

Group Project Log

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Deliverable:	Skip the Bins - Project Report
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TECHNICAL REPORT

GROUP 14

Skip the Bins



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Abstract

This report describes the details of the “Skip the Bins” website designed and implemented for course CSCI 5709 – Advanced Web Services for Dalhousie University. Our website addresses the issue of waste recycling and provides a convenient way, and motivates the users to recycle waste to contribute to improving the environment. It also includes recycling vendors with a way to find waste to recycle. This report consists of the current problems, solutions, scope, features, design prototypes, the actual look of the website, user interactions, recommendations, and conclusion for the website.

Keywords

Bins

Waste management

Architecture

Vendors

Task-flows

Process Workflow

Application Architecture

Use cases

User Interface

MERN stack

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1. Project Overview

1.1 Background

Waste is a major global issue causing an imbalance in our ecosystem. Humans' garbage has been harmful to our environment for a long time. Humans make far too much junk and cannot dispose of it sustainably. Our oceans and landfills are overflowing with waste that is not biodegradable or cannot be recycled adequately. Recycling is dismantling and repurposing materials that would otherwise be discarded.

People are increasingly worried about trash generation and its consequences, but they lack awareness and motivation. With our SkipTheBins, we provide a solution to the problem that is beneficial to our ecosystem and the people. SkipTheBins creates a central channel between organizations that act as waste collectors and the public, waste depositors. We motivate our users to recycle waste regularly by offering exciting rewards in different vouchers.

1.2 Purpose

SkipTheBins provides a user-friendly web application and a platform between waste collection vendors and end-users to have a modern waste management system. The user can submit their recyclable waste for recycling by scheduling a waste pickup from different vendors who collect and recycle the waste. To motivate the user to contribute to the environment, we introduce rewards for each waste pickup scheduled, which will help us reduce the environmental pollution caused by improper waste management. By proper recycling, we can conserve our natural resources, which would reduce the need to harvest new materials from nature.

1.3 Objective

We aim at providing the solution to regulate the waste management process to reduce carbon footprint. Our web application would be easy to use and a medium between waste depositors and collectors. It would support features like custom waste pick-up scheduling as per user availability and reward them with points that can be redeemed to get vouchers. We want to generate awareness among people about environmental issues arising due to not recycling the waste.

1.4 Project URLs

Application URLs

- Deployed application: <https://skipthebins.herokuapp.com>
- Deployed backend: <https://skip-the-bins-backend.herokuapp.com>

GitLab Repositories:

- Frontend: [Group 14 CSCI5709](#)
- Backend: [Group 14 Backend CSCI5709](#)

2. Project Insights

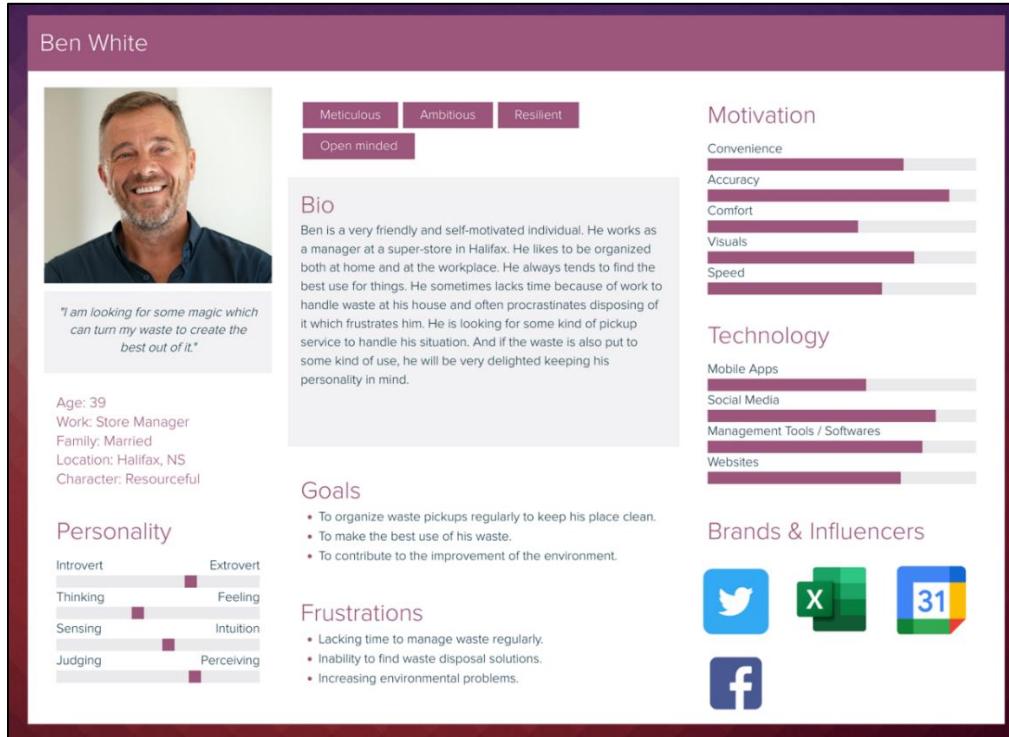
2.1 Target User base

There will be three types of users for the Skip the Bins website. General users, Vendors, and an Administrator. Public users will be ordinary people who will use the website to manage their waste pickups and earn vouchers based on the reward points collected by waste submissions. Vendors will represent any organization that recycles the waste and use the website to organize pickups. The administrator will be a user who will manage the standard users and vendors and maintain the website.

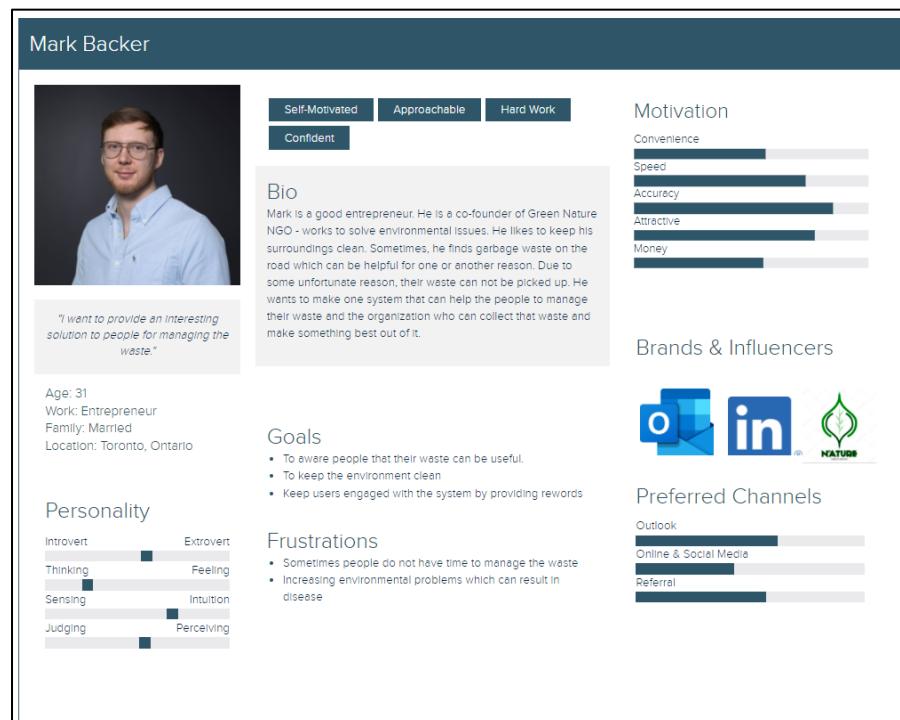
Skip the bins is a website with a simple user interface that will enable ordinary people with minimal computer and technology skills to use it effortlessly without any training. The website will be fully responsive to users on their computers, laptops, iPads, or mobile phones. Vendors will also have more straightforward functionality and interface, so they will also use it easily. The administrator will require a short training because the functionality of an administrator includes features that can affect user experience and alteration of the user information. The website will also provide features such as Contact Us and Frequently Asked Questions (FAQs) which will be helpful to the users in case of any difficulties.

The representation of each type of user is as shown in Figure 1, Figure 2, Figure 3:

General user



Admin



Vendor

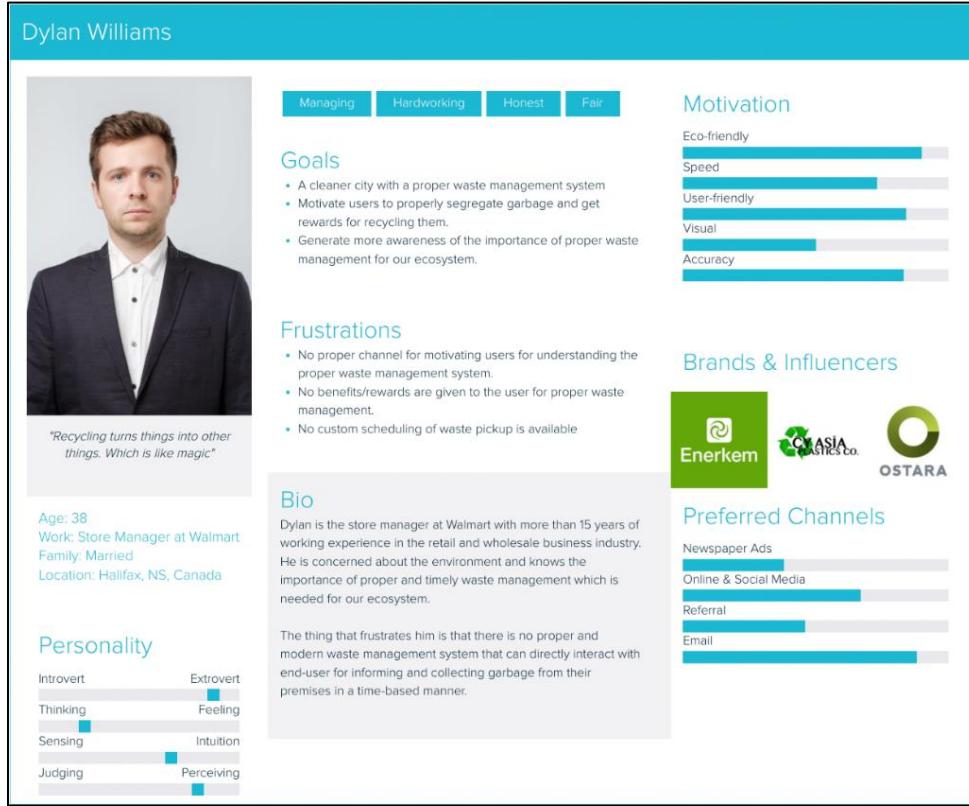


Figure 3: User persona of Vendor [1].

2.2 Brand Attributes

The primary focus of Skip the Bins is to make the waste as helpful as possible to save resources and keep the environment clean. People should be aware of how significant they can make, even with a small contribution. The website depicts the concepts with slogans throughout to convey the message to users. It will display data representations representing an individual's contribution to the cause, thus promoting waste recycling. The users must trust the application so that it will be designed with due diligence and professionalism and, at the same time, will be reliable in all the information and functionalities it provides. The idea of a cleaner environment will be promoted by organizing awareness events at regular intervals through the website. User convenience is kept in mind during the design phase to provide comfort to users in navigating the application. Protection of the user data will be of utmost importance, and all user information will be kept private with proper authentication and authorization throughout the application.

2.3 Competitive Landscape

Skip the Bins is an application to help users find a better way to handle their waste and provide vendors with exposure to find these users. It will contribute significantly to keeping the environment clean with better waste management.

Some of the competitors of our application are WM, Terra cycle, and Waste reduction group [2][3][4].

The features which set us apart are:

- **Residential Pickup Scheduling:** The website supports residential waste pickups allowing individuals to book their waste picked up even in lesser amounts. This feature is not seen in other applications where the waste pickup is only supported in commercial and industrial areas or bulk. Even small contributions will make a notable change to the environmental cause.
- **Rewards:** The website users are motivated to deposit as much waste as possible by rewarding them with points that can be redeemed in vouchers. Some similar organizations provide services by charging the individuals, whereas our application not only offers it accessible but also provides rewards to join more people to recycle their waste.
- **Contribution Analysis:** The users and recycling vendors are shown a graphical analysis of their contributions in real-time. Due to this, users can see how their contributions affect the environment rather than just guessing.
- **Waste Pickup Tracking:** The website allows users to track their waste from its schedule to recycling. Users can see where their waste is and whether it fulfills its purpose of recycling. This feature is unique to our application as no other competitors provide live tracking of waste pickup.
- **Cause Oriented:** The website allows all recycling vendors to register and schedule pickups rather than some specifically chosen vendors. This allows focusing on the cause of recycling rather than profiting just a handful of vendors. It also provides small-scale recycling vendors with a digital platform to help fulfill their recycling abilities.

3. Project Scope

3.1 Goals

- To create a web application to regulate the waste management process.
- To find a profitable way of better waste management to contribute to the environment.
- To provide a user-friendly platform where users and vendors can interact with the application.
- The users can give away their recyclable garbage and, in return, reward points that they can spend in the reward store.
- To create an interactive application leveraging the concepts of modern web development.
- To deliver a valuable product for society and be profitable for all its stakeholders by creating this application.

3.2 Must-Have Features

3.2.1 User Profile Management

This feature ensures the regulation of all the users and roles within the application and consists of the following tasks:

- Signing up for the web portal as shown in Figure 9
- Logging in into the web portal as shown in Figure 10
- Logging out of the web application, as shown in Figure 14
- Forgot password functionality to reset the password as shown in Figure 11
- Editing profile information of the user as shown in Figure 12
- Deleting the account from the web application, as shown in Figure 13
- Account creation approval - Admin can approve the creation of vendor accounts as shown in Figure 15
- Account deletion approval - Admin can approve the deletion of vendor accounts as shown in Figure 16

3.2.2 Scheduling

This feature ensures waste pickups and scheduling. within the application and consists of the following tasks:

- Schedule Pickup – Booking a waste pickup as shown in Figure 18Figure 17.
- View Pickup – View a booked waste pickup as shown in Figure 21.
- Edit Pickup – Edit details of a booked waste pickup as shown in Figure 20.
- Delete Pickup – Delete a scheduled waste pickup as shown in Figure 22.
- Schedule Pickup – Create a waste pickup schedule in Figure 24Figure 23.

- View schedules— View a scheduled waste pickup as shown in Figure 27.
- Edit schedule – Edit details of the created schedule as shown in Figure 26.
- Delete schedule— Delete a created schedule as shown in Figure 28.

3.2.3 Tracking

This feature provides users with a way to track the progress of their garbage pick-ups. It consists of the following tasks:

- The users can view the status updates as shown in Figure 30
- Vendors can update the status of each pickup as shown in Figure 29

3.2.4 Frequently asked questions

This feature provides users an initial platform to resolve their general queries before contacting the company's subject matter experts. It consists of the following tasks:

- A user can view all the frequently asked questions and answers to the desired questions, as shown in Figure 31.
- The vendor organizations can request the addition/update/deletion of FAQs as shown in Figure 34
- An admin can add the frequently asked questions, as shown in Figure 33.
- An admin update/delete the existing frequently asked questions as shown in Figure 35
- The admin can approve or deny the requests of the vendor, as shown in Figure 37

3.2.5 Contact Us

This feature provides users with a podium to reach out to the subject matter experts of Skip the Bins in case of any query. It consists of the following tasks:

- Users can view the vendors' contact information (address, phone number, e-mail id) as shown in Figure 38.
- Users can send their queries by filling out the query form on Skip the bins, as shown in Figure 39
- The vendor can reply to these queries as shown in Figure 42

3.2.6 Announcements

This feature is intended to notify the users of all the latest announcements. It consists of the following tasks:

- Each announcement related notification would expire within 72 hours, as shown in Figure 45
- For each announcement, the user will be notified, as shown in Figure 45.

- Users will receive an email also for each announcement.
- Admin/Vendors can post announcements as shown in Figure 43
- Admins/Vendors can revert their announcements as shown in Figure 44

3.2.7 Rewards

This feature provides the users with a reason to use Skip the Bins. On every garbage giveaway, they get reward points. It consists of the following tasks:

- The users can view the reward points and the history of points, as shown in Figure 47Figure 46.
- The users can spend their reward points at the store, as shown in Figure 49.
- On each transaction with the reward points, the user will be notified.
- Each user gets 30 signup reward points for joining skip the bins.
- After completion of a pickup, the vendor can make a lot of reward points for the users.
- After completing a pickup, the admin can allow reward points to the users, as shown in Figure 47.
- The admin can alter the reward points in case of grievances, as shown in Figure 48.

3.2.8 Reward Store

This feature gives the users a platform to redeem the points they earned from giving away their garbage. It consists of the following tasks:

- The Users can view & purchase the vouchers with the reward points shown in Figure 49.
- The user receives a notification about the transaction and voucher details.
- The admin can add or remove vouchers in the reward store, as shown in Figure 47.

3.2.9 History and Statistics

The above feature helps users to see their past pickup orders. Vendors also benefited from this feature because they could see their previous pickups and customers. It consists of the following tasks:

- The users can view their past pickups and the points earned by them in each pickup, as shown in Figure 53.
- Their vendors can view their past pickups, as shown in Figure 54.

3.3 Nice to Have Features

3.3.1 Portal Analytics

The above feature is helpful for the admin to analyze the portal's data. Admin can view all the details of users, vendors, and different rewards. It consists of the following tasks:

- User Dashboard - The admin can view user analytics, e.g., how many users joined, their participation, etc., as shown in Figure 55.
- Vendor Dashboard - The admin can view vendor analytics, e.g., How many vendors are there, how many users each vendor has, information about their pickups, etc., as shown in Figure 56.
- Reward Dashboard - The admin can view the stats of the reward store, e.g., how many vouchers were redeemed, how many points were spent, etc., as shown in Figure 57.

3.3.2 Events

The above feature helps in organizing and sharing events and their details. It consists of the following tasks:

- Admin can post the different environmental awareness event details in Figure 58.
- Admin can remove the events as shown in Figure 59.
- Users can register for the events and get the confirmation email, as shown in Figure 60.

3.3.3 Careers

The above feature provides a platform for the people who wants to work for Skip the Bins. It consists of the following tasks:

- Admin can put job opportunities which will be offered by one of the vendors who are registered in our system.
- Admin can delete the job posting also.

4. Information Architecture

4.1 Application Architecture

The figure below describes our application's architecture with MVC (Model View Controller) pattern. The model layer contains all the schema of data objects. The view has all the fronts using which users can interact. The controller layer has the core business logic.

We have chosen the MERN stack for building our application. We use MongoDB to store and access data in JSON format, which helps scale our application. ExpressJS and NodeJS frameworks are used for developing the efficient back end. The front-end is developed using ReactJS, Bootstrap, and CSS.

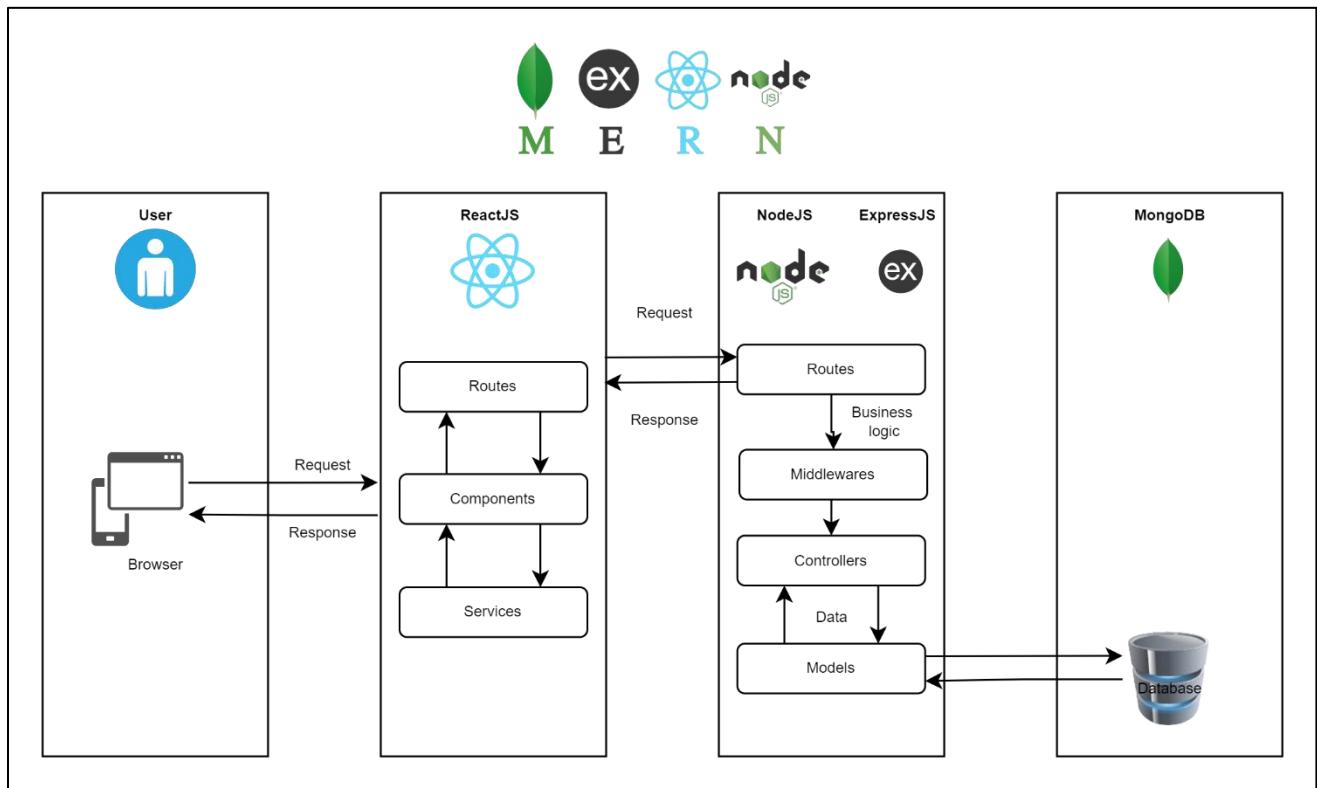


Figure 4: Application architecture

4.2 Sitemap

There are three sitemaps based on the type of user. Figure 5 is the sitemap for the general user, Figure 6 is the sitemap for admin, and Figure 7 is for a vendor.

4.2.1 User Sitemap

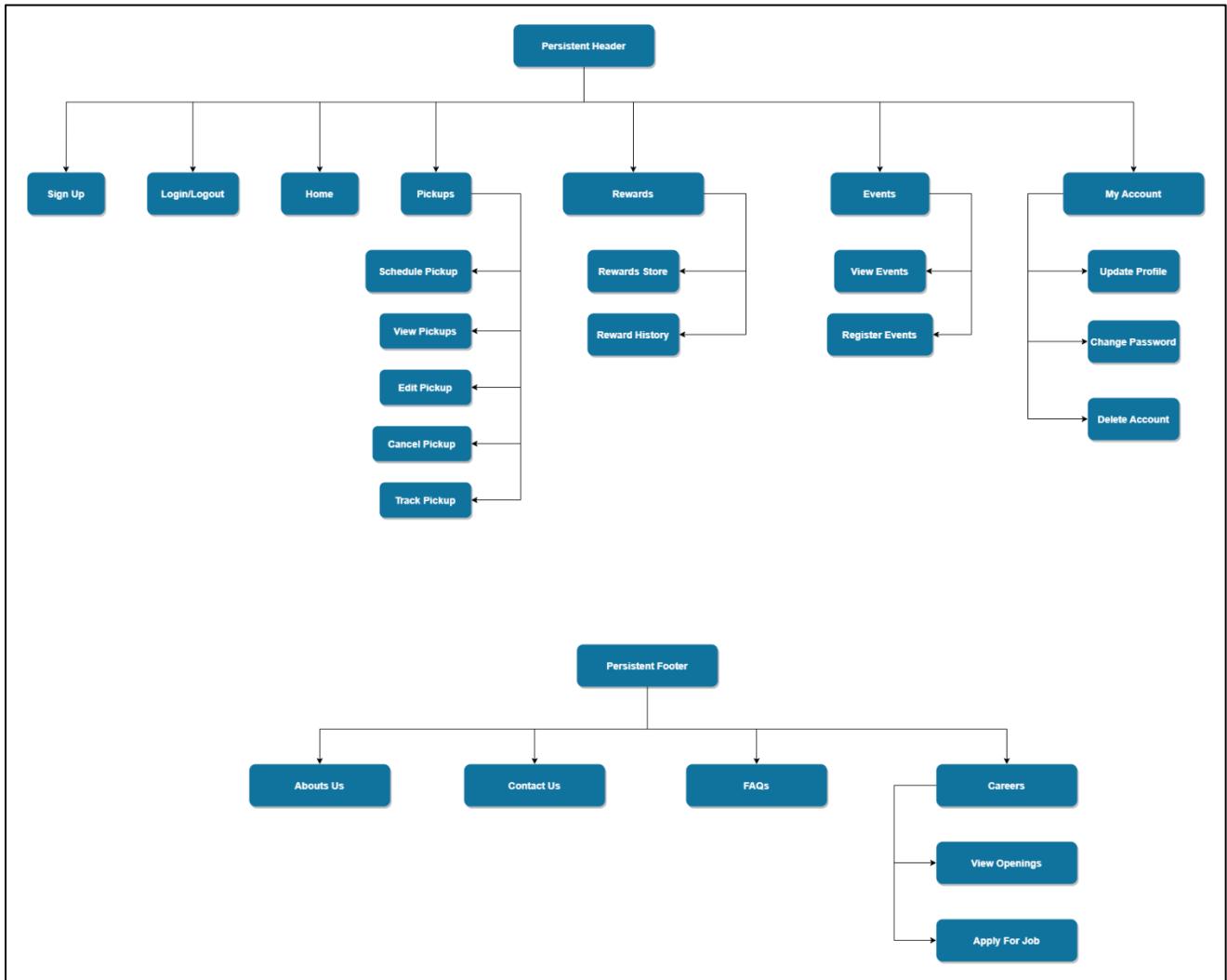


Figure 5: Sitemap for general user [5]

4.2.2 Admin Sitemap

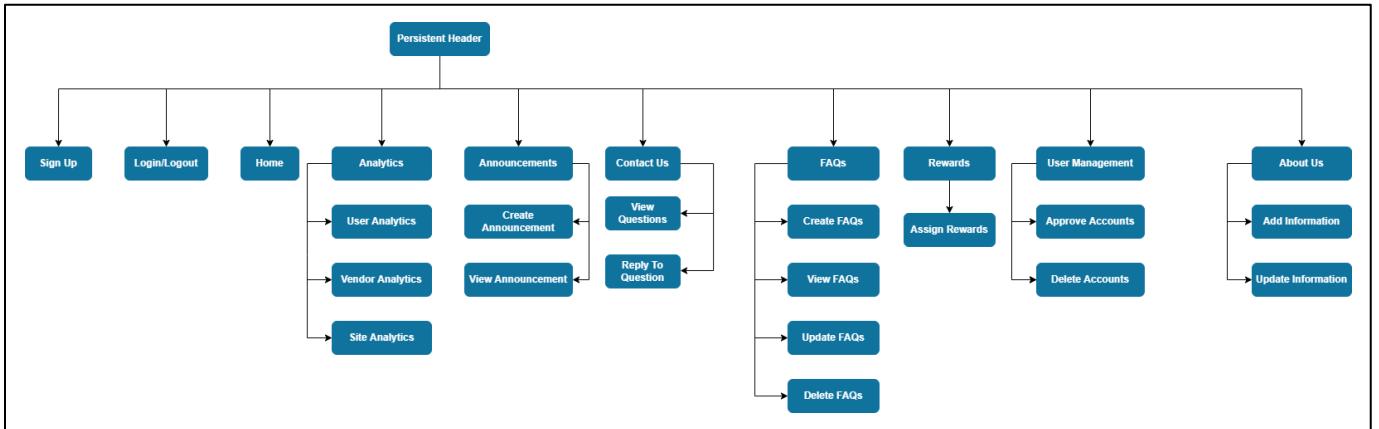


Figure 6: Sitemap for Admin user [5]

4.2.3 Vendor Sitemap

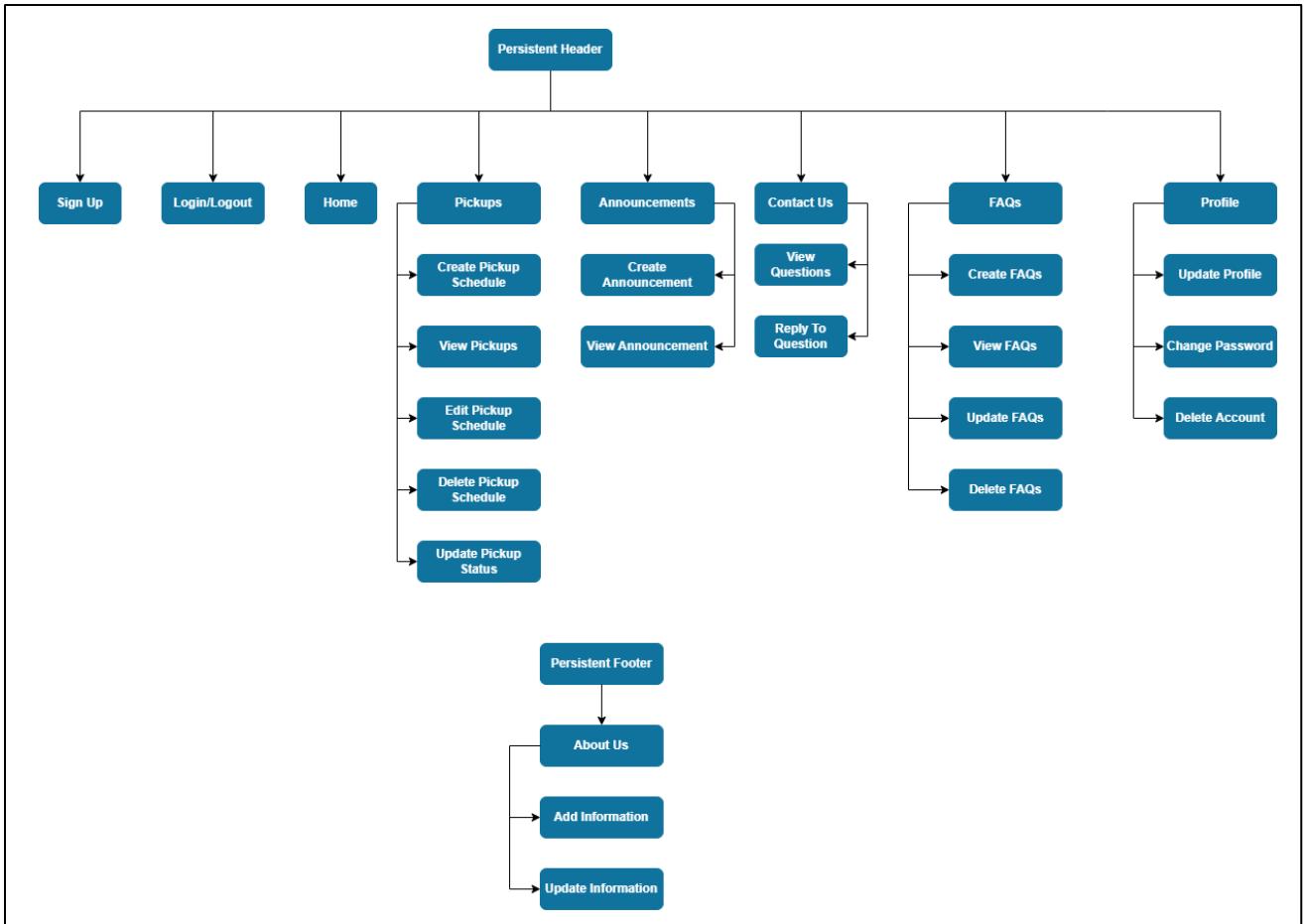


Figure 7: Sitemap for Vendor [5]

4.3 UI Designs

4.3.1 Home page

Figure 8 describes the landing page of Skip the Bins; it is the home page of our application.

