FIT3175 Submission 2 High-Fidelity Prototype and Report

Group: Duodo

Maya Dutia

Hesamreza Motiei

Shesh Murali

Nithik Vijayanand

Table of Contents

HIGH FIDELITY PROTOTYPE

LINK:

https://www.figma.com/design/4lVBLUHKao8m3mcV5Ysa00/screens?node-id=162-178&t=r2ezgujBoC6j3eAk-1

IMAGES + ANNOTATIONS AND DESIGN GUIDELINES

Screen 1: Home screen

Design Implementation:
Shneiderman's golden rule: strive for consistency

The home screen adheres to the Shneudermans rule to strive for consistency by maintaining a clear layout and uniformity in text and icons (home, feed, scan). This gives users a predictable and reliable way to interact with the app's features. Cohesion in sizing and spacing ensures that users can quickly familiarise

themselves with the layout and locate functions without confusion. The division of content into sections (“Check for recycle” and “Feed”) enhances the interface's logical structure and feeds into the positional hierarchy, aiding user feature prioritisation. By maintaining consistency, the app reduces cognitive load and enables users to focus on recycling.

Screen 2: Scan Feature

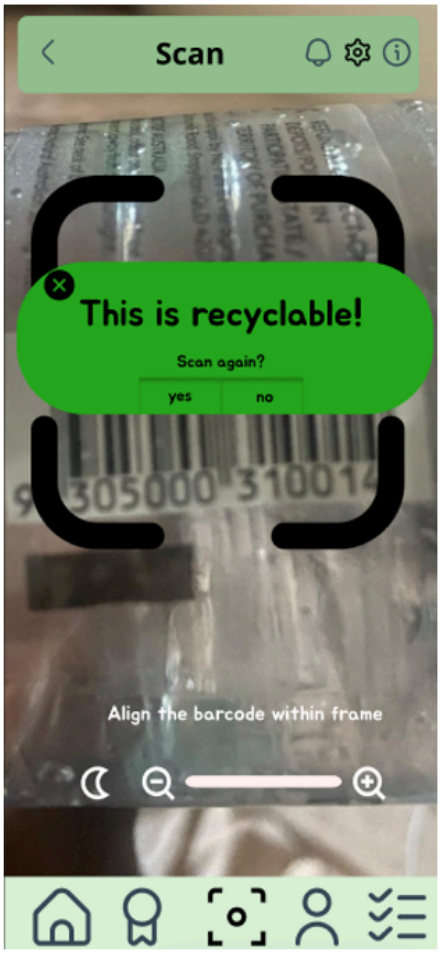
Design Implementation

Normal Principle: Visibility

The scan feature utilises visibility by ensuring the scanning functionality is clear through a central camera view with a barcode frame. Therefore aiding users to focus on the function of scanning without distractions. Furthermore, instructions like “Align the barcode within the frame” provide clear guidance. This provides clarity, as all the information is at a glance. Adjustable controls (brightness and focus) are visible and accessible, enhancing controllability. This app becomes user-friendly and adaptable for different environments, and navigation icons at the bottom allow for navigation through the application. The interface eliminates unnecessary complexity by focusing on the primary goal of scanning items, reducing user confusion and improving interaction.

Screen 2 (cont.): Scan Results

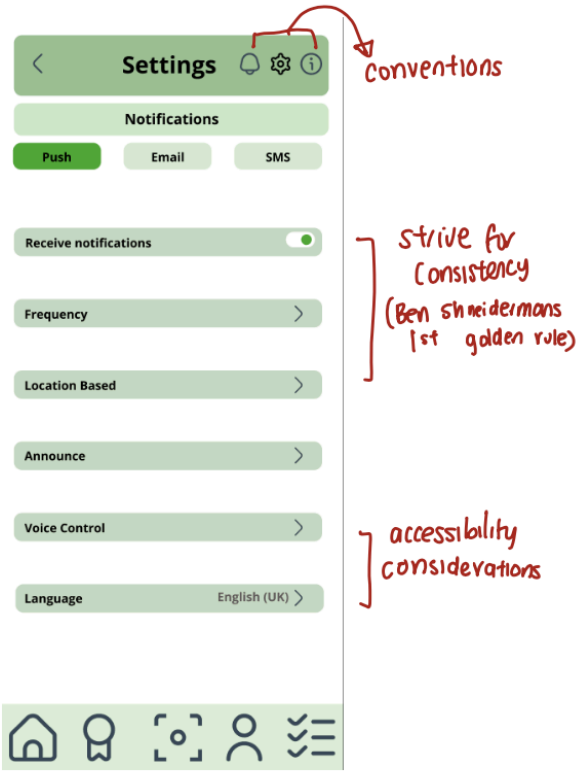
Design Implementation



Gestalt Principle: Proximity

The results screen organises information logically, grouping related elements (recyclability status and action buttons ‘Scan again?’, and the “yes” and “no”). This creates a logical and cohesive interface, aiding the users’ interactive flow, as the prompts and action buttons streamline decision-making. The proximity of related content reduces visual clutter and helps users process the information quickly. The different sections create distinct visual zones, aiding users in identifying the focus area quickly. Furthermore, the green confirmation message (“This is recyclable!”) is expressive and visually separated, providing immediate feedback while ensuring the user knows what action to take next.

