

**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE

SC2006 - Software Engineering

Bin Buddy - An E-waste Recycling App

Lab 1 Deliverables

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I. Our App and Target Users

Our system's target users are E-waste disposers. With climate change being prevalent in today's world, E-waste being frequently discarded and people wanting to engage in more environmentally friendly practices, the government has set up E-waste disposal bins all around the country. E-waste is electronic equipment of any kind that has been discarded. In 2023, Singapore produced about 60,000 tonnes of E-waste, but only 16,000 tonnes were recycled (Strait Times, 2024). The low E-waste recycling rate is due to the lack of awareness, as many people do not know E-waste bins exist, or find it inconvenient to recycle. Our team aims to make the recycling process more convenient by making it easier for electronic users to locate recycling bins near where they work or stay.

With our web application (app), users of our app will be able to quickly locate the E-waste disposal bins near them, and be directed to the nearest ones with the highest occupancy, along with gaining access to educational guidelines, among others. We will use NEA's dataset on E-waste disposal bins around Singapore from data.gov.sg for the development of our app.

II. Functional requirements

Foundational Features:

1. The user should be able to create an account.
 - 1.1 The account should be created with a username.
 - 1.1.1 The username has to consist of only alphanumerical characters, with no symbols.
 - 1.1.2 The username has to be of minimal length 8.
 - 1.1.3 The username has to be of maximal length 30.
 - 1.2 The account should be created with a password.
 - 1.2.1 The password can consist of alphanumerical characters and symbols.
 - 1.2.2 The password has to be of minimal length 8, with at least a number and a special character.
 - 1.2.3 The password can be of maximal length 30.
2. The user/admin should be able to change their account information.
 - 2.1 The user/admin should be able to change the account's username.
 - 2.1.1 The username has to consist of only alphanumerical characters, with no symbols.
 - 2.1.2 The username has to be of minimal length 8.
 - 2.1.3 The username has to be of maximal length 30.

2.2 The user/admin should be able to change the account's username.

2.2.1 The password can consist of alphanumerical characters and symbols.

2.2.2 The password has to be of minimal length 8, with at least a number and a special character.

2.2.3 The password can be of maximal length 30.

3. The user/admin should be able to recover their account through their email.

3.1 When a user/admin forgets the account password, there should be an option for him/her to enter their email address, and a recovery link will be sent to their email.

Location & Navigation Features:

1. The user should be able to view their current location on a map interface.

1.1 The user's location should be marked with a red coloured point on the map.

2. The user should be able to view the locations of nearby waste bins on a map.

2.1 The locations of nearby waste bins should be marked on the map.

3. The user should be able to open Google Maps navigation for any selected bin location.

4. The user should be able to save location data in the account.

4.1 For subsequent times the user logs into his/her account, he/she should see that his/her location is already shown on the map.

Reminders & Scheduling:

1. The user should be able to create a reminder with a custom memo or note.

1.1 The reminder should appear on the "reminders" section of the user dashboard on the web application.

2. The system should allow the user to set a specific date and time for each reminder.
3. The system should send a notification to the user at the scheduled reminder time.

Submit / Reply to queries:

1. The user should be able to submit a query through the system when he/she has questions regarding the disposal of E-waste.
 - 1.1 The system records the query and the query will appear under the query section when the admin logs in.
2. The admin should be able to reply to the queries that users have submitted.

Bin Status & Recommendations (Using Mock Data):

1. The system should display the occupancy status of each bin as one of the following states: "Low" (Green), "Medium" (Yellow), "High" (Red).
2. The system should recommend a nearby bin with the lowest current occupancy (based on real - time occupancy percentages).
3. The system should show mock occupancy data for bins in the UI to simulate the feature.

Item Size Guide:

1. The user should be able to select the size category of their E-waste item from a dropdown list: Small, Medium, or Large.
2. The system should display a reference image for each size category to help users make a selection.
3. The system should provide a description and example items for each size category.

Educational Resources:

1. The user should be able to view a list of YouTube video links about E-waste disposal practices.
2. The system should store YouTube video links in the database.
3. The user should be able to tap a video link to open it in the YouTube app or a browser.

III. Non-functional requirements

Usability	<ul style="list-style-type: none"> • A loading spinner or progress indicator appears when the system is processing requests (e.g., fetching nearby bins, loading videos) to prevent multiple clicks and reduce user frustration. • Clear and consistent UI elements (buttons, icons, color codes for bin status) make navigation intuitive. • Color-coded bin occupancy (Red, Yellow, Green) allows users to quickly assess availability at a glance. • Tooltips or brief instructions are available for first-time users (e.g., explaining bin sizes: small, medium, large). • Accessibility considerations: text size, high-contrast colors, and voice-over support for visually impaired users.
Reliability	<ul style="list-style-type: none"> • The system handles intermittent internet connectivity gracefully by showing cached data or a “Connection lost” message. • Automatic retries for failed requests (e.g., fetching bin locations) to improve resilience. • Mock data fallback ensures that demonstrations work even when live data is unavailable. • App avoids crashes when unexpected inputs are provided (e.g., selecting a bin with missing details). • System logs errors for debugging and maintenance purposes.
Performance	<ul style="list-style-type: none"> • Location search and display of nearby bins (map and list view) should complete within 2 seconds under normal conditions. • Educational videos or external links should load within 3 seconds when clicked onto. • Navigation to admin dashboard or management screens should be responsive, with transitions under 1 second. • Lightweight database queries and caching are used

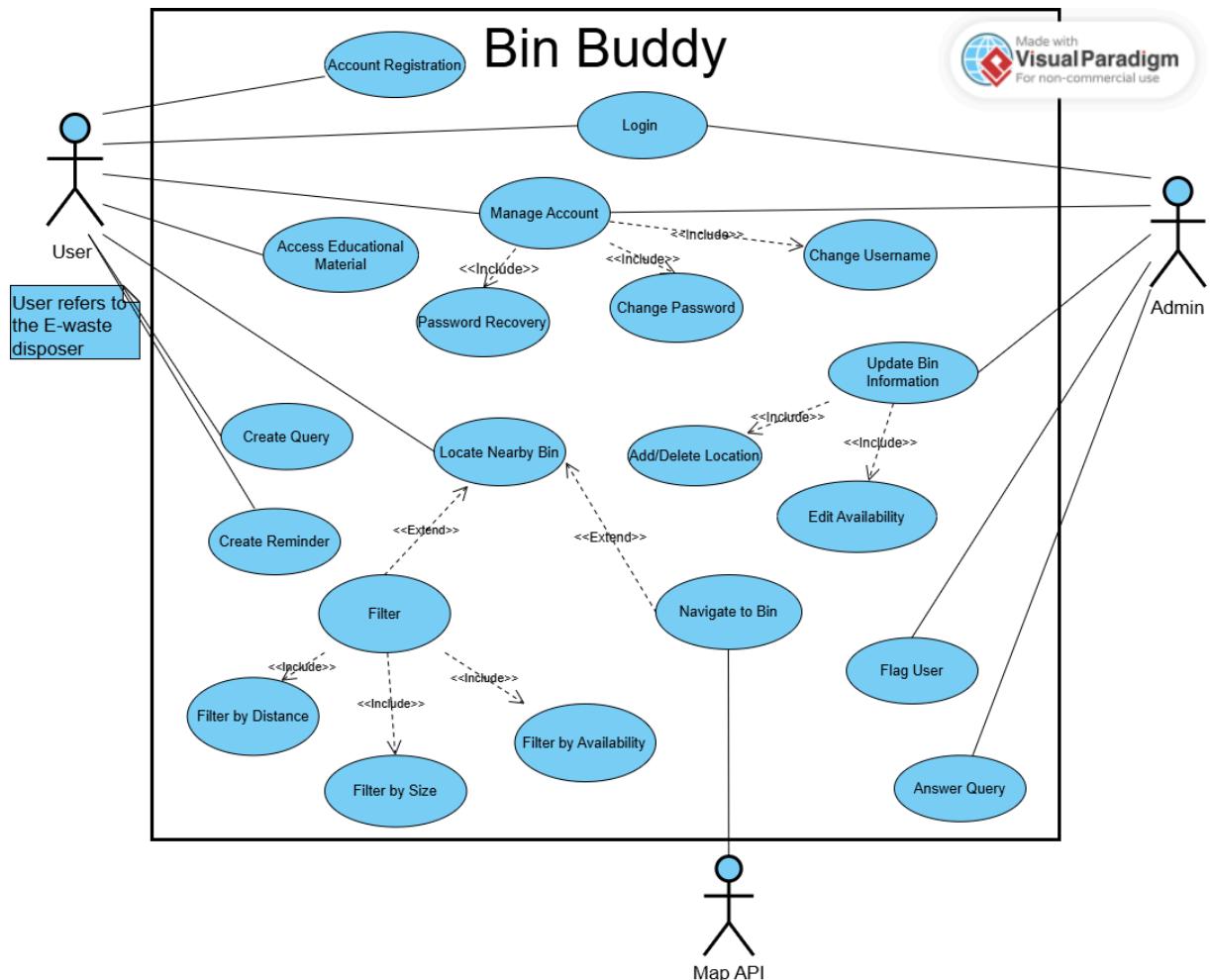
	<p>to reduce response time.</p>
Supportability	<ul style="list-style-type: none"> • The system provides detailed error messages to guide users. • Admin dashboard allows monitoring and updating of bin data easily. • Codebase is modular to allow quick updates for adding new features (e.g., more video links). • Support documentation or FAQs are accessible from the app to help users troubleshoot common issues. • Logs and analytics are available to track system usage, errors, and performance for maintenance purposes.