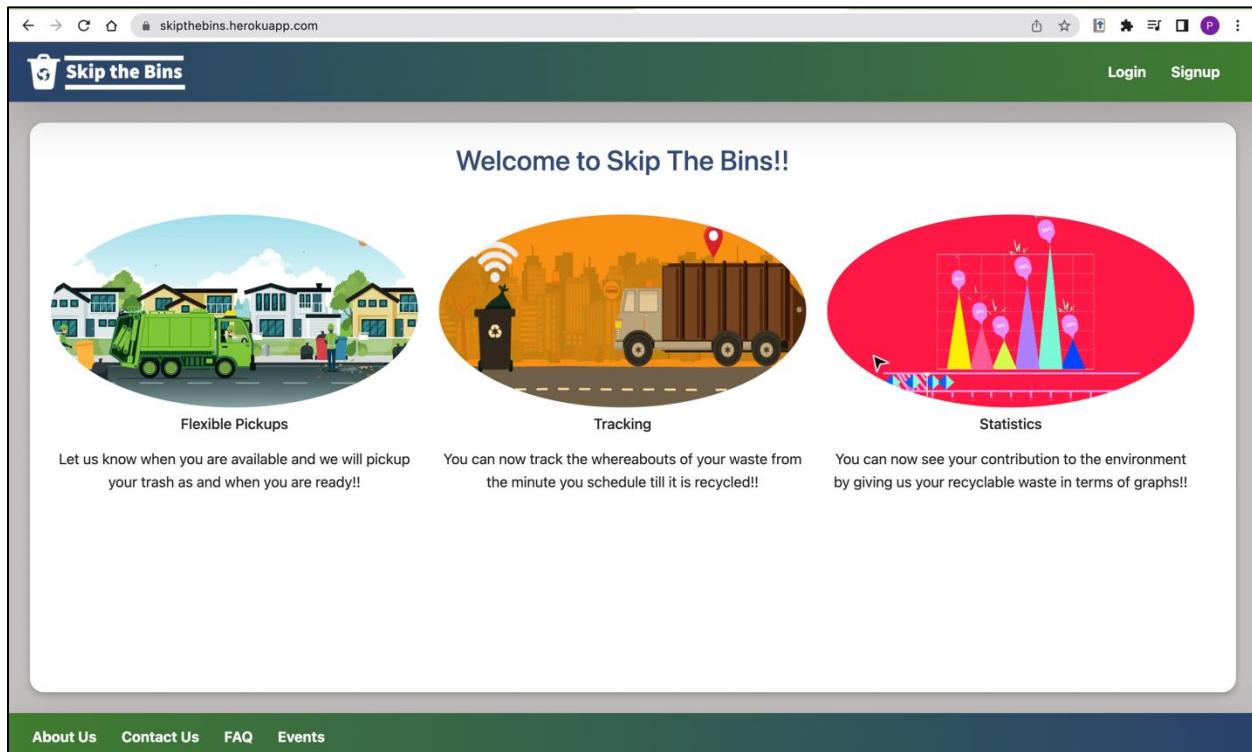


Figure 8: UI of Home page [6].

4.3.2 Feature: User Management

1. Sign up

The screenshot shows the sign-up page for the "Skip the Bins" application. The header features the logo "Skip the Bins" with a trash bin icon. On the right side of the header are "Login" and "Signup" buttons. The main content area has a white background with rounded corners. At the top center, it says "Sign up". Below that, a note in red text reads "Fields marked with * are mandatory!". The form consists of several input fields:

- First Name *: An input field with placeholder text "Enter First Name".
- Last Name *: An input field with placeholder text "Enter Last Name".
- Email *: An input field containing the text "skbuser@gmail.com".
- Password *: An input field containing the text ".....".
- Confirm Password *: An input field with placeholder text "Confirm Password".
- Mobile Number *: An input field with placeholder text "Mobile Number".
- Address *: An input field with placeholder text "Address".
- Profile Image *: A file input field labeled "Choose File" with the message "No file chosen".
- Gender *: A group of three radio buttons labeled "Male", "Female", and "Prefer Not to Say".
- Sign up as... *: A group of three radio buttons labeled "Normal user", "Vendor", and "Business".

At the bottom left is a blue "Sign up" button, and to its right is the text "Or Already a user?". The footer of the page contains links: "About Us", "Contact Us", "FAQ", and "Events".

Figure 9: UI of Sign-up page [6].

2. Login

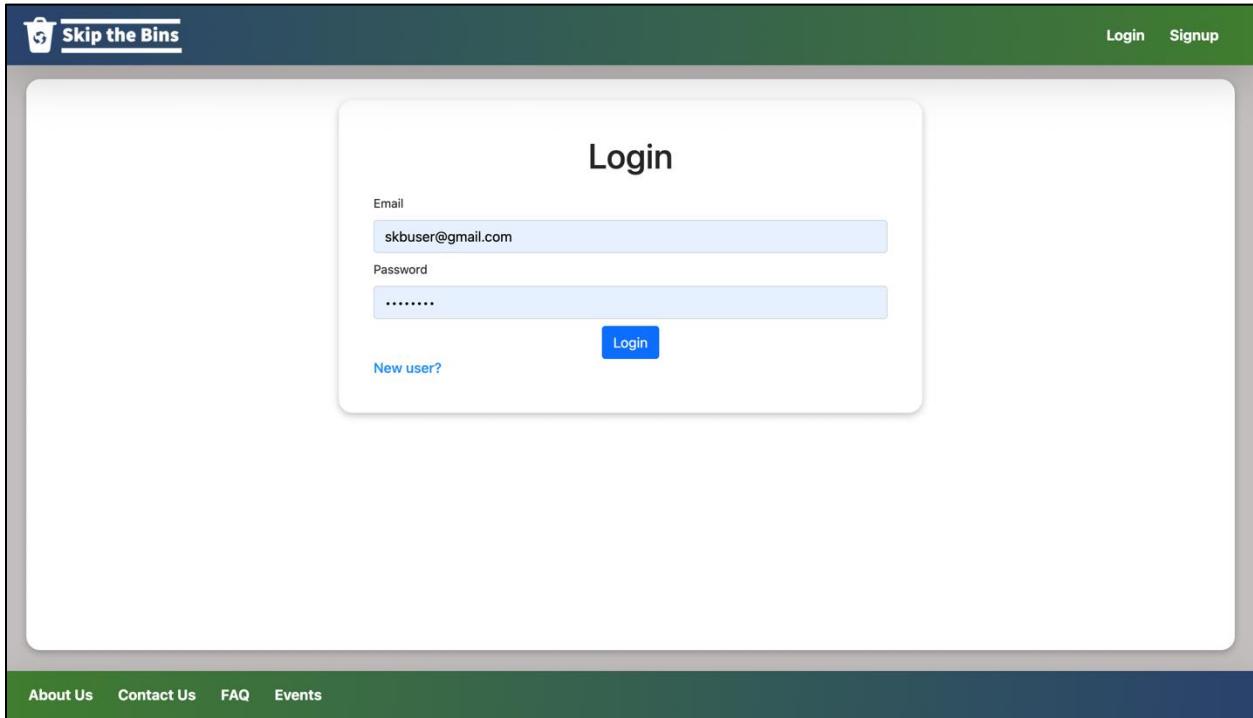


Figure 10: UI of Login page [6].

3. Change Password

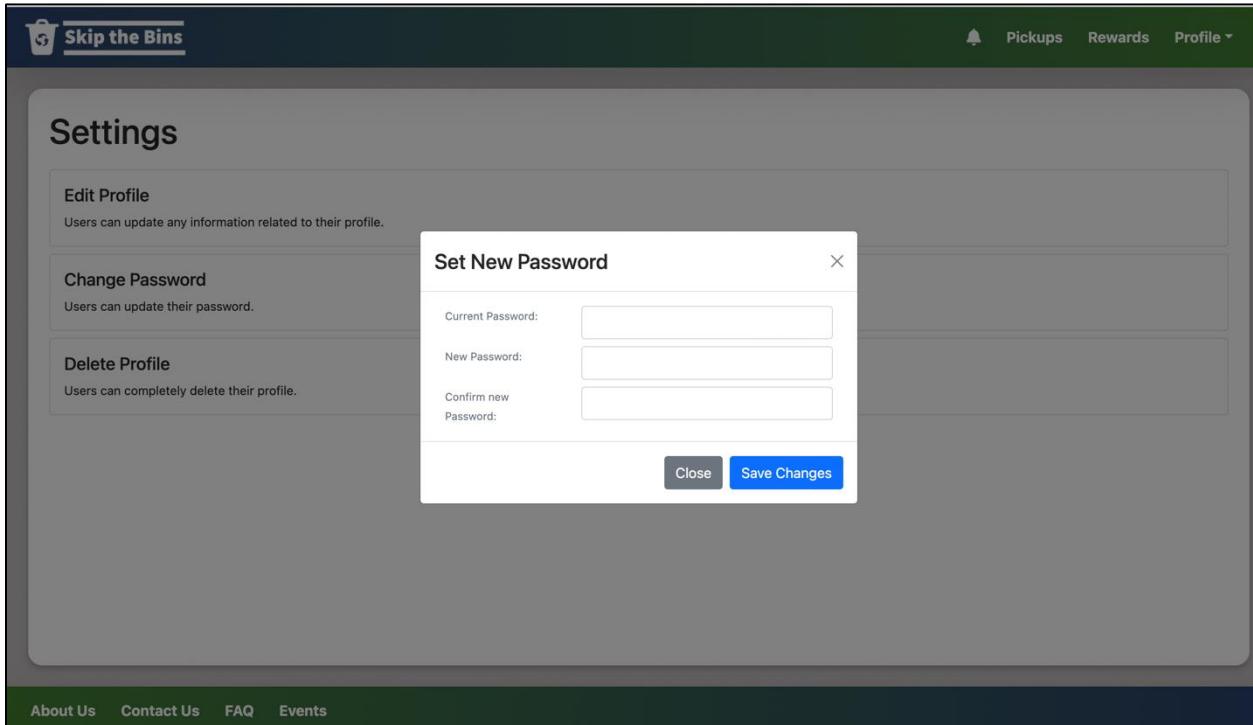


Figure 11: UI of Change password page [6].

4. Edit Profile

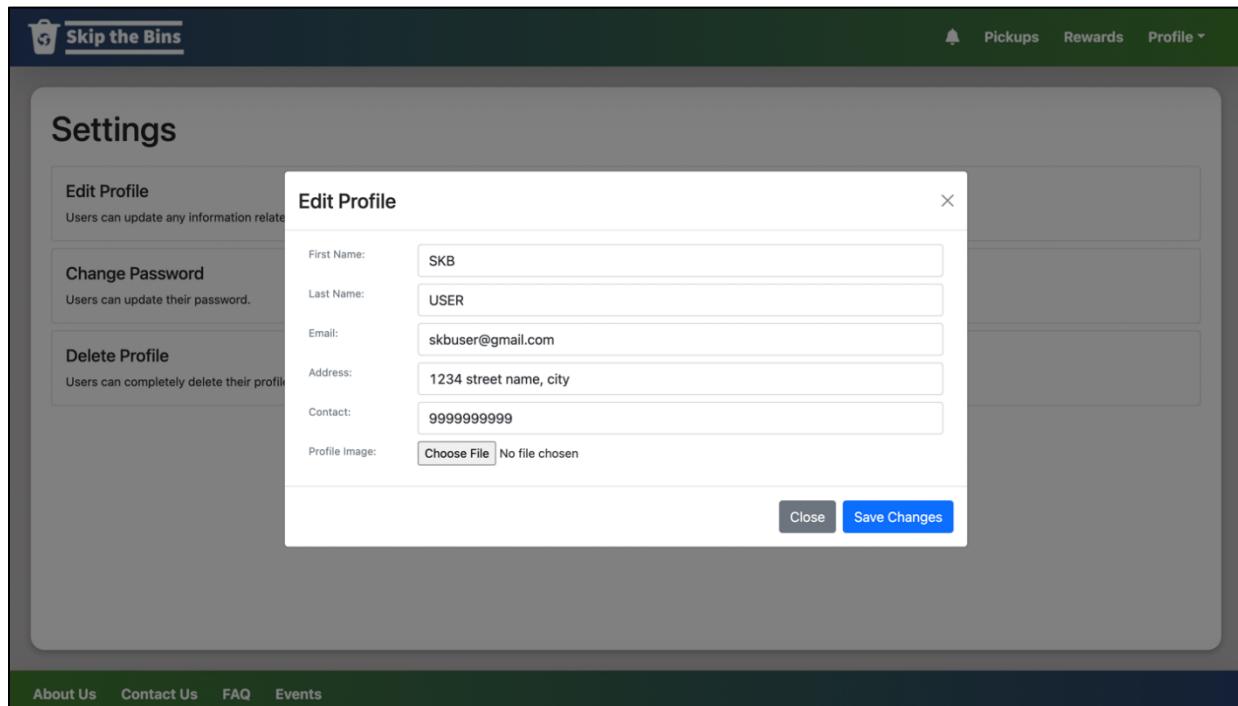


Figure 12: UI of Edit profile page [6].

5. Delete Account

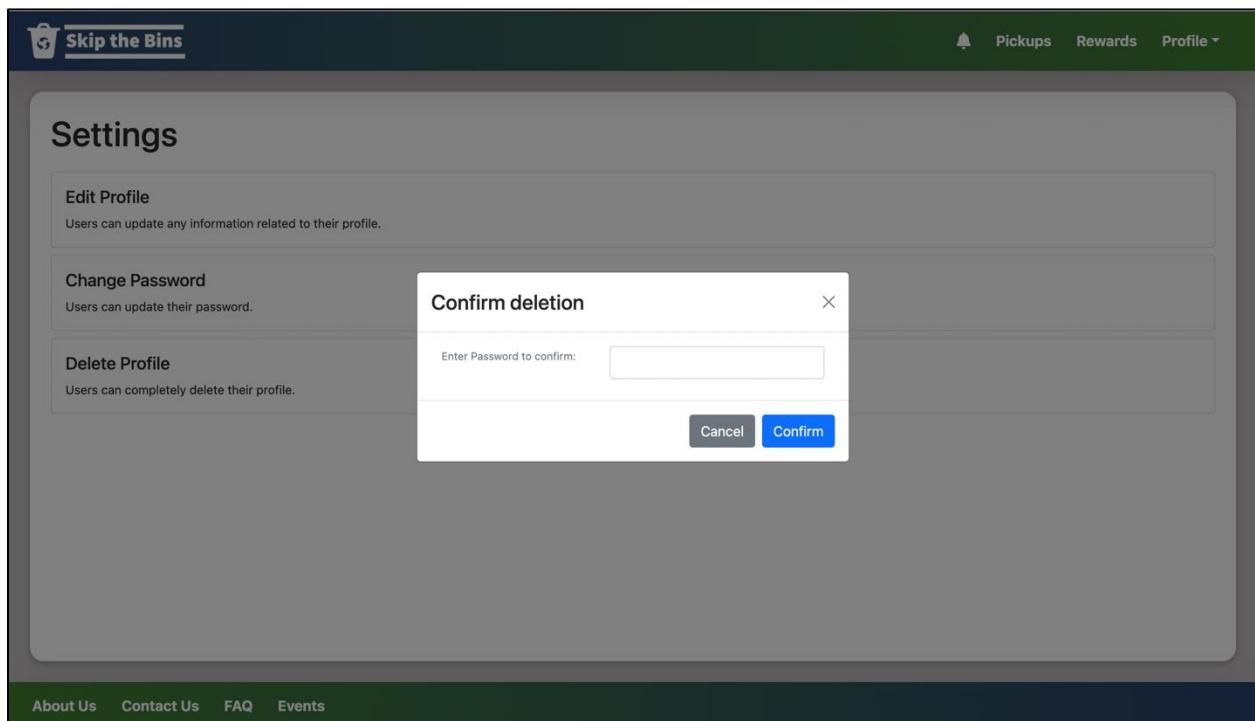


Figure 13: UI of Delete account page [6].

6. Logout

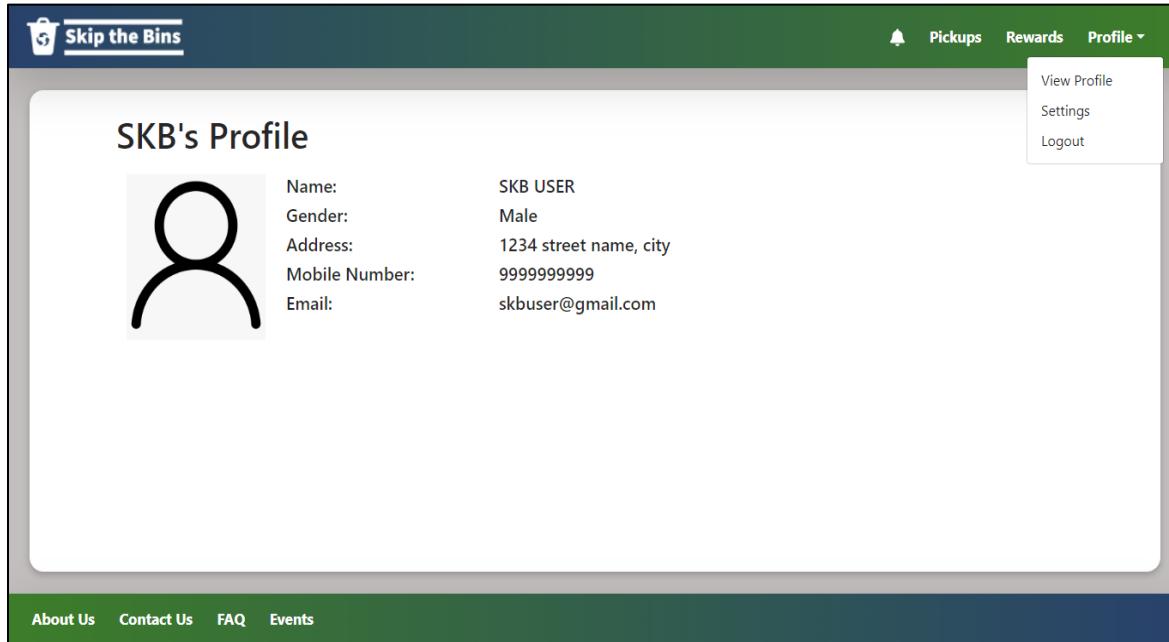


Figure 14: UI of the Profile page and Logout [6].

7. Admin approval for creation

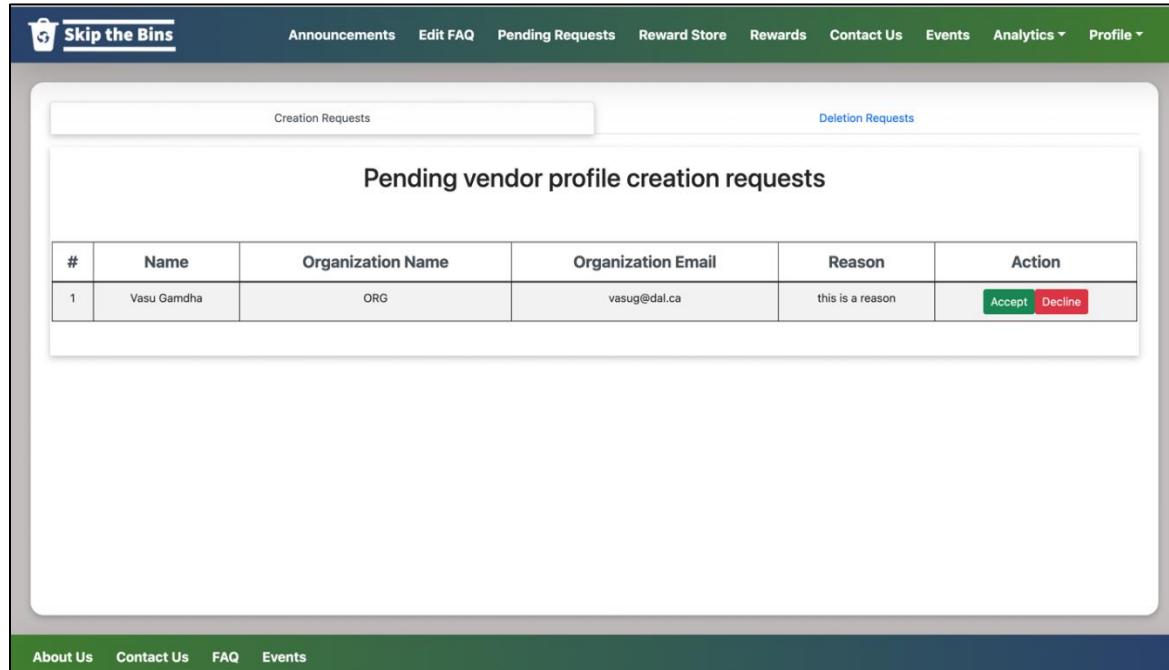


Figure 15: UI of Admin approval for creating vendor account [6].

8. Admin approval for deletion

The screenshot shows a web application interface for 'Skip the Bins'. At the top, there's a dark blue header bar with the logo 'Skip the Bins' on the left and navigation links: Announcements, Edit FAQ, Pending Requests, Reward Store, Rewards, Contact Us, Events, Analytics, and Profile. Below the header, there are two tabs: 'Creation Requests' (highlighted in blue) and 'Deletion Requests' (in grey). A large title 'Pending vendor profile deletion requests' is centered above a table. The table has columns: #, Name, Organization Name, Organization Email, Reason, and Action. One row is shown, corresponding to the entry in the 'Creation Requests' tab. The row details are: #1, Name Prashit Patel, Organization Name ABC, Organization Email prashitppatel@gmail.com, Reason Pickup wastes, and Action buttons 'Accept' (green) and 'Decline' (red). At the bottom of the page, there's a dark green footer bar with links: About Us, Contact Us, FAQ, and Events.

#	Name	Organization Name	Organization Email	Reason	Action
1	Prashit Patel	ABC	prashitppatel@gmail.com	Pickup wastes	<button>Accept</button> <button>Decline</button>

Figure 16: UI of Admin approval for vendor account deletion [6].

4.3.3 Feature: Scheduling Waste Pickups

1. Manage pickups – User

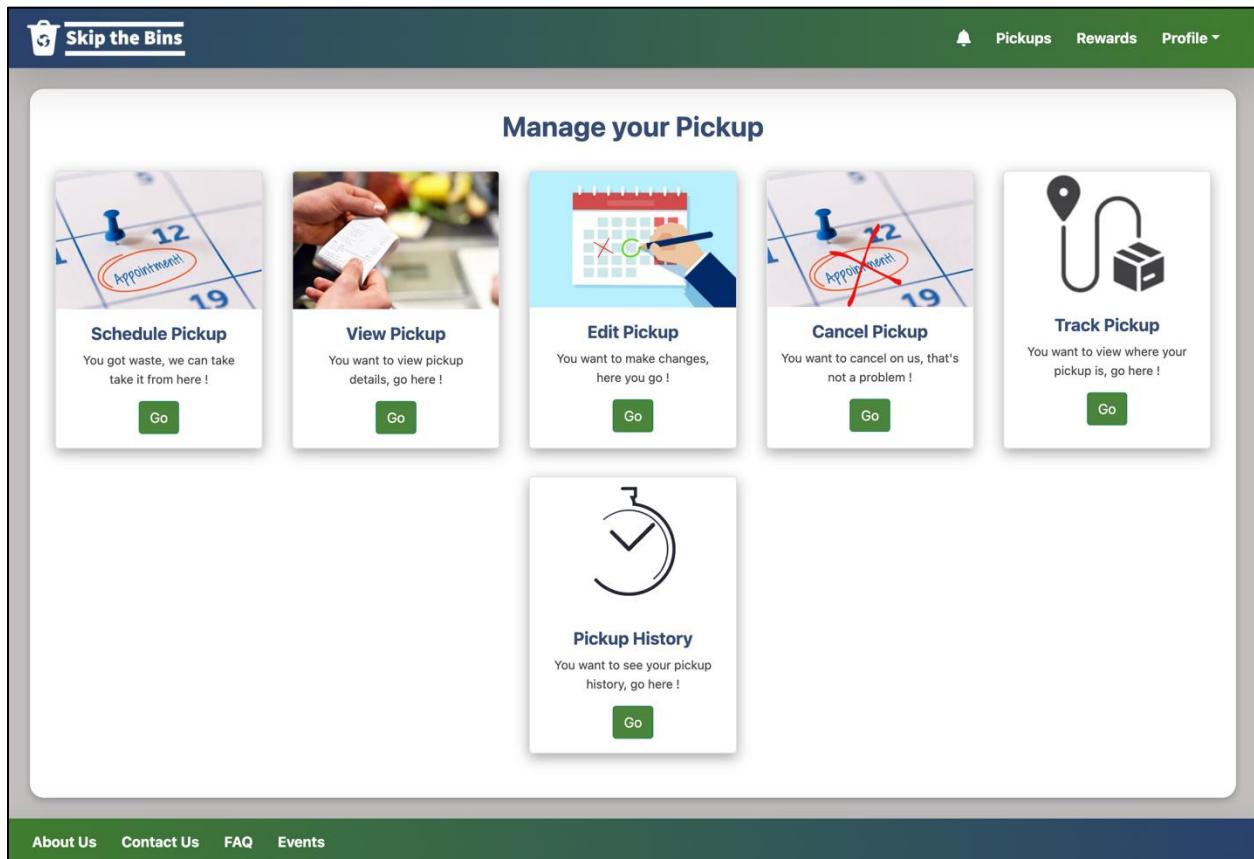


Figure 17: UI of Pickups page for user [6].

2. Schedule Pickup – User

The screenshot shows the 'Schedule your Pickup' page. At the top, there's a green header bar with the 'Skip the Bins' logo and navigation links for 'Pickups', 'Rewards', and 'Profile'. Below the header, a title 'Schedule your Pickup' is centered above a progress bar showing '100%'. A green button labeled 'Spring Garden' is visible. The main form area is divided into four sections: 'Select Date' (a calendar showing April 2022 with April 18 selected), 'Select Time & Vendor' (a dropdown showing '02:30 AM - 01:30 PM = SKB VENDOR'), 'Select Waste Types' (a list of waste types: Plastic, Cardboard, Glass, Metal, Wood, Clothing, Other, each in its own box), and 'Number of bags/boxes' (a field with '2' and a dropdown for 'Approximate Weight (kg)' set to '3'). A large green 'Next' button is at the bottom.

Figure 18: UI of Schedule pickup page for user [6].

3. Pickup Confirmation – User

The screenshot shows the 'Pickup details' confirmation page. At the top, there's a green header bar with the 'Skip the Bins' logo and navigation links for 'Pickups', 'Rewards', and 'Profile'. The main content area is titled 'Pickup details' and contains the following information: 'Date : April 18, 2022', 'Time : 02:30 AM - 01:30 PM = SKB VENDOR', 'Waste Types : Plastic, Glass', 'No. of bags : 2', and 'Weight : 3'. To the right, under 'Pickup Address', it says 'Area: Spring Garden' with a radio button selected for '1234 street name, city'. Below that is a 'Different Address?' input field and a green 'Schedule' button.

Figure 19: UI of the pickup confirmation page for user [6].

4. Edit Pickup Details – User

Same as Schedule Pickup, only previous details will be filled and will allow the user to edit the same. The schedule button will change to the Update button.

The screenshot shows the 'Edit Pickup Details' page. At the top, there's a header with the 'Skip the Bins' logo and navigation links for 'Pickups', 'Rewards', and 'Profile'. Below the header, the main title is 'Change your Pickup'. The page is divided into four sections: 'Select Date' (a date picker showing April 18, 2022), 'Select Time & Vendor' (a dropdown showing '02:30 AM - 01:30 PM = SKB VENDOR'), 'Select Waste Types' (a list of checkboxes for Plastic, Cardboard, Glass, Metal, Wood, Clothing, and Other, with Cardboard and Glass checked), and 'Number of bags/boxes' (a text input showing '2') and 'Approximate Weight' (a text input showing '1'). A large green 'Update' button is at the bottom. At the very bottom of the page are links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 20: UI of Edit pickups page for user [6].

5. View Pickup Details – User

The screenshot shows the 'View Pickup Details' page. The layout is similar to the edit page, with a header, 'View Pickup Details' title, and four main sections: 'Select Date' (showing April 18, 2022), 'Select Time & Vendor' (showing '02:30 AM - 01:30 PM - SKB VENDOR'), 'Details' (a summary box containing 'Date : April 18, 2022', 'Time : 02:30 AM - 01:30 PM - SKB VENDOR', 'Waste Types : Cardboard, Glass', 'No. of bags : 2', 'Weight : 1 kg', 'Address : 1234 street name, city', and 'Area : Spring Garden'), and a 'Home' button at the bottom. Like the edit page, it includes links for 'About Us', 'Contact Us', 'FAQ', and 'Events' at the bottom.

Figure 21: UI of View pickups page for user [6].

6. Cancel Pickup – User

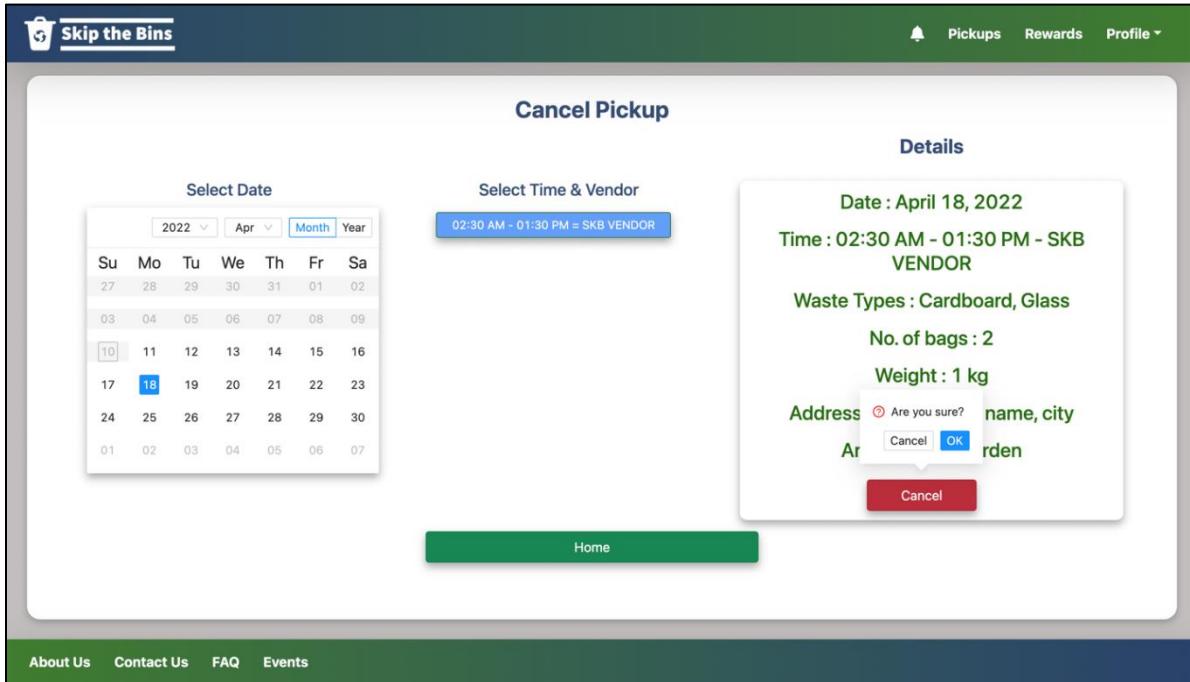


Figure 22: UI of Cancel pickups page for user [6].

7. Manage Pickup Schedules – Vendor

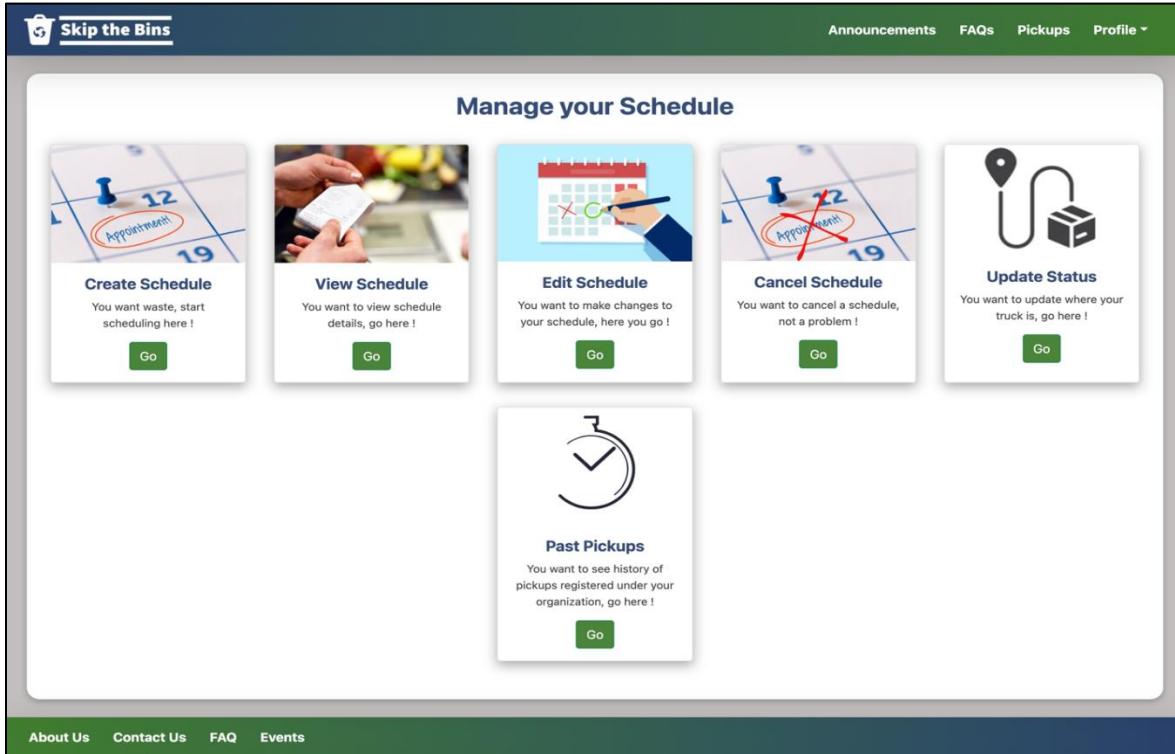


Figure 23: UI of pickups page for vendor [6].

