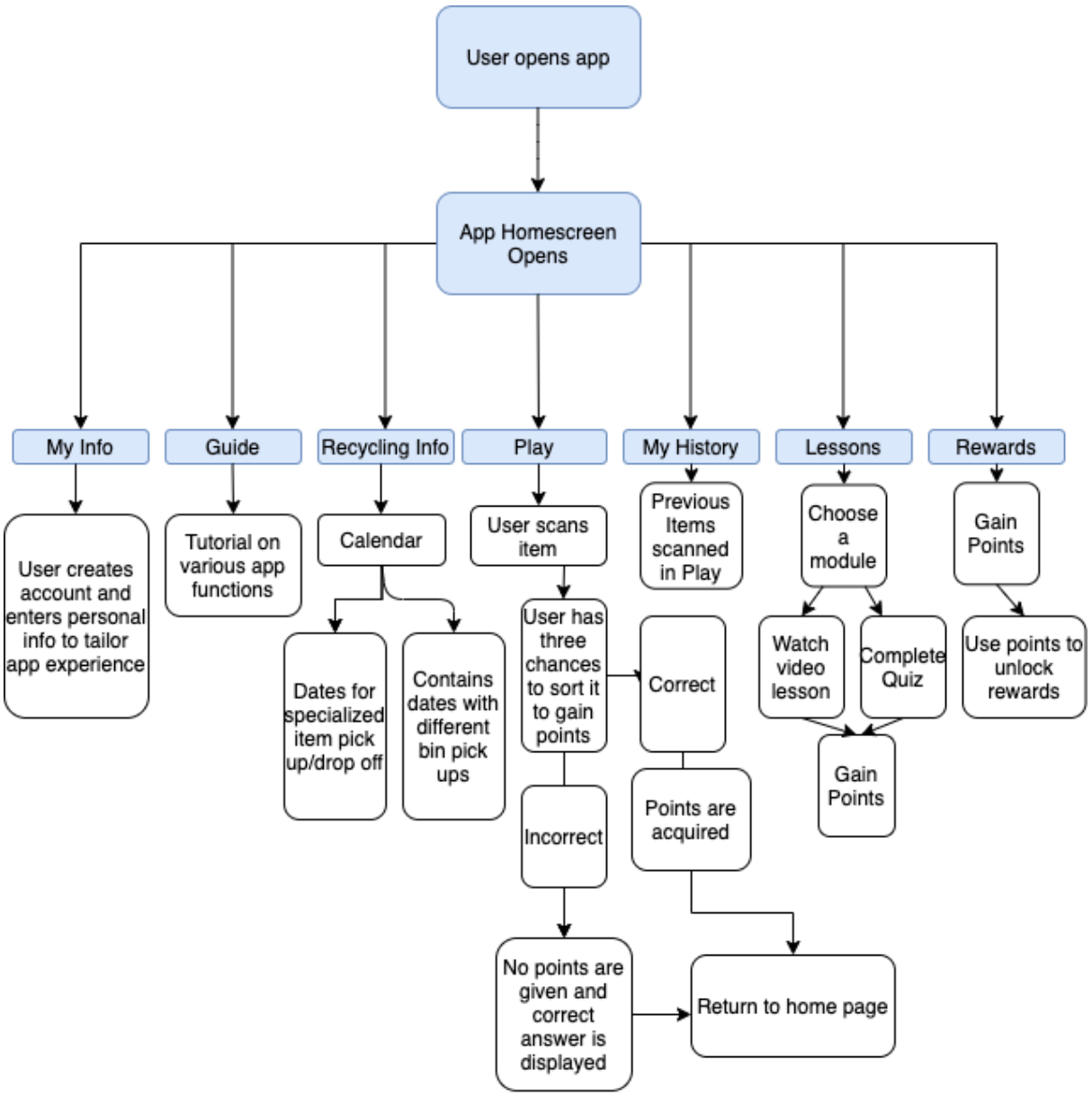

Figure 4.2. Flow Chart of Kayla's Design Concept

Sydney's Concept

Home Page

The home page has a start, rewards, calendar, about and help button. The start button brings the user to a new page where they can play the sorting game or scan their recycling. The rewards button allows the user to see what rewards they can earn or have earned. The calendar button brings the user to their recycling schedule. The about button allows the user to learn about recycling. The help button allows the user to change the game settings and contact someone to help.

Start

The user can choose if they would like to play the sorting game or scan their recycling at the start page. If the user clicks the sorting game, a short tutorial will appear. The tutorial will explain how to recycle, the importance of recycling, and how to play it. If the user clicks the scan button, a short tutorial will appear. The tutorial will explain how to recycle, the importance of recycling, and how to use the scanner.

Rewards

The reward system will keep the user motivated to use the app. You can earn rewards through the sorting game and the scanner. Some awards would include playing the sorting game ten times and scanning their recycling five times. The prizes will be simple initially and gradually increase the difficulty as the user earns more rewards.

Calendar

The calendar will allow the user to know their recycling schedule. The user will add their location so their city's schedule can automatically be put into the calendar or manually set their recycling schedule. The calendar will also provide notifications to know if it is a recycling day and what type of recycling.