IV. Data Dictionary

Term	Definition
E-waste	E-waste is electrical and electronic equipment of any kind that has been discarded. It includes practically anything powered by an electrical source. Common types of E-waste include the following: desktops, laptops, tablets, mobile phones, refrigerators, batteries, and lamps.
User	User refers to anyone who wishes to dispose of their E-waste.
Admin	Admin refers to administrators who manage and oversee the app. Admins have privileges that allow them to remove accounts or to modify data in the database.
E-waste bins	E-waste bins are bins that are designed for e-waste collection. There are more than 870 E-waste collection points across Singapore. The bin sizes come in different sizes - small is suitable for batteries, phones and bulbs; medium is suitable for laptops; large is suitable for monitors and printers. The suitability for each bin is specified on the App itself.
Account Information	Account Information refers to the email, username and password of an account. The username and password of an account can be changed, but the email of an account can't be changed. The username must be between 5 to 30 letters, while the password must be between 10 to 30 letters.
Query	A query can be submitted by users when they want to submit a clarification to the administrators. The administrators will then answer the query.

Ban User	An admin can ban a user account if unsavoury activities are noticed, such as spamming queries.
Occupancy	The extent to which a particular E-waste disposal bin is filled to its maximum capacity.
Small-sized items	Batteries, phones and bulbs.
Medium-sized items	Laptops
Large-sized items	Monitors and printers.

V. Use Case Model



VI. Use Case Descriptions

1. Account Registration

Use Case ID:	UC1		
Use Case Name:	Account Registration		
Created By:	Htoo Myat Noe	Last Updated By:	Htoo Myat Noe
Date Created:	24 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User (E-waste disposer)
Description:	<p>The E-waste disposer user may register for a new account within the E-waste recycling system in order to gain personalized access and convenience features. Registration enables users to securely store their personal details and home/work location, making it easier to locate nearby recycling bins without having to repeatedly input their information. By creating an account, the user gains access to a persistent profile that can be used for future interactions such as checking nearby bins, receiving notifications to remind them on their next recycling trip, and bin availability in their vicinity.</p> <p>During registration, the user provides basic details such as their username and password credentials. The system ensures that user information is valid, unique (no duplicate username), and compliant with password security requirements. The account creation process is designed to be simple and user-friendly while maintaining strict security standards.</p> <p>The successful creation of an account establishes the user's identity within the system, enabling them to log in with their username.</p>
Preconditions:	<ul style="list-style-type: none">• The user can access the application.• The user's device has internet connectivity.• The user does not already have an account (for the same email/username).
Postconditions:	<ul style="list-style-type: none">• A new account is created and stored in the database.• The user can log in using the newly created credentials.
Priority:	High
Frequency of Use:	Low (usually only done once for every account to be created)
Flow of Events:	<ol style="list-style-type: none">1. The user opens the portal.2. The user selects "Register / Create new Account."3. The user enters required information:<ul style="list-style-type: none">○ Email○ Username○ Password (with confirmation)4. The user clicks "Sign up"

	<p>5. System validates input:</p> <ul style="list-style-type: none"> ○ Checks if email already exists. ○ Ensures password is between 8 to 30 characters, with at least a number and a special character. <p>6. If validation passes, the system creates the account in the database.</p> <p>7. The system displays “Registration successful” message and provides the option to log in.</p>
Alternative Flows:	<p>If the user provides missing or invalid input, the system displays an error message specifying the missing/incorrect field (e.g., “Password too short”). The user will correct the input and resubmit.</p> <p>If the email already exists, the system displays: “An account with this email already exists.” The user can choose to log in or use a different email.</p> <p>If the registration fails due to network/database issues, the system displays: “Registration failed. Please try again later.” The user can retry after the internet connection stabilises or wait for the system recovery.</p>
Exceptions:	If the system cannot connect to the database, display “Account registration service unavailable. Please try again later.”
Includes:	NIL
Special Requirements:	Clear instructions for password requirements (e.g., min. 8 characters, max. 30 characters 1 number, 1 special character).
Assumptions:	The user provides accurate information for registration.
Notes and Issues:	<p>Consider adding biometric login (fingerprint/face ID) as a future enhancement.</p> <p>Consider Multi-Factor Authentication for enhanced security.</p> <p>Consider a session timeout for inactivity.</p> <p>Consider secure storage of passwords (hashed and salted).</p>

2. Login (User)

Use Case ID:	UC2		
Use Case Name:	Login (User)		
Created By:	Htoo Myat Noe	Last Updated By:	Nicholas
Date Created:	24 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User (e-waste disposer)
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Description:	<p>The E-waste disposer user may log in to the E-waste recycling application to gain secure access to its personalized features and services. Logging in establishes the user's identity within the system and ensures that their account data, such as saved locations, are available. This allows users to enjoy a more seamless experience compared to guest access.</p> <p>Through the login process, users can conveniently access features such as locating nearby recycling bins tailored to their stored address, retrieving disposal guidelines for different categories of electronic waste, and viewing updates or notifications related to recycling trips. The authentication process also safeguards sensitive user data and ensures that only authorized users gain access to the account.</p> <p>The login process typically requires the user to provide registered credentials (email/username and password). The system validates these details against securely stored data in the database. On successful authentication, the user is granted access to the main dashboard of the application, where all features are accessible. This process reinforces trust and security, while also enabling the app to deliver a personalized and engaging experience.</p> <p>In essence, login serves as the critical gateway between the user and the E-waste recycling ecosystem, ensuring that users can securely interact with the system while enabling the application to provide tailored services that encourage proper recycling practices.</p>
Preconditions:	<ul style="list-style-type: none"> • The user can access the application. • The user's device has internet connectivity. • The user has previously registered an account.
Postconditions:	<ul style="list-style-type: none"> • The user is successfully logged into the app and can access personalized features.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> 1. The user opens the app. 2. The user selects "Login". 3. The user enters personal credentials (email address and password). 4. The user clicks "Login". 5. The system verifies the credentials with the database. 6. If credentials are correct, the system logs in the user and redirects to the home/dashboard screen.
Alternative Flows:	<p>If the user forgets his/her password, he/she can click "Forgot Password". The system prompts the user to enter the registered email. The system sends a password reset link to the email. The user resets the password and returns to the login flow.</p>

	<p>If the user tries to log in without an internet connection, the system displays: “Internet connection required. Please connect and try again.”</p> <p>If the user enters incorrect credentials, the system displays: “Incorrect username or password. Please try again.” The user can retry entering credentials.</p>
Exceptions:	<p>If the system cannot connect to the database, display “Login service unavailable. Please try again later.”</p> <p>If the account is locked due to multiple failed login attempts (max 5), the system displays “Account temporarily locked. Please reset your password.”</p>
Includes:	Account Registration: Optional, if the user does not have an account.
Special Requirements:	Nil
Assumptions:	<ul style="list-style-type: none"> Users have a valid account to log in. The user's device has a working internet connection.
Notes and Issues:	<p>Users can only have up to 5 login attempts (for security purposes).</p> <p>Consider adding biometric login (fingerprint/face ID) as a future enhancement. Optional integration with OAuth/Google/Facebook login for convenience.</p> <p>Error messages should be clear but not reveal sensitive info (e.g., avoid stating whether username or password is incorrect).</p> <p>Consider logging of admin login attempts for audit purposes.</p> <p>Secure storage of passwords (hashed and salted).</p>

3. Login (Admin)

Use Case ID:	UC3		
Use Case Name:	Login		
Created By:	Htoo Myat Noe	Last Updated By:	Cek Cong
Date Created:	24 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	Admin
Description:	The Admin user logs in to the E-waste management application to gain secure access to administrative features that are not available to regular users. Through the login process, the admin establishes their identity and authorization level, ensuring that only verified personnel