8. Create Schedule – Vendor

The screenshot shows the 'Create your Schedule' page. At the top, there are two input fields: 'Select Date Range' (2022-04-11 to 2022-04-15) and 'Enter Slot Details' (12:30 PM to 01:30 PM - Spring Garden). Below these is a time picker dialog with the following details:

- Start time: 12:30
- End time: 01:30
- AM/PM: AM
- Area: Spring Garden

At the bottom right of the dialog are 'Add' and 'Cancel' buttons.

At the bottom of the page, there is a navigation bar with links: About Us, Contact Us, FAQ, and Events.

Figure 24: UI of Schedule pickup page for vendor [6].

9. Create Pickup Schedule Confirmation – Vendor

The screenshot shows the 'Schedule Details' page. It displays the date range: 11/04/2022 to 15/04/2022. Below this is a table titled 'Slots' showing the scheduled time and area:

Time	Area
12:30 PM to 01:30 PM	Spring Garden

At the bottom right is a green 'Home' button.

At the bottom of the page, there is a navigation bar with links: About Us, Contact Us, FAQ, and Events.

Figure 25: UI of the schedule details page for vendor [6].

10. Edit Pickup Schedule – Vendor

Same as Create Pickup Schedule, only previous details will be filled and will allow the user to edit the same. The schedule button will change to the Update button.

The screenshot shows the 'Edit Schedule' page for a vendor. At the top, there's a navigation bar with links for Announcements, FAQs, Pickups, and Profile. Below the navigation is a title 'Edit Schedule'. On the left, there's a 'Select Date' section with a calendar showing April 2022. The date 11th is selected. On the right, there's a 'Slot Details' section showing '12:30 PM to 01:30 PM - Spring Garden' with a trash can icon and a pencil icon. Below that are fields for 'Start time' and 'End time' with a clock icon, and a 'Select Area' dropdown with an 'Add' button and a checkmark icon. At the bottom is a large green 'Update' button.

Figure 26: UI of Edit schedules page for vendor [6].

11. View Pickup Schedule – Vendor

The screenshot shows the 'View Schedule Details' page for a vendor. At the top, there's a navigation bar with links for Announcements, FAQs, Pickups, and Profile. Below the navigation is a title 'View Schedule Details'. On the left, there's a 'Select Date' section with a calendar showing April 2022. The date 11th is selected. On the right, there's a 'Slots' section with a table:

Time	Area
12:30 PM to 01:30 PM	Spring Garden

At the bottom is a green 'Home' button.

Figure 27: UI of View schedules page for vendor [6].

12. Delete Pickup Schedule – Vendor

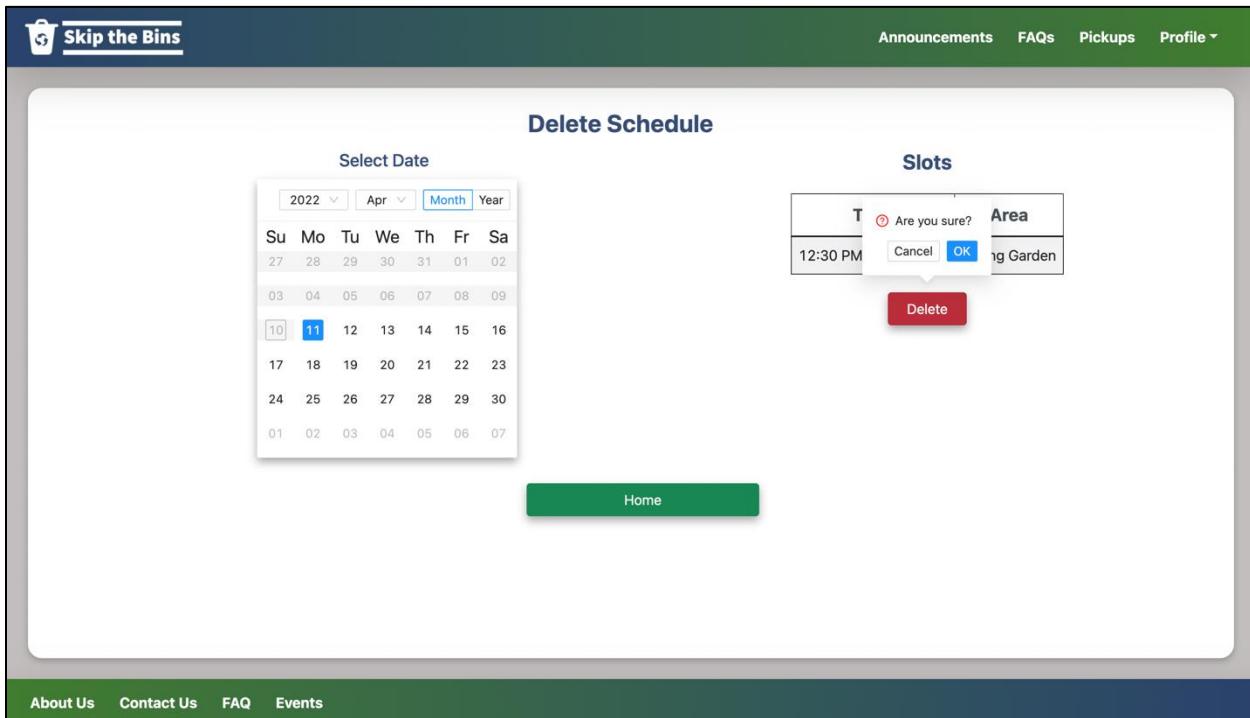


Figure 28: UI of Delete Schedule page for vendor [6].

4.3.4 Feature: Pickup Tracking

1. Update Pickup Status - Vendor

The screenshot shows a web application interface for managing pickup statuses. At the top, there's a navigation bar with links for Announcements, FAQs, Pickups, and Profile. On the left, there's a logo for "Skip the Bins". The main content area is titled "Update Pickup Status". Below the title is a table listing 14 pickup entries. Each entry includes columns for Batch No., Pickup Date, Pickup Area, Pickup Slot, and Status. The first entry (Batch11) has its status set to "Waste Recycled". A dropdown menu for "Status" is open over this entry, showing "Waste Recycled" as the selected option. An "Update" button is located below the dropdown. Each row in the table also features an "Update Status" button.

Batch No.	Pickup Date	Pickup Area	Pickup Slot	Status	
BATCH11	April 8, 2022	Quinpool Road	03:00 PM - 04:00 PM	Waste Recycled	<button>Update Status</button>
BATCH12	April 9, 2022	Quinpool Road	03:00 PM - 04:00 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH13	April 13, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH14	April 14, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH15	April 18, 2022	Spring Garden	02:30 AM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH16	April 19, 2022	Spring Garden	02:30 AM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH17	April 20, 2022	Spring Garden	02:30 AM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH18	April 21, 2022	Spring Garden	02:30 AM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH19	April 22, 2022	Spring Garden	02:30 AM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH20	April 11, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH21	April 12, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH22	April 13, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH23	April 14, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>
BATCH24	April 15, 2022	Spring Garden	12:30 PM - 01:30 PM	Waste Pick-up Scheduled	<button>Update Status</button>

At the bottom of the page, there are links for About Us, Contact Us, FAQ, and Events.

Figure 29: UI of Update Pickup Status page [6].

2. Track Pickup - User

The screenshot shows the 'Track Pickup' page of the 'Skip the Bins' website. At the top, there's a navigation bar with a trash bin icon, 'Skip the Bins', and links for 'Pickups', 'Rewards', and 'Profile'. Below the navigation is a title 'Track Pickup'. The main content area contains a table with five columns: 'Pickup ID', 'Pickup Date', 'Pickup Area', 'Pickup Slot', and 'Batch No.'. There are four rows of data, each with a 'Track' button. Above the table, there are four numbered circles (1, 2, 3, 4) connected by arrows, indicating a process flow: 1. Waste Pick-up Scheduled, 2. Waste Picked-up, 3. Waste Arrived at Recycling Facility, 4. Waste Recycled. The table data is as follows:

Pickup ID	Pickup Date	Pickup Area	Pickup Slot	Batch No.
3	April 13, 2022	Spring Garden	01:00 PM - 03:00 PM	BATCH5
6	April 18, 2022	Spring Garden	02:30 AM - 01:30 PM	BATCH15
7	April 12, 2022	Spring Garden	01:00 PM - 03:00 PM	BATCH3

At the bottom of the page, there are links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 30: UI of Track Pickups page [6].

4.3.5 Feature: Frequently asked questions

1. View FAQ

The screenshot shows a web application interface for viewing frequently asked questions. At the top, there is a dark green header bar with the logo 'Skip the Bins' on the left and navigation links 'Pickups', 'Rewards', and 'Profile' on the right. Below the header, the main content area has a light gray background. A large title 'Frequently asked questions' is centered at the top of this area. Below the title is a list of questions, each with a small downward arrow icon to its right:

- Q 1. What happens if I put waste and garbage in my recycling container?
- Q 2. What should I do with old clothes and old shoes?
- Q 3. What's the best way to recycle glass? (This question is expanded, showing its answer below)
- Q 4. Test
- Q 5. New Question

The expanded answer for Q 3. is as follows:

Check with your local program first when recycling glass. Most curbside community recycling programs accept different glass colors and types mixed together.

At the bottom of the content area, there is a dark blue footer bar with links: 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 31: UI of View FAQ - User [6].

This screenshot shows the same 'View FAQ' page as Figure 31, but from the perspective of a vendor. The header bar is identical, featuring the 'Skip the Bins' logo and navigation links for 'Announcements', 'FAQs', 'Pickups', and 'Profile'. The main content area also features the 'Frequently asked questions' title. The list of questions is identical to Figure 31, with Q 3. expanded to show its answer. Additionally, there is a green 'Add FAQ' button located at the bottom left of the expanded question area. The footer bar at the bottom is also identical to Figure 31.

Figure 32: UI of View FAQ - Vendor [6].

2. Add FAQ

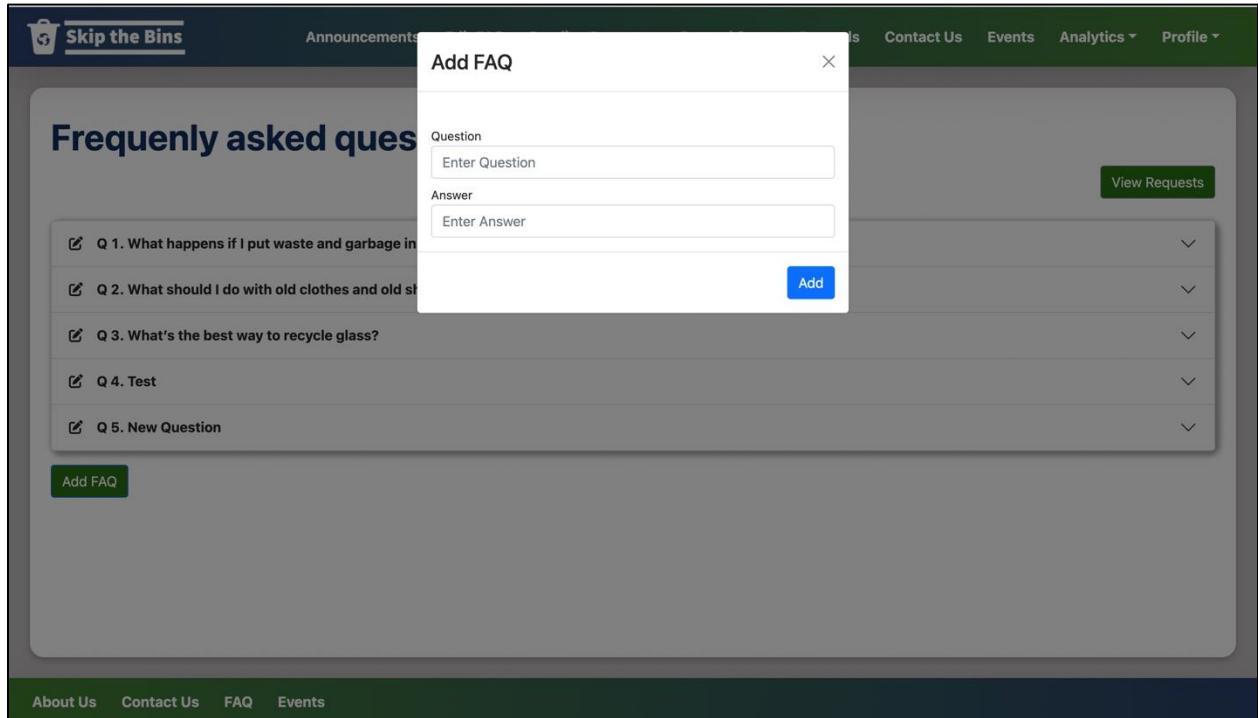


Figure 33: UI of Add FAQ - Admin [6].

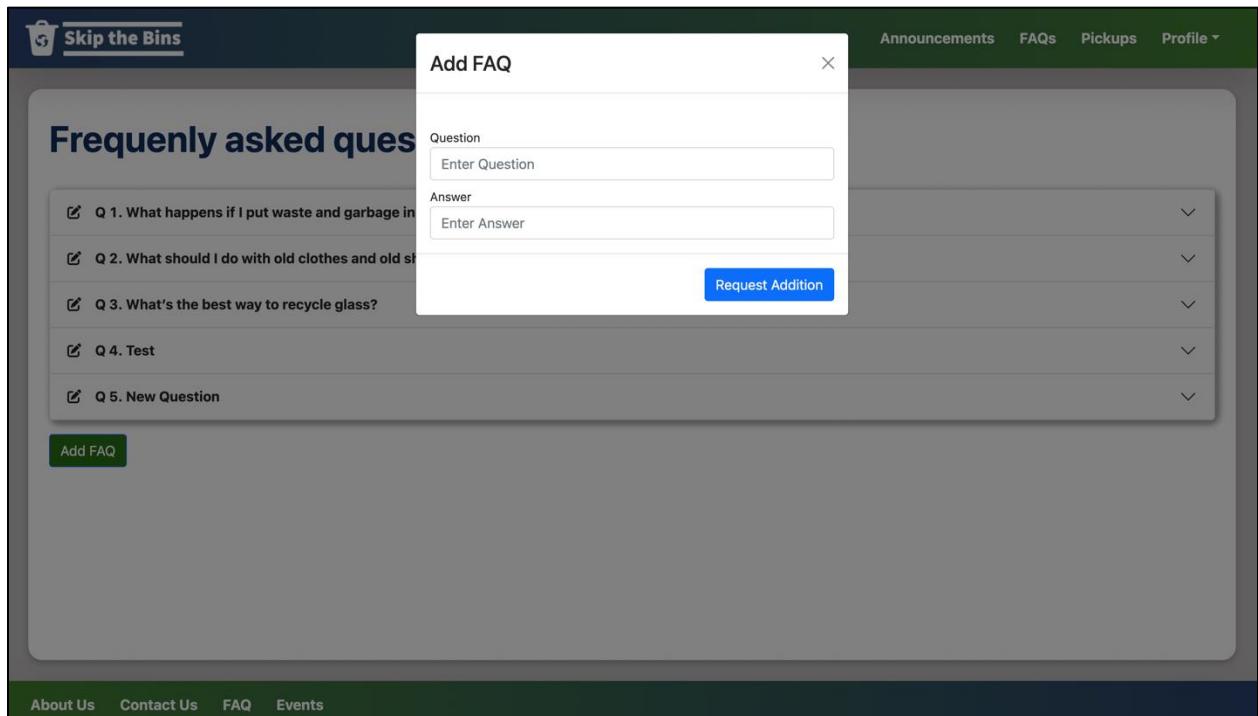


Figure 34: UI of Add FAQ – Vendor [6].

3. Update FAQ request

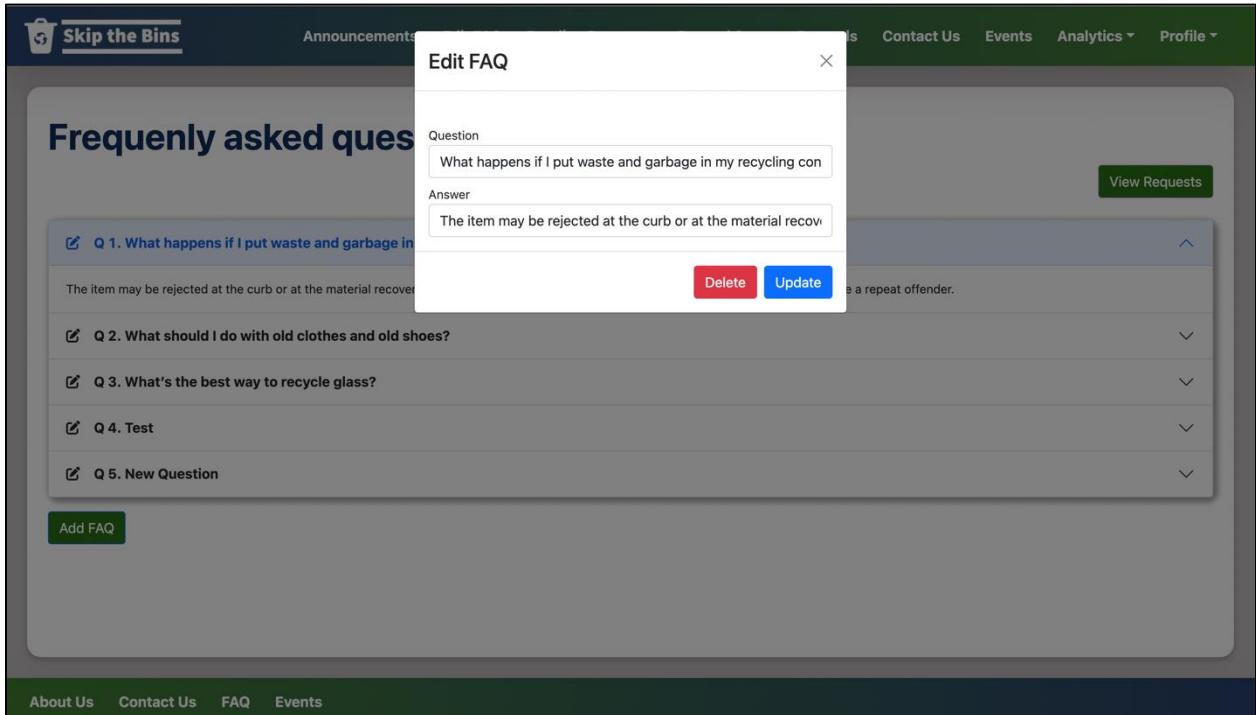


Figure 35: UI of Update FAQ – Admin [6].

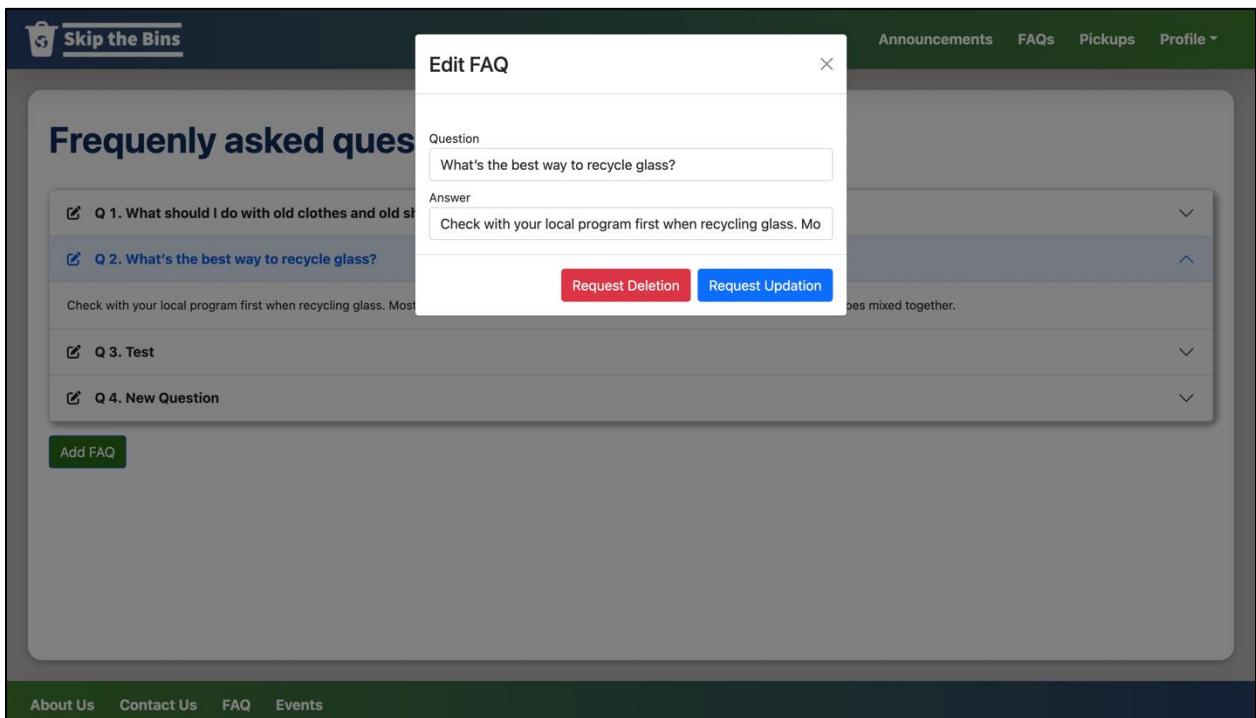


Figure 36: UI of Update FAQ – Vendor [6].

4. Processing FAQ request

The screenshot shows a 'FAQ Requests' modal window. At the top, it displays the author ('vendor'), type ('add'), and a question ('What if I want to see recycled waste?'). Below this, the answer is provided: 'You can email us and we will help the best way possible'. Two buttons are present: 'Approve' (blue) and 'Deny' (red). A 'View Requests' button is located in the top right corner of the modal. The main content area lists five questions, each preceded by a checkbox and a dropdown arrow:

- Q 1. What happens if I put waste and garbage in my recycling container?
- Q 2. What should I do with old clothes and old shoes?
- Q 3. What's the best way to recycle glass?
- Q 4. Test
- Q 5. New Question

A 'Add FAQ' button is located at the bottom left of the list.

Figure 37: UI of Processing FAQ request – Admin [6].

4.3.6 Feature: Contact Us

1. Contact Us – Home page

The screenshot shows the 'Contact Us' page with 'Vendor Contact Details' for three companies:

- Walmart**
Address - 6990 Mumford Rd, Halifax, NS B3L 4W4
Phone Number - 9024547991
Email - walmart6990@walmart.ca
- Sobeys**
Address - 1120 Queen St, Halifax, NS B3H 2R9
Phone Number - +1-9024229884
Email - sobeys1120@sobeys.ca
- Atlantic Superstore**
Address - 1075 Barrington St, Halifax, NS B3H 2P8
Phone Number - +1-9024923240
Email - superstore1075@atlantic.ca

A 'Submit a Query' button is located at the bottom center of the page.

Figure 38: UI of Contact us page [6].

2. Contact Us – User Query form

The screenshot shows the 'Contact Us' page of the Skip the Bins website. At the top, there's a dark header bar with the 'Skip the Bins' logo and navigation links for 'Announcements', 'FAQs', 'Pickups', and 'Profile'. Below the header is a large white contact form with a grey border. The form has a title 'Contact Us' and a subtitle 'Submit a query'. A note below the subtitle says 'Facing an issue, please fill in the form below and we will get back to you.' The form includes five input fields: 'Full Name' (placeholder 'Your name'), 'E-mail' (placeholder 'Your e-mail address'), 'Mobile Number' (placeholder 'Your mobile number'), 'Query Subject' (placeholder 'For any complaint, please add complaint in subject line'), and a large 'Query' text area (placeholder 'Enter query...'). At the bottom right of the form is a green 'Submit' button.

Figure 39: UI of Contact us query form [6].

3. Contact Us – User query success message

The screenshot shows the 'Contact Us' page after a query has been submitted successfully. The page has a similar layout to Figure 39, with a dark header bar and a white main content area. The main content area features a title 'Contact Us' and a message: 'Your query has been successfully submitted with reference number - k4rv06t1u. We will get back to you within 2-3 working days.' Below this message is a blue 'Home' button. At the bottom of the page is a dark footer bar with links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 40: UI of Contact us submission success message page [6].

4. Contact Us – Admin page for viewing queries

Contact Us

User Queries List

S.No	Reference No.	Name	Email	Mobile	Query Subject	Query
1	uojy79cwg	Micheal Williams	michealwilliam@gmail.com	9024121111	Delivery Person Contact Details	How to get the contact details of the delivery person?
2	upae87cwg	Sarah Brown	sarahbrown@live.com	9024123434	Rewards ETA	What is the expected time to reflect rewards?
3	pmae19cwg	Caroline K. Jackson	carolinekj@hotmail.com	7043674444	Garbage dropping at facility	Can we visit the recycling facility for dropping off the garbage?
4	lhfe19cwg	Dona Parley	donap@gmail.com	9023457766	Complaint for points not received	I have not received reward points for the last pick-up.
5	uoae27hwg	Neharika	neharika.sehgal@dal.ca	9024122222		test123
6	uoae19cwg	Prashit Patel	prashitppatel@gmail.com	7128292033	Complaint for not picking up waste on time	I have been facing this issue more than 2 times now. Every time the pickup trucks arrive late for waste pickup and I am held back at home due to this. I want more reward points in compensation for this.
7	k4rv06t1u	Prashit	prashitppatel@gmail.com	9817282723	Complaint for not getting correct reward points	Hi, I submitted my waste yesterday, status is recycled but has not received any points.

Modify Vendor Details

About Us Contact Us FAQ Events

Figure 41: UI of Contact Us query list for admin [6].

5. Contact Us – Admin page for modifying vendors

Contact Us

Vendors List

S.No	Name	Address	Phone Number	Email	Actions
1	Walmart	6990 Mumford Rd, Halifax, NS B3L 4W4	9024547991	walmart6990@walmart.ca	<button>Edit</button> <button>Delete</button>
2	Sobeys	1120 Queen St, Halifax, NS B3H 2R9	+1-9024229884	sobeys1120@sobeys.ca	<button>Edit</button> <button>Delete</button>
3	Atlantic Superstore	1075 Barrington St, Halifax, NS B3H 2P8	+1-9024923240	superstore1075@atlantic.ca	<button>Edit</button> <button>Delete</button>

Add a new vendor

Name
Vendor Name

Address
Vendor Address

Phone Number
Vendor Phone Number

Email
Vendor Email

Add

About Us Contact Us FAQ Events

Figure 42: UI of Contact Us Modify Vendors

4.3.7 Feature: Announcements

1. Posting Announcements

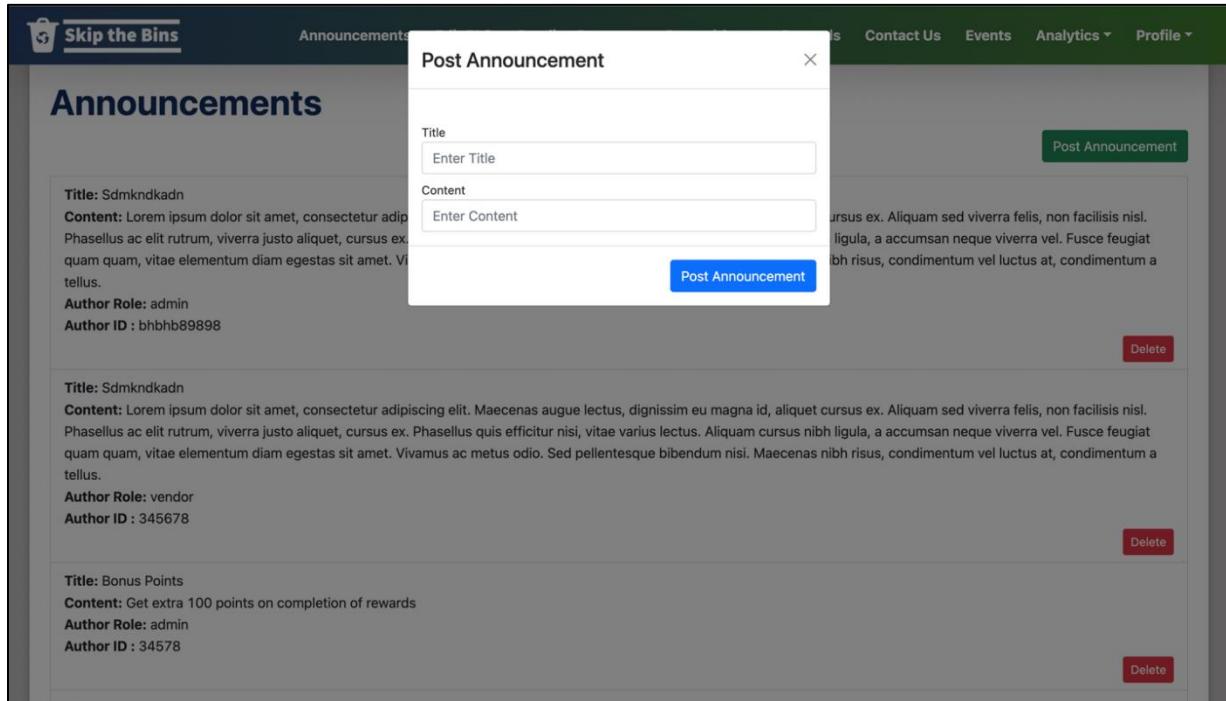


Figure 43: UI of Posting Announcements – Admin [6].

2. Retracting Announcements

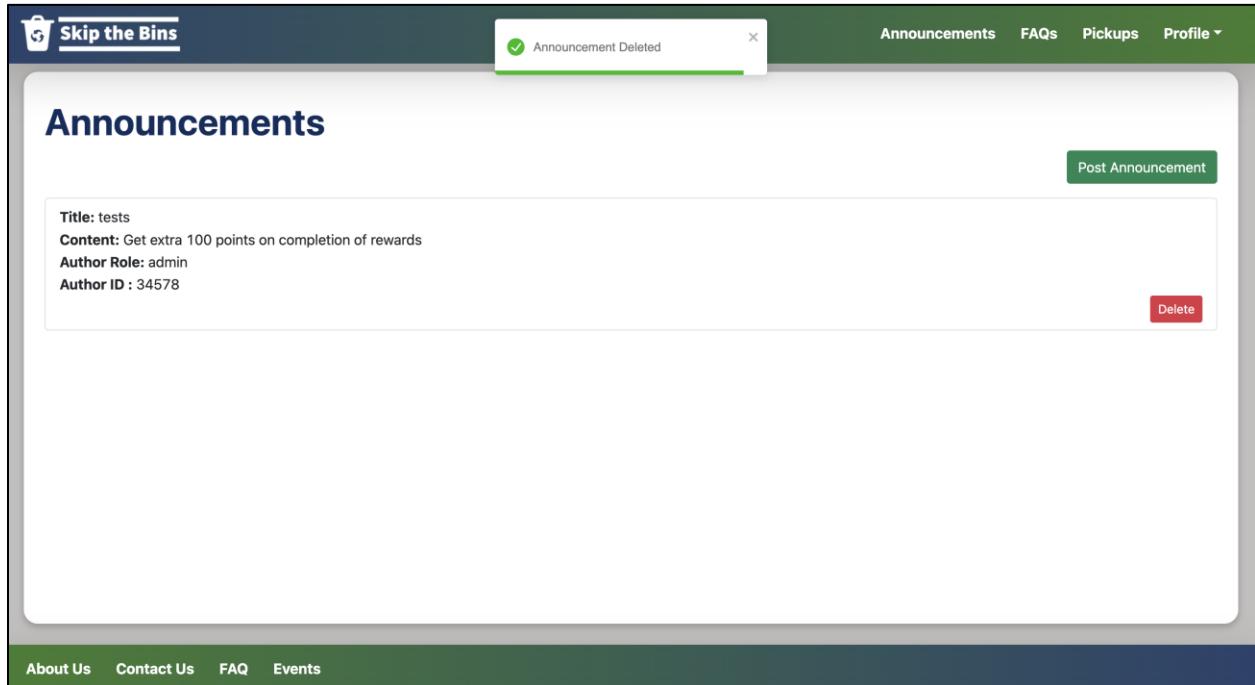


Figure 44: UI of Retracting Announcements - Admin [6].