About

The about button allows the user to learn more about the app and recycling. It would give information about why the app was made and FAQ about the app. It would provide information about how recycling works, FAQ about recycling and the importance of recycling.

Help

The help button allows the user to change the game settings and contact someone to help. The game settings will include sound, video, and camera.

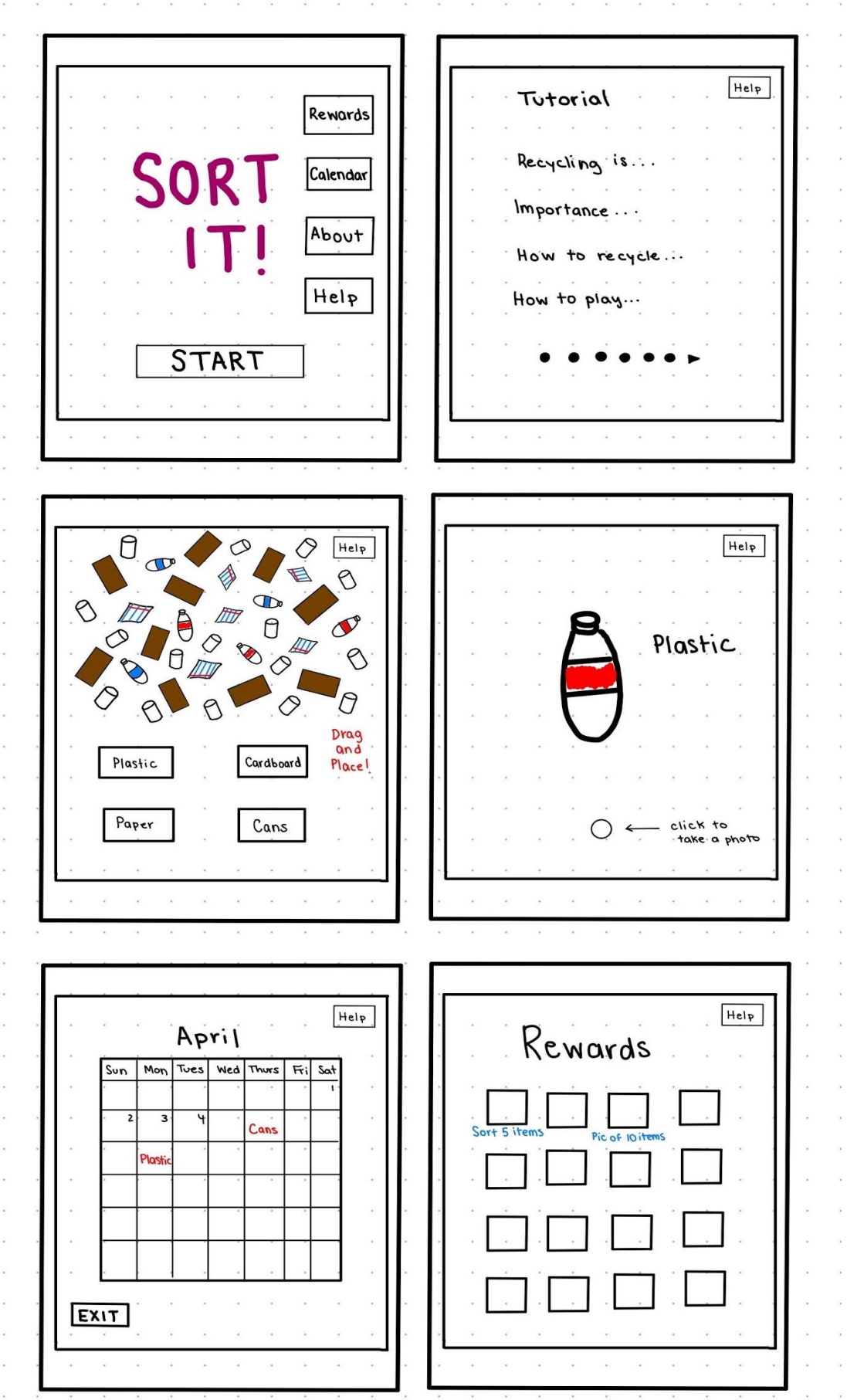

Figure 5.1. Mock-up of Sydney's Design Concept

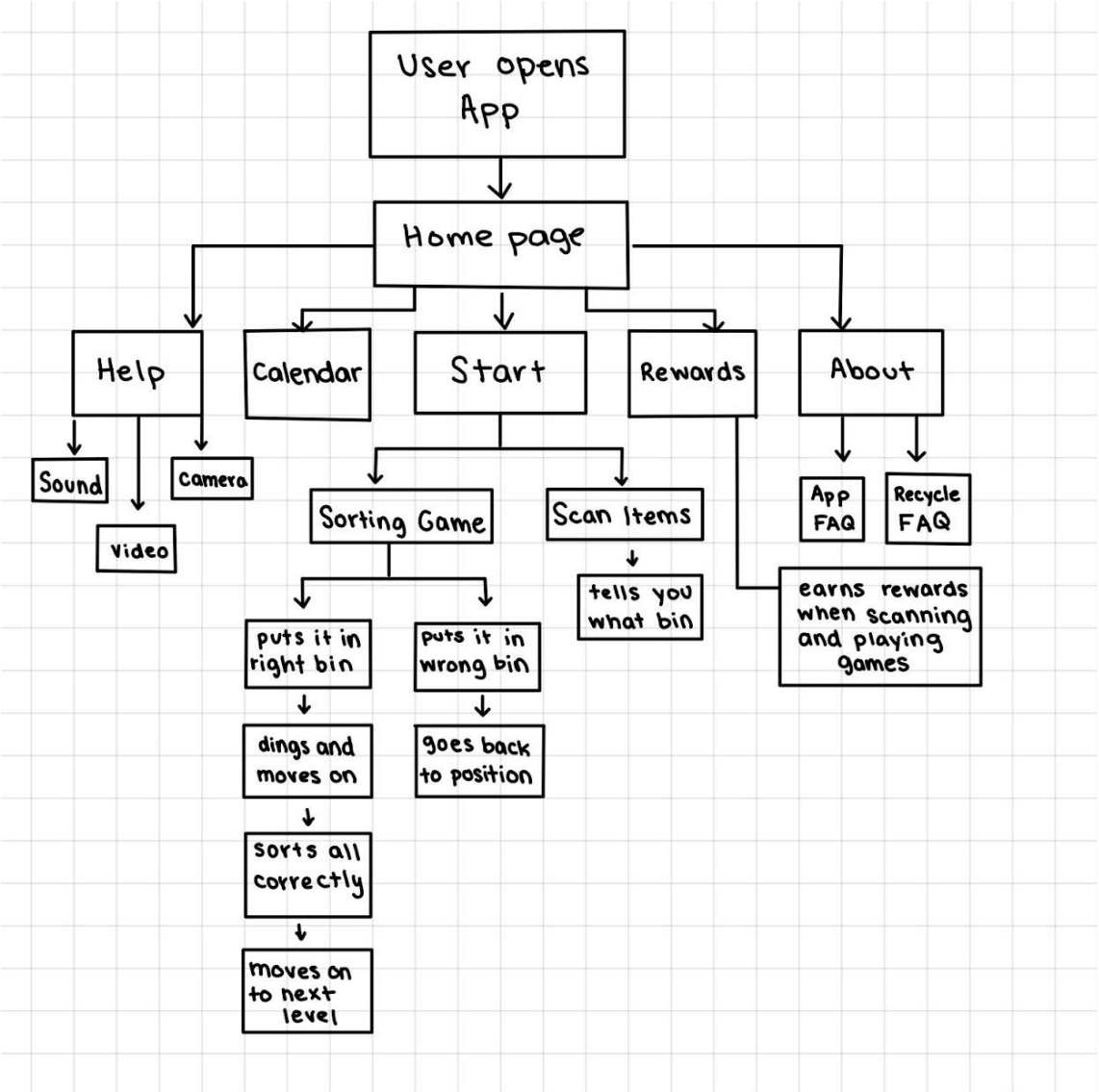

Figure 5.2. Sydney's Design Concept Flowchart

Benchmarking

Our group design concept was compared to the competitors found in the current market. The benchmarking was done to quantify how much the product designed suits the target specification.

	Competition Applications			
Specifications	**Region of Waterloo Waste Whiz**	**Recycle Coach**	**Ottawa Collections Calendar**	**Sort It!**
Developer	**Region of Waterloo**	**Municipal Media Inc.**	**City of Ottawa**	**Group 4**

Age Rating	4+	4+	4+	3+