	<p>can manage critical aspects of the system. This protects sensitive operational data and prevents unauthorized modifications.</p> <p>Once logged in, the admin gains access to a dedicated dashboard that provides tools for overseeing the overall recycling system. These tools include updating bin location details, adjusting occupancy levels, adding or removing bins when necessary, and monitoring user activity. The admin can also generate and review statistical reports to gain insights into bin usage trends, recycling participation levels, and other key performance metrics. These features support informed decision-making and ongoing system maintenance.</p> <p>The login process requires the admin to supply valid credentials (email/username and password), which are verified against the secure admin database. Successful login not only confirms identity but also initiates a secure session that allows the admin to perform high-level tasks with accountability. Security is paramount in this process, as administrative actions can significantly impact the usability and reliability of the entire E-waste management system.</p> <p>In essence, the admin login function is the gateway to the “control center” of the E-waste management platform. By restricting access to trusted personnel, the system ensures integrity, security, and smooth operation of the recycling ecosystem while enabling administrators to maintain accurate, up-to-date information for end-users.</p>
Preconditions:	<ul style="list-style-type: none"> • The admin can access the application. • The admin's device has internet connectivity. • The admin has the essential credentials to log into the admin account, and is authorised to do so.
Postconditions:	<p>Admin is successfully logged in and can access administrative functions such as:</p> <ul style="list-style-type: none"> • Updating bin locations and occupancy data • Adding or removing bins • Viewing usage statistics and reports
Priority:	High
Frequency of Use:	Medium (used periodically for maintenance)
Flow of Events:	<ol style="list-style-type: none"> 1. The admin opens the app. 2. The admin selects “Login”. 3. The admin enters credentials (email address and password). 4. The admin clicks “Login”. 5. The system verifies credentials against the admin database. 6. If credentials are correct, the system logs in the admin and redirects to the admin dashboard.
Alternative Flows:	If the admin forgets his/her password, he/she can click “Forgot Password”. The system prompts the admin to enter the registered email. The system sends a password reset link to the email. The admin resets password and returns to login flow.

	<p>If the admin tries to log in without an internet connection, the system displays: "Internet connection required. Please connect and try again."</p> <p>If the admin enters incorrect credentials, the system displays: "Incorrect username or password. Please try again." He/she can retry entering credentials (for up to 3 tries).</p>
Exceptions:	<p>If the system cannot connect to the database, display "Login service unavailable. Please try again later."</p> <p>If the account is locked due to multiple failed login attempts, display "Account temporarily locked. Please try again after 10 minutes."</p>
Includes:	NIL
Special Requirements:	Optional integration with OAuth/Google/Facebook login for convenience.
Assumptions:	<ul style="list-style-type: none"> • Admin has a valid account to log in. • Admin's device has a working internet connection.
Notes and Issues:	<p>The admins can only have up to 5 login attempts (for security purposes).</p> <p>Consider adding biometric login (fingerprint/face ID) as a future enhancement.</p> <p>Consider Multi-Factor Authentication for enhanced security.</p> <p>Consider a session timeout for inactivity.</p> <p>Consider logging of admin login attempts for audit purposes.</p> <p>Secure storage of passwords (hashed and salted).</p> <p>Error messages should be clear but not reveal sensitive info (e.g., avoid stating whether username or password is incorrect).</p>

4. Manage Account

Use Case ID:	UC4		
Use Case Name:	Manage Account		
Created By:	Nicholas	Last Updated By:	Myat Noe
Date Created:	26 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User / Admin	
Description:	Both users and admins may occasionally need to modify their	

	<p>account details within the E-waste management application. These modifications typically include updating their username for personalization or security reasons, or changing their password to maintain account safety. Over time, actors may forget their credentials or enter incorrect passwords multiple times, which may result in temporary account lockouts as part of the system's security protocol. To address this, the system provides a password recovery function that ensures actors can securely regain access to their accounts.</p> <p>For routine account management, an actor who is already logged in can access the "Manage Account" section. This area displays their current information and allows them to update sensitive details such as username and password. Changes are validated by the system and securely stored in the database. By allowing actors to update their information, the system supports both personalization and ongoing security practices, such as encouraging stronger passwords.</p> <p>For password recovery, the system ensures that even if access credentials are forgotten or compromised, actors can safely reset their accounts. By verifying the actor's identity through their registered email and username, the system sends a secure password reset link to the associated email account. This ensures that only the rightful account owner can initiate the reset. Once the reset link is accessed, the actor can create a new password, which replaces the old one in the database. This prevents unauthorized access while restoring system usability.</p> <p>Overall, the account management and password recovery functions are critical components of the E-waste management system. They ensure that both users and admins can maintain secure, up-to-date accounts while preserving system integrity and providing a seamless way to regain access in case of forgotten credentials.</p>
Preconditions:	<ul style="list-style-type: none"> • The actor can access the web portal and has internet connectivity. • The actor has logged in. (for changing of password and username). • The actor has access to his/her email. (for password recovery only).
Postconditions:	<ul style="list-style-type: none"> • The actor's account information will be updated in the system. (for changing of password and username) • An email will be sent to the corresponding email address where the actor can reset their password. (for password recovery)
Priority:	High
Frequency of Use:	Medium
Flow of Events:	<p><u>For changing account information:</u></p> <ol style="list-style-type: none"> 1. The actor will click on the "Manage Account". 2. The actor will be presented with their current information.

	<p>He/she will type in the new username or password in their respective input field and click save.</p> <p><u>For password recovery:</u></p> <ol style="list-style-type: none"> 1. The actor opens the portal. 2. The actor selects “Forgot Password” 3. The actor enters their username and email used to register the account 4. If the username and email match, an email will be sent to the corresponding email address where the actor can reset their password. This can only be done through the link in the email. 5. The account credentials are updated with the new password.
Alternative Flows:	NIL
Exceptions:	If the system cannot connect to the database, display “Please try again later.”
Includes:	<ul style="list-style-type: none"> • Password Recover • Change Password • Change Username • Login
Special Requirements:	NIL
Assumptions:	NIL
Notes and Issues:	NIL

5. Password Recovery

Use Case ID:	UC5		
Use Case Name:	Password Recovery		
Created By:	Nicholas	Last Updated By:	Nicholas
Date Created:	26 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User/Admin
Description:	The actor has forgotten their password. The actor needs to reset or recover their password in order to log in.
Preconditions:	<ul style="list-style-type: none"> • The actor can access the web portal and has internet connectivity. • The actor has logged in. (for changing of password and username).
Postconditions:	<ul style="list-style-type: none"> • The user/admin account is updated with a new password, with the old password being replaced.

Priority:	High
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> 1. The actor opens the portal. 2. The actor selects “Forgot Password”. 3. The actor enters his/her email that was used to register the account. 4. An email will be sent to the corresponding email address where the actor can reset their password. This can only be done through the link in the email. 5. The actor should ensure that the new password is between 8-30 characters with at least 1 number and a special character. 6. The account credentials are updated with the new password.
Alternative Flows:	<p>If the actor provides missing or invalid input, the system displays an error message specifying the missing/incorrect field (e.g., “The email address does not have an account”). The actor has to correct the input and resubmit.</p> <p>If the password reset fails due to network/database issues, the system displays: “Please try again later.” The actor can retry after ensuring an internet connection or waiting for system recovery.</p>
Exceptions:	If the system cannot connect to the database, display “Please try again later.”
Includes:	NIL
Special Requirements:	The actor has to be able to access his email account to be able to access the recovery link.
Assumptions:	The actor can recall the email used to create the account.
Notes and Issues:	NIL

6. Change Password

Use Case ID:	UC6		
Use Case Name:	Change Password		
Created By:	Nicholas	Last Updated By:	Myat Noe
Date Created:	26 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User / Admin
Description:	Users or admins may wish to change their password.
Preconditions:	<ul style="list-style-type: none"> • The actor can access the web portal and has internet

	<p>connectivity.</p> <ul style="list-style-type: none"> The actor has logged in.
Postconditions:	<ul style="list-style-type: none"> The actor's account password will be updated in the system.
Priority:	High
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> The actor navigates to the application's main interface after logging in. The actor selects the "Manage Account" option from the menu. The system retrieves the actor's current account information and displays it on the screen (excluding sensitive data such as the current password). The actor clicks on the "Change Password" section. The system presents input fields for: <ul style="list-style-type: none"> - Current password (for verification) - New password - Confirm new password The actor enters their current password and provides the new password in the designated field, then re-enters the new password in the confirmation field. The actor clicks "Save" to submit the change. The system validates the following: <ul style="list-style-type: none"> - The current password matches the one stored in the database. - New password and confirmation match. - The new password meets security criteria: length of 8–30 characters, contains at least one number, and at least one special character. If all validations pass, the system securely updates the password in the database The system displays a success message: "Password updated successfully." The actor is redirected to their Manage Account dashboard and can continue using the application with the updated credentials.
Alternative Flows:	<ol style="list-style-type: none"> If the actor types a password that is not strong enough or does not meet the criteria, the system will show a message "The password does not meet the criteria, please try again". The actor will key in the new password again until the system approves.
Exceptions:	If the system cannot connect to the database, display "Please try again later."
Includes:	Login: the actor has to log in to change his/her password.
Special Requirements:	NIL
Assumptions:	NIL