3. Viewing Announcements

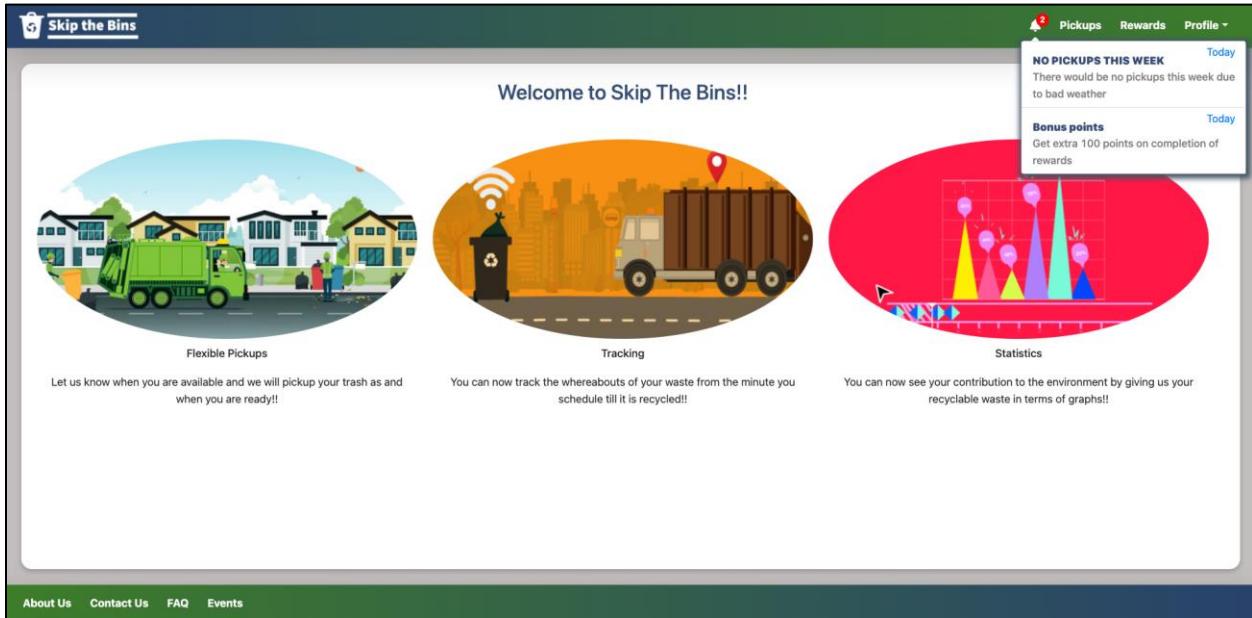


Figure 45: UI of Announcement List – User [6].

4.3.8 Feature: Rewards

1. Rewards Page – User

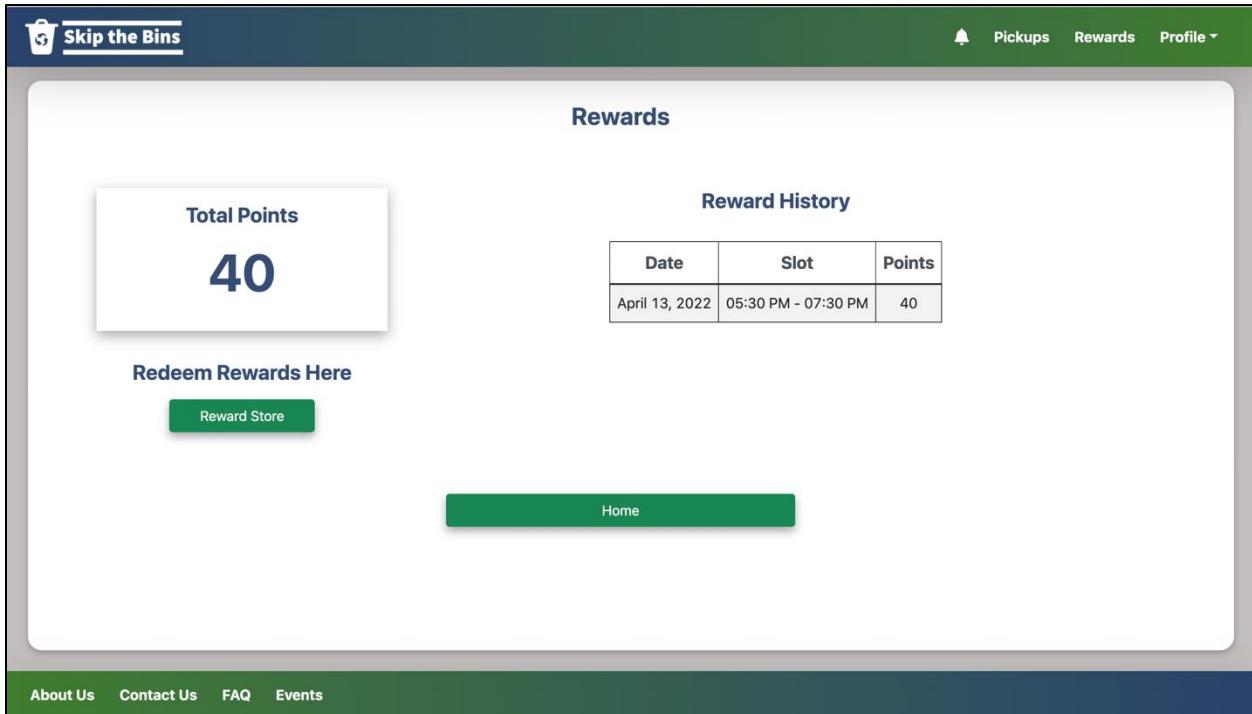


Figure 46: UI of rewards page for user [6].

2. Rewards Page – Admin

The screenshot shows the 'Reward Settings' section of the admin interface. It features a 'Reward Points per kg:' input field set to 30, with an 'Update' button next to it. Below this is a section titled 'Reward Points compensation' under 'User complaints'. A table lists two complaints:

User	Email	Subject	Points	Action
Dona Parley	donap@gmail.com	Complaint for points not received	0	<button>View</button>
Prashit Patel	prashitppatel@gmail.com	Complaint for not picking up waste on time	20	<button>View</button>

A green 'Home' button is located at the bottom center of the main content area. The footer contains links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 47: UI of Rewards page for Admin [6].

3. Allocate Rewards for Complaint – Admin

The screenshot shows the 'Reward Settings' page with a modal window open over the 'User complaints' section. The modal is titled 'Complaint Details' and displays the following information:

User: Prashit Patel
Email: prashitppatel@gmail.com
Subject: Complaint for not picking up waste on time

I have been facing this issue more than 2 times now. Every time the pickup trucks arrive late for waste pickup and I am held back at home due to this. I want more reward points in compensation for this.

Add Reward Points

20

Close Save

The background shows the same reward settings and user complaints table as Figure 47.

Figure 48: UI of Rewards for complaint page for admin [6].

4.3.9 Feature: Reward store

1. Reward Store - Home page

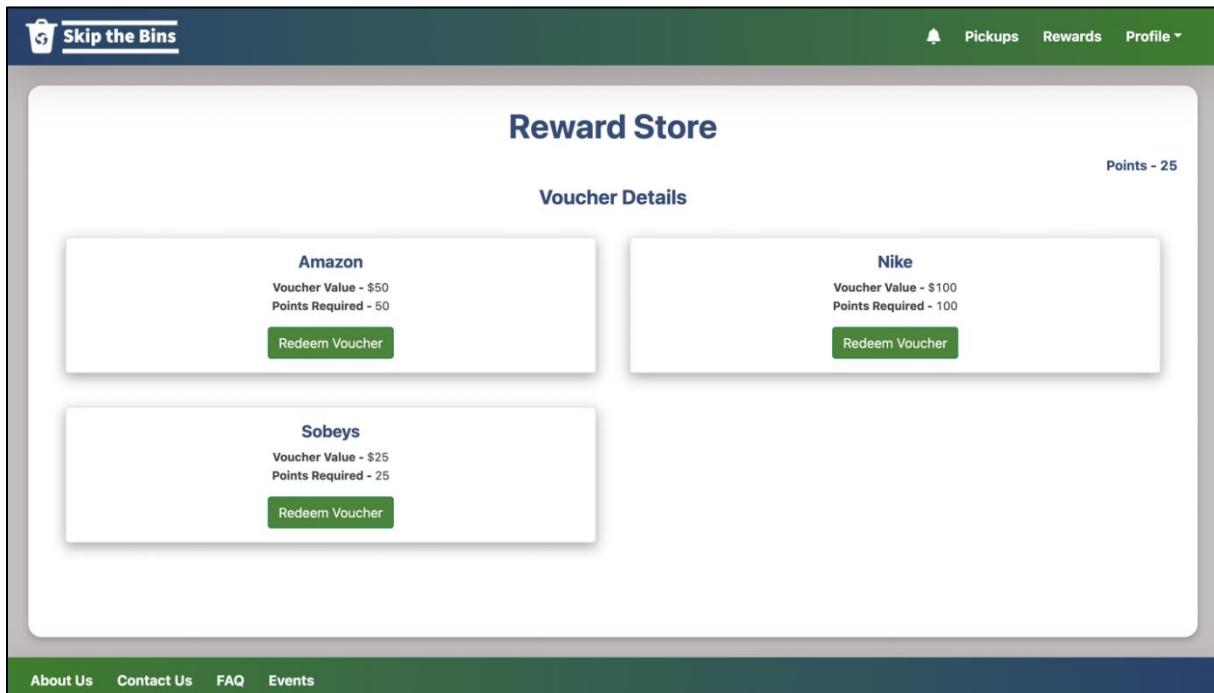


Figure 49: UI of Reward store page [6].

2. Reward Store – Success message page after voucher purchase

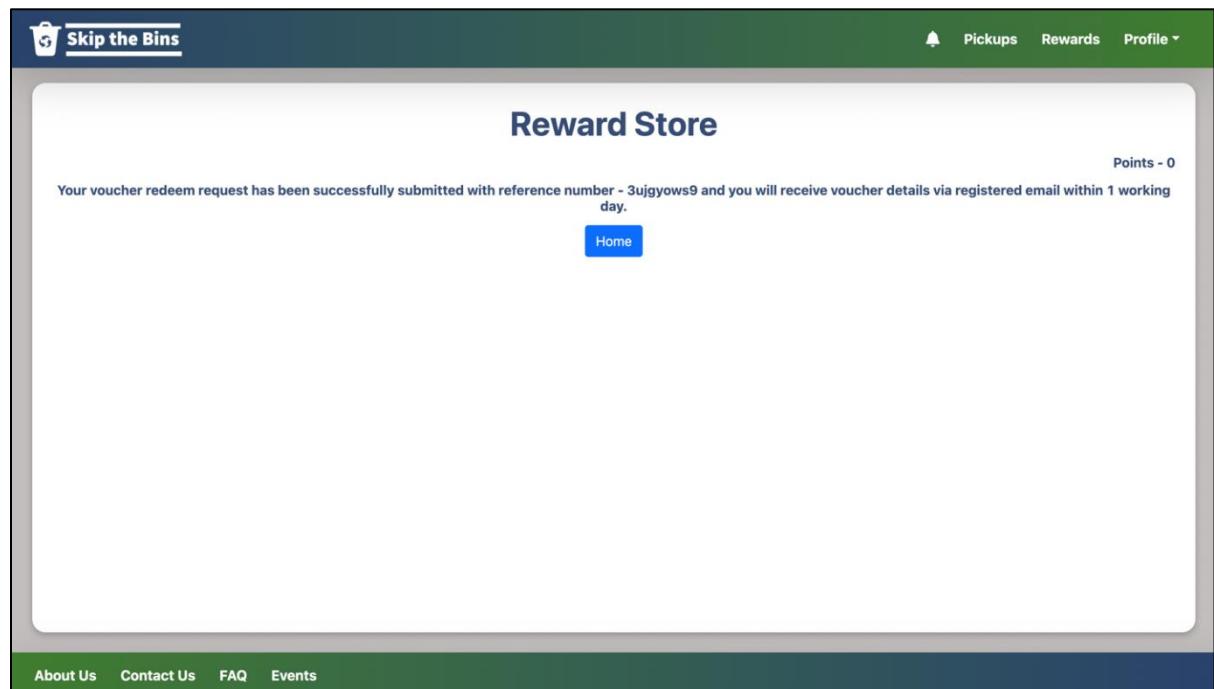


Figure 50: UI of Purchase success message [6].

3. Reward Store – Voucher purchase history page

Reward Store

Purchased Voucher List

S.No	Reference No.	Company Name	Value	Points	Customer Id	Email	Purchase Date
1	r5csz7311	Sobeys	25	25	62421a4ddfcbc3be2975ae5a	skbuser@gmail.com	April 6, 2022
2	95bnz15wg	Amazon	50	50	62421a4ddfcbc3be2975ae5a	skbuser@gmail.com	April 7, 2022
3	v7cq5hu1a	Nike	100	100	62421a4ddfcbc3be2975ae5a	skbuser@gmail.com	April 7, 2022
4	p5gizqxte	Sobeys	25	25	62421a4ddfcbc3be2975ae5a	skbuser@gmail.com	April 9, 2022
5	3ujgyows9	Sobeys	25	25	62421a4ddfcbc3be2975ae5a	skbuser@gmail.com	April 10, 2022

[Modify Voucher Details](#)

About Us Contact Us FAQ Events

Figure 51: UI of purchase history page [6].

4. Reward Store – Add & remove voucher page

Reward Store

Voucher List

S.No	Company Name	Value	Points	Actions
1	Amazon	50	50	Edit Delete
2	Nike	100	100	Edit Delete
3	Sobeys	25	25	Edit Delete

Add a new voucher

Company Name

Value

Points

[Add](#)

About Us Contact Us FAQ Events

Figure 52: UI of remove voucher page [6].

4.3.10 Feature: Pickup History and Statistics

1. View Pickup History – User

The screenshot shows the 'Skip the Bins' website with a dark green header bar. On the left is the logo 'Skip the Bins' with a trash bin icon. On the right are navigation links: a bell icon, 'Pickups', 'Rewards', and 'Profile'. Below the header is a white section titled 'Pickup History' in bold. Underneath is a table with the following data:

Pickup ID	Pickup Date	Pickup Area	Pickup Slot	Batch No.	Waste Quantity	Reward Points	Pickup Vendor	Boxes	Address
3	April 13, 2022	Spring Garden	01:00 PM - 03:00 PM	BATCH5	2 KG	0	New Vendor	3	1234 street name, city
6	April 18, 2022	Spring Garden	02:30 AM - 01:30 PM	BATCH15	1 KG	0	SKB VENDOR	2	1234 street name, city
7	April 12, 2022	Spring Garden	01:00 PM - 03:00 PM	BATCH3	6 KG	0	New Vendor	6	1234 street name, city

At the bottom of the page, there is a dark blue footer bar with links: 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 53: UI of Pickup History page [6].

2. View Past Pickups – Vendor

The screenshot shows the 'Skip the Bins' website with a dark green header bar. On the left is the logo 'Skip the Bins' with a trash bin icon. On the right are navigation links: 'Announcements', 'FAQs', 'Pickups', and 'Profile'. Below the header is a white section titled 'Past Pickups' in bold. Underneath is a table with the following data:

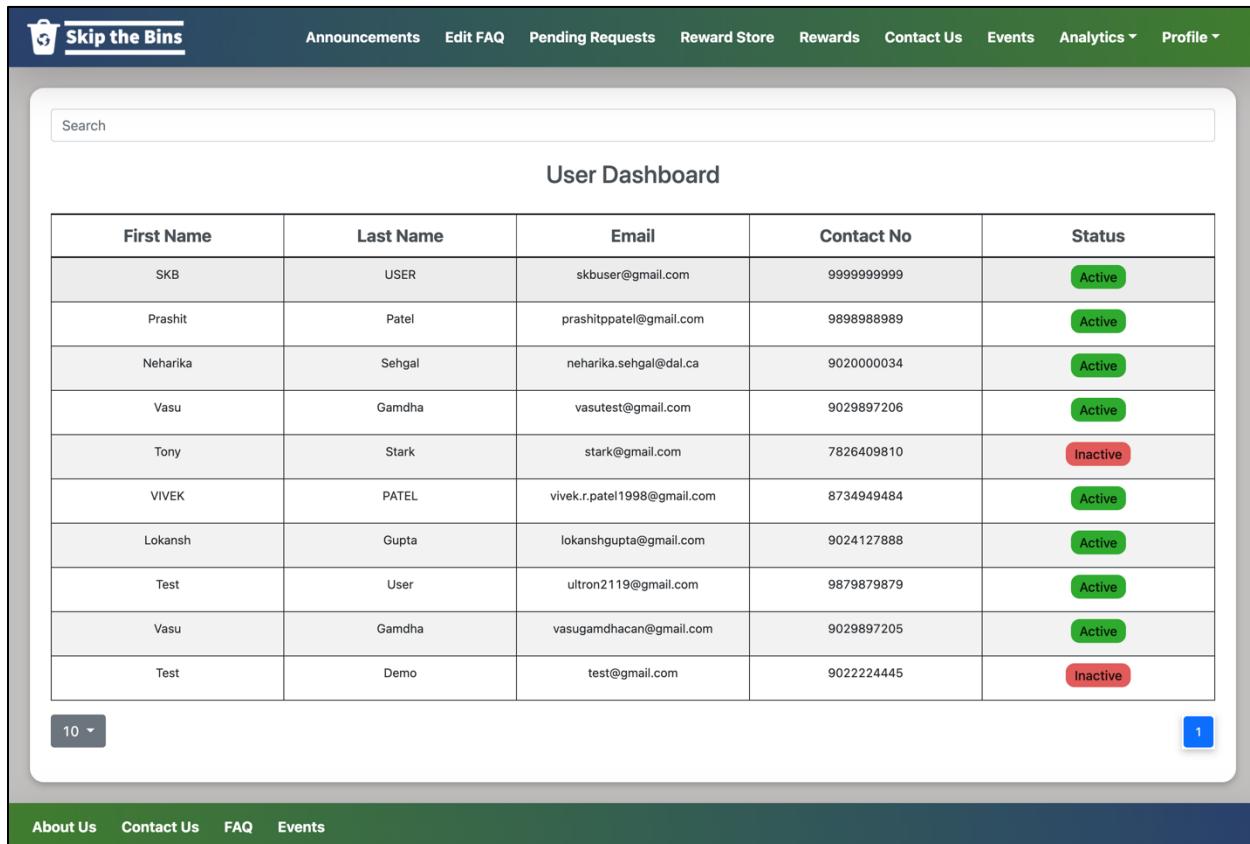
Pickup ID	Pickup Date	Pickup Area	Pickup Slot	Batch No.	Waste Quantity	Reward Points	Pickup Vendor	Boxes	Address
4	April 8, 2022	Quinpool Road	03:00 PM - 04:00 PM	BATCH11	5 KG	150 Points	SKB VENDOR	4	2327 Brunswick Street
6	April 18, 2022	Spring Garden	02:30 AM - 01:30 PM	BATCH15	1 KG	0 Points	SKB VENDOR	2	1234 street name, city

At the bottom of the page, there is a dark blue footer bar with links: 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 54: UI of Past Pickups page [6].

4.3.11 Feature: Portal Analytics

1. User Analytics –Admin



The screenshot shows the 'User Dashboard' page of a web application. At the top, there is a navigation bar with links: Announcements, Edit FAQ, Pending Requests, Reward Store, Rewards, Contact Us, Events, Analytics ▾, and Profile ▾. Below the navigation bar is a search bar labeled 'Search'. The main content area is titled 'User Dashboard' and contains a table with ten rows of user data. The table has columns for First Name, Last Name, Email, Contact No, and Status. The status is represented by a small button: green for 'Active' and red for 'Inactive'. The data in the table is as follows:

First Name	Last Name	Email	Contact No	Status
SKB	USER	skbuser@gmail.com	9999999999	Active
Prashit	Patel	prashitppatel@gmail.com	9898988989	Active
Neharika	Sehgal	neharika.sehgal@dal.ca	9020000034	Active
Vasu	Gamdha	vasutest@gmail.com	9029897206	Active
Tony	Stark	stark@gmail.com	7826409810	Inactive
VIVEK	PATEL	vivek.r.patel1998@gmail.com	8734949484	Active
Lokansh	Gupta	lokanshgupta@gmail.com	9024127888	Active
Test	User	ultron2119@gmail.com	9879879879	Active
Vasu	Gamdha	vasugamdhacan@gmail.com	9029897205	Active
Test	Demo	test@gmail.com	9022224445	Inactive

At the bottom left of the dashboard, there is a dropdown menu with the number '10' and a '1' at the bottom right.

Below the dashboard, there is a footer bar with links: About Us, Contact Us, FAQ, and Events.

Figure 55: UI of User Analytics page [6].

2. Vendor Analytics – Admin

The screenshot shows the Vendor Dashboard. At the top, there is a search bar and a navigation menu with links: Announcements, Edit FAQ, Pending Requests, Reward Store, Rewards, Contact Us, Events, Analytics ▾, and Profile ▾. Below the menu is a table titled "Vendor Dashboard" with four columns: Organization Name, Email, Contact No, and Status. The table contains three rows of data:

Organization Name	Email	Contact No	Status
Test ORG	skbvendor@gmail.com	1234567890	Active
ABC Ltd	neharika.sehgal001@gmail.com	9020000056	Active
ORG	vasug@dal.ca	9029897207	Inactive

At the bottom of the dashboard, there are two buttons: a dark blue button labeled "10" with a dropdown arrow and a light blue button labeled "1".

Below the dashboard is a footer bar with links: About Us, Contact Us, FAQ, and Events.

Figure 56: UI of Vendor analytics page [6].

3. Reward Analytics – Admin

The screenshot shows the Reward Dashboard. At the top, there is a search bar and a navigation menu with links: Announcements, Edit FAQ, Pending Requests, Reward Store, Rewards, Contact Us, Events, Analytics ▾, and Profile ▾. Below the menu is a table titled "Reward Dashboard" with three columns: Reward, Points Required, and Value(\$). The table contains three rows of data:

Reward	Points Required	Value(\$)
Amazon	50	50
Nike	100	100
Sobeys	25	25

At the bottom of the dashboard, there are two buttons: a dark blue button labeled "10" with a dropdown arrow and a light blue button labeled "1".

Below the dashboard is a footer bar with links: About Us, Contact Us, FAQ, and Events.

Figure 57: UI of Reward analytics page [6].

4.3.12 Feature: Events

1. Add event – Admin

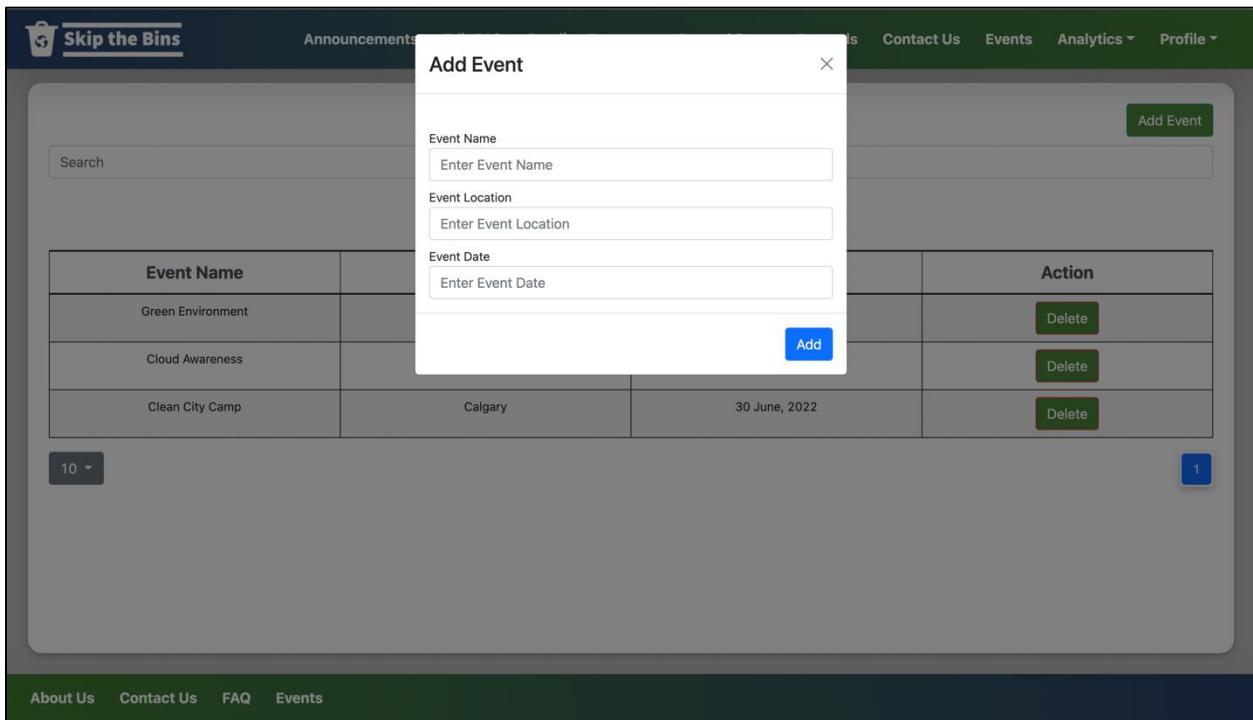


Figure 58: UI of add event for admin [6].

2. Event listing – Admin

The screenshot shows the 'Event Dashboard' for an administrator. At the top right is a green 'Add Event' button. Below it is a search bar with the placeholder 'Search'. The main area contains a table with three rows of event data:

Event Name	Event Location	Event Date	Action
Green Environment	Halifax	8 May, 2022	<button>Delete</button>
Cloud Awareness	Toronto	15 June, 2022	<button>Delete</button>
Clean City Camp	Calgary	30 June, 2022	<button>Delete</button>

Below the table are two buttons: a grey '10 ▾' button on the left and a blue '1' button on the right. The bottom navigation bar includes links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 59: UI of Event listing page for admin [6].

3. Event Listing – User

The screenshot shows the 'Events' page for a user. At the top right are icons for 'Pickups', 'Rewards', and 'Profile'. Below is a search bar with the placeholder 'Search'. The main area contains a table with three rows of event data:

Event Name	Event Location	Event Date
Green Environment	Halifax	8 May, 2022
Cloud Awareness	Toronto	15 June, 2022
Clean City Camp	Calgary	30 June, 2022

Below the table are two buttons: a grey '10 ▾' button on the left and a blue '1' button on the right. The bottom navigation bar includes links for 'About Us', 'Contact Us', 'FAQ', and 'Events'.

Figure 60: UI of event listing page for users [6].

4.4 Website design

4.4.1 Colour pallet

The color pallets that would be used for our project are given below. The color pallets were thoughtfully decided to keep in mind the type of the application. SkiptheBins concentrates on improving the environment by promoting waste recycling and providing a platform for ordinary people to deliver the waste from the comfort of their homes to the recycling vendors. This idea of making the environment clean justifies the color pallet used. Green and Blue colors were decided based on earth and water, two of the five elements of nature, as shown in Figure 61, Figure 62, and Figure 63. White color was specifically chosen as a standard color to increase the visibility of the components and improve user experience.



Figure 61: Colour pallet 1 [8].



Figure 62: Colour pallet 2 [8].

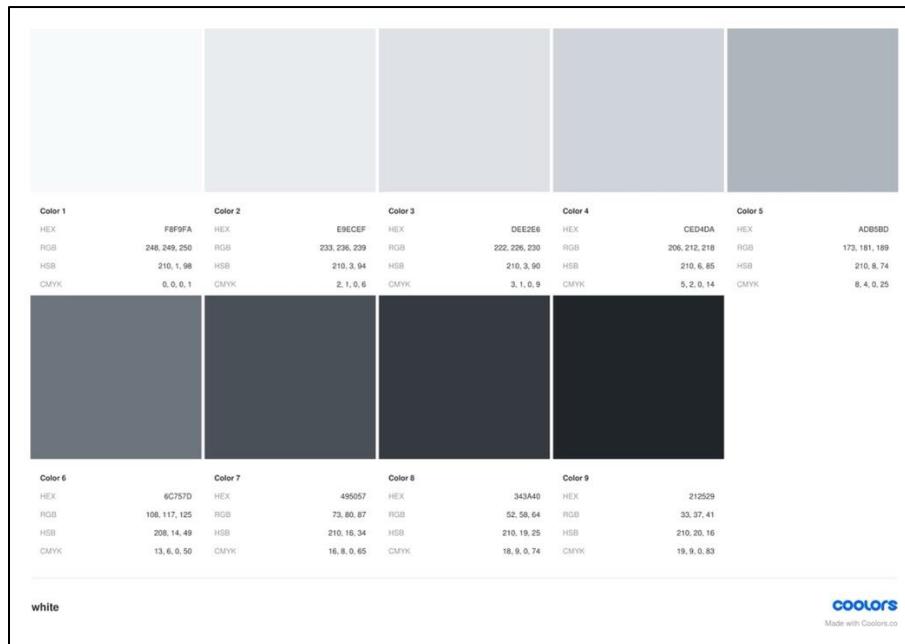


Figure 63: Colour pallet 3 [8].

4.4.2 Libraries

We have used Bootstrap & React Bootstrap libraries as they are:

- Easy to use so new learners can quickly get the hang of it.
- It is the most popular UI framework/library for UI [9].
- It is open source & has several components.
- It is a grid system that is an ideal solution for responsiveness.
- It takes care of typography and the styling of buttons.
- It is flexible, which provides us with scope for innovation.
- It gives us cross-browser compatibility, so our app styling would not malfunction over different browsers.
- It has enormous community support, and hence it would be easier to find solutions to the issues we face while using it.

5. Scenarios, Use cases, Task-flow Diagrams

5.1 Feature: User Management

Figure 64 is the legend to consider for the following feature.

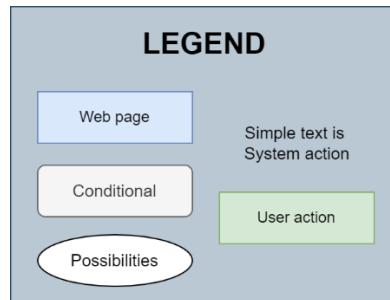


Figure 64: Legend to consider for this feature [5].

5.1.1 Sign up

Scenario: This feature will be used when a new user sets up an account to schedule garbage collection and earn rewards.

User Persona: The user who wants to give away their garbage receives rewards for their excellent work.

Need: To allow each user to manage their garbage collection, collect rewards, and utilize it.

Context: A user who wants to get rid of the garbage as soon as possible. The user is new to our website, and to schedule pick up of waste, the user needs a personal account.

Use case:

1. The user is at the landing page of <https://www.skipthebins.herokuapp.com/>
2. The user clicks on the sign-up button at the top right corner, as shown in the figure below.
3. The user visits the sign-up page.
4. The user finds a form asking for a name, email, and password to sign up for a new account.
5. The user fills up this simple form.
 - o If a user cannot submit the form, some details must be incorrectly entered.
 - o The guidelines in red color below the input boxes will suggest the correct way.
6. The user will receive an email with OTP.
7. The user will enter the same OTP.
 - o If the user enters an incorrect OTP, the user will re-verify the OTP from the email and re-enters.

8. Once the authentication completes, the user will be directly redirected to the login page, where the user can enter the credentials used when signing up.

Figure 65 and Figure 66 describe the task flow and clickstream diagrams, respectively.

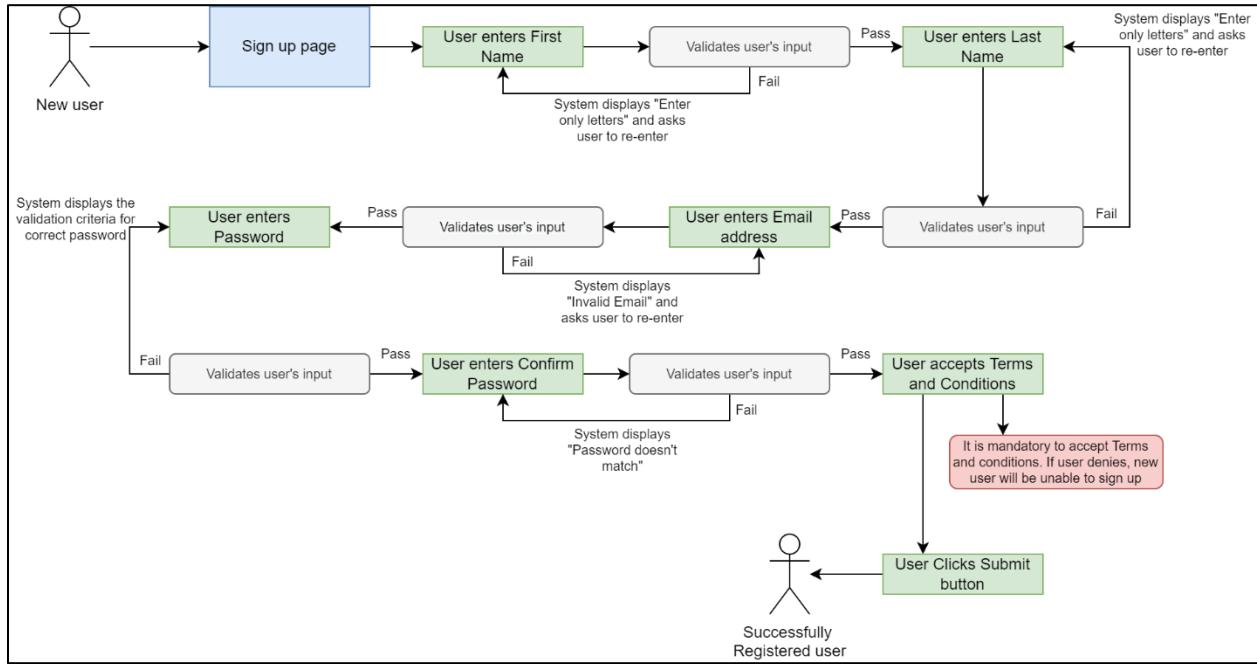


Figure 65: Task flow diagram of Sign-up page [5].