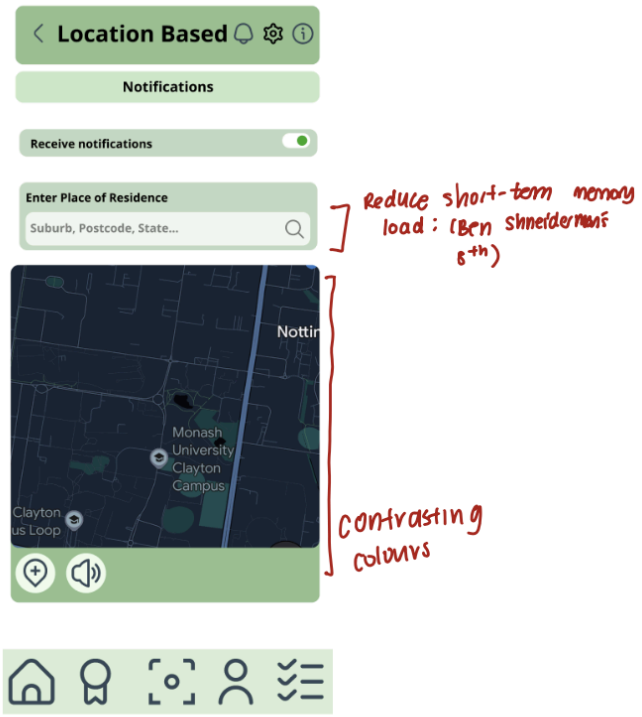
Screen 3: Settings



Design Principle - Ben Shneiderman's: Strive for Consistency (1st Golden Rule)

The settings layout and buttons are consistent with common mobile app conventions. The "Receive notifications" toggle is positioned at the top, following standard mobile design patterns, while the menu categories (like "Frequency" and "Language") are clearly labelled, helping users recognise what each option is for. This consistency makes it easy for users to understand and navigate the settings screen. Furthermore, the language and voice control features take into consideration those with accessibility requirements.

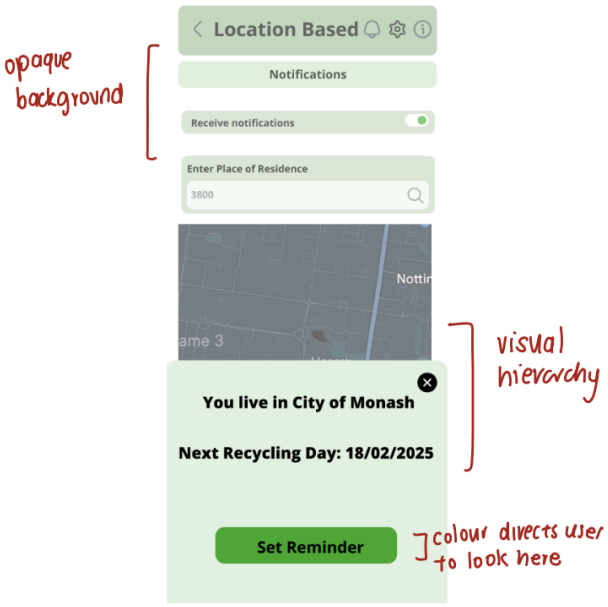
Screen 3 (cont.): Location Based Notification



Design Principle - Ben Shneiderman's: Reduce Short-Term Memory Load (8th Golden Rule)

The "Enter Place of Residence" field uses an autocomplete search box, reducing the need for users to recall specific address details. By allowing users to select locations from a list or enter postcodes easily, the design minimises cognitive load, allowing users to focus on interacting with the app rather than remembering exact details. The contrasting colours with the map also provide a clear indication of the main feature of this page.

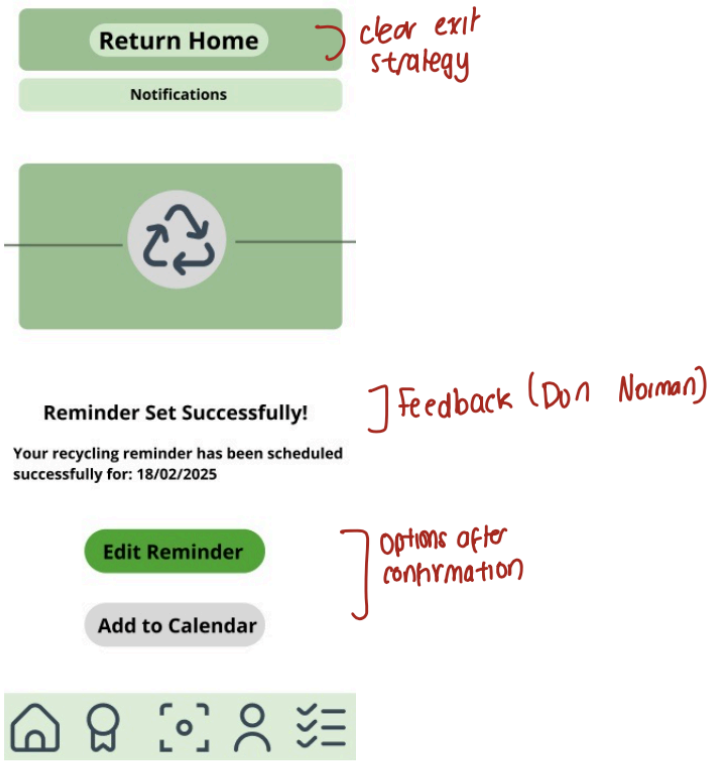
Screen 3 (cont.): Location Based Notification



Design Principle - Visual Hierarchy

This screen effectively uses visual hierarchy to guide the user's attention. The background map is made slightly opaque, ensuring that the most important elements, such as the message “You live in City of Monash” and the bright green "Set Reminder" button, stand out. The contrast between the background and the highlighted content directs the user’s focus towards the key action they need to take, which is to set the reminder. This visual emphasis helps users quickly recognise the most important step in the process.