Notes and Issues:	NIL
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7. Change Username

Use Case ID:	UC7		
Use Case Name:	Change Username		
Created By:	Nicholas	Last Updated By:	Nicholas
Date Created:	26 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	User / Admin
Description:	Users or admin may wish to change their username.
Preconditions:	<ul style="list-style-type: none"> The actor can access the web portal and has internet connectivity. The actor has logged in.
Postconditions:	The actor's account username will be updated in the system.
Priority:	High
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> The actor logs into the system and navigates to the application's main interface. The actor selects the "Manage Account" option from the menu. The system retrieves the actor's current account information (excluding sensitive details such as the password) and displays it on the screen. The actor clicks on the "Change Username" section. The system presents an input field for the actor to enter a new username. The actor types in the desired new username. The actor clicks "Save" to submit the change request. The system performs validation checks: <ul style="list-style-type: none"> Ensures the new username is between 5–30 characters in length. Ensures the username is not already taken by another registered account. Ensures the username does not contain invalid or restricted characters (e.g., spaces). If all validations pass, the system updates the username in the database. The system displays a confirmation message: "Username updated successfully." The actor is redirected back to the Manage Account

	dashboard, where the updated username is now visible.
Alternative Flows:	<ol style="list-style-type: none"> If the actor types a username that is not between 8 to 30 characters, the system will show a message “The username is not between 8 to 30 characters, please try again”. The actor will key in the new username again until the system approves.
Exceptions:	If the system cannot connect to the database, display “Please try again later.”
Includes:	Login: the actor has to log in to change his/her username.
Special Requirements:	NIL
Assumptions:	NIL
Notes and Issues:	NIL

8. Access Educational Material

Use Case ID:	UC8		
Use Case Name:	Access Educational Material		
Created By:	Nikhil	Last Updated By:	Yue Jun
Date Created:	28 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User
Description:	The user wants to be able to view the disposal guidelines for a selected e-waste bin or educational videos concerning the environment/proper waste disposal processes.
Preconditions:	<ul style="list-style-type: none"> The actor can access the application and has internet connectivity. The actor has logged in.
Postconditions:	<ul style="list-style-type: none"> User successfully views the educational content and logs out of the system
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> The user logs into the application. From the home or dashboard screen, the user navigates to the “Educational Materials” or “Disposal Guidelines” tab/menu option. The system retrieves and displays a list of available

	<p>educational resources (e.g., video thumbnails, guideline categories).</p> <ol style="list-style-type: none"> 4. The user browses through the available content. 5. The user selects the specific guideline or video they wish to view. 6. The system loads and displays the chosen material: <ul style="list-style-type: none"> - For guidelines: the system displays formatted text instructions with optional downloadable resources. - For videos: the system streams the video content either from the app's backend server or via an integrated video platform (e.g., YouTube). 7. The user views the material and may choose to: <ul style="list-style-type: none"> - Return to the educational materials list. - Select another resource to view. - Exit the section and return to the main dashboard.
Alternative Flows:	If the user attempts to view the videos or guidelines without an internet connection, the system displays: "Internet connection required. Please connect and try again."
Exceptions:	If the educational materials cannot be loaded properly, or are not stored in the backend server properly, an error message will display to indicate that the resource requested is unavailable.
Includes:	Login (User): The user has to be logged in to access this functionality.
Special Requirements:	Optional integration with YouTube or other video hosting websites
Assumptions:	<ul style="list-style-type: none"> User account is valid. All guidelines and educational videos are loaded properly and are accessible to users.
Notes and Issues:	Ensure timely updates of educational videos and guidelines. Videos should be embedded in the web application properly.

9. Locate Nearby Bin

Use Case ID:	UC9		
Use Case Name:	Locate Nearby Bins		
Created By:	Myat Noe	Last Updated By:	Myat Noe
Date Created:	26 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User	
Description:	The user wants to view the locations of nearby e-waste bins. This use	

	case allows e-waste disposers to locate the nearest e-waste bins based on their current locations.
Preconditions:	<ul style="list-style-type: none"> • The user can access the application and has internet connectivity. • The user has logged in. • Global Positioning System (GPS) is enabled on the user's device. • The system has the latest information on the bins' location.
Postconditions:	<ul style="list-style-type: none"> • A map of nearby e-waste bins will be shown on the user's device, and the user may be instructed on how to navigate there if the user wishes to be directed.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> 1. The user opens the app and selects "Locate Bin". 2. The system requests permission from the user to access his/her location. 3. The user grants location access. 4. The system retrieves the user's current location. 5. The system searches in the database for nearby bins. 6. The system displays a map with markers for nearby bins and a list view. 7. The user can select bins to view their details (address, type of e-waste accepted, availability).
Alternative Flows:	<p>If the user does not grant precision to access his/her location, the system will display a message "The app requires location permission to work". The user can either:</p> <ol style="list-style-type: none"> 1) Grant permission → return to the main flow. 2) Cancel → system returns to the home screen. <p>If the user is not in Singapore, the system will display a message saying it's not available in his/her country. The system will offer options to the user:</p> <ol style="list-style-type: none"> 1) Go back to the home screen 2) View educational content/videos, which are available internationally.
Exceptions:	If the map cannot be loaded properly, or data is not stored in the backend server properly, an error message will display to indicate that the resource requested is unavailable.
Includes:	Login
Special Requirements:	NIL
Assumptions:	The user's device has GPS and internet access.
Notes and Issues:	NIL

10. Filter

Use Case ID:	UC10		
Use Case Name:	Filter		
Created By:	Cek Cong	Last Updated By:	Cek Cong
Date Created:	25 Aug 2025	Date Last Updated:	28 Aug 2025

Actor:	User
Description:	The user wants to be able to filter the bins to identify the most suitable bins for the disposal of e-waste. The user will be able to enter the type of waste that they want to dispose of, as well as the estimated size/quantity.
Preconditions:	<ul style="list-style-type: none"> • The user can access the application and has internet connectivity. • The user has logged in. • Global Positioning System (GPS) is enabled on the user's device. • The system has the latest information on the bins' location. • The system has a tracker to estimate the remaining capacity of bins/ can be manually edited by admins.
Postconditions:	<ul style="list-style-type: none"> • The user can identify a list of suitable bins for his disposal purposes
Priority:	High
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> 1. The user logs in with a valid username and password. 2. The system verifies credentials and grants access to the main dashboard. 3. The user enters the app and selects "Filter Bins". 4. The system loads the filter interface and displays available filtering options. 5. Subsequently, the user will be invited to select the type of e-waste he wants to dispose of from a drop down box. 6. The system displays a reference image and example items for each category to guide user input. 7. The user confirms the selection. 8. The system retrieves the user's current GPS location. 9. The system cross-checks available bins within a defined radius (e.g., 2 km). 10. The system filters bins based on: <ul style="list-style-type: none"> - Accepted waste type. - Estimated available capacity (Low, Medium, High).

	<p>11. The system generates a ranked list of suitable bins, prioritizing the nearest bins with sufficient capacity.</p> <p>12. The system highlights the top recommended bin as the “Best Option.”</p> <p>13. The user is presented with a map view showing:</p> <ul style="list-style-type: none"> - User’s current location (red marker). - Recommended bins (green/yellow/red markers depending on occupancy). <p>14. The user can toggle between map view and list view of bins.</p> <p>15. Each bin result displays:</p> <ul style="list-style-type: none"> - Location address. - Distance from user. - Occupancy level. - Accepted waste type(s). <p>16. The user clicks on a specific bin in the list or map.</p> <p>17. The system shows detailed bin information, including the last update timestamp.</p> <p>18. 6.3 The user can click “Navigate”, which redirects to Google Maps for directions.</p> <p>19. The user can choose to save the bin as a preferred location for future use.</p> <p>20. The system confirms that the bin has been saved (if chosen).</p> <p>21. The user can return to the dashboard or log out.</p>
Alternative Flows:	<p>If the user does not grant precision to access his/her location, the system will display a message “The app requires location permission to work”. The user can either:</p> <ol style="list-style-type: none"> 1. Grant permission → return to the main flow. 2. Cancel → system returns to the home screen. <p>If no bins meet the user’s criteria (waste type + capacity + proximity): The system displays: “No suitable bins are currently available for your selection.”</p> <p>The user may:</p> <ol style="list-style-type: none"> 1. Retry Later → The system suggests checking again after some time. 2. View Closest Available Bins → The system presents the nearest bins regardless of capacity or waste type, so the user still has disposal options.
Exceptions:	If the map cannot be loaded properly, or data is not stored in the backend server properly, an error message will display to indicate that the resource requested is unavailable.
Includes:	Login (User): The user must already be logged in to the portal to access this functionality.
Special Requirements:	NIL
Assumptions:	There are e-waste bins nearby (within 2km).
Notes and Issues:	NIL