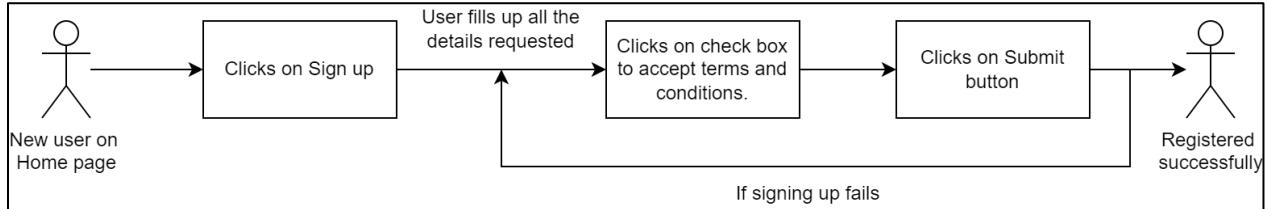


Figure 66: Clickstream of Sign-up page [5].

5.1.2 Log in

Scenario: This feature will be used when the user already has signed up for an account on SkipTheBins

User Persona: The user who loves a clean environment and wants to join the initiative of Clean Canada and uses Skip the bins to schedule garbage pickups. The user wants to give away their garbage and reward their excellent work.

Need: To manage and access the personally collected rewards and schedule a garbage pickup.

Context: A user who wants to get rid of the garbage as soon as possible. User logs in to his account and schedule a pickup of waste.

Use case:

1. The user is at the landing page of <https://www.skipthebins.herokuapp.com/>
2. The user clicks on the Login button at the top right corner, as shown in the figure below.
3. The user visits the Login page.
4. The user finds a form asking for an email and password to login into the account.
5. The user will enter an email/username and password and click on the Login button. The user can also use google authenticator to log in to the account.
 - o If the user has entered any wrong credentials, the password field will be emptied and ask the user to check their credentials and re-enter.
 - o After five failed attempts, the user will be notified about constant failed attempts via email and suggested using forgot password feature.
6. Once the user enters the correct credentials and clicks on the Login button, the user logs in successfully and is redirected to the profile page.

Figure 67 and Figure 68 describe the task flow and clickstream diagrams, respectively.

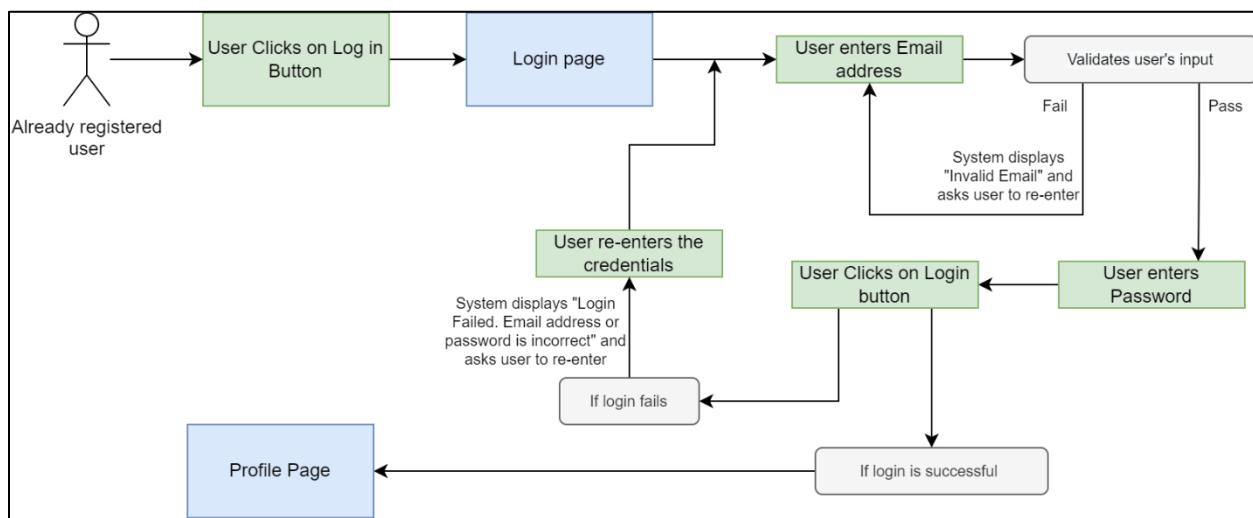


Figure 67: Task flow diagram of login page [5].

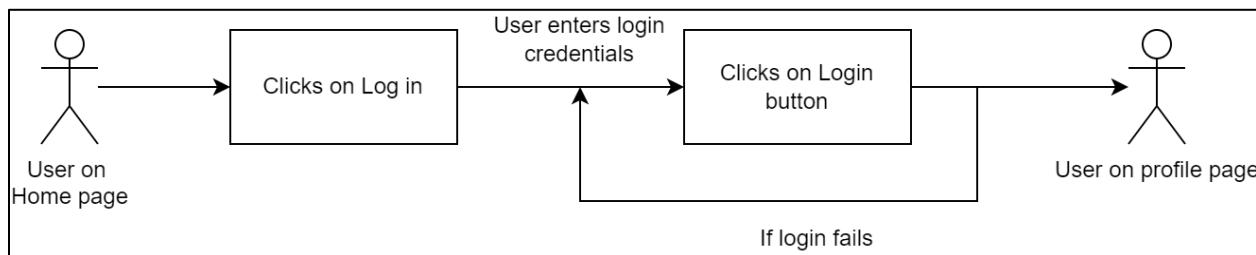


Figure 68: Clickstream of the login page [5].

5.1.3 Forgot password

Scenario: This feature will be used when the user forgets the username or password of the account.

User Persona: The user who wants to give away their garbage receives rewards for their excellent work. The user finds it hard to remember the password.

Need: To reset the password that the user tried to remember. The user even tried different passwords he could remember, but none worked.

Context: The user visits the website to check updates. The user is on the login page and forgot the password he set. He tried his best but could not recall the password.

Use case:

1. The user is on the login page.
2. The user clicks on forgot password just below the password box, as shown in the figure below.
3. The user is asked to enter the account's email address.
4. The user enters the email address and clicks on reset password.
5. The user receives an OTP via email authenticating the request to change the password
6. The user will enter the same OTP.
 - o If the user enters an incorrect OTP, the user re-verifies the OTP from the email and re-enters.
7. Once the authentication is done, the user is asked to enter a new password twice.
8. The user enters a new password that is easy to remember and clicks on the reset password button.
9. The user will be redirected to the login page, where the user can now log in with the new password.

Figure 69 and Figure 70 describe the task flow and clickstream diagrams, respectively.

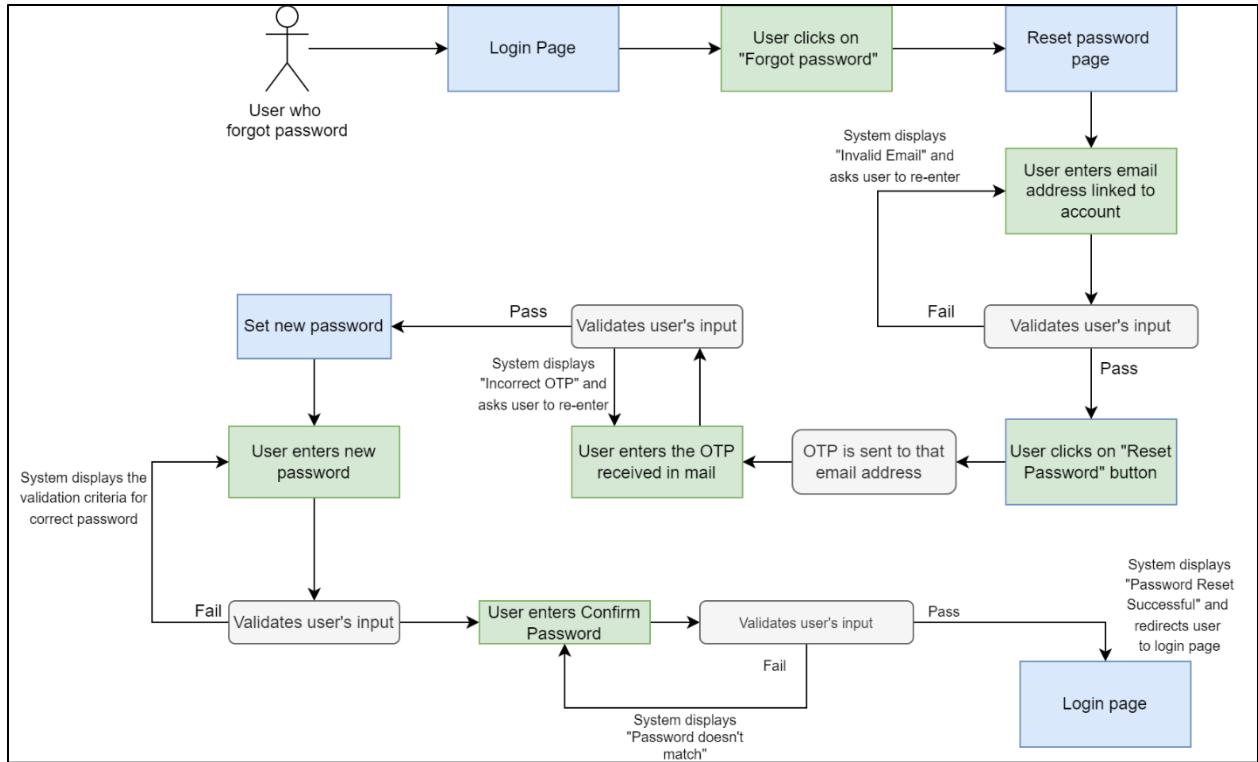


Figure 69: Task flow diagram of forgot password page [5].

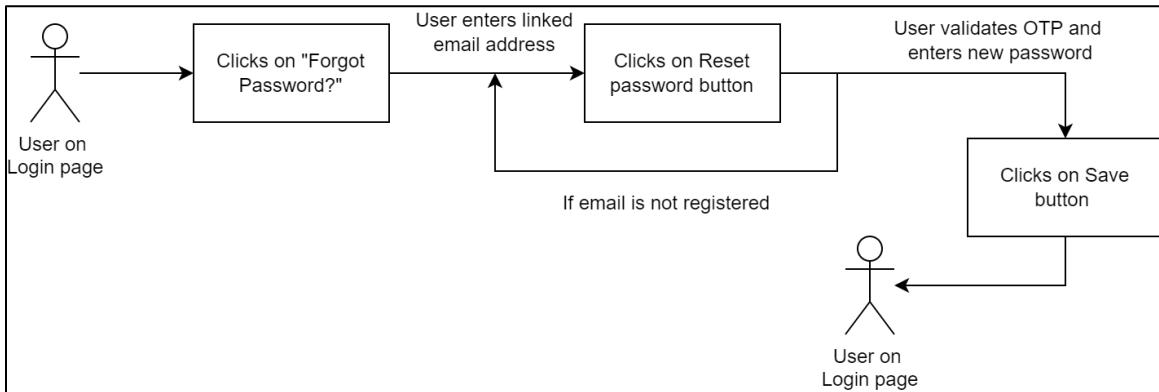


Figure 70: Clickstream of forgot password page [5].

5.1.4 Logout

Scenario: This feature will be used when the user wants to logout

User Persona: The user, vendor, or admin who wishes to log out from their account.

Need: To log in from a different account or log out for privacy concerns.

Context: The user visits the website to check updates. The user logs in and gets the updates. When done, the user wants to log out of their account from that machine.

Use case:

1. The user is already logged in on SkipTheBins.
2. The user wants to log out of the account.

3. The user clicks on the “Profile” button in the top-right corner of the webpage, as shown in the figure below.
4. The system drops down a menu with few options.
5. The user selects the “Log out” option.
 - o If the user is successfully logged out, the system will redirect the user to the home page.
 - o If logging out fails, the system will notify with the error “Failed to log out.” And the user must repeat the steps from 3rd one again.

Figure 71 and Figure 72 describe the task flow and clickstream diagrams, respectively.

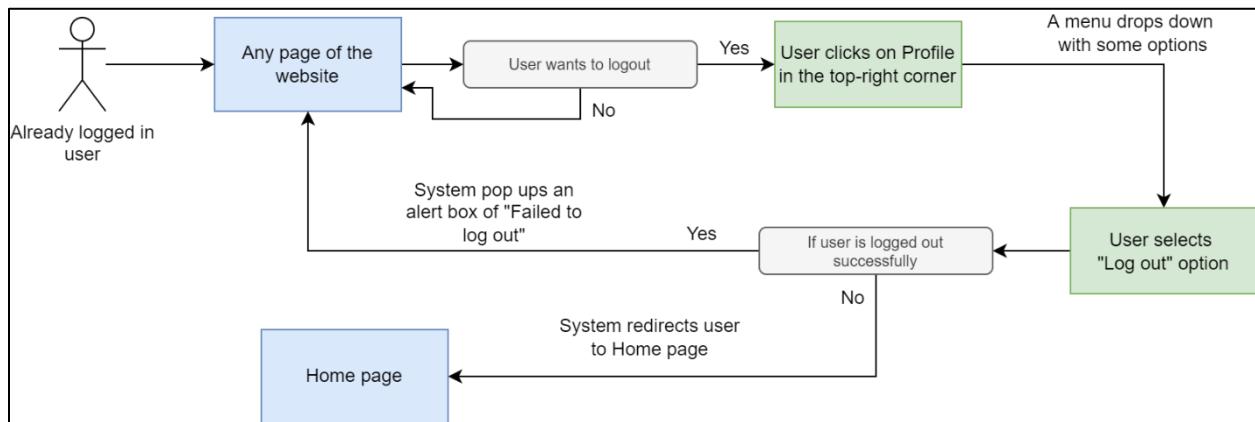


Figure 71: Task flow diagram to Log out [5].

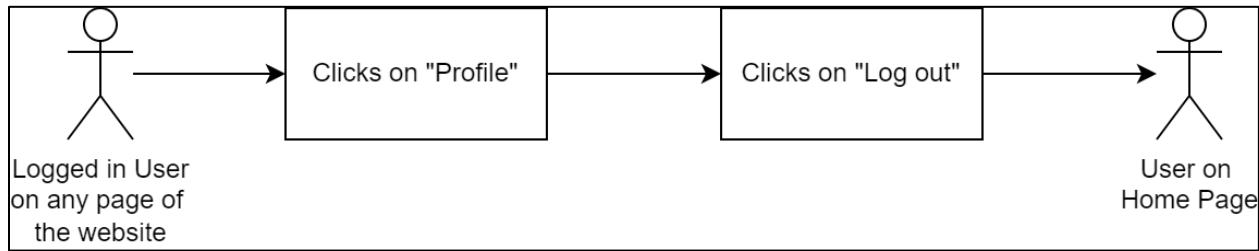


Figure 72: Clickstream to Log out [5].

5.1.5 Edit Profile

Scenario: This feature will be used when users want to edit any information about themselves.

User Persona: The user, vendor, or admin who wishes to change any detail linked to their account.

Need: To update any information or rectify minor mistakes made during signing up.

Context: The user has misspelled any spelling or email id/name, or other detail when signing up. Now the user will use this feature and modify it accordingly.

Use case:

1. The user is already logged in on SkipTheBins.

2. From any page, the user decides to change some details on their profile.
3. The user clicks on the “Profile” button in the top-right corner of the webpage, as shown in the figure below.
4. The system drops down a menu with few options.
5. The user selects the “Settings” option.
6. The system redirects the user to the Settings page.
7. The user clicks on “Edit Profile.”
8. The system displays a modal box with labeled form fields to edit profile information.
9. The user updates the required details in the field accordingly.
10. The system requires the final call of the user to finalize the modification.
 - o If the user clicks on “Save,” the system will save all the modifications and update them on the “Profile” page. The system will also redirect the user to the “Profile” page.
 - o If the user clicks on “Discard,” the system will ignore all the modifications and close the modal box. The user will be on the “Settings” page.

Figure 73 and Figure 74 describe the task flow and clickstream diagrams, respectively.

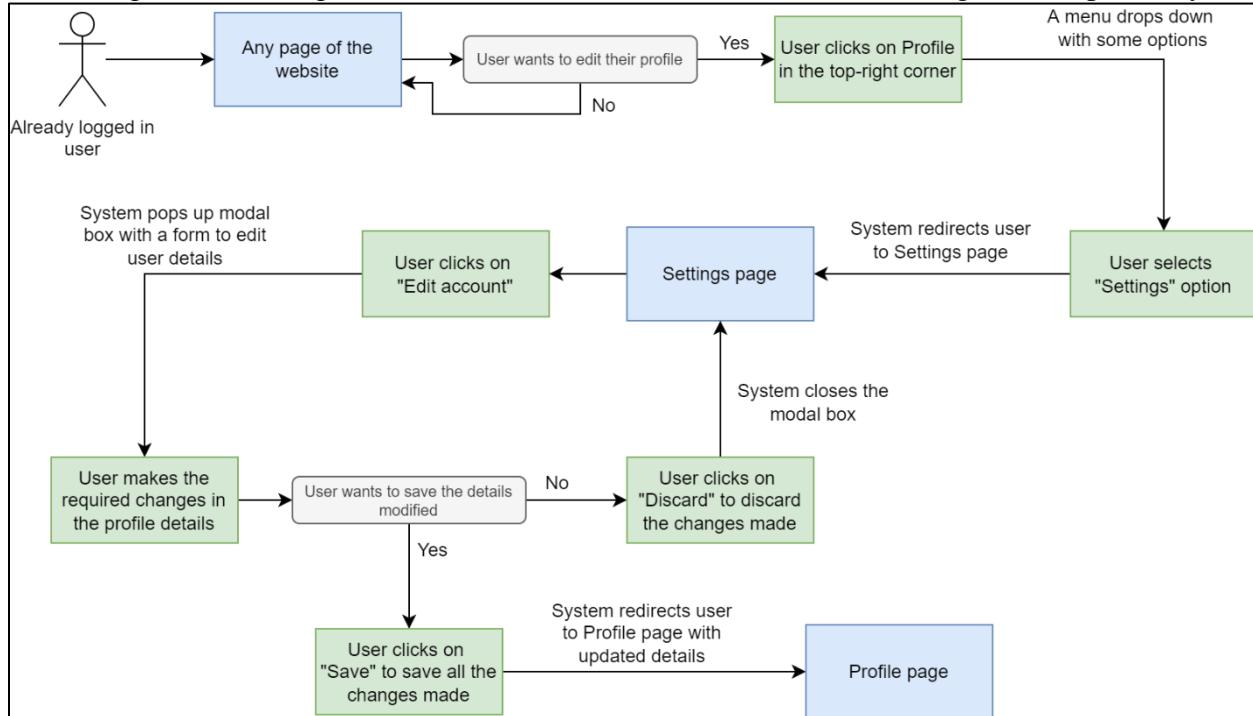


Figure 73: Task flow diagram to edit account [5].

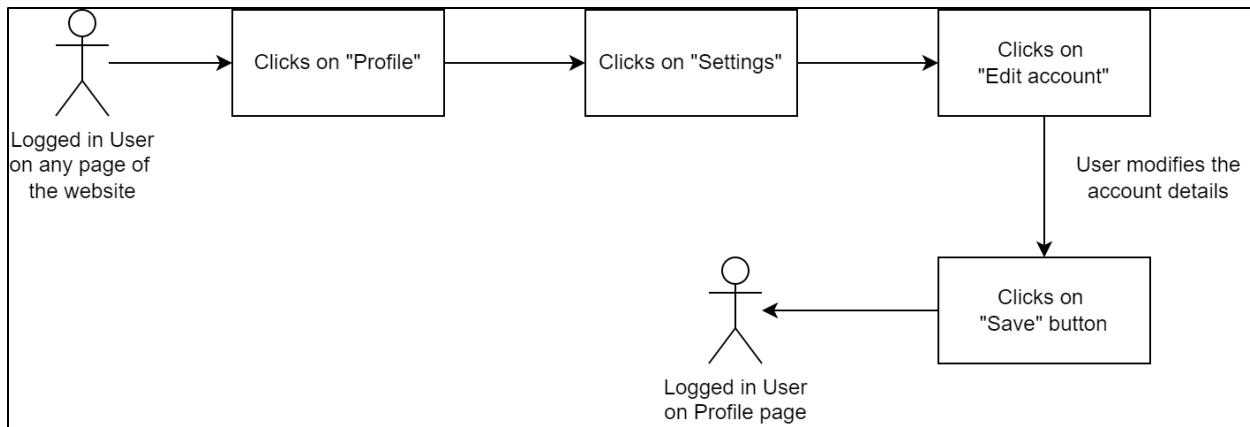


Figure 74: Clickstream to edit account [5].

5.1.6 Delete Account

Scenario: This feature will be used by the user to delete their account.

User Persona: The user who wishes to delete the account

Need: To completely delete the profile from SkipTheBins.

Context: A user decides to remove their account from SkipTheBins and agrees to give up all the rewards earned.

Use case:

1. The user is already logged in on SkipTheBins.
2. From any page, the user decides to delete their profile.
3. The user clicks on the “Profile” button in the top-right corner of the webpage, as shown in the figure below.
4. The system drops down a menu with few options.
5. The user selects the “Settings” option.
6. The system redirects the user to the Settings page.
7. The user clicks on “Delete Account.”
8. The system displays an alert box with a warning.
9. The system requires the final call of the user to confirm their decision.
 - o If the user clicks on “Yes,” the system will delete all the rewards linked with that account and delete their complete profile from the database. The system will redirect the user to the “Home” page.
 - o If the user clicks on “No,” the system closes the alert box, and the user will be returned to the “Settings” page.

Figure 75 and Figure 76 describe the task flow and clickstream diagrams, respectively.

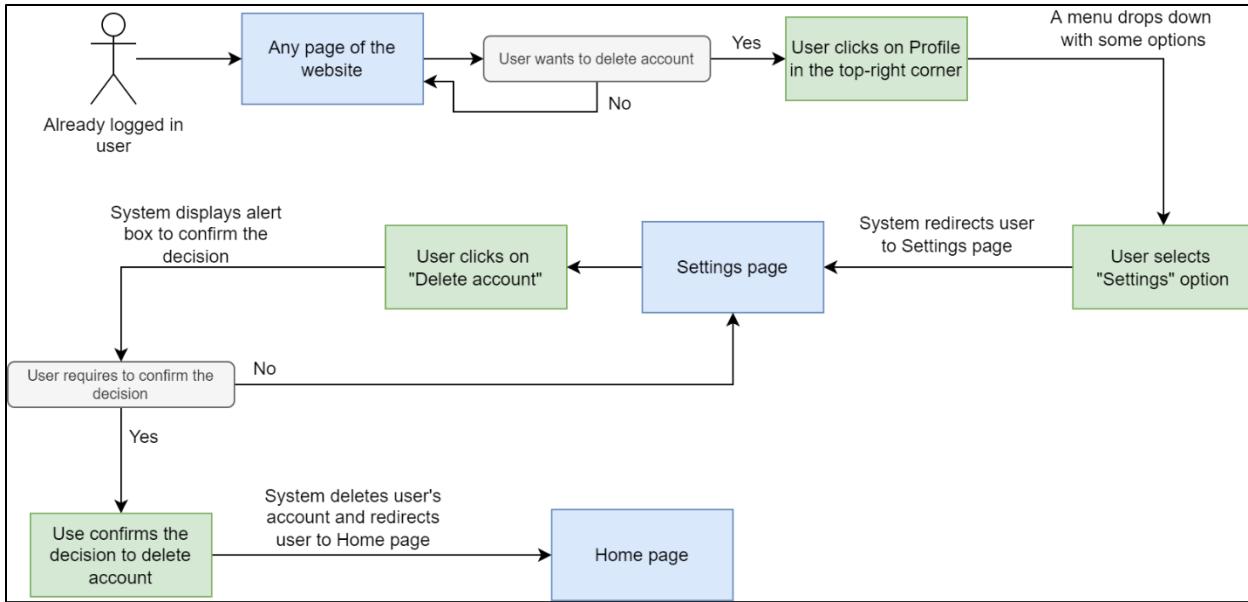


Figure 75: Task flow diagram to delete account [5].

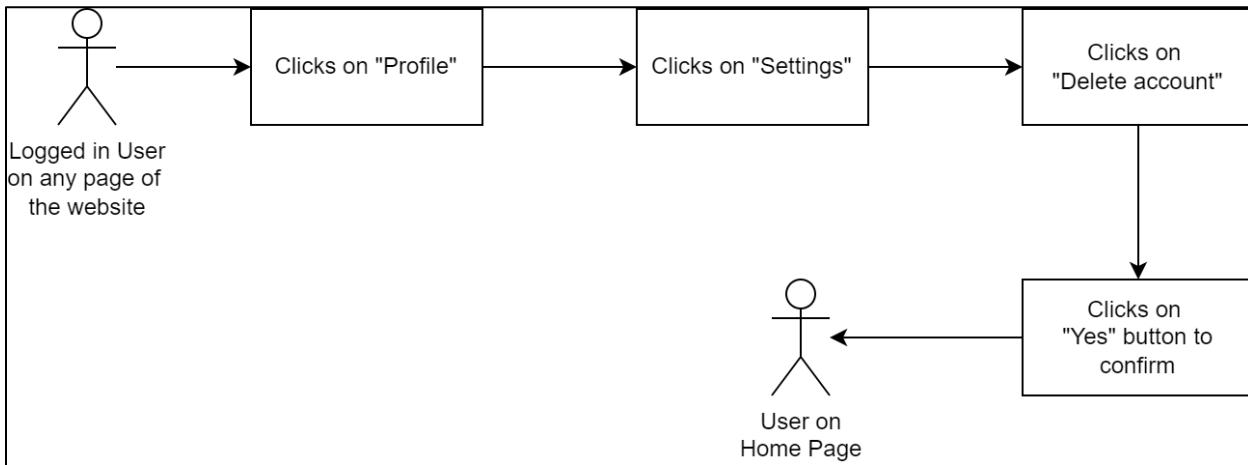


Figure 76: Clickstream to delete account [5].

5.1.7 Admin approval for creation

Scenario: This feature will be used by the admin to accept or decline the requests of the vendor to create an account.

User Persona: Admin will handle all the requests for account creation.

Need: To allow or disallow the profile creation of vendors and maintain the authenticity of vendors.

Context: Admin decides whom to allow creating an account as a vendor. To avoid any frauds and create a trustworthy community of vendors.

Use case:

1. The admin is already logged in on SkipTheBins.
2. The admin is in user management.

3. The admin clicks on pending requests for account creation.
4. The system displays the list of pending requests, as shown in the figure below.
5. The admin examines the request.
 - o If any requirement is missing, the admin clicks on the “Incomplete” button to mark it incomplete, and the system will send an email to the author of the request about missing requirements. The requested account will not be created.
 - o If the admin finds the request invalid after the background check, the admin clicks on the “Decline” button to reject the bid, and the system will send an email to the author of the request about the rejection of the request. The requested account will not be created.
 - o If the admin finds the request valid after the background check, the admin clicks on the “Accept” button to approve the request, and the system will send an email to the author of the request about the approval of the request and the vendor account be created.
6. The system reloads the page and removes the request already answered from the pending list.

Figure 77 and Figure 78 describe the task flow and clickstream diagrams, respectively.

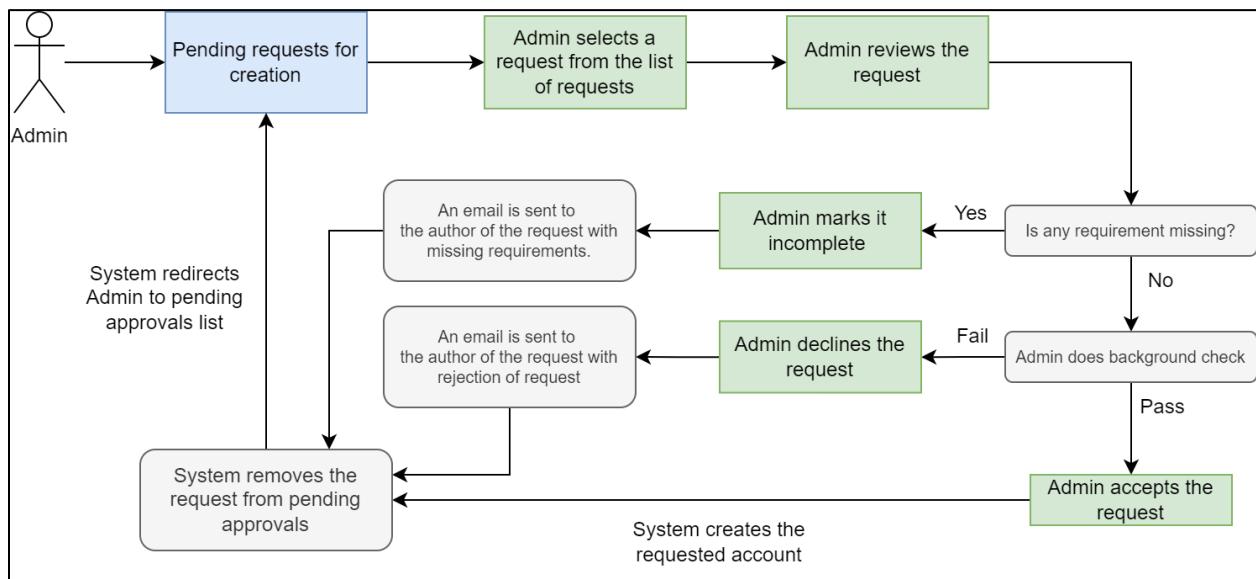


Figure 77: Task flow diagram for admin approval for vendor account creation [5].

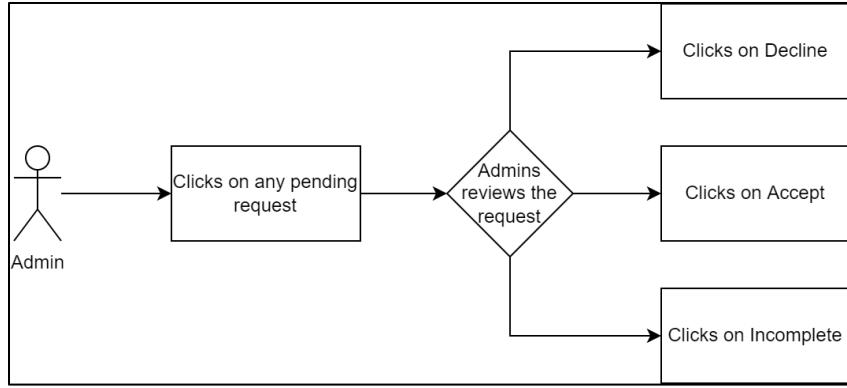


Figure 78: Clickstream for admin approval for vendor account creation [5].

5.1.8 Admin approval for deletion

Scenario: This feature will be used by the admin to accept or decline the requests of the vendor to delete an account.

User Persona: Admin will handle all the requests for account deletion.

Need: To allow or disallow the profile deletion of vendors and know the reasons to quit SkipTheBins.

Context: Admin decides whom to allow deleting an account as a vendor. To avoid any frauds or hack and create a trustworthy community of vendors.

Use case:

1. The admin is already logged in on SkipTheBins.
2. The admin is in user management.
3. The admin clicks on pending requests for account deletion.
4. The system displays the list of pending requests, as shown in the figure below.
5. The admin examines the request.
 - o If any requirement is missing, the admin clicks on the “Incomplete” button to mark it incomplete, and the system will send an email to the author of the request about missing requirements. The requested account will not be deleted.
 - o If the admin finds the request invalid after the background check, the admin clicks on the “Decline” button to reject the bid, and the system will send an email to the author of the request about the rejection of the request. The requested account will not be deleted.
 - o If the admin finds the request valid after the background check, the admin clicks on the “Accept” button to approve the request, and the system will send an email to the author of the request about the approval of the request and the vendor account be deleted.
6. The system reloads the page and removes the request already answered from the pending list.

Figure 79 and Figure 80 describe the task flow and clickstream diagrams, respectively.

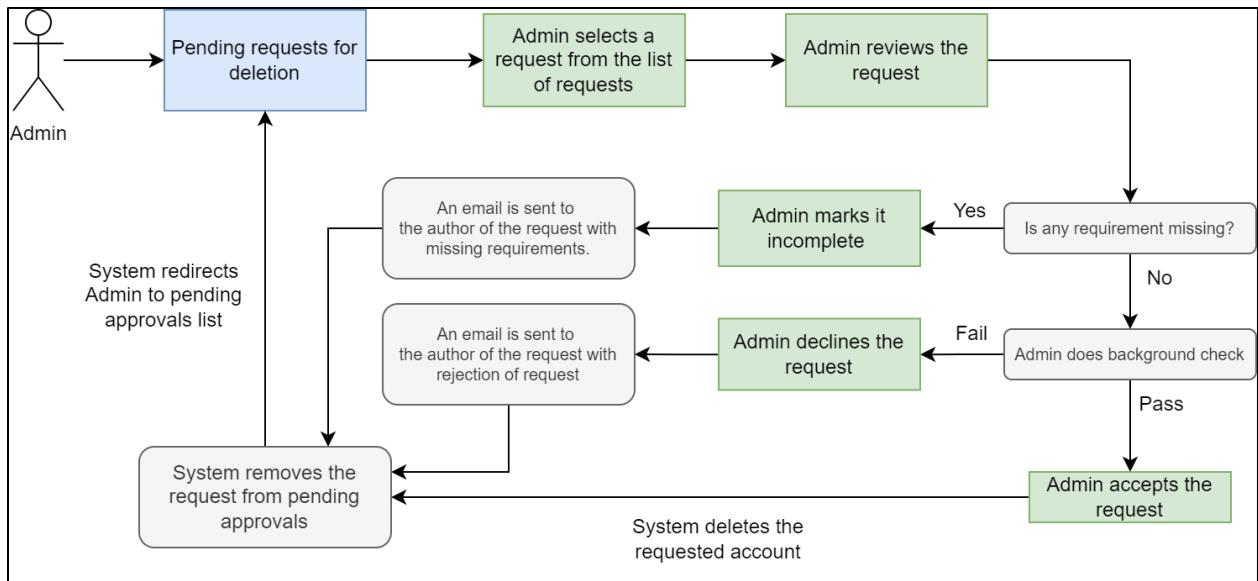


Figure 79: Task flow diagram admin approval for vendor account deletion [5].