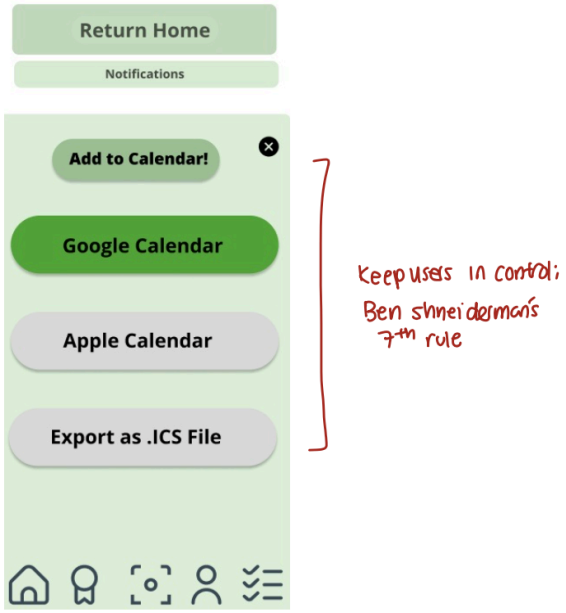
Screen 4: Reminder Confirmation



Design Principle - Don Norman's: Feedback

After the user sets a reminder, the system provides clear feedback through the message: "Reminder Set Successfully!". This confirms that the action has been completed successfully, which reassures the user and keeps them informed about the system status. Providing confirmation feedback ensures that the user knows what's happening and that their action has been registered.

Screen 4 (cont.): Add to Calendar



Design Principle - Ben Shneiderman's: Keep Users in Control (7th Golden Rule)

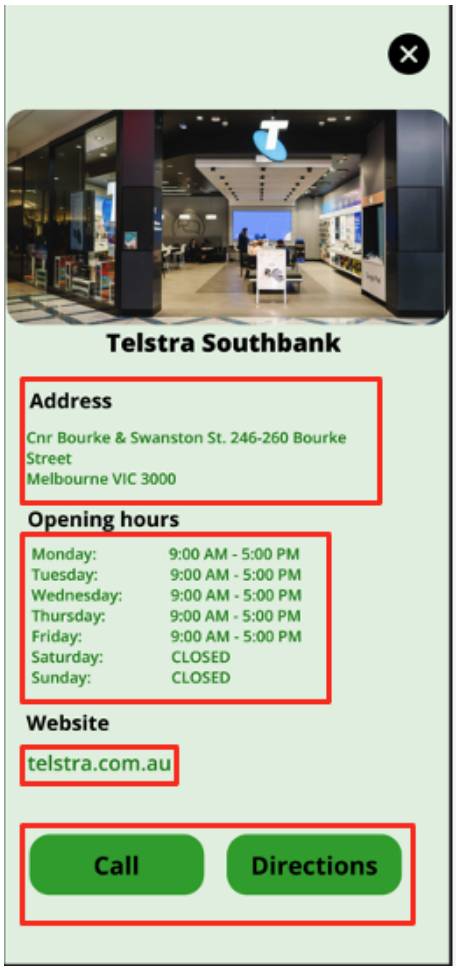
The Add to Calendar screen gives users control over their actions by providing multiple options to add the reminder to their preferred calendar (Google, Apple, or .ICS file). This ensures that users are not locked into a single choice and can freely select the method that suits them best. Allowing the user to choose the method of adding the reminder empowers them with flexibility and control over how they manage the reminder.

Screen 5: E-Waste Drop off

The map view screen in the recycling app mirrors the design of familiar mapping platforms like Google Maps, applying Jakob's Law effectively. This design helps users quickly

adapt to using the app, as the interface features common elements such as a search bar and location pins that they're already used to. This familiarity avoids the usual learning curve and focuses on ease of use. By designing the map with recognisable tools and layout, users can navigate the information efficiently, reducing potential frustration and enhancing the overall user experience.