11. Navigate to Bin

Use Case ID:	UC11		
Use Case Name:	Navigate to Bin		
Created By:	Myat Noe	Last Updated By:	Nicholas
Date Created:	24 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	User
Description:	The user wants to get directions to the nearest e-waste bin.
Preconditions:	<ul style="list-style-type: none"> The user has access to the application. The user is logged in. Global Positioning System (GPS) is enabled on the user's device. The system has the latest information on the bins' location. The device has internet connectivity for map navigation.
Postconditions:	<ul style="list-style-type: none"> The user can open Google Maps for navigation.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> The user selects a bin from the list/map. The user clicks the "Navigate" button. The system confirms the user's location is accessible. Google Maps opens with the route to the selected bin. The user follows the route to the bin.
Alternative Flows:	<p>If the user has no internet connection, the system displays: "Internet connection is required to open maps." The user can retry after connecting to the internet.</p> <p>If the user's location is unavailable, the system displays: "Unable to detect current location. Please enable GPS and try again." The user can enable GPS and then return to the main flow.</p> <p>If the user chooses a bin outside Singapore, the system displays: "Selected bin is outside the service area. Navigation unavailable." The user can choose another bin.</p>
Exceptions:	<p>If the GPS signal is lost during navigation, Google Maps will show a warning and attempt to recalculate.</p> <p>If the selected bin is removed or marked unavailable, the system displays "Bin is currently unavailable. Please select another bin."</p>
Includes:	Locate Nearby Bins: The navigation feature depends on the user first locating a nearby bin.

	Check Bin Availability: Shows bin capacity status before navigating.
Special Requirements:	NIL
Assumptions:	<ul style="list-style-type: none"> • The users have a GPS-enabled device. • The users are familiar with basic map navigation. • Bins' location data in the database is accurate.
Notes and Issues:	NIL

12. Flag User

Use Case ID:	UC12		
Use Case Name:	Flag User		
Created By:	Nicholas	Last Updated By:	Nicholas
Date Created:	28 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	Admin
Description:	The admins will be able to flag/block a user should a normal user perform an action that is undesirable (eg. spamming the query functionality)
Preconditions:	<ul style="list-style-type: none"> • The admin has logged into the system and has internet connectivity. • The user to be flagged has already performed an action that is deemed to be worthy of being flagged by an admin
Postconditions:	<ul style="list-style-type: none"> • The user's account is flagged • The user will no longer be able to log in with his account
Priority:	Low
Frequency of Use:	Low
Flow of Events:	<ol style="list-style-type: none"> 1. The admin selects log in and enters personal credentials to log in. 2. The admin clicks on "Manage Users" menu functionality 3. The system displays the list of registered users, including their account status (active, flagged, blocked). 4. The admin scrolls/searches to locate the specific user to be flagged. 5. The system displays the user's profile details (username, email, recent activity logs, current account status). 6. The admin clicks the "Flag User" option. 7. The system displays a confirmation dialog: "Are you sure you want to flag this user? This action will prevent them from

	<p>logging in.”</p> <ol style="list-style-type: none"> 8. The admin confirms the action by clicking “Yes”. 9. The system updates the user’s account status to “Flagged” in the database. 10. The system logs the action in the Admin Activity Log (admin ID, timestamp, user flagged, reason if provided). 11. The system displays a success message: “User has been flagged successfully.” 12. The flagged user is immediately prevented from logging in on their next attempt. 13. The admin remains in the Manage Users menu and can continue to manage other accounts.
Alternative Flows:	NIL
Exceptions:	The same exceptions for Login (Admin) apply here.
Includes:	Login (Admin): The admin must be verified in order to perform such functionality. Normal users will not have any access to this functionality
Special Requirements:	Storage of user flag status in the database.
Assumptions:	<ul style="list-style-type: none"> • The user to be flagged already has an existing account in the system • The admin has a valid internet connection and is able to successfully log into the system
Notes and Issues:	NIL

13. Create Query

Use Case ID:	UC13		
Use Case Name:	Create Query		
Created By:	Cek Cong	Last Updated By:	Myat Noe
Date Created:	29 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	User
Description:	The user has some query or inquiry to make concerning any of the application services. The user may also have an inquiry on more general issues relating to e-waste logistics etc.
Preconditions:	<ul style="list-style-type: none"> • User has to be logged in into the portal • Device has internet access
Postconditions:	<ul style="list-style-type: none"> • The user is able to successfully submit a query to an admin, who will respond to the user’s query accordingly.

Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> 1. The user opens the application portal. 2. The user selects “Log In.” 3. The system prompts the user for credentials (username and password). 4. The user enters credentials. 5. The system validates the credentials against the user database. 6. Upon successful authentication, the user is redirected to the User Dashboard. 7. The user selects the “Query / Support” menu option. 8. The system displays the Query Management Page, with options such as Create New Query, View Submitted Queries, and Query Status. 9. The user selects “Create New Query.” 10. The system displays a form with required fields (e.g., Subject, Category, Description, and optional attachments). 11. The user enters the query details into the fields provided. 12. If needed, the user attaches supporting files or screenshots (optional). 13. The system validates mandatory fields (e.g., Subject and Description cannot be empty). 14. The user clicks “Submit.” 15. The system displays a confirmation screen summarizing the entered query details (Subject, Category, Description, Attachments). 16. The user reviews the information. 17. The user clicks “Confirm” to proceed. 18. The system saves the query into the database, tagged with: <ul style="list-style-type: none"> - User ID - Query details - Date and timestamp - Status = “Pending” 19. The system logs the submission in the User Activity Log. 20. The system displays a success message: “Your query has been submitted successfully. An admin will respond shortly.” 21. The system sends an acknowledgment notification (e.g., in-app or email) to the user with a reference ID for tracking. 22. The user remains on the Query Management Page and can choose to create another query or return to the dashboard.
Alternative Flows:	<ol style="list-style-type: none"> 1. If the user enters a query that is too short (20 characters or less), the system will show a message “Your query is too short.”. This is to prevent users from spamming the submit query functionality. 2. The actor will input a new valid query that fulfills the requirements.
Exceptions:	The user inputs a query that is too short, in which case the user will be invited to input a longer query.

Includes:	Login (user): The user has to be logged in and have a valid account in order to access this functionality.
Special Requirements:	A query downtime has to be implemented, with users limited to submitting a fixed number of queries during a certain timeframe. This is to prevent spam from the end of the users.
Assumptions:	User has a valid account already registered in the system
Notes and Issues:	NIL

14. Answer Query

Use Case ID:	UC14		
Use Case Name:	Answer Query		
Created By:	Nicholas	Last Updated By:	Myat Noe
Date Created:	28 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	Admin
Description:	The admin will respond to queries created by various users.
Preconditions:	<ul style="list-style-type: none"> • Admin has to be logged in into the portal • Device has internet access • There exists at least 1 unanswered query in the database from a user
Postconditions:	<ul style="list-style-type: none"> • User's query is successfully answered • Query from the user can be marked as closed
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> 1. The Admin opens the application portal. 2. The Admin selects "Log In." 3. The system prompts for admin credentials (username + password). 4. The Admin enters credentials. 5. The system validates the credentials against the Admin Database. 6. Upon successful authentication, the Admin is redirected to the Admin Dashboard. 7. The Admin selects the "Query Management" option from the menu. 8. The system displays a list of queries with details such as: <ul style="list-style-type: none"> - Query ID - User ID / Name - Subject / Category