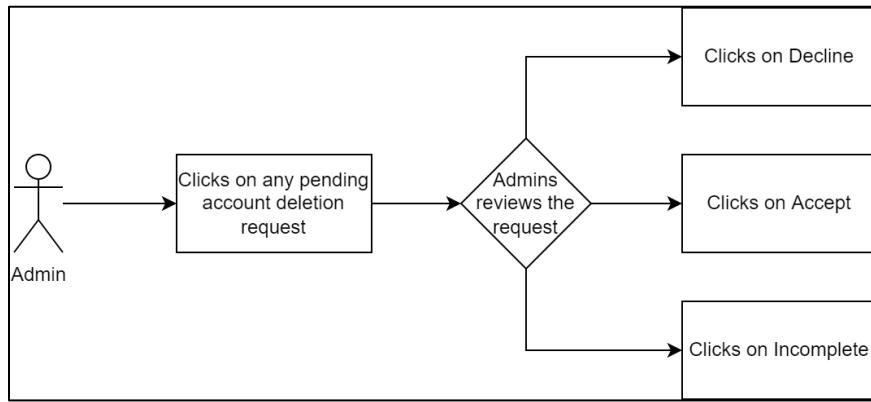


Figure 80: Clickstream for admin approval for vendor account deletion [5].

5.2 Feature: Scheduling Waste Pickups

5.2.1 Schedule a waste pickup

Scenario: A user wants to get rid of the recyclable waste, has prepared some bags and boxes and wants someone to pick it up. The user visits the website to schedule a waste pickup for the next day. The website displays different time slots available for waste pickup. The user selects one opening from the available slots.

Persona: A general user

Feature: Schedule waste pickup

Need: Book a slot for picking up recyclable waste.

Context: The user is logged in to the system and books the slot independently.

Use Case: Schedule a slot for waste pickup

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Schedule Pickup” option.
6. The **System** displays date selection with the next day date already selected and time slots available for the selected date.
7. The **User** keeps the current selection and selects a time slot.
8. The **System** displays a prompt for entering additional information such as waste type, kg waste, and the number of bags/boxes.
9. The **User** enters the above additional information and hits the enter key.
10. The **System** checks for the validity of the details.
 - 10.1. The **System** displays an error message for incorrect fields.
 - 10.1.1. The **System** prompts the user to enter the correct details.
 - 10.1.2. The **User** updates the incorrect details and hits the enter key.
 - 10.2. The **System** displays an error message for missing fields.
 - 10.2.1. The **System** prompts the user to enter the missing details.
 - 10.2.2. The **User** enters the missing details and hits the enter key.
11. The **System** prompts for the address of the pickup.
 - 11.1. The **System** does not have any address for the user.
 - 11.1.1. The **System** prompts for a new address for the pickup.
 - 11.1.2. The **User** enters the address and hits the enter key.
 - 11.1.3. The **System** saves the address for that user.
 - 11.2. The **System** does have previous addresses for the user.
 - 11.2.1. The **System** prompts the user to select any one address or enter a new address.
 - 11.2.1.1. The **User** selects one from previous addresses.
 - 11.2.1.2. The **User** enters a new address and hits the enter key.

11.2.1.2.1. The System saves the address for that user.

12. The User clicks on the “Schedule” button.

13. The System displays a “Successfully booked” message.

Figure 81 and Figure 82 describe the task flow and clickstream diagrams, respectively.

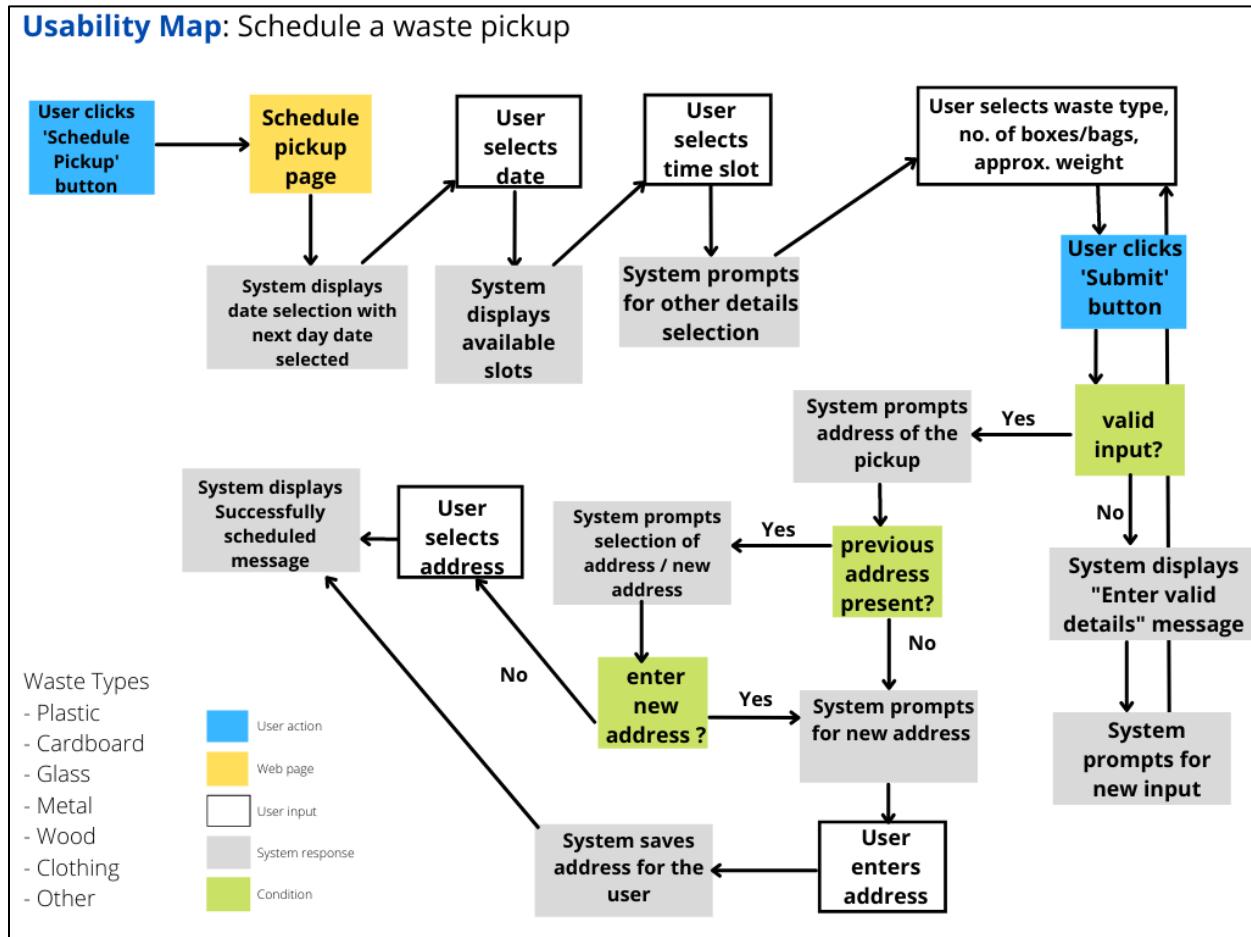


Figure 81: Task flow diagram to schedule a waste pickup - General user [7].

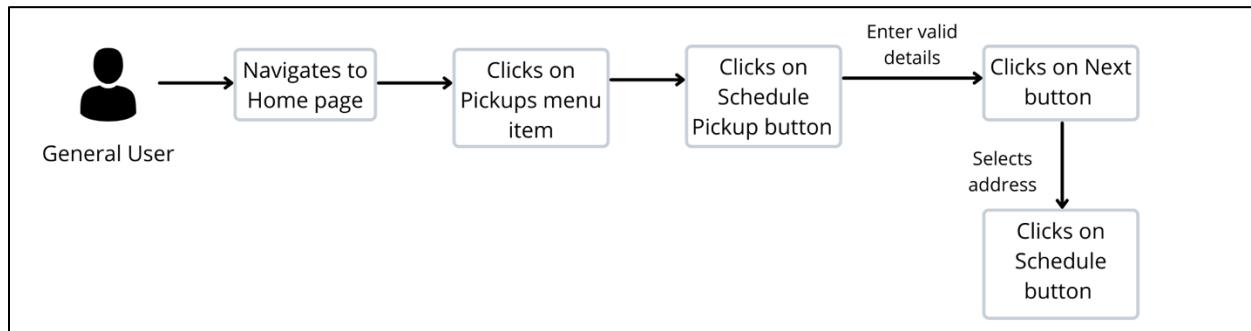


Figure 82: Clickstream - Schedule waste pickup - General user [7].

5.2.2 View waste pickup

Scenario: A user wants to view a scheduled waste pickup for the current day to see the details entered while scheduling to ensure he entered it correctly. The user visits the website to check the details and then selects a particular pickup for verifying. The system displays the details for the chosen pickup.

Persona: A general user

Feature: Schedule waste pickup

Need: View details for the scheduled pickup.

Context: The user is logged in to the system and has already booked a time slot for picking up the recyclable waste.

Use Case: View details for a waste pickup

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “View Pickups” option.
6. The **System** shows date selection with the next day’s already selected and scheduled pickups for the current day.
7. The **User** selects a pickup to see the details.
8. The **System** displays the details of the selected pickup.

Figure 83 and Figure 84 describe the task flow and clickstream diagrams, respectively.

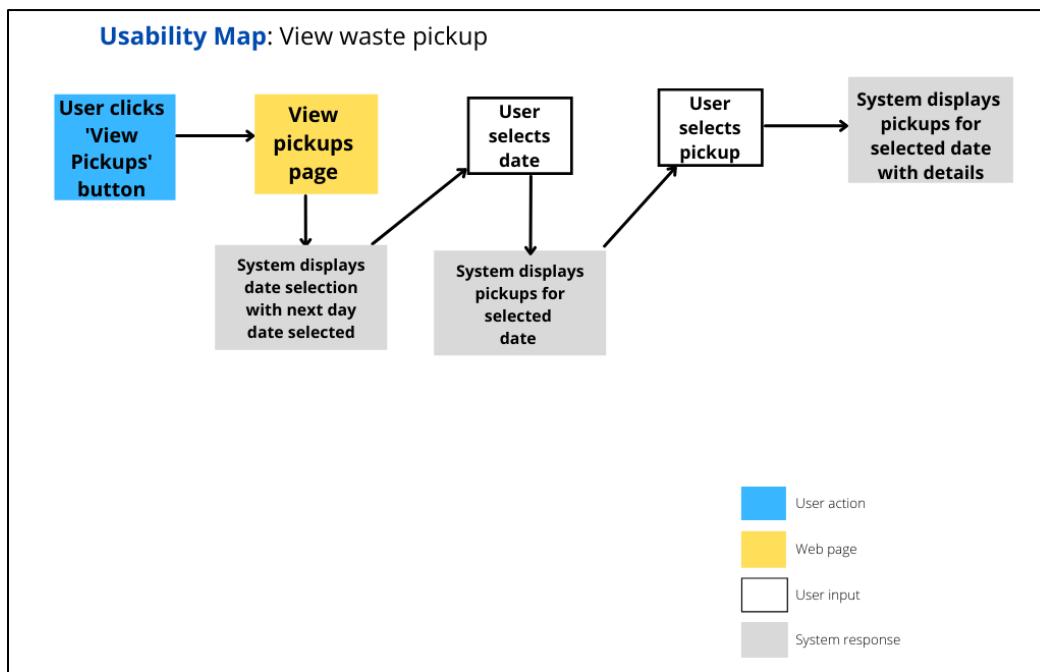


Figure 83: Task flow diagram to view waste pickup - General user [7].

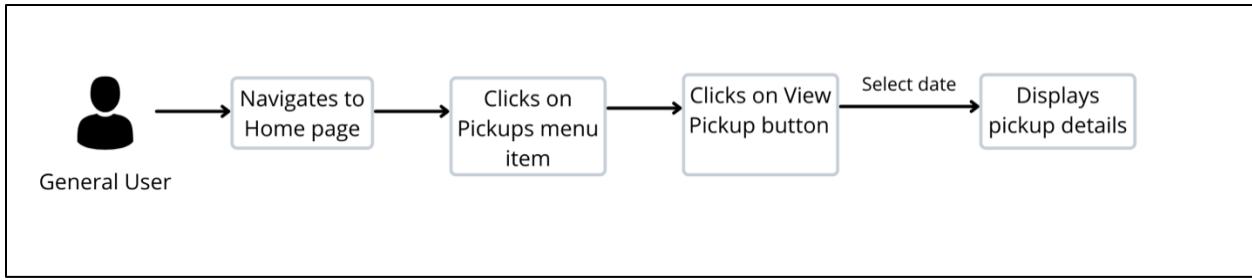


Figure 84: Clickstream - View pickup - General user [7].

5.2.3 Edit a scheduled waste pickup

Scenario: A user collected more recyclable waste and just added a couple of more bags and wants to update the scheduled pickup so they can also be get ridden. The user visits the website to edit a scheduled waste pickup for the next day. The user selects the desired pickup and updates the details.

Persona: A general user

Feature: Schedule waste pickup

Need: Add some more waste to an already scheduled pickup.

Context: The user is logged in to the system and has already booked a time slot for picking up the recyclable waste.

Use Case: Edit a scheduled waste pickup

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Edit Pickup” option.
6. The **System** displays date selection with the next day date already selected and scheduled pickups for the current date.
7. The **User** selects a pickup to be updated.
8. The **User** updates the information such as date, time slot, waste type, the waste amount, number of bags/boxes, and address and hits the enter key.
9. The **User** clicks on the “Update” button.
10. The **System** checks for the validity of the details.
 - 10.1. The **System** displays an error message for incorrect fields.
 - 10.1.1. The **System** prompts the user to enter the correct details.
 - 10.1.2. The **User** updates the incorrect details and hits the enter key.
 - 10.2. The **System** displays an error message for missing fields.
 - 10.2.1. The **System** prompts the user to enter the missing details.
 - 10.2.2. The **User** enters the missing details and hits the enter key.
11. The **System** displays a “Successfully updated” message.

Figure 85 and Figure 86 describe the task flow and clickstream diagrams, respectively.

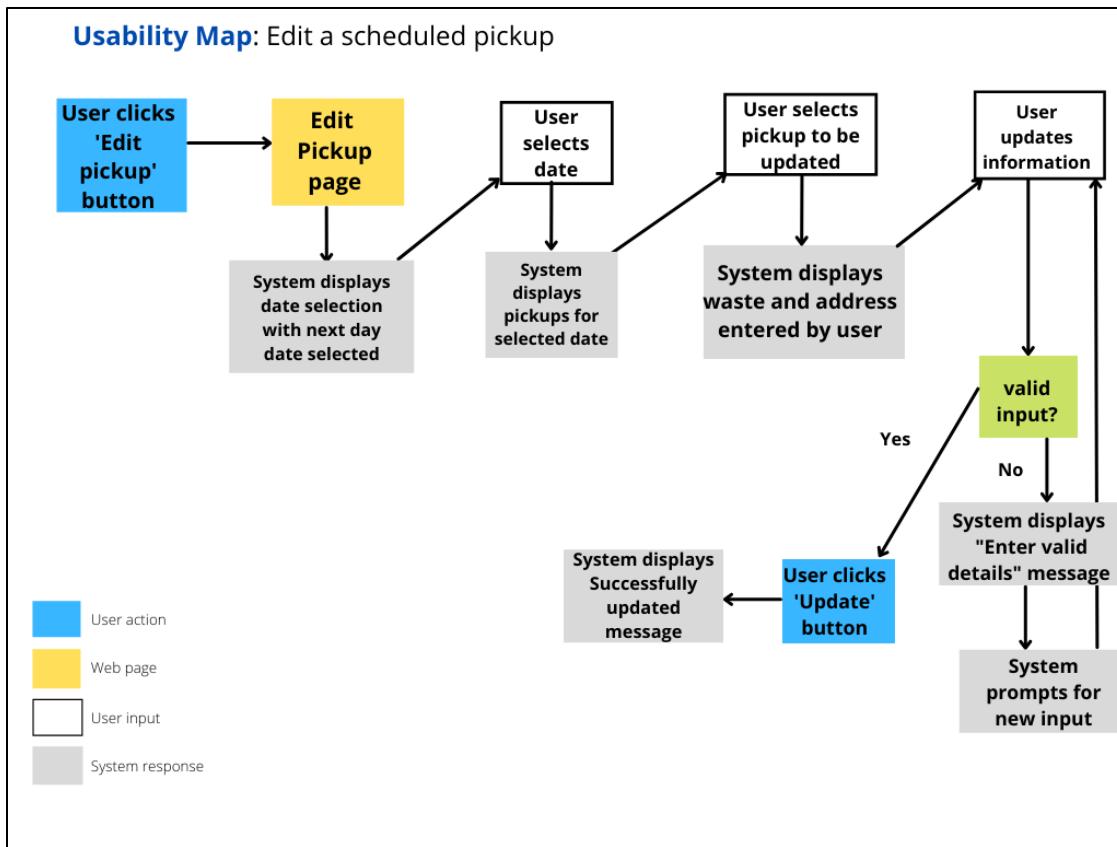


Figure 85: Task flow diagram to edit scheduled pickup - General user [7].

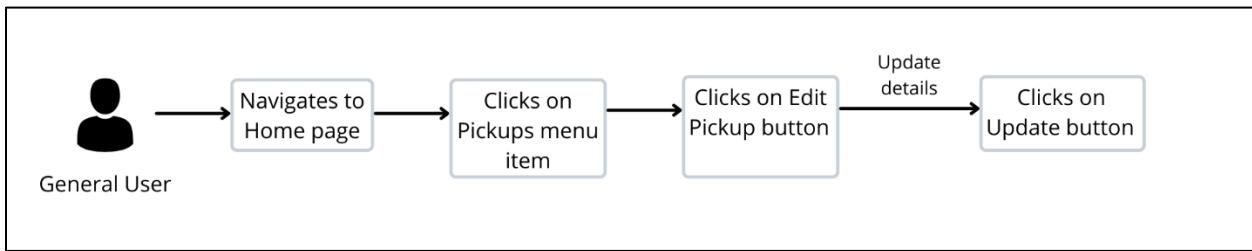


Figure 86: Edit pickup - General user [7].

5.2.4 Cancel a waste pickup

Scenario: A user mistakenly scheduled a pickup and later realized that the pickup is not required anymore. The user visits the website and then cancels a particular pickup scheduled by mistake.

Persona: A general user

Feature: Schedule waste pickup

Need: Cancel a scheduled waste pickup.

Context: The user is logged in to the system and has already booked a time slot for picking up the recyclable waste.

Use Case: Cancel a waste pickup

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Cancel Pickup” option.
6. The **System** shows date selection with the next day date already selected and scheduled pickups by the user.
7. The **User** selects a pickup to be canceled.
8. The **System** shows details of the selected pickup.
9. The **User** clicks the “Cancel” button.
10. The **System** displays “Are you sure you want to delete?”
 - 10.1. The **User** selects the “Yes” option.
 - 10.1.1. The **System** displays a “Successfully canceled” message.
 - 10.2. The **User** selects the “No” option.
 - 10.2.1. The **System** again displays scheduled pickups for the selected date for the user to choose.

Figure 87 and Figure 88 describe the task flow and clickstream diagrams, respectively.

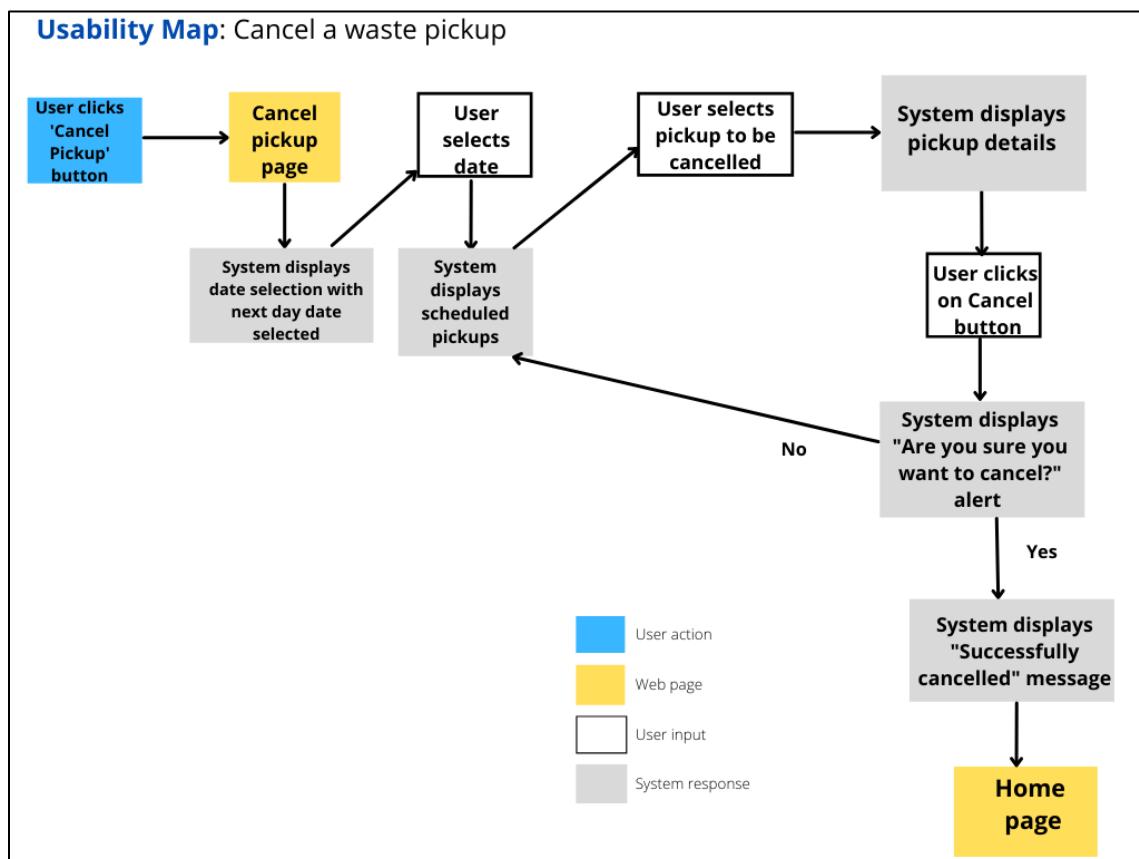


Figure 87: Task flow diagram to cancel waste pickup - General user [7].

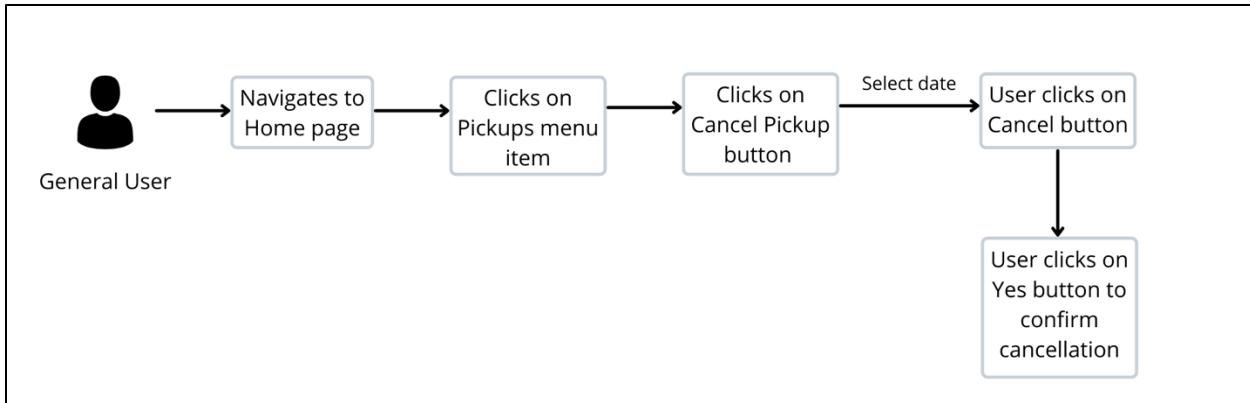


Figure 88: Clickstream - Cancel pickup - General user [7].

5.2.5 Create a Schedule for waste pickup

Scenario: A vendor wants to create a schedule for next week. They want to make one slot for the Spring Garden area every day over the next week so that users can book an opening for their waste to be picked up. The vendor logs in to the website and creates a schedule for the next week.

Persona: A vendor

Feature: Schedule waste pickup

Need: Create a schedule to make pickup slots visible to the general user.

Context: The user (vendor) is logged in to the system.

Use Case: Create a waste pickup schedule

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the Vendor Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Create Schedule” option.
6. The **System** shows date selection with the next day’s date already selected.
7. The **User** selects next week’s range of dates.
8. The **System** displays a clock for time selection and a dropdown box for area selection.
9. The **User** selects a time slot and an area Spring Garden and clicks the confirm button.
10. The **User** clicks on the “Schedule” button.
11. The **System** checks for a valid schedule (at least one slot is mandatory).
 - 11.1. The **System** displays an error message for no slots.
 - 11.1.1. The **System** prompts the user to create at least one slot.
 - 11.1.2. The **User** updates the schedule.
12. The **System** displays a “Schedule created successfully” message and the scheduled details.

Figure 89 and Figure 90 describe the task flow and clickstream diagrams, respectively.

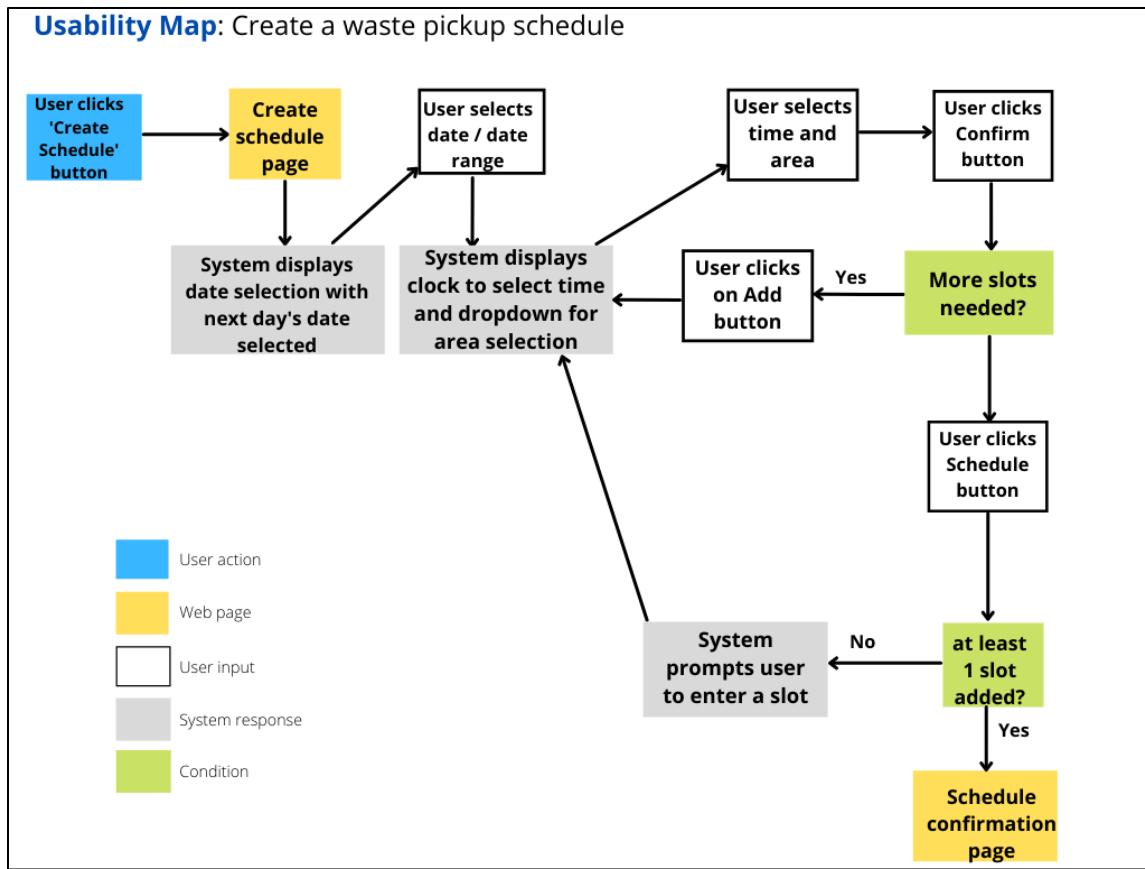


Figure 89: Task flow diagram to create a waste pickup schedule - Vendor [7].

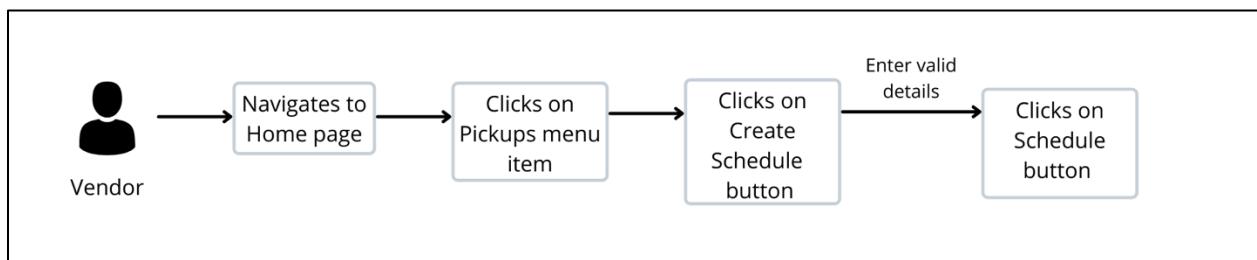


Figure 90: Clickstream - Create a schedule – Vendor [7].

5.2.6 View a Schedule for waste pickup

Scenario: A vendor created a schedule and wants to view that schedule for confirmation of the time slots. The vendor logs in to the website and considers the plan designed for the next week.

Persona: A vendor

Feature: Schedule waste pickup

Need: View a schedule for next week to confirm the time slots.

Context: The user (vendor) is logged in to the system and has already created a schedule.
Use Case: View a waste pickup schedule

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the Vendor Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “View Schedule” option.
6. The **System** shows date selection with the next day date already selected.
7. The **User** selects next week’s range of dates.
8. The **System** displays details of the schedule for selected dates.

Figure 91 and Figure 92 describe the task flow and clickstream diagrams, respectively.

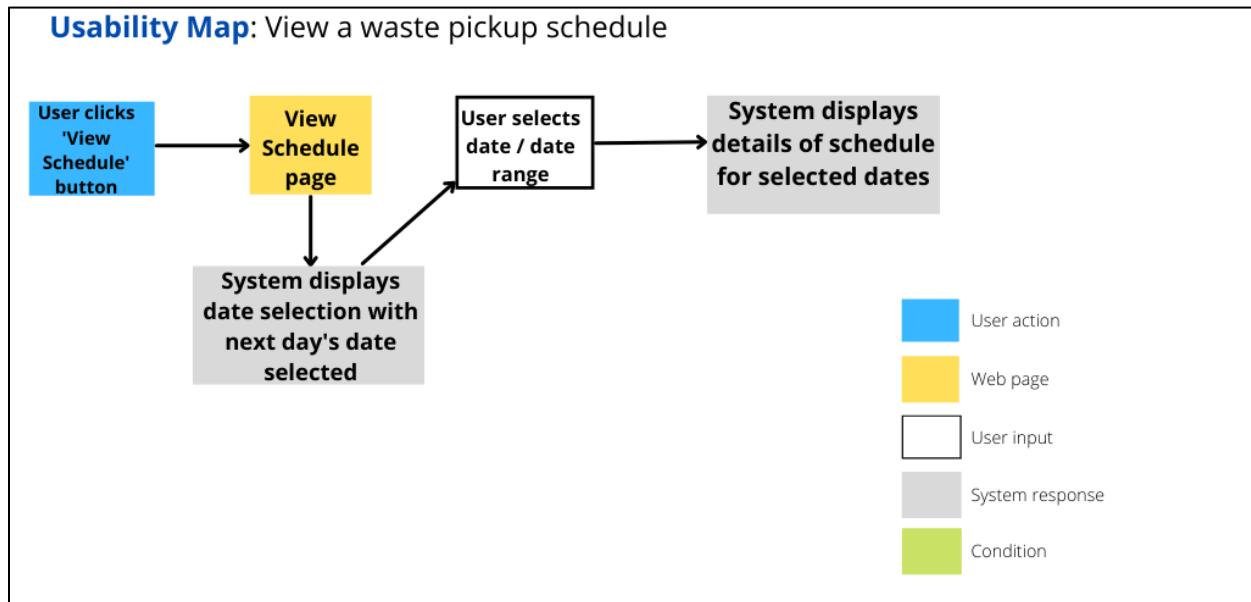


Figure 91: Task flow diagram to view waste pickup schedule - Vendor [7].