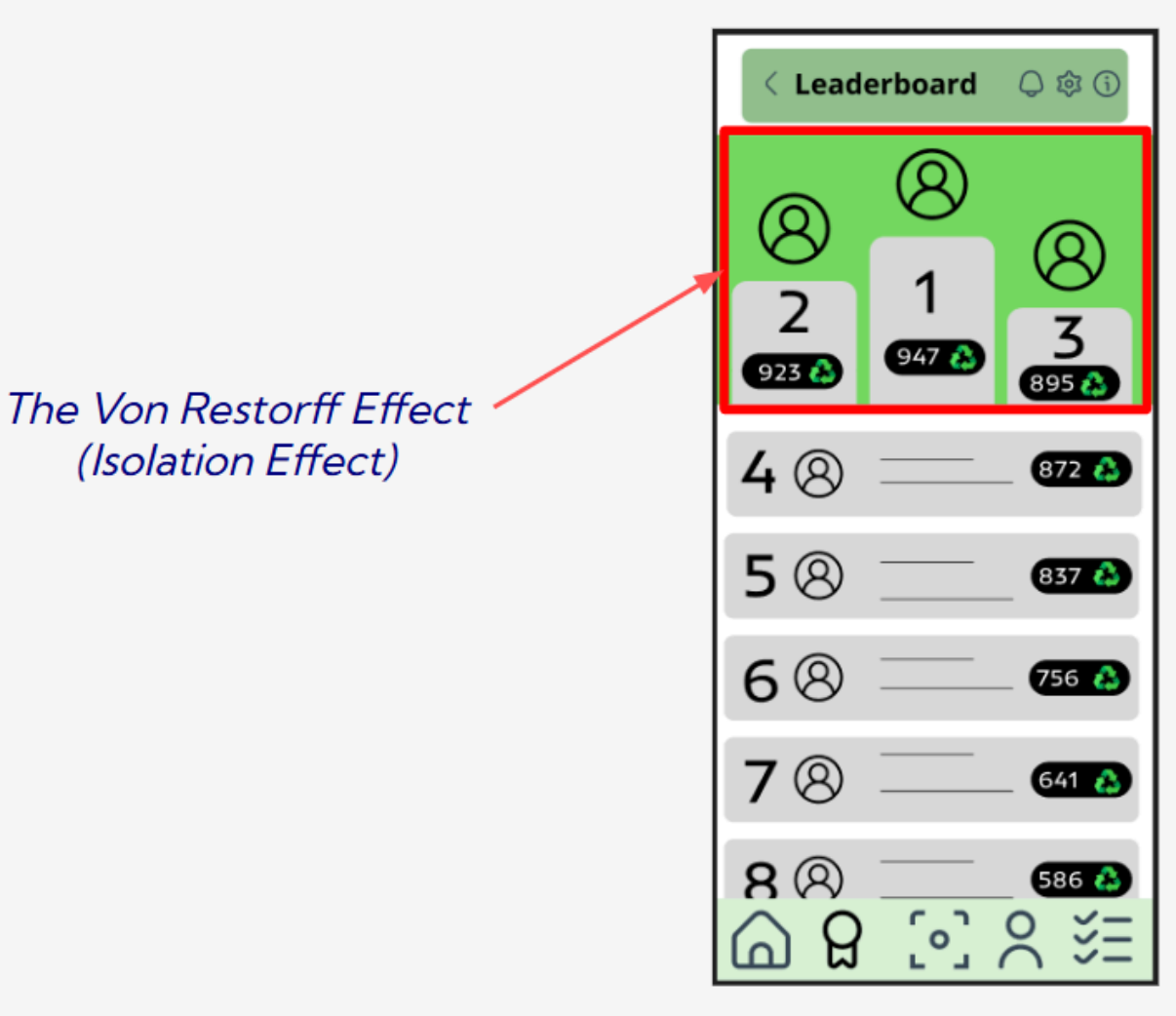
Screen 6: Facility details



Gestalt Principle of Continuity

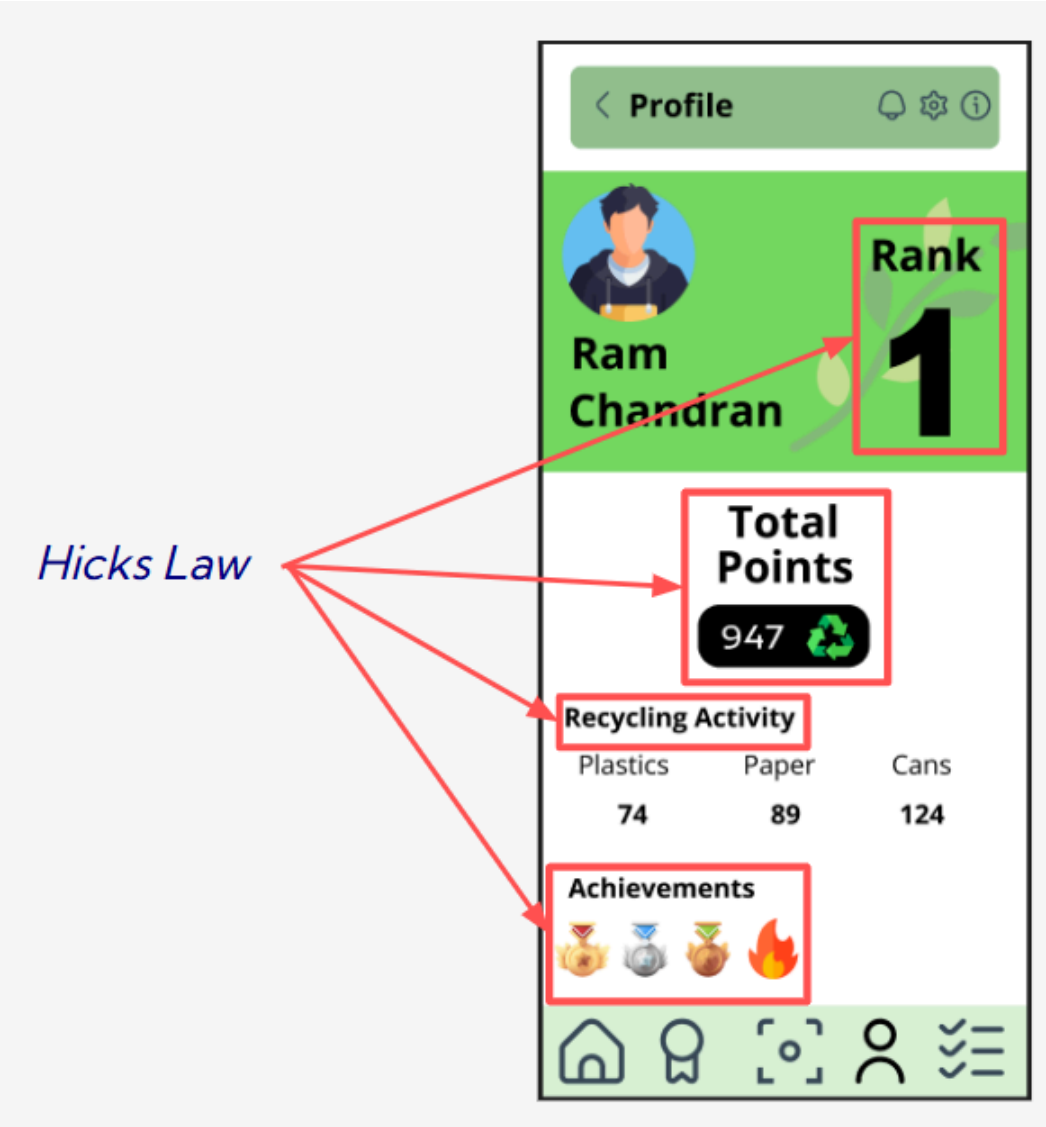
The Gestalt Principle of Continuity is applied through the structured presentation of information on the details screen. Information such as the centre's name, address, opening hours, and contact options are visible in a logical sequence that guides the user's eye from top to bottom. This arranged flow helps in understanding by providing a straightforward path through the content. It ensures that users can easily understand each piece of information, which enhances clarity and simplifies navigation through the details.

Screen 7: Leaderboard



The leaderboard screen uses the Von Restorff Effect, which states that when multiple similar elements are present, the one that differs the most will be remembered. The top three ranks are highlighted in a different design, with larger, elevated blocks and a green background. This makes them stand out immediately compared to the lower ranks, which follow a simpler list format. The first-place rank is further emphasised with a central position and the tallest block, ensuring users' attention is drawn to the highest performer first.