Size	69.2 MB	40.7 MB	69 MB	40-50MB
Platform	IOS, Android	IOS, Android	IOS, Android	IOS, Android
Game	Sorting Game	No	No	Sorting Game
Sorts Material	Yes	Yes	No	Yes
Explains Bin Colours	Yes	Yes	Yes	Yes
AR/VR Capabilities	No	No	No	Yes
Add-Ons	Displays collection calendar	Displays Collection calendar Displays drop-off locations.	Displays collection calendar Notifies about drop off locations	Display's collection calendar Notifies about drop off locations

TABLE 1.1: Benchmarking of Recycling Sorting Apps using Design Criteria

	Competition Applications				
Specifications	**Importance**	**Region of Waterloo Waste Whiz**	**Recycle Coach**	**Ottawa Collections Calendar**	**Sort It!**
Age Rating	1	3	3	3	3
Size	2	1	3	2	2
Platform	5	3	3	3	3
Game	3	3	1	1	3
Sorts Material	5	3	3	1	3
Explains Bin Colours	4	3	3	3	3
AR/VR Capabilities	5	1	1	1	3
Total	n/a	61	59	47	73

TABLE 1.2: Benchmarking of Similar Products using Design Criteria

Conclusion

The final design will be presented to the client, where feedback will be received and taken into account and applied to our product.