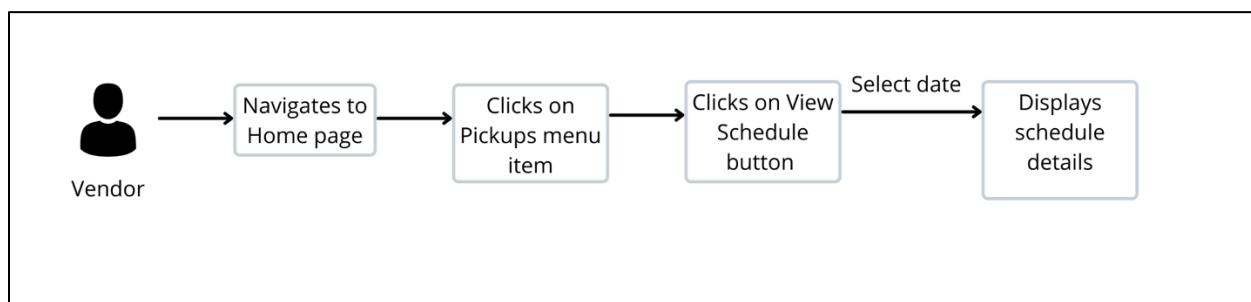


Figure 92: Clickstream - View schedules – Vendor [7].

5.2.7 Edit a schedule for waste pickup

1. Edit a time slot for the waste pickup schedule

Scenario 1: A vendor created a schedule for next week. They want to update the Spring Garden area's time slot for next week's program. The vendor logs in to the website and edits the schedule for the next week.

Persona: A vendor

Feature: Schedule waste pickup

Need: Edit a schedule to make changes to pick-up slots.

Context: The user (vendor) is logged in to the system and has already created a schedule.

Use Case 1: Edit a time slot for the waste pickup schedule

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the Vendor Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Edit Schedule” option.
6. The **System** shows date selection with the next day date already selected.
7. The **User** selects next week's range of dates.
8. The **System** displays time slots and details of the schedule.
9. The **User** clicks the edit button for the slot with Spring Garden.
10. The **System** displays a clock for time selection and a dropdown box for area selection.
11. The **User** selects and updates the time slot and clicks the confirm button.
12. The **User** clicks on the “Update” button.
13. The **System** checks for a valid schedule (at least one slot is mandatory).
 - 13.1. The **System** displays an error message for no slots.
 - 13.1.1. The **System** prompts the user to create at least one slot.
 - 13.1.2. The **User** updates the schedule.
 14. The **System** displays a “Schedule updated successfully” message and the schedule details.

Figure 93 and Figure 94 describe the task flow and clickstream diagrams, respectively.

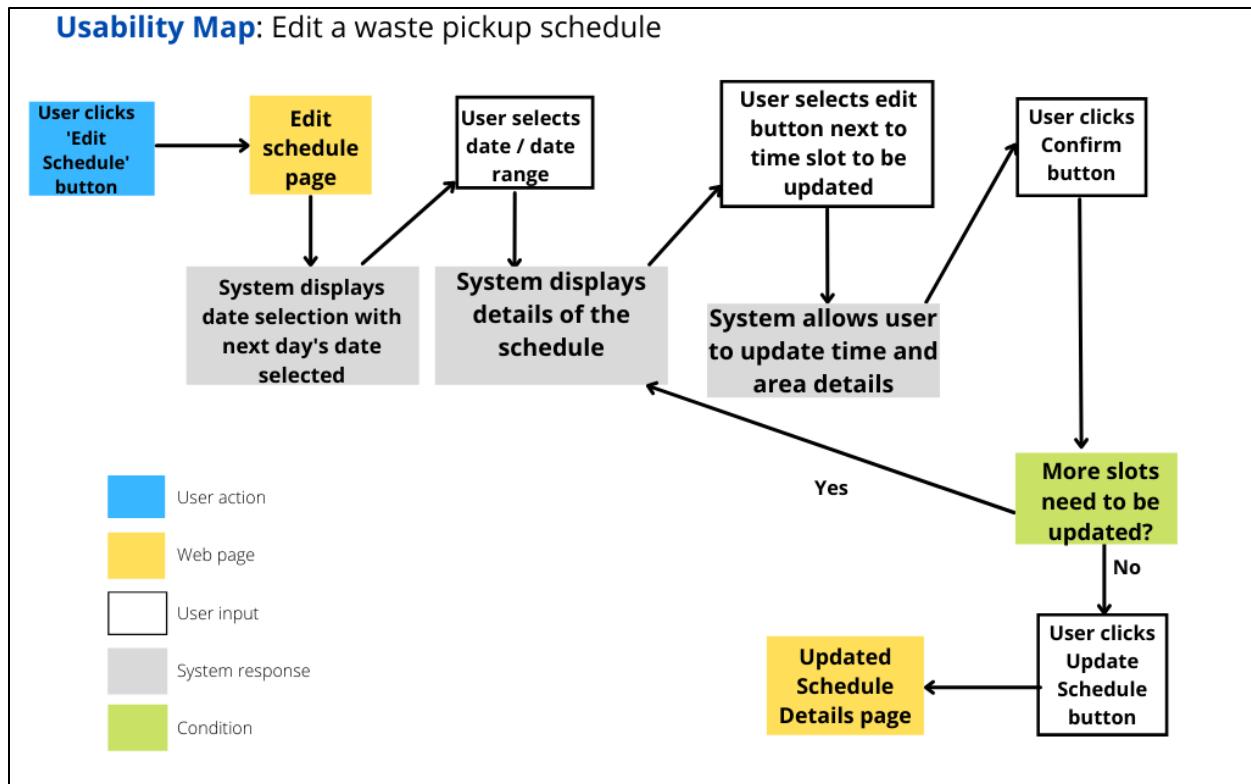


Figure 93: Task flow diagram to edit waste pickup schedule - Vendor [7].

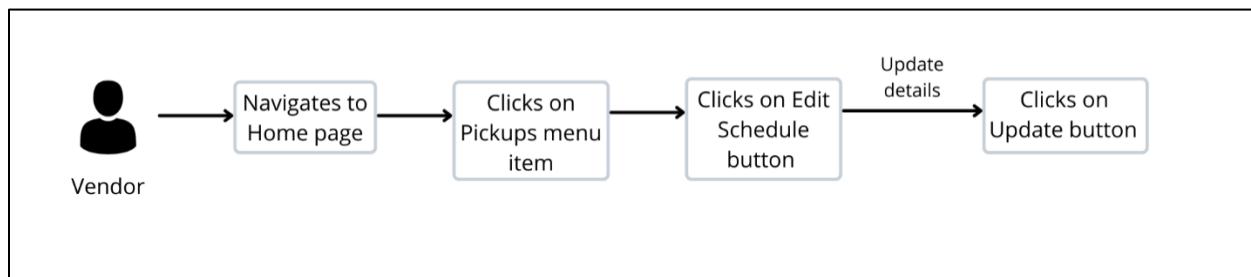


Figure 94: Clickstream - Edit schedule – Vendor [7].

2. Delete a time slot for the waste pickup schedule

Scenario 2: A vendor created a schedule for next week. They want to delete the Spring Garden area's time slot for next week's program. The vendor logs in to the website and deletes the time slot from the following week's schedule.

Persona: A vendor

Feature: Schedule waste pickup

Need: Delete a time slot from the scheduled pickup.

Context: The user (vendor) is logged in to the system and has already created a schedule.

Use Case 2: Delete a time slot for the waste pickup schedule

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.

3. The **System** displays the Vendor Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Edit Schedule” option.
6. The **System** shows date selection with the next day date already selected.
7. The **User** selects next week’s range of dates.
8. The **System** displays time slots and details of the schedule.
9. The **User** clicks the delete button for the slot with Spring Garden.
10. The **System** displays “Are you sure you want to delete?”
 - 10.1. The **User** selects the “Yes” option.
 - 10.1.1. The **System** displays a “Successfully deleted” message.
 - 10.2. The **User** selects the “No” option.
 - 10.2.1. The **System** again displays the time slots and details of the schedule.
11. The **User** clicks on the “Update” button.
12. The **System** validates the schedule.
 - 12.1. The **System** deletes the entire schedule if no slots are present.
 - 12.2. The **System** displays a “Schedule updated successfully” message and the schedule details if at least one slot is present.

Figure 95 and Figure 96 describe the task flow and clickstream diagrams, respectively.

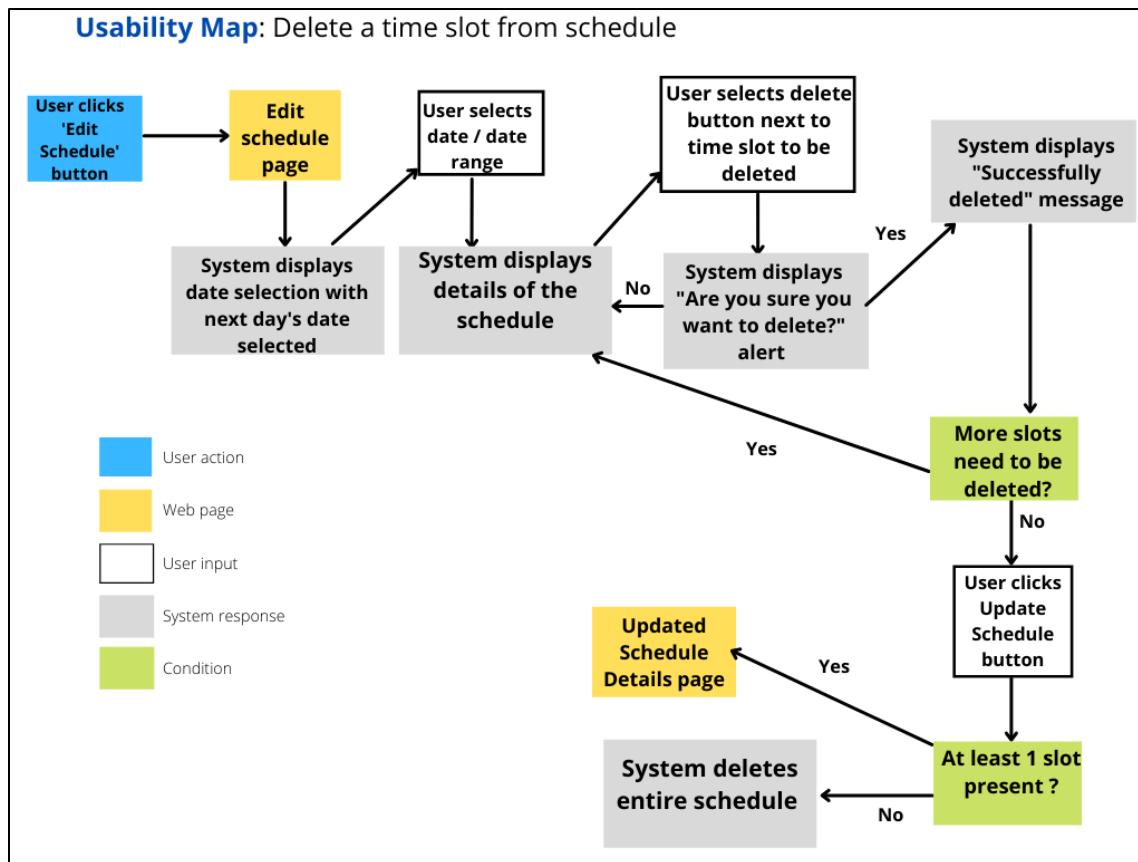


Figure 95: Task flow diagram to delete a time slot from the schedule - Vendor [7].

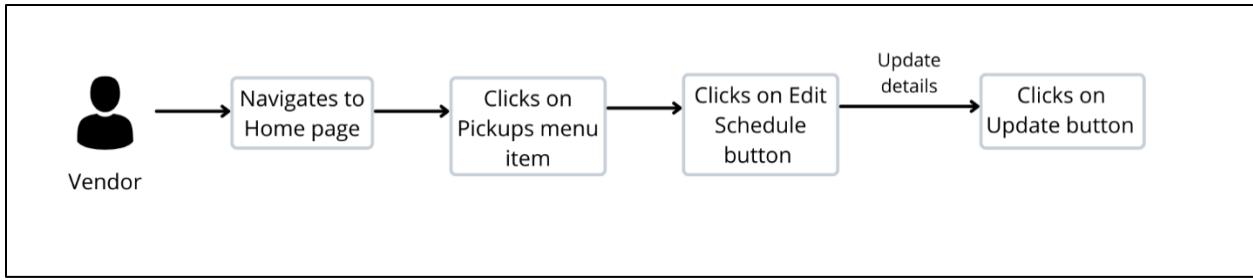


Figure 96: Clickstream – Delete a time slot from the schedule – Vendor [7].

5.2.8 Delete a Schedule for waste pickup

Scenario: A vendor creates a schedule and then realizes that next week is Christmas week and there will be no workers available. So, the vendor decides to delete the whole program. The vendor logs in to the website and deletes the plan for the following week.

Persona: A vendor

Feature: Schedule waste pickup

Need: Delete a schedule for next week.

Context: The user (vendor) is logged in to the system and has already created a schedule.

Use Case: Delete a waste pickup schedule

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the Vendor Dashboard page.
4. The **User** selects the “Pickups” option from the navigation menu.
5. The **User** selects the “Delete Schedule” option.
6. The **System** shows date selection with the next day date already selected.
7. The **User** selects next week’s range of dates.
8. The **System** displays details of the schedule for selected dates.
9. The **User** clicks the “Delete” button.
10. The **System** displays, “Are you sure you want to delete?”
 - 10.1. The **User** selects the “Yes” option.
 - 10.1.1. The **System** displays a “Successfully deleted” message.
 - 10.2. The **User** selects the “No” option.
 - 10.2.1. The **System** again displays details of the schedule for selected dates.
11. The **System** displays a “Successfully Deleted” message.

Figure 97 and Figure 98 describe the task flow and clickstream diagrams, respectively.

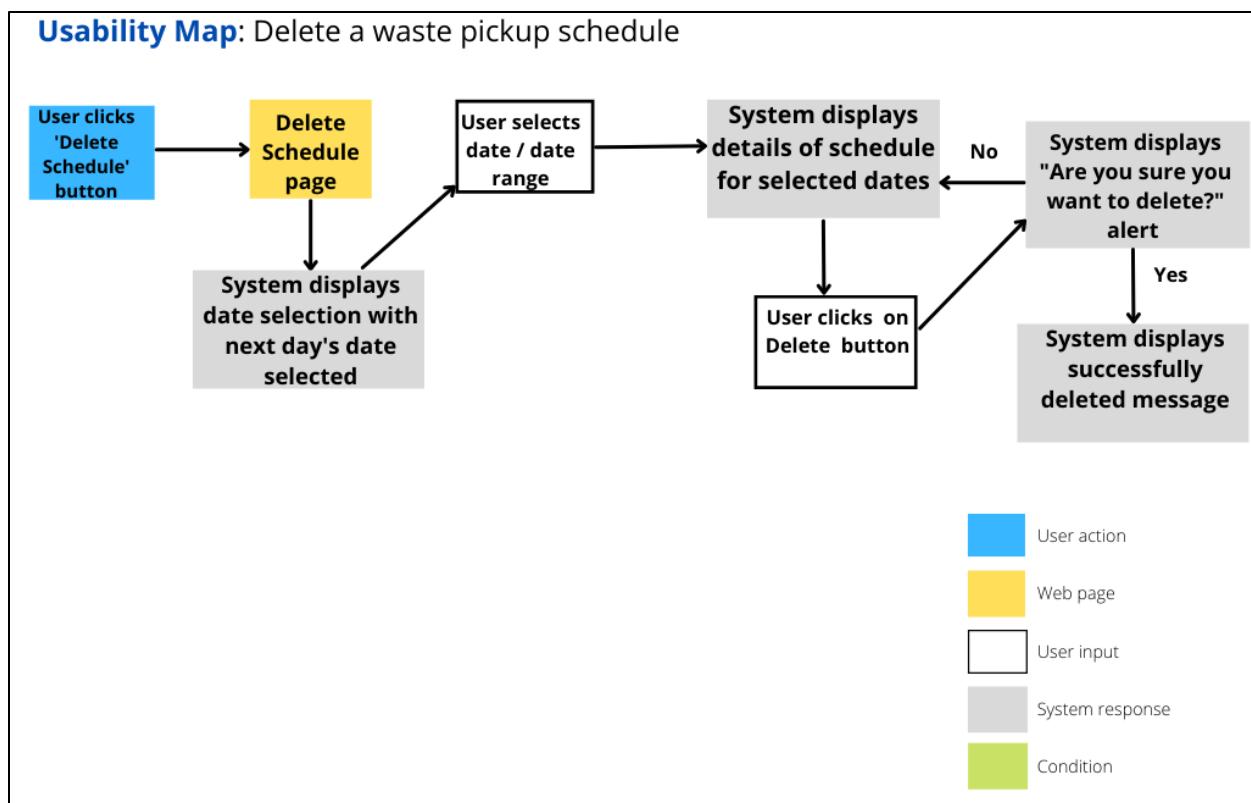


Figure 97: Task flow diagram to delete waste pickup schedule - Vendor [7].

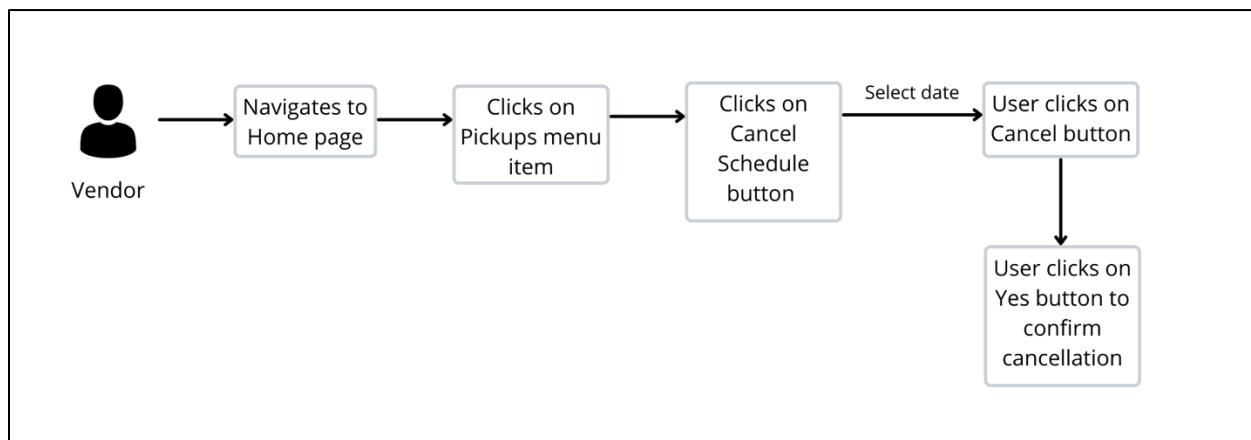


Figure 98: Clickstream - Delete schedule – Vendor [7].

5.3 Feature: Pickup Tracking

5.3.1 Update Pickup Status

Scenario: The Envi Warrior is an organization that provides recyclable waste pick-up service to Halifax citizens. The organization wants to provide information on the status of the waste pick-up to the waste depositors. So, the organization opens the website and updates the position of the waste pick-up.

Use case: Update waste pick-up status

1. The organization visits the website dashboard page.
2. The organization clicks on the **Update Pick-Up Status** tile.
3. The website displays a list of pickups with the corresponding Update Status button.
4. The organization clicks on the Update Status button for the pickup batch of their choice.
5. The website displays a form to update the status.
6. The organization updates the status by selecting the status message from the dropdown list.
7. The organization submits the form by clicking on the Update button.
8. The website displays a “Status Updated Successfully” message in a dialog.

Figure 99 and Figure 100 describe the task flow and clickstream diagrams, respectively.

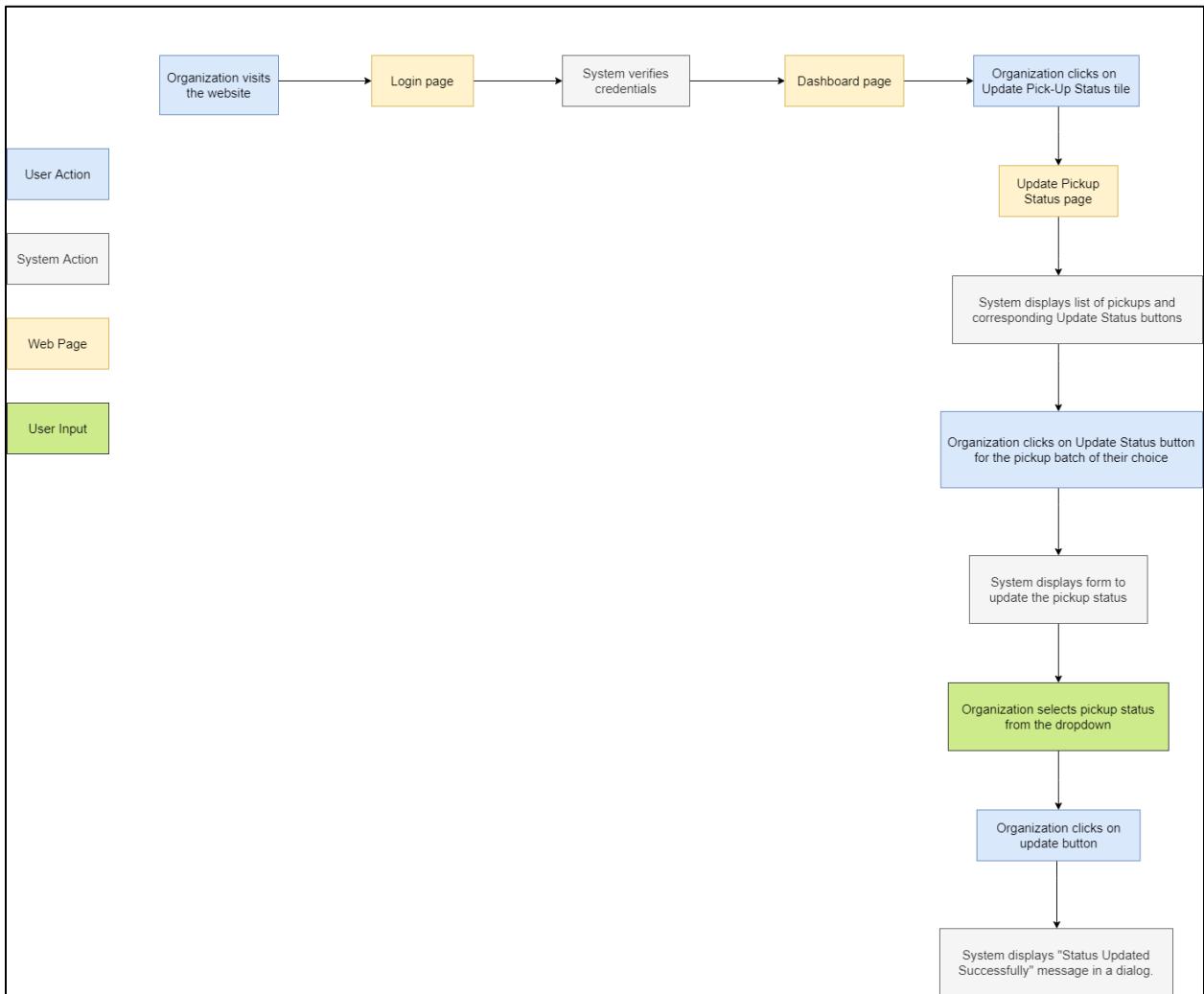


Figure 99: Task Flow diagram for updating pickup status [5].

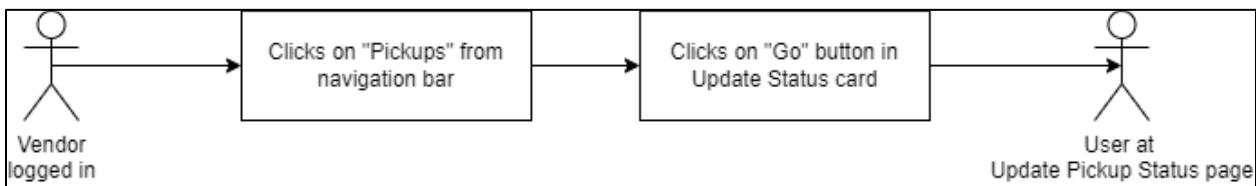


Figure 100: Click Stream for Update Pickup Status – Vendor [5].

5.3.2 Track Pickup

Scenario: The user has submitted the waste for recycling by scheduling the pickup, and he wants to track the status of the waste pickup. So, the user visits the website and tracks the position of the waste pickup.

Use Case: View Pickup Status

1. The user visits the website dashboard page.
2. The user clicks on the Track Pick-Up Status tile.
3. The website displays a list of pickups of that user with the corresponding Track button.
4. The user clicks on the Track button for the pickup batch of their choice.
5. The website displays the pickup status for the pickup batch in the form of stages.

Figure 101 and Figure 102 describe the task flow and clickstream diagrams, respectively.

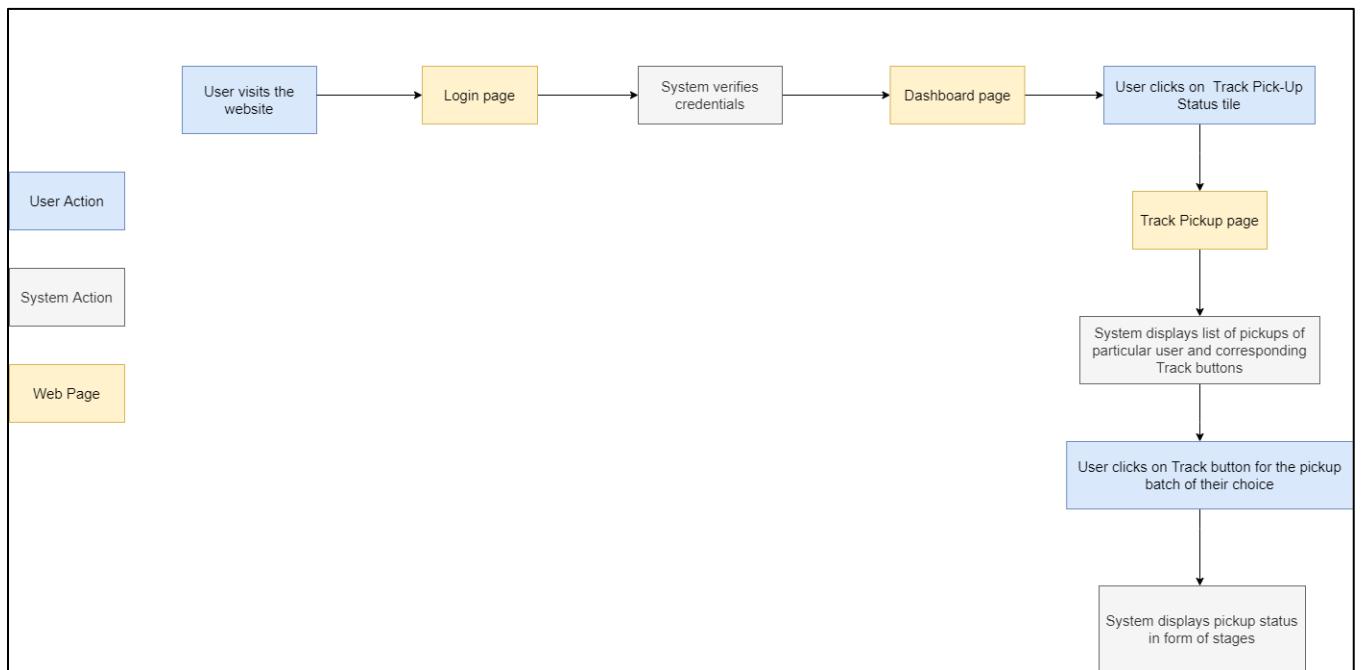


Figure 101: Task Flow diagram for track pickup [5].

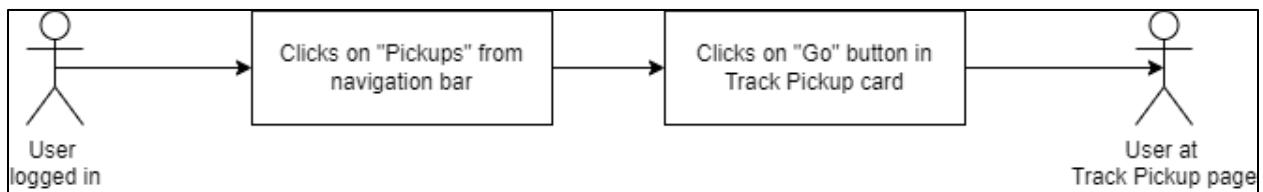


Figure 102: Click Stream for Track Pickup – User [5].

5.4 Feature: Frequently asked questions

5.4.1 View FAQ

Scenario: A user has some general queries and wants to check the FAQs. The website displays all the questions. The user can select the desired question to view the answer.

Persona: User

Feature: Frequently Asked Questions

Need: To view the answer to a general query

Context: Users can view the FAQs without a login

Use Case: To view the FAQs

1. The **user** opens a browser and opens the website
2. The **user** clicks on the FAQ on the navbar
3. The **system** displays the FAQ page containing all the questions in the form of closed accordions
4. The **user** clicks on the desired question
5. The **system** expands the respective accordion revealing the answer
6. The **user** reads the answer

Figure 103 and Figure 104 describe the task flow and clickstream diagrams, respectively.

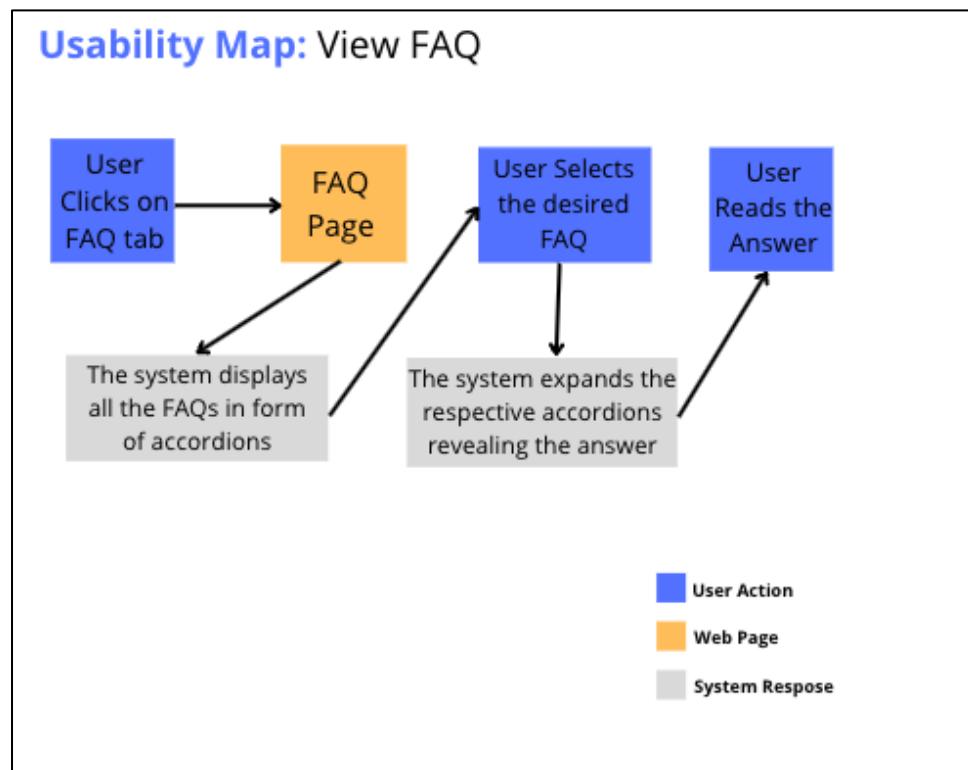


Figure 103: Task Flow diagram of View FAQ [7].

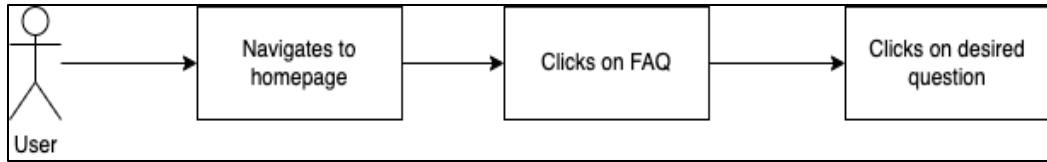


Figure 104 Click Stream of View FAQ [5].

5.4.2 Add FAQ

Scenario: The admin wants to add a FAQ. The website displays an adding form in a modal. The admin fills in the details and submits the form.