Screen 8: Profile



The profile screen follows **Hick's Law**, which states that the time required to make a decision increases with the number of choices available. To minimise cognitive overload, the profile screen prioritises only the most relevant information: the user's rank, total points, recycling breakdown, and achievements. Instead of overwhelming users with unnecessary details, the interface keeps the information structured and easy to digest. The use of a clear visual hierarchy—such as the large rank number and bold points—ensures that the most critical

information is processed first. This design choice enhances efficiency, allowing users to interpret their standing and progress quickly.

ACCESSIBILITY GUIDELINES IMPLEMENTED

1. **Perceivable**

   The app implements the Perceivable accessibility guideline by ensuring that text has sufficient contrast against the background, making it easier for users with visual impairments, such as low vision or colour blindness, to perceive the content. For example, the green and white colour scheme provides a high level of contrast, ensuring that the text is easily readable. This design follows the **1.4.3 Contrast (Minimum)** WCAG guideline, which ensures that text contrasts strongly with its background for improved readability. This approach helps users with various types of visual disabilities access and understand the content without strain.

2. **Operable**

   The app implements the operable accessibility guideline by ensuring that interactive elements, such as the "Set Reminder," "Scan again," and "Add to Calendar" buttons, are large enough and easily accessible. These buttons meet the **2.1.1 Keyboard** requirement under the Web Content Accessibility Guidelines (WCAG) by being operable through a keyboard or touch interface, making it easier for users with limited dexterity to interact with them. The buttons are also

placed within easy reach, minimising the effort required to tap them. This design ensures that users with mobility impairments can interact with the app seamlessly, providing an accessible experience.

3. **Understandable**

   The app implements the Understandable accessibility guideline by providing clear instructions on Screen 6, such as "Align the barcode within the frame" and "Scan again?". These instructions help users understand the necessary steps, reducing confusion, especially for users with cognitive disabilities or those unfamiliar with the app. By offering concise and direct guidance, the app ensures that users know exactly what to do next. This approach follows the **3.3.2 Labels or Instructions** WCAG guideline, which requires providing clear instructions or labels to assist users in understanding actions, making the app more accessible to a wider audience.

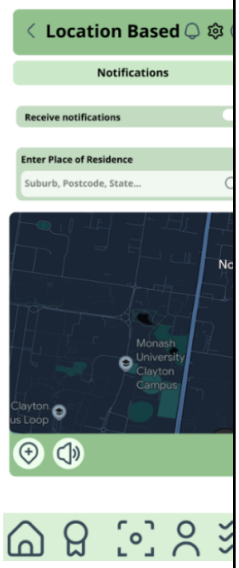
INDIVIDUAL WORK: HEURISTIC EVALUATION

Violation & Compliance Tables

Violation Table

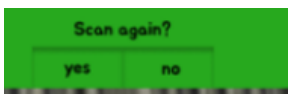
Table 1: Shesh Murali

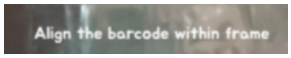
An instance of violation	Heuristic Rule	Evidence	Severity Rating and justification	Recommendation
There is a lack of clear error prevention during the	**#5 Error Prevention**	**Scan Feature**	**Severity 3/4** This is a crucial usability issue as users may not	Include an error message if an invalid barcode is scanned.

scanning process For instance, if a user scans an unrecognised barcode or incorrect item, there is no visual message that guides the user that they made an error and on what to do next			know why a barcode is not being recognised or what action to take next. Since the app is designed to provide recycling information, thus if failing to guide users when errors occur creates ground for confusion and frustration towards the application	Furthermore, it provides clearer instructions for the user to perform, such as "Barcode not recognised, try again or enter manually."
Crowded information on the location-based notification screen There is a large amount of text and map imagery displayed at once, which could be overwhelming to the user. The notification settings and the "Enter Place of Residence" sections are clustered together, thus making it hard to distinguish	**#8, Aesthetic and Minimalist Design**	**Location Based notification** 	**Severity: 2/4** The current design does not maintain proper spacing, which could lead to users misinterpreting the purpose of different sections. This may slow down the user completing the task, but it does not completely block the function of the application.	Increase the sectioning and use clearer borders and section dividers. Moreover, expanding the section to simplify the screens and the the whitespace between sections.

between interactive elements				

Compliances Table

An instance of Compliance	Heuristic Rule	Evidence	Design Justification
Consistent navigation across all screens with the recognisable icons	#1 Visibility of System Status	Home Screen The navigation bar across all the screens 	The navigation bar at the bottom is always visible, always keeping the users informed about where they are on the app. Moreover, it allows for seamless navigation between sections.
Logical grouping of scan results using the gestalt principles	#2 Match between System and Real-world	Scan Results 	The app provides feedback in a human real-world language format: “This is recyclable!”. Mimicking a recognisable statement that one would use when finding the recyclability of an object,
Scanning options given ‘Yes’ and ‘no’	#3 User control and freedom	Scan Results 	Whenever a user completes a task or makes an error, they are given the option of doing it one more time or exiting the action on the interface and going home. This prevents

			users from feeling trapped and frustrated
Set Reminder features	#4 Consistency & Standards	Reminder Confirmation 	Users are given options like “Edit Reminder” or “Add to calendar”, which are consistent with other calendar application features m, so users do not need to wonder about differences. Words or actions. This ensures consistency with the task at hand
Clear scan feature guidance	#6 Recognition Rather than recall	Scan Feature 	The app provides a visual scanning frame and on-screen instructions (“Align barcode within a frame”), reducing cognitive load by not requiring users to remember what to do.
The search function in E-waste drop-offs is easily accessible	#7 Flexibility and Efficiency of Use	E-waste drop-off 	The app accommodates both experienced and new users by offering a search bar, a recognisable screen feature for quick lookup and a map for exploratory browsing.
Use of meaningful and recognisable icons	#9 Help Users Recognise, Diagnose	Setting	The settings screen utilised reconsider

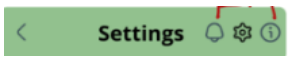
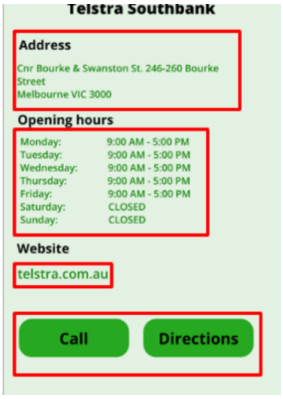
	and Recover from errors		icons like the notification bell and settings gear. Making it easy for users to identify functionalities without reading long descriptions.
Clear details and actionable buttons for users	#10 Help and Documentation	Facility details 	The page provides user assistance regarding opening hours, address, and contact details regardignt the drop-off zone. Additionally, the actionable buttons “Call” and “Direction” buttons provide immediate assistance, allowing users to connect and contact for assistance, This structure prevents confusion and ensures clarity.