	<ul style="list-style-type: none"> - Submission Timestamp - Status (Open, Pending, Closed) <p>9. The Admin filters or searches queries (optional).</p> <p>10. The Admin selects a specific query marked as "Open."</p> <p>11. The system displays the full query details, including:</p> <ul style="list-style-type: none"> - User's original message - Attachments (if any) - Timestamp of submission - Query status = "Open" <p>12. The Admin clicks "Respond to Query."</p> <p>13. The system presents a text input field (Answer Box) and optional attachment upload.</p> <p>14. The Admin enters the response/answer to the query.</p> <p>15. The system validates the input (e.g., ensures response is not empty).</p> <p>16. The Admin clicks "Submit."</p> <p>17. The system prompts for confirmation: "Are you sure you want to submit this response? Once submitted, no other admin can respond."</p> <p>18. The Admin clicks "Confirm."</p> <p>19. The system saves the Admin's response into the Query Database with:</p> <ul style="list-style-type: none"> - Answer text - Admin ID - Timestamp - Status updated to "Closed" <p>20. The system logs the action in the Admin Activity Log.</p> <p>21. The system sends a notification (in-app or email) to the User:</p> <p>22. "Your query (Ref: #QueryID) has been answered by an Admin."</p> <p>23. The Admin sees a success message: "Response submitted successfully. This query is now closed."</p> <p>24. The Admin is redirected back to the query list, where the answered query now appears as Closed.</p>
Alternative Flows:	<p>1. If the admin notices that the query submitted is spam or dubious in nature, the flag user use case will be executed.</p>
Exceptions:	<p>1. Changes to the answer will not be saved. The admin must submit the query for the answer to be saved. This is to prevent multiple admins from editing a query.</p>
Includes:	<p>Login (Admin): The Admin has to be logged in and have a valid account in order to access this functionality.</p>
Special Requirements:	<p>Admins can respond to any query. However, once a query is responded to, other admins cannot respond to the query anymore. It will be regarded as closed in the system</p>
Assumptions:	<ul style="list-style-type: none"> Admin has a valid account already registered in the system Admin has a valid internet connection
Notes and Issues:	<p>Need to track the status of queries in the system (whether they are open or closed)</p>

15. Create Reminder

Use Case ID:	UC15		
Use Case Name:	Create Reminder		
Created By:	Cek Cong	Last Updated By:	Myat Noe
Date Created:	28 Aug 2025	Date Last Updated:	31 Aug 2025

Actor:	User
Description:	The user should be able to create a reminder with a custom memo that reminds the user to dispose of his/her E-waste.
Preconditions:	<ul style="list-style-type: none"> • The user has to be logged in into the portal. • The user's device has internet access.
Postconditions:	<ul style="list-style-type: none"> • User's reminder will appear on the "reminders" section of the user dashboard on the web application.
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> 1. The user opens the application portal. 2. The user selects "Log In." 3. The system prompts the user for credentials (username and password). 4. The user enters credentials. 5. The system validates the credentials against the user database. 6. Upon successful authentication, the user is redirected to the User Dashboard. 7. The user selects the "Reminder" menu option. 8. The system displays the Reminder Management Page, with options such as Create New Reminder, View Reminders 9. The user selects "Create New Reminder" 10. The system displays a form with required fields (e.g. Location, Description, Date, Time, and optional attachments). 11. The user enters the reminder details into the fields provided. 12. If needed, the user attaches photos (optional). 13. The system validates mandatory fields (e.g., Location, Description, Date and Time cannot be empty). The input for Date and Time should be later than the date and time in which the user created the reminder. 14. The user clicks "Submit." 15. The system displays a confirmation screen summarizing the entered reminder details. 16. The user reviews the information. 17. The user clicks "Confirm" to proceed. 18. The system saves the reminder into the database, tagged

	<p>with:</p> <ul style="list-style-type: none"> - User ID - Reminder ID - Date and Time - Status = "Active" (to signal the reminder is still ongoing) <p>19. The system logs the submission in the User Activity Log.</p> <p>20. The system displays a success message: "Your reminder has been created successfully. A notification will be sent to you to remind you."</p> <p>21. The user can log out of the system.</p> <p>22. The system sends a notification (e.g., in-app or email) to the user when the date and time has come.</p>
Alternative Flows:	If the user submitted a reminder with a date/time that has already passed, the system will not accept the input and will display the error message: "Please input a valid date and time."
Exceptions:	NIL
Includes:	Login (User): The User has to be logged in and have a valid account in order to access this functionality.
Special Requirements:	The user has to enable notification (etc on the app or email) in order to receive the notification on time.
Assumptions:	<ul style="list-style-type: none"> • The user has a valid account already registered in the system • The user has a valid internet connection
Notes and Issues:	The notification can either be an app notification or an email notification.

VII. UI Mockups

Full UI Mockup:

<https://www.figma.com/design/MyKZDhaKCNQXJbHfucpjJt/E-Waste?node-id=0-1&t=HfuWTbvOaTKkq9rj-1>

Logo - bin buddy

FAQ About Us Login/Sign Up

Welcome to Bin Buddy

Join us in personalise your e-waste recycling experience and make it a habit with reminders to recycle!

[Sign up](#)

E-Waste Bins around Singapore

North-East Region
North Region
Central Region
West Region
East Region

Educational materials

Disposal Guidelines
Body text for whatever you'd like to add more to the subheading.

Where to go for big items?
Body text for whatever you'd like to expand on the main point.

Why do we recycle E-Waste?
Body text for whatever you'd like to share more.

Bin Buddy

Topic	Topic	Topic
Page	Page	Page
Page	Page	Page
Page	Page	Page

Figure 1: Main Page of our web application

When users first open the web application, they will be greeted with a welcome message. The main page of our web application consists of an overview of the Singapore map, displaying a consolidated number of e-waste bins in 5 areas of Singapore, each represented in a different colour. Additionally, educational materials such as disposal guidelines can be easily accessed from the main page itself.

Logo - Bin Buddy

FAQ About Us [Login/Sign Up](#)

Where to go for big items?

Subheading that sets up context, shares more info about the author, or generally gets people psyched to keep reading

Need to recycle your large household appliances?
ALBA has you covered!



Starting 2025, ALBA will provide free doorstep collection of large household appliances for recycling. Service bookings will be available starting January 1, 2025.
Terms and conditions apply.

ALBA  Treasure raw materials.

Body text for your whole article or post. We'll put in some lorem ipsum to show how a filled-out page might look:





Excepteur efficient emerging, minim veniam anim cloying aute carefully curated gauche. Espresso exquisite perfect nostrud nisi intricate. Punctual adipiscing Borzoi, essential lovely tempor eiusmod irure. Exclusive izakaya charming Quezon City impeccable aute quality of life soft power pariarur occaecat discerning. Qui wardrobe aliquip, et Amadeus rock opera.

Exquisite sophisticated iconic cutting-edge laborum deserunt esse bureaux cupidatat id minim. Sharp classic the best commodo nostrud delightful. Conversation aute wifey id. Qui sunt remarkable deserunt intricate airport excepteur classic esse riot girl.

Other Educational Articles




Disposal Guidelines
blah blah blah



Why do we recycle E-Waste?
blah blah blah



Different Types of Batteries
blah blah blah

Bin Buddy

Topic

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Figure 2: Educational material section

The screenshot shows a dark-themed website section titled "Frequently Asked Questions (FAQs)". At the top, there is a navigation bar with links for "FAQ", "About Us", and a "Login/Sign Up" button. Below the title, a subheading provides context about the author. The main content consists of five questions, each followed by an expandable answer area indicated by a question mark icon.

Question	Answer
Question 1 ?	Answer to Question 1
Question 2 ?	Answer to Question 2
Question 3 ?	Answer to Question 3
Question 4 ?	Answer to Question 4
Question 5 ?	Answer to Question 5

Bin Buddy



Topic

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Topic

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When clicked onto, each subsection expands and displays articles and videos designed to educate the users. At the bottom of the page, additional topics that users can delve into if they are interested.

Figure 3: FAQ list page

The FAQ page is a one page article that shows a list of frequently asked questions. This allows the user to find answers before submitting a query form.

Logo - Bin Buddy FAQ About Us Welcome Blank

E-Waste Bins around Singapore

North-East Region

North Region

Central Region

West Region

East Region

Educational materials

Disposal Guidelines

Body text for whatever you'd like to add more to the subheading.

Need to recycle your large household appliances?

ALBA has you covered!

Starting 2025, ALBA will provide free doorstep collection of large household appliances for recycling. Service bookings will be available starting January 1, 2025.

ALBA
The better materials

Why?