Persona: Admin

Feature: Frequently Asked Questions

Need: To add an FAQ to the existing FAQs

Context: Only the admin, after login, can directly add the FAQs

Use Case: To add the FAQs

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default
3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage in admin mode
5. The **user** clicks on the FAQ on the navbar
6. The **system** displays the FAQ page containing all the questions in the form of closed accordions with an ‘Add FAQ’ button at the bottom
7. The **user** clicks on the ‘Add FAQ’ button
8. The **system** opens a modal with a form
9. The **user** enters the details and clicks on the ‘Add’ button
10. The **system** checks for validity on the form
 - 10.1. The **system** displays error messages for every invalid validation
 - 10.2. The **system** submits the form with a success message, and the new FAQ is reflected in the FAQ list

Figure 105 and Figure 106 describe the task flow and clickstream diagrams, respectively.

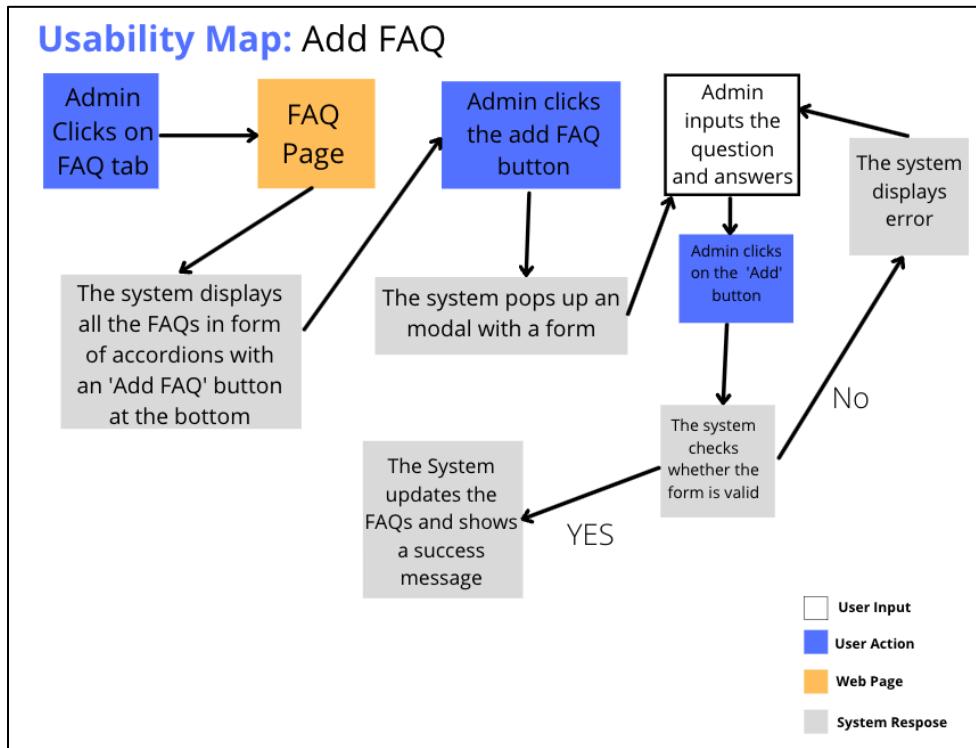


Figure 105: Task Flow diagram of Add FAQ [7].

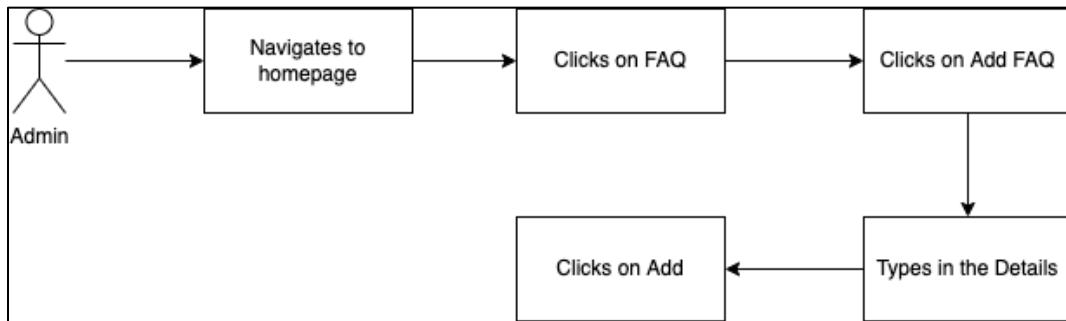


Figure 106 Click Stream of Add FAQ [5].

5.4.3 Update FAQ request

Scenario: A vendor wants to update a FAQ. The website displays a form in a modal for updating. The vendor fills in the details and submits the request.

Persona: Vendor

Feature: Frequently Asked Questions

Need: To request the update of an existing FAQ

Context: The vendors, after login, can request the update of an FAQ to the admin

Use Case: To submit the update request of the FAQs

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default
3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage in vendor mode
5. The **user** clicks on the FAQ on the navbar
6. The **system** displays the FAQ page containing all the questions in the form of closed accordions with an edit icon on each accordion
7. The **user** clicks on the edit icon of the desired FAQ
8. The **system** opens a modal with a form that is prefilled with the existing FAQ
9. The **user** alters the details and clicks on the ‘Request Update’ button
10. The **system** checks for validity on the form
 - 10.1. The **system** displays error messages for every invalid validation
 - 10.2. The **system** submits the form with a success message, and the request is forwarded to the admin

Figure 107 and Figure 108 describe the task flow and clickstream diagrams, respectively.

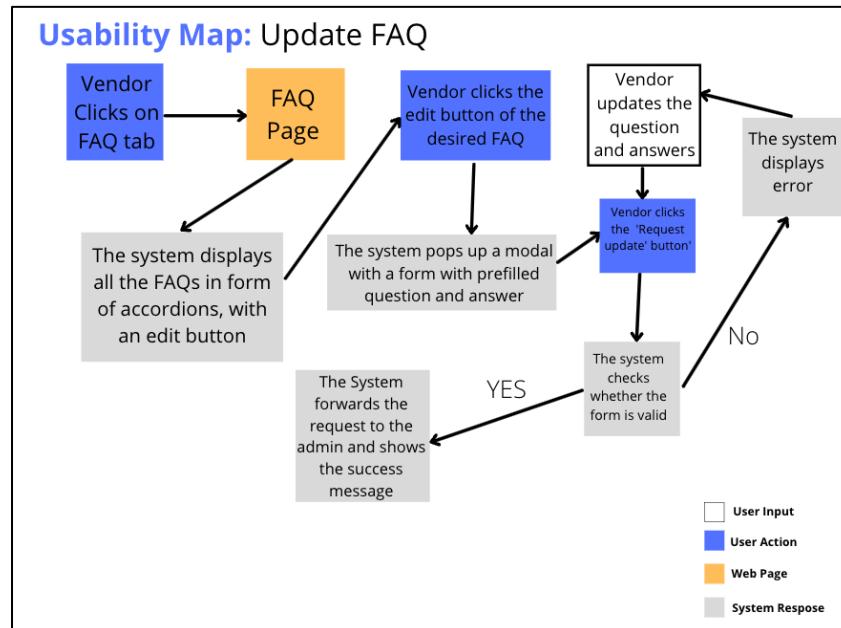


Figure 107: Task Flow diagram of Update FAQ [7].

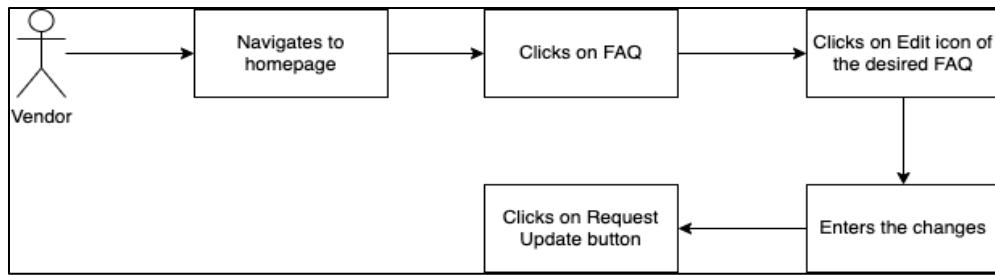


Figure 108 Click Stream of Update FAQ [5].

5.4.4 Processing FAQ request

Scenario: Admin wants to process the FAQ requests. The website displays the requested changes by the vendors. The admin approves/denies the same. In case of approval, the FAQs are updated.

Persona: Admin

Feature: Frequently Asked Questions

Need: To process the requests for FAQ updates

Context: Only the admin, after login, can process the FAQ requests

Use Case: To process the update request of the FAQs

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default
3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage in admin mode
5. The **user** clicks on the FAQ on the navbar
6. The **system** displays the FAQ page
7. The **user** clicks on the view requests button
8. The **system** opens a modal with all the requests
9. The **user** clicks on the desired request
10. The **system** shows both the original and updated data of the FAQ
11. The **user** checks the changes and acts
 - 11.1. The **user** clicks on the ‘Deny’ button in case he does not want the changes
 - 11.2. The **user** clicks on the ‘Update’ button in case he wants the changes
 - 11.2.1. The **system** updates the FAQs with the latest changes

Figure 109 and Figure 110 describe the task flow and clickstream diagrams, respectively.

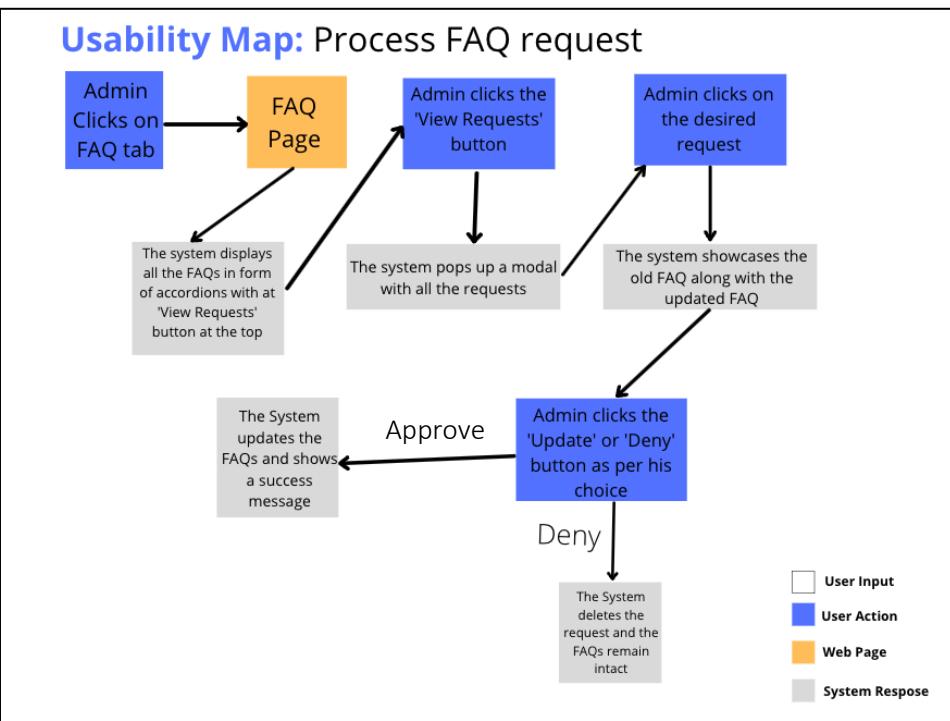


Figure 109: Task Flow diagram of Process FAQ request [7].

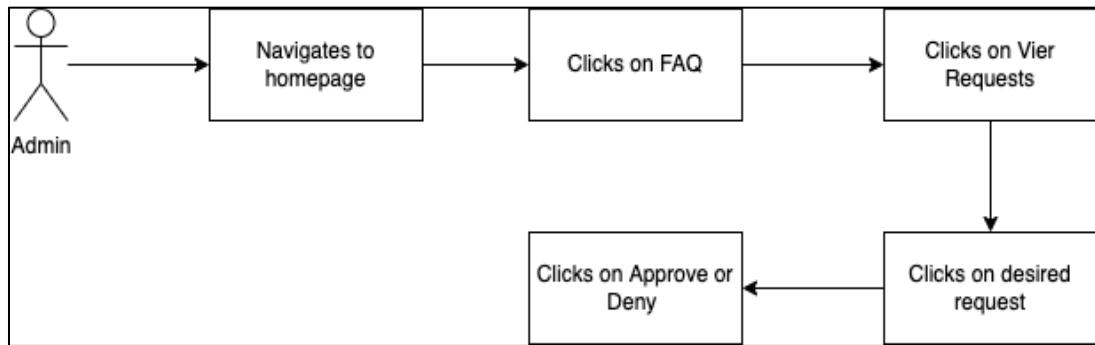


Figure 110 Click Stream of Process FAQ request [5].

5.5 Feature: Contact Us

5.5.1 Users can view the contact information of the vendors

Scenario: The user wants to know the Walmart vendor's contact details, doing garbage collection for Skip the Bins website.

Persona: User

Use Case: User searching for vendor contact information

1. The User opens the browser and logs in to our website as a user.
2. The System displays the home page.
3. The User clicks "Contact Us" on the home page.
4. The System displays the contact us page with all vendor details.

Figure 111 and Figure 112 describe the task flow and clickstream diagrams, respectively.

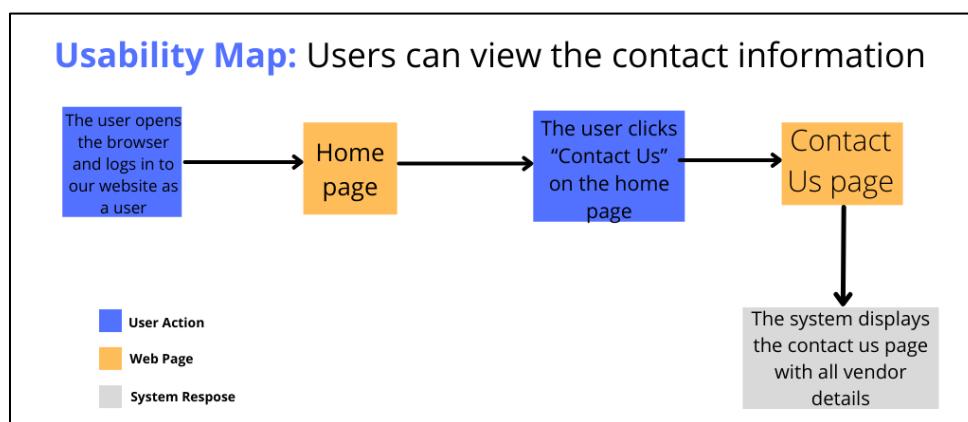


Figure 111: Task flow diagram to view contact information [7].

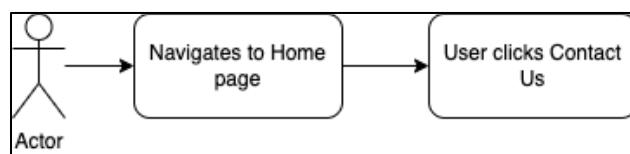


Figure 112: Clickstream for Contact us vendor details page [5].

5.5.2 Users can send their queries by filling out the query form on Skip the bins

Scenario: The user wants to raise a query about the process for new user registration on the portal. Resident enters their name, email, mobile number, and question, then submit the query on Skip the Bins.

Persona: User

Use Case: User raising a query

1. The User opens the browser and logs in to our website as a user.
2. The System displays the home page.
3. The User clicks “Contact Us” on the home page.
4. The System displays the contact us page.
5. The User enters their name, email, mobile number, and query in text boxes and hits submit button.
6. The User filled details are validated.
 - 6.1. The system displays “To enter all required details.”
 - 6.1.1. The User enters all required details.
 - 6.2. The System displays “Enter email in the correct format.”
 - 6.2.1. The User enters the email in the correct format.
 - 6.3. The System displays “Enter mobile no. in the correct format.”
 - 6.3.1. The User enters the mobile number in the correct format.
7. The System submits the query and displays a success message to the user.

Figure 113 and Figure 114 describe the task flow and clickstream diagrams, respectively.

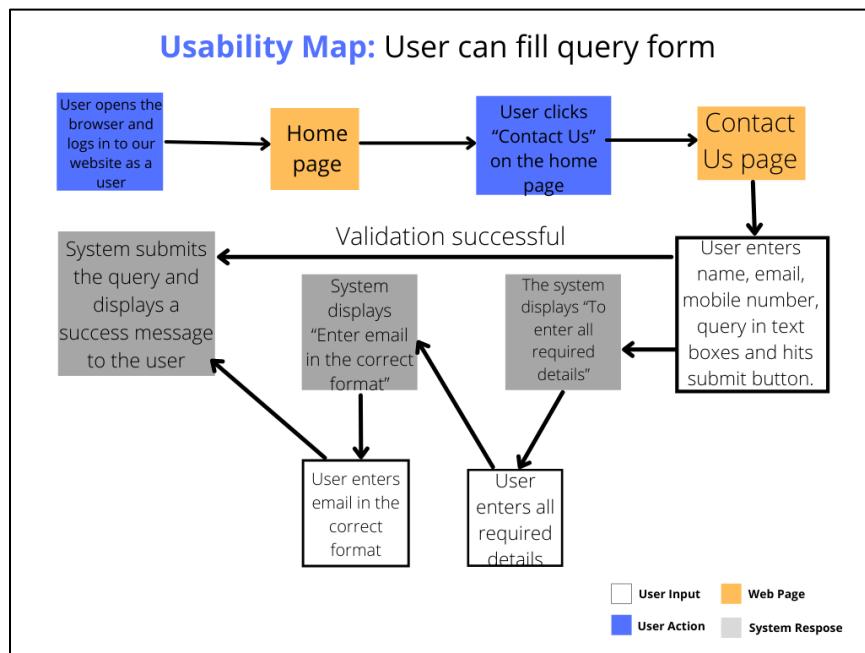


Figure 113: Task flow diagram to fill query form [7].

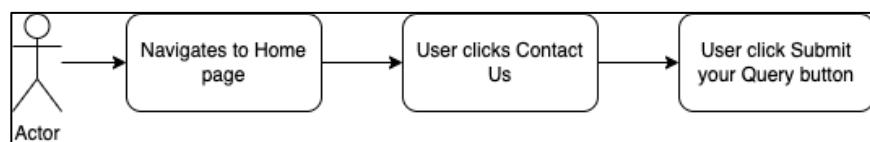


Figure 114: Clickstream for Contact Us Query Submit [5].

5.5.3 The vendor can reply to these queries

Scenario: The vendor can answer the queries that the user has submitted on the Contact Us portal

Persona: Vendor

Use Case: The vendor answering the query

1. The User opens the browser and logs in to our website as a vendor.
2. The System displays the home page.
3. The User clicks the “Contact Us” page.
4. The System displays the contact us page with an admin view.
5. The User selects the query, types the resolution for it, and sends it to the user.
 - 5.1. The System displays “To enter the value in reply text box field.”
 - 5.1.1. The User enters resolution into the text box field.
6. The System displays the success message.

Figure 115 and Figure 116 describe the task flow and clickstream diagrams, respectively.

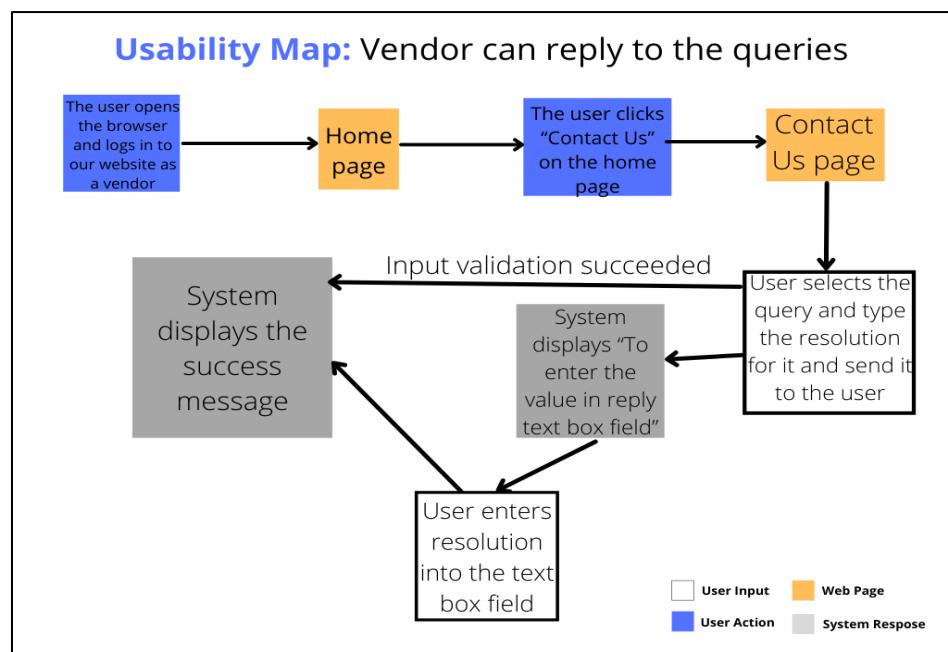


Figure 115: Task flow diagram to reply to the queries [7].

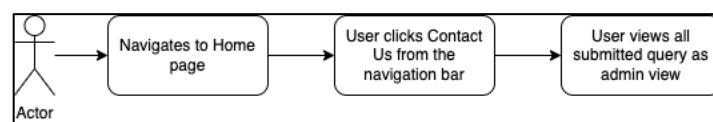


Figure 116: Contact Us view all queries with admin access [5].

5.6 Feature: Announcements

5.6.1 Posting Announcements

Scenario: A user has some announcements to make. The website posts announcements for target audiences and notifies them.

Persona: Admin/Vendor

Feature: Announcements

Need: For posting an announcement

Context: Only Admin and vendors after login can post announcements

Use Case: To post an announcement

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default
3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage in admin/vendor mode
5. The **user** clicks on the Announcements on the navbar
6. The **system** displays the Announcements page
7. The **user** clicks on the ‘Add Announcement’ button
8. The **system** opens a modal with an announcement form
9. The **user** fills in the details
 - 9.1. The **user** clicks on the ‘Cancel’ button in case he does not want to post the announcement
 - 9.1.1. The **system** shows the original announcement page without any updates
 - 9.2. The **user** clicks on the ‘Post’ button in case he wants to post the announcement
 - 9.2.1. The **system** shows the announcement page with the new announcement added

Figure 117 and Figure 118 describe the task flow and clickstream diagrams, respectively.

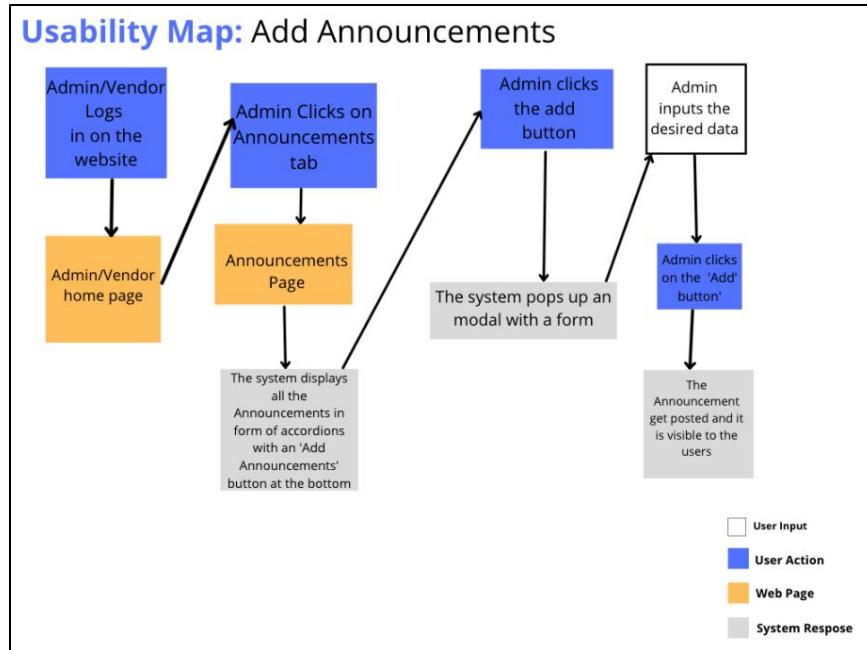


Figure 117: Task Flow diagram of Add Announcements [7].

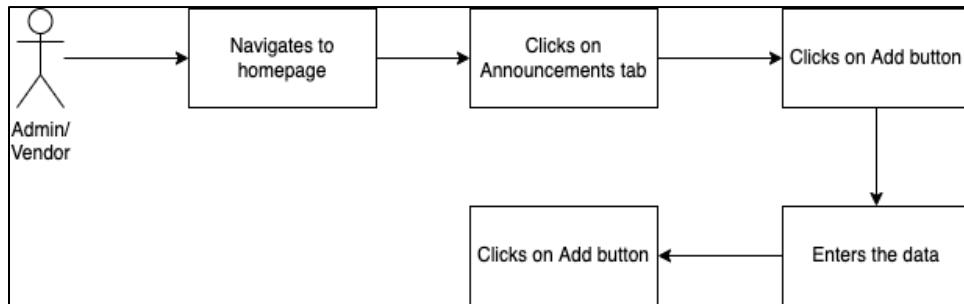


Figure 118 Click Stream of Add Announcements [5].

5.6.2 Retracting Announcements

Scenario: A user had made some announcements, but due to some reason, they want them retracted. The website displays the updates made by the user, where the user can abandon his update.

Persona: Admin/Vendor

Feature: Announcements

Need: For retracting an announcement

Context: Only Admin and vendors after login can retract their announcements

Use Case: To retract an announcement

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default

3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage in admin/vendor mode
5. The **user** clicks on the Announcements on the navbar
6. The **system** displays the Announcements page with all the posted announcements
7. The **user** clicks on the desired announcement
8. The **system** opens in the accordion of that announcement
9. The **user** clicks on the retract button
10. The **system** pops a confirmation modal
 - 10.1. The **user** clicks on the 'No' button in case he does not want to retract the announcement
 - 10.1.1. The **system** shows the original announcement page without any updates
 - 10.2. The **user** clicks on the 'yes' button in case he wants to retract the announcement
 - 10.2.1. The **system** shows the announcement page with the announcement marked as retracted. The announcement would not be visible to users

Figure 119 and Figure 120 describe the task flow and clickstream diagrams, respectively.

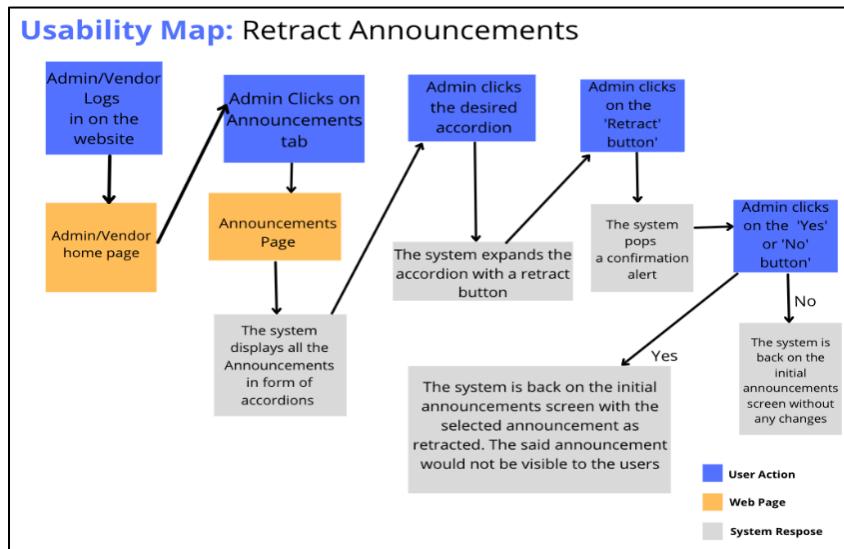


Figure 119: Task Flow diagram of Retract Announcements [7].

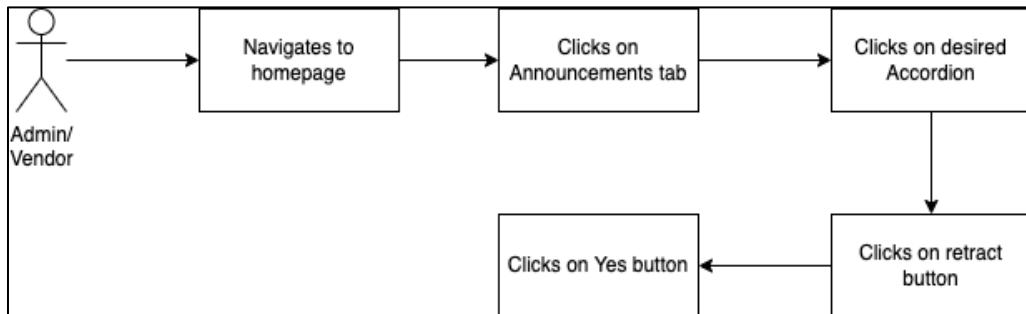


Figure 120 Click Stream of Retract Announcements. [5].

5.6.3 Viewing Announcements

Scenario: A user wants to view the announcements. The website displays the notifications posted by the admin/vendor.

Persona: User

Feature: Announcements

Need: For viewing an announcement

Context: Users, after login, can view the announcements

Use Case: To view an announcement

1. The **user** opens a browser and opens the website
2. The **system** highlights the login page by default
3. The **user** enters his credential and presses the login button
4. After the successful login **system** displays the homepage
5. The **user** clicks on the 'Notifications' icon on the navbar
6. The **system** displays the Announcements page with all the posted announcements
7. The **user** clicks on the desired announcement
8. The **system** opens in the accordion of that announcement
9. The **user** clicks on the retract button
10. The **system** pops a confirmation modal
 - 10.1. The **user** clicks on the 'No' button in case he does not want to retract the announcement
 - 10.1.1. The **system** shows the original announcement page without any updates

Figure 121 and Figure 122 describe the task flow and clickstream diagrams, respectively.

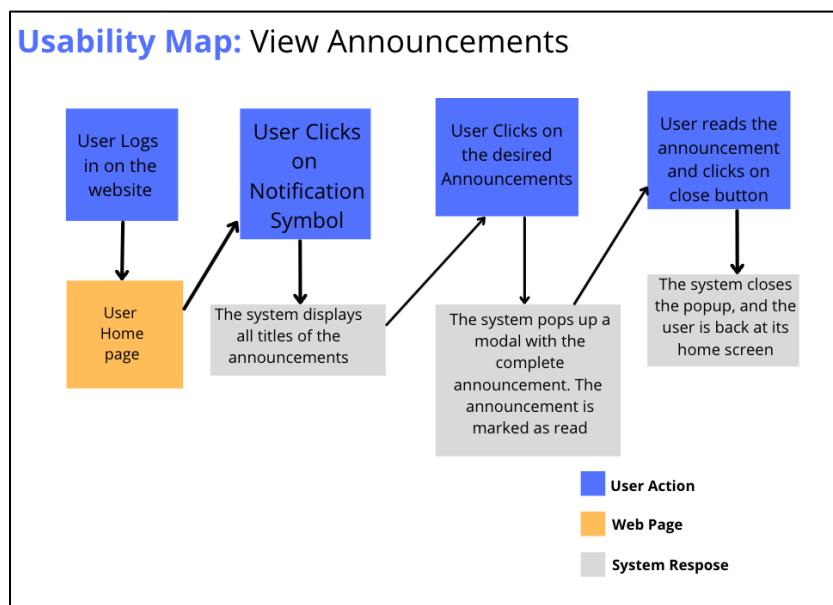


Figure 121: Task Flow diagram of View Announcements [7].

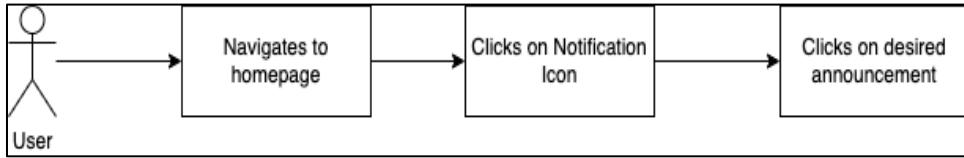


Figure 122 Click Stream of View Announcements [5].

5.7 Feature: Rewards

5.7.1 View Reward Points

1. View Total Reward Points

Scenario 1: A user gives recyclable waste to different vendors for two months. The user was motivated to provide more trash, keeping in mind the rewards the system would provide. After two months, the user wants to check the total reward points earned. The user visits the website and views the total reward points.

Persona: A general user

Feature: Rewards

Need: View total reward points earned till now.

Context: The user is logged in to the system, has submitted waste for two months, and wants to know the total reward points earned.

Use Case 1: View Reward Points

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Rewards” option from the navigation menu.
5. The **System** displays the total reward points earned till now.

2. View Reward Points History

Scenario 2: A user gave recyclable waste to a vendor yesterday. The user was motivated to provide the trash, keeping the system’s rewards in mind. Today, the user wants to see how many reward points were earned for yesterday’s pickup. The user visits the website and views the history of reward points made.

Persona: A general user

Feature: Rewards

Need: View reward points earned for yesterday’s pickup.

Context: The user is logged in to the system, has submitted waste yesterday, and wants to know the reward points earned for that pickup.

Use Case 2: View Reward Points History

1. The **User** opens a browser and opens the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the User Dashboard page.
4. The **User** selects the “Rewards” option from the navigation menu.
5. The **System** displays a reward points history table, which shows reward points earned for yesterday’s reward.

Figure 123 and Figure 124 describe the task flow and clickstream diagrams, respectively.