Table 2: Maya Dutia

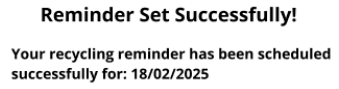
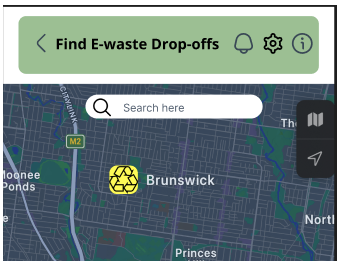
Violation Table

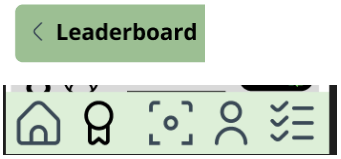
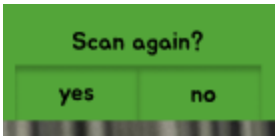
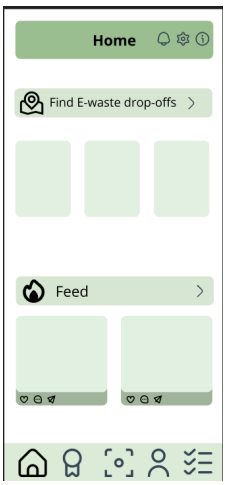
An instance of violation	Heuristic Rule	Evidence	Severity Rating and justification	Recommendation

Location-based notification settings	#5 Error Prevention	No evidence of preventing users from entering invalid or incomplete addresses/postcodes in the "Enter Place of Residence" field. 	**3/4** **Without proper validation, the user could accidentally set a notification for a location that doesn't exist or isn't relevant to them.** **This makes the severity rating fairly high, which needs to be addressed early on before developing the app.**	Add validation checks for the address or postcode input. A real-time error message could notify the user if the input is invalid, preventing them from submitting incorrect data.
Barcode Scanning Feature	#7 Flexibility and Efficient Use	After scanning a barcode, users are prompted with a message saying whether the item is recyclable and then asked if they want to scan again. However, for experienced users who frequently scan items, this flow might be a bit repetitive. 	**2/4** **The severity rating is not as high, as there may be other more important matters to deal with first.** **However, this feature is very important to take into consideration for experienced users so they are satisfied with their experience.**	A shortcut could be added for experienced users, allowing them to quickly scan another item without confirming the scan result each time. For example, a "Scan Again" button could be made more prominent, or users could skip the confirmation dialogue entirely after multiple scans. .

Lack of error messages if the user inputs the wrong destination	#9 Recognise, Diagnose and Recover from Errors	Similar to #5, there is a lack of recovery from errors. For example, in the scan barcode screen, there is no clear indication of what would happen if a user were to scan the barcode of an item that isn't recyclable or in the database for the app.	**3/4** **Similar to the first instance of a violation, prevention of error and recovery from this is imperative to an app that is highly intuitive and UI friendly, so it should be taken into consideration early on before developing the app.**	A red box around the input message can indicate to the user that there is an error and should re-enter their address.

Compliance Table

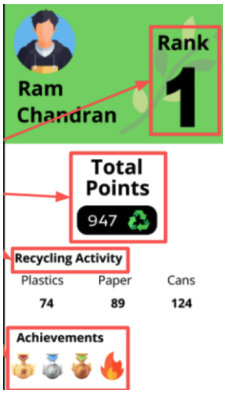
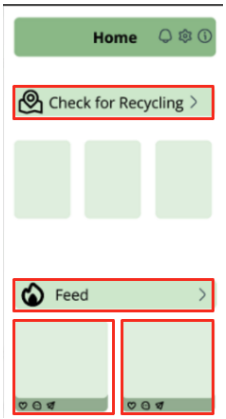
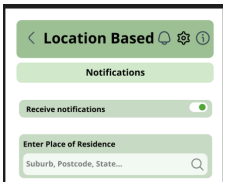
An instance of Compliance	Heuristic Rule	Evidence	Design Justification
Feedback is provided on actions such as in the reminder section.	#1 Visibility of System Status		Ensures users are aware of the system's status after performing important actions.
Home screen categories like 'Find E-waste drop-offs' match real-world task needs.	#2 Match between the System and the Real World		Matches real-world task needs, improving the user's understanding of what the app can do.

Users can easily cancel or backtrack in navigation, ensuring control.	#3 User Control and Freedom		Users have the freedom to undo actions, enhancing user control.
Standard icons are used for navigation, making it intuitive for users.	#4 Consistency and Standards		Ensures users are not confused by unfamiliar elements, creating a consistent experience.
Options like 'Scan again' avoid the need for recalling actions.	#6 Recognition Rather than Recall	After scanning, users are immediately offered the "Scan Again" option. 	The user doesn't need to remember prior actions, as it's made easy to continue.
Minimalist design for the core actions.	#8 Aesthetic and Minimalist Design		The minimalist design reduces cognitive load by focusing on key functions.
No help is needed as navigation and usage are clear. With a help symbol if needed.	#10 Help and Documentation	The app's intuitive design does not require any additional documentation. However, there is an information symbol on all screens in the design that allows users to receive	Users can navigate the app without needing instructions, as it's self-explanatory.

		assistance if needed. 	