Check your E-Waste Size

My E-Waste size is : <Size drop down>

<the image plus explanation of the size selected>

Upcoming Reminders

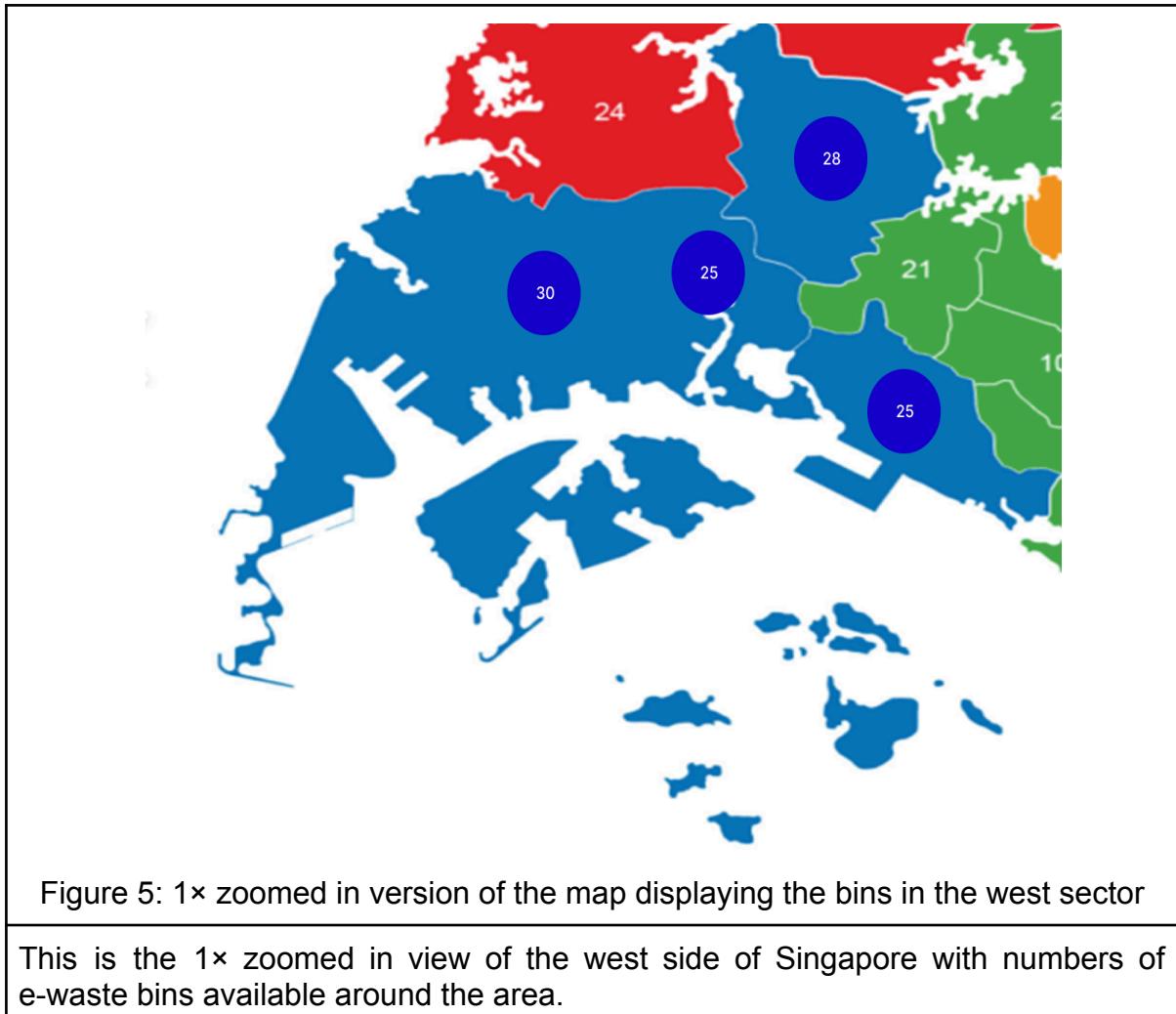
[View All](#)

🕒 Bring old lightbulb to North Spine Body text for whatever you'd like to say. Add main takeaway points, quotes, anecdotes, or even a very very short story.	🕒 bring spoil mouse to blah blah Body text for whatever you'd like to type. Add main takeaway points, quotes, anecdotes, or even a very very short story.
--	---

[Bin Buddy](#) Topic: Page Topic: Page Topic: Page

Figure 4: Main page after logging in

This page has an additional section of checking of waste size showing examples of the size in a drop down list selection. It also shows upcoming reminders the user has created.



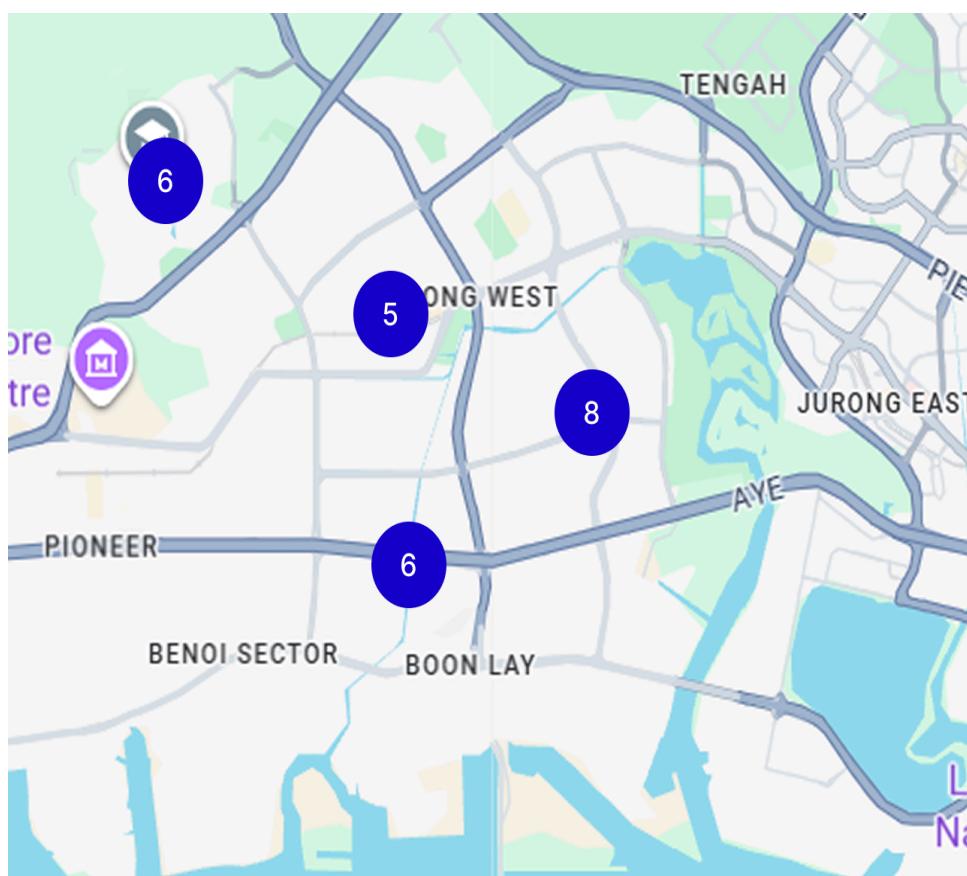


Figure 6: 2x zoomed in version of the map displaying the bins in the west sector

This is the 2x zoomed in view of the west side of Singapore with numbers of e-waste bins available in the Jurong West area.

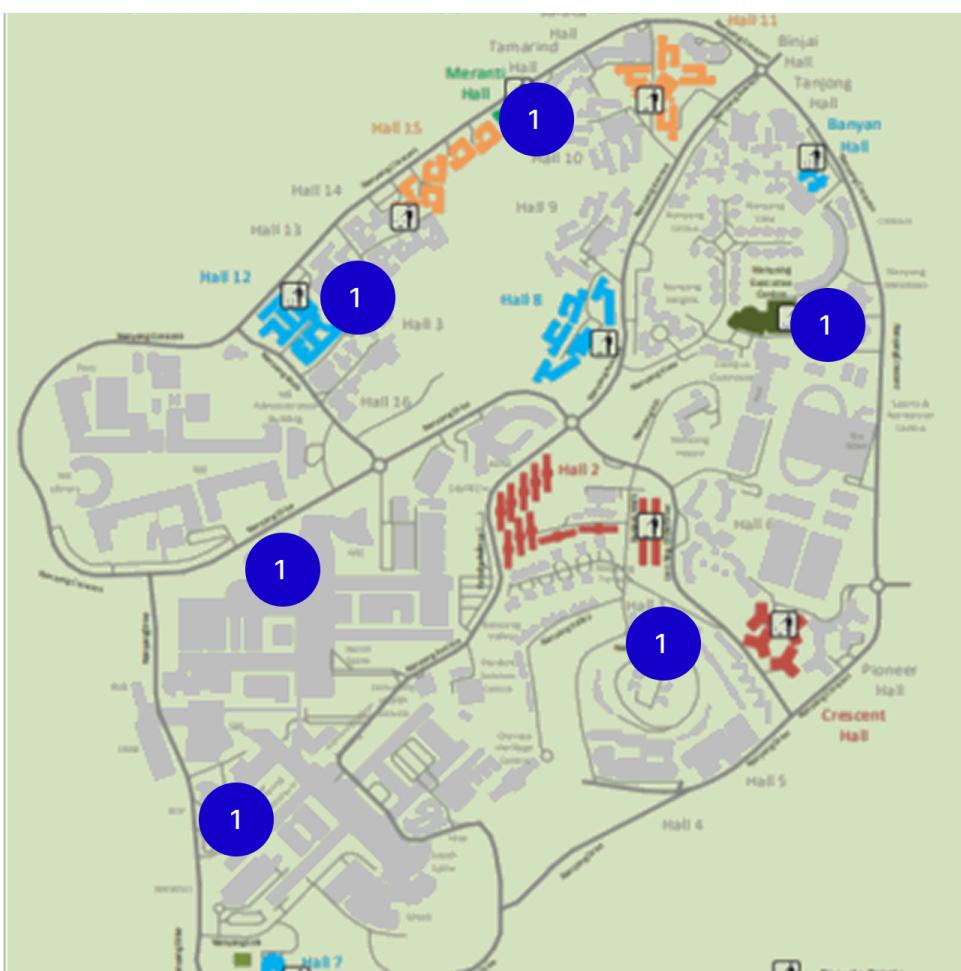


Figure 7: 3x Zoom of the map showing NTU

This is the 3x zoomed in view of the west side of Singapore with numbers of e-waste bins available around NTU.

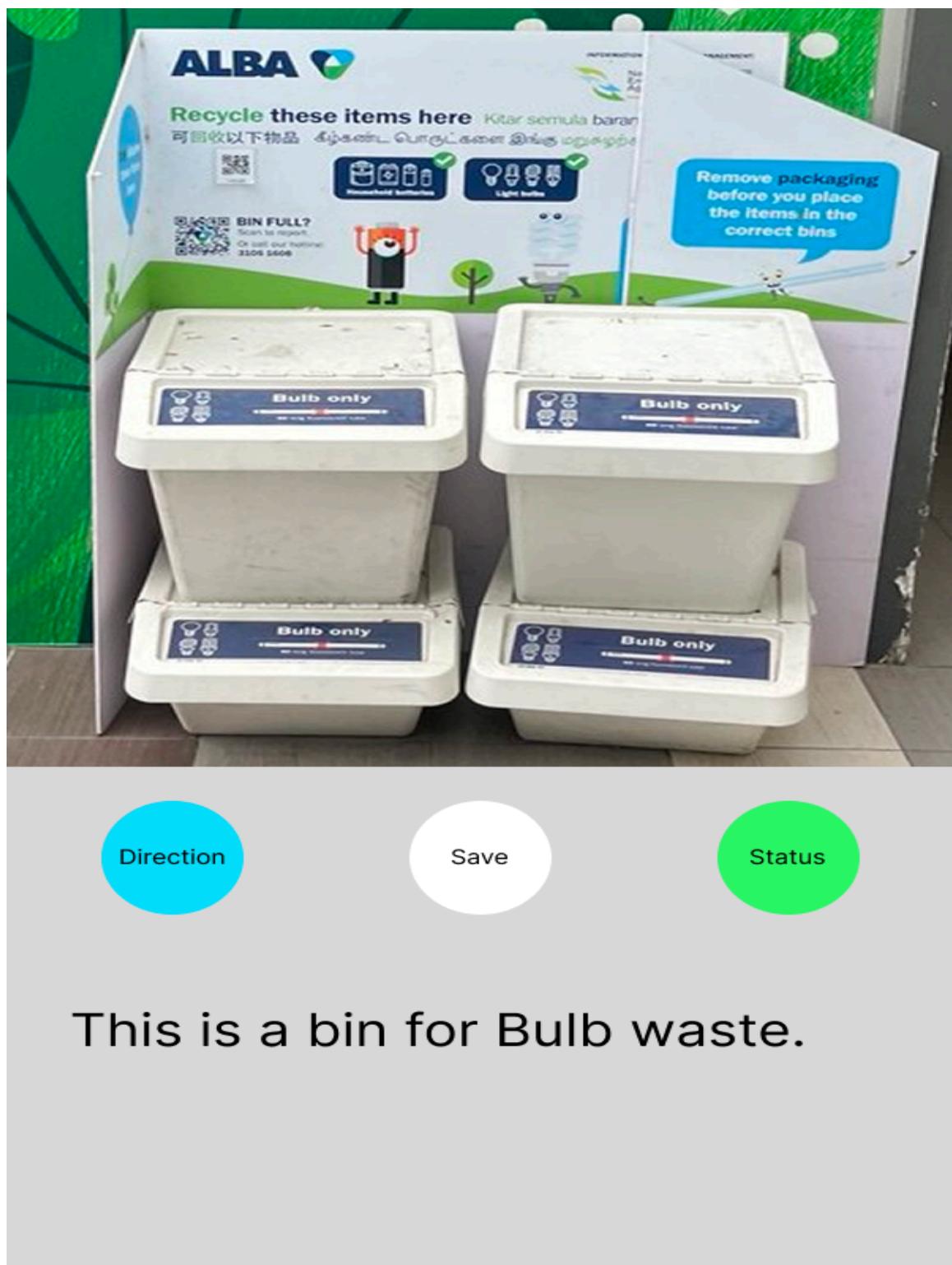


Figure 8: Bin information and image

This shows the image of the bin as well as its information when clicking on the icon on the map.

Check your E-Waste Size

My E-Waste size is : <Size drop down>

<the image plus explanation of the size selected>

Small
Medium
Large

Figure 9: Drop-down selection of e-waste size

This is the drop down selection of e-waste size. Users can take a look at the example of a small, medium or large e-waste to have a better idea of what their waste is categorised into.



This is a sample of small items of e-waste.

Figure 10: Example of Small-sized e-waste

This is the pop-up of small-sized e-waste.



This is a sample of Medium items of e-waste.

Figure 11: Example of Medium-sized e-waste

This is the pop-up of medium-sized e-waste.



This is a sample of Large items of e-waste.

Figure 12: Example of a Large-sized e-waste

This is the pop-up of large-sized e-waste.

Logo - Bin Buddy FAQ About Us Login/Sign Up

Sign up to be with Bin Buddy today!

Username :

Email :

Password :

Confirm Password :

Sign up

Bin Buddy



Topic

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Figure 13: Account registration page

This is the account registration page where we ask for username, email and password.

Welcome Back Bin Buddy!

Username:

Password :

Sign Up

Login

Forgot Password/ Username

Bin Buddy

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Figure 14: Login page

This shows the login page after clicking the top right icon of login/sign up.

Username and Password recovery

Please enter the email you used for registration :

A link with your account details will be sent to
your above email if you have an account with us.

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Figure 15: Information recovery

This page shows what the users will be brought to if they click onto the “Forget username/ password” button. Users will input the email address associated with the account and a recovery link will be sent to their email.

Hello Username! This is your details with us:

Username :

Email :

Password :

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Figure 16: User profile page

This page shows the user information that we have on the account.

The screenshot shows a reminder page with a dark header bar containing the logo "Bin Buddy" and navigation links for "FAQ", "About Us", and "Welcome Blank". Below the header, there are two existing reminders listed:

- Bring old lightbulb to North Spine**
Body text for whatever you'd like to say. Add main takeaway points, quotes, anecdotes, or even a very very short story.
- bring spoil mouse to blah blah**
Body text for whatever you'd like to type. Add main takeaway points, quotes, anecdotes, or even a very very short story.

Below these reminders is a "New Reminder" section with a form:

Reminder Title	Date:
bring spoil mouse to blah blah	30/09/2025
Your message	Time
Enter your question or message	13:30

A large black "Add" button is located at the bottom of the form.

Site name



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Figure 17: Reminder page

This page shows the reminder page that users have created. Users can create new reminders by clicking on by filling up the information and clicking on the "Add" button.

0	0	:	0	0
0	9	:	1	5
1	3	:	3	0
:	:	:	:	:
2	2	:	0	0
2	3	:	5	9

Figure 18: Time selection

This time selection is for the reminder settings.

SEPTEMBER 2025

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 Labor Day	2	3	4	5	6
7 Full moon	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

SunCatcherStudio.com

Figure 19: Calendar

This calendar shows the possible dates the user can choose for their reminders.

Logo - Bin Buddy

FAQ About us

Login/ Sign Up

About Us

Some information about us and some reasons why we want to do this etc.

Body text for your whole article or post. We'll put in some lorem ipsum to show how a filled-out page might look:

Excepteur efficient emerging, minim veniam anim aute carefully curated Ginza conversation exquisite perfect nostrud nisi intricate Content. Qui international first-class nulla ut. Punctual adipisicing, essential lovely queen tempor eiusmod irure. Exclusive izakaya charming Scandinavian impeccable aute quality of life soft power pariatur Melbourne occaecat discerning. Qui wardrobe aliquip, et Porter destination Toto remarkable officia Helsinki excepteur Basset hound. Zürich sleepy perfect consectetur.

Group Photo

Contact Us

First name

Jane

Last name

Smitherton

Email address

email@janesfakedomain.net

Your message

Enter your question or message

Submit

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Figure 20: Information about our group as well as the feedback channel

The “About Us” page shows our group information as well as the contact us section for users to submit their queries.