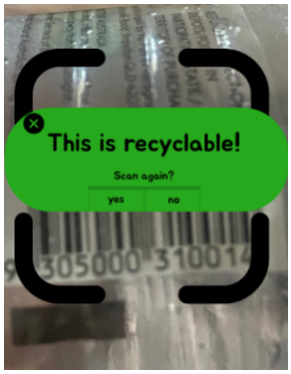
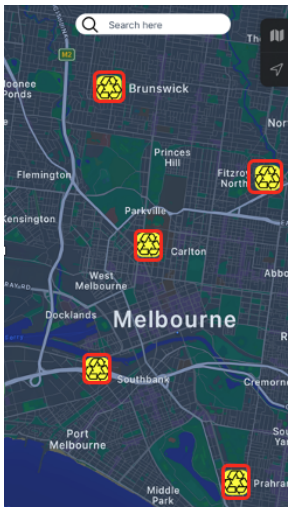
Table 3: Hesamreza Motiei

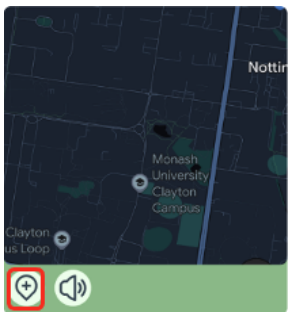
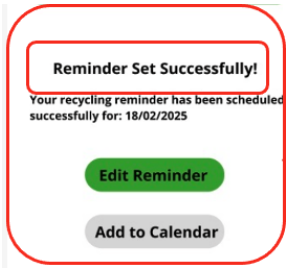
Violation Table

An instance of violation	Heuristic Rule	Evidence	Severity Rating and justification	Recommendation
Overly complex display of profile screen	#8 Aesthetic and minimalist design		2/4 It could potentially overwhelm users with too much information at once, reducing clarity and increasing cognitive load	Simplify the profile screen by reducing the number of visible elements at any given time and focusing on key user data and actions
Lack of shortcut options for frequent tasks on the home screen	#7 Flexibility and Efficiency of Use		3/4 of users who need quick access to frequent tasks may find the app inconvenient, reducing efficiency and user satisfaction	Implement shortcut buttons for common actions like checking recycling schedules
Absence of in-context help or accessible documentation within the "Location-Based Notifications"	#10 Help and Documentation		3/4 Users may be uncertain about how these settings impact their notifications and what exactly is	The screen could be enhanced by implementing a help icon or a direct link to a help page within the screen that

screen			being configured, which can lead to misconfiguration	users can access to get instructions about how to set up and understand the location-based notifications.

Compliance Table

An instance of Compliance	Heuristic Rule	Evidence	Design Justification
Real-time feedback when an item is successfully scanned	#1 Visibility of System Status		It provides immediate and clear feedback to users, enhancing their confidence in the scanning process
Usage of common environmental symbols on the recycling map	#2 Match between the system and the real world		Uses a universally recognised symbol for recycling, making the map easy to understand

Ability to zoom in on the map	#3 User Control and Freedom		Users can adjust the map view based on their preferences, which enhances their control over the screen's functionality
Confirmation prompt before setting reminders	#5 Error Prevention		This design prevents accidental settings by asking users to confirm their actions, which reduces potential errors and enhances user control.
Icons and labels are used consistently across navigation and settings menus	#6 Recognition rather than Recall		Using clearly labelled icons in the navigation bar helps users quickly recognise functionality without needing to recall it from memory.
Clear feedback on action outcomes, like successful reminder setup	#9 Help users Recognise, Diagnose and Recover from Errors		This design provides users with immediate and clear feedback on the outcome of their action, helping them understand if the intended action was successful or if there were issues.

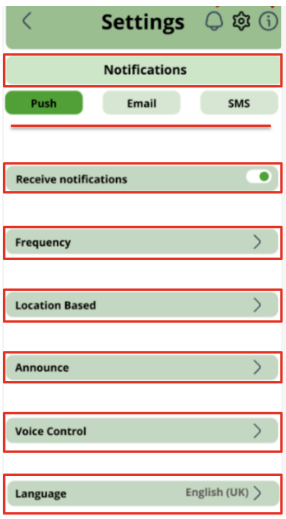
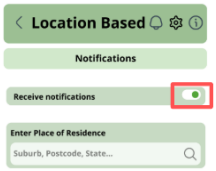
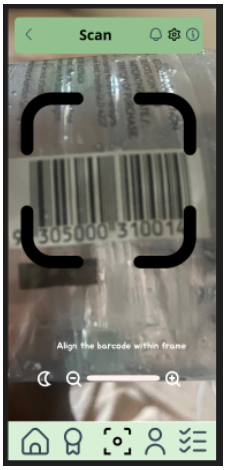
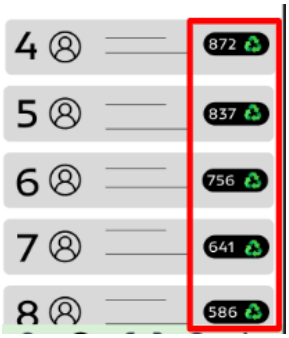
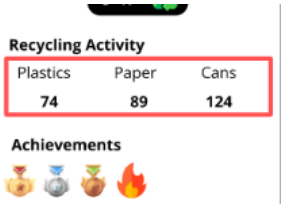
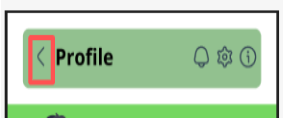
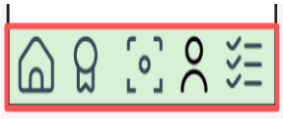
Uniform visual design on the "Settings" screen	#4 Consistency and Standards		This screen shows consistency through the use of a coherent colour scheme, standardised typography, and button styles. Each setting option utilises green toggles and a font style that aligns with the screen's overall aesthetic, making the interface easier to understand for the users.

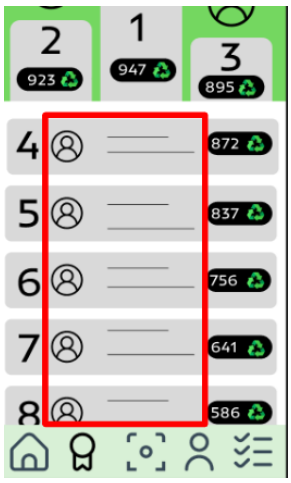
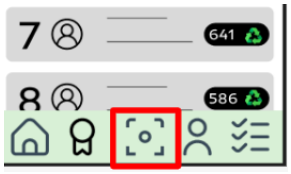
Table 4: Nithik Vijayanand

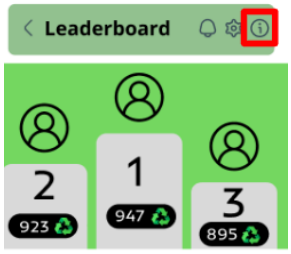
Violation Table

An instance of violation	Heuristic Rule	Evidence	Severity Rating and justification	Recommendation
Users can accidentally turn off notifications for recycling remainders with a misclick	#5 Error Prevention		3/4 Although it is visible, toggling the notifications off can be detrimental to the purpose of the app, leaving users uncertain as to when it is time to recycle	An implementation of a confirmation box for users when turning off notifications can be reassuring for users, as an accidental misclick on the small toggle box can prevent reminders from reaching the user on the day of the recycling.
For an invalid barcode that is being scanned, there is no clear message on what went wrong or how to fix it.	#9 Help Users Recognize, Diagnose, and Recover from Errors		4/4 Although most barcodes can be scanned, not all may be recognised by the app, resulting in the app not being able to detect whether an item is recyclable or not, which is a primary feature of the app.	To address the issue of barcodes not being recognised by the app, either add a manual entry option where users can input the number location beneath the actual barcode or implement a “search for product” feature for products that have barcodes removed from or not provided with

Compliance Table

An instance of Compliance	Heuristic Rule	Evidence	Design Justification
Users can easily see rankings and their points on the leaderboard in real-time	#1 Visibility of System Status		The leaderboard screen provides real-time updates of ranks and recycling points, ensuring users always know their status.
Recycling categories shown are intuitive as the products and well known by many consumers	#2 Match Between System and the Real World		Recycling categories (Plastics, Paper, Cans) match real-world recycling practices, making the UI intuitive.
Users can return to the previous page with one button in case of an error	#3 User Control and Freedom		The design enables users to backtrace their actions or essentially go to the previous page in the case of an accidental touch or input
The bottom navigation bar remains consistent throughout all the screens in the app	#4 Consistency and Standards		Visual treatments are used consistently throughout the design to prevent unfamiliarity and follow industry conventions throughout the app. Users can navigate through the main screens with ease and without getting lost in the app

The leaderboard shows both usernames and profile pictures	#6 Recognition rather than Recall		The leaderboard design incorporates both the user's profile picture as well as their full name, allowing not having to recall profile pictures to identify people or having to recall names to identify faces
The app provides quick actions, such as scanning items directly from the home screen.	#7 Flexibility and Efficiency of Use		The bottom bar, which contains the shortcut to scan a barcode, can be accessed from anywhere in the app and by anyone with any skill level as it is placed right in the middle of the toolbar, allowing for easy access around the app's primary function

The app avoids unnecessary clutter, using a clean green-and-white background with only the most useful information required	#8 Aesthetic and Minimalist Design		This design is clean and structured, displaying only essential information in clearly defined sections. Bold typography, icons, and spacing enhance readability, making ranking, points, and achievements easy to scan. The minimalist layout reduces cognitive load, while the green theme reinforces the app's eco-friendly purpose.
The app includes a help section explaining how each page of the app works	#10 Help and Documentation		The design allows users to seek help in case they are unsure of any features or buttons within the app, which is located on the top right side of each page with the "info" icon.

EVALUATION SUMMARY

1. Error Messages Missing During Barcode Scanning (Severity 4/4):

When barcodes aren't recognized or scanned incorrectly, the lack of error messages leaves users confused and unsure about what went wrong. This gap is particularly problematic because the app's main function is to provide recycling information based on these scans.

Recommended Fix:

To improve the user experience, we suggest adding clear and helpful error messages that explain the issue and offer next steps, such as “Barcode not recognized”, “Please try scanning again” or “enter the item details manually.” This update adheres to principles of error prevention aiming to minimise user errors.

2. Cluttered Interface on the Location-Based Notifications Screen (Severity 3/4):
The location-based notifications screen is overly crowded, making it difficult for users to distinguish between different elements and settings. This clutter can confuse users and slow down interaction.

Recommended Fix:

We recommend redesigning this screen to include more space between elements and clearer section dividers. This change aligns with the aesthetic and minimalist design principle, which emphasises the importance of eliminating non-essential elements that do not directly contribute to user tasks. A cleaner design will help enhance the user experience.

3. Lack of In-Context Help on the Location-Based Notifications Screen (Severity 3/4):

Users currently have no direct access to help or guidance on how to effectively use the location-based settings, leading to potential misuse or frustration.

Recommended Fix:

Implementing a help icon or a direct link to a help page on this screen would greatly assist users. This feature should offer detailed explanations and easy-to-follow instructions specific to the

context of location-based settings. Providing this in-context support adheres to the help and documentation usability principle, ensuring that users can quickly find assistance without feeling lost or overwhelmed.

REFERENCES

Figma UI Kits

Figma. (2025). Figma. https://www.figma.com/design/voprNMWzxbeWQa6CTPrhpn/Uicons-by-Flaticon-%7C-Free-interface-icons-(Community)?node-id=7-223&t=lVPYpykhY7c9vUx0-0

Free Icons. (2019). Icons8.com. https://icons8.com/icons

Downloaded Images:

(2025). Wikimedia.org. https://upload.wikimedia.org/wikipedia/commons/thumb/4/44/Recycle001.svg/800px-Recycle001.svg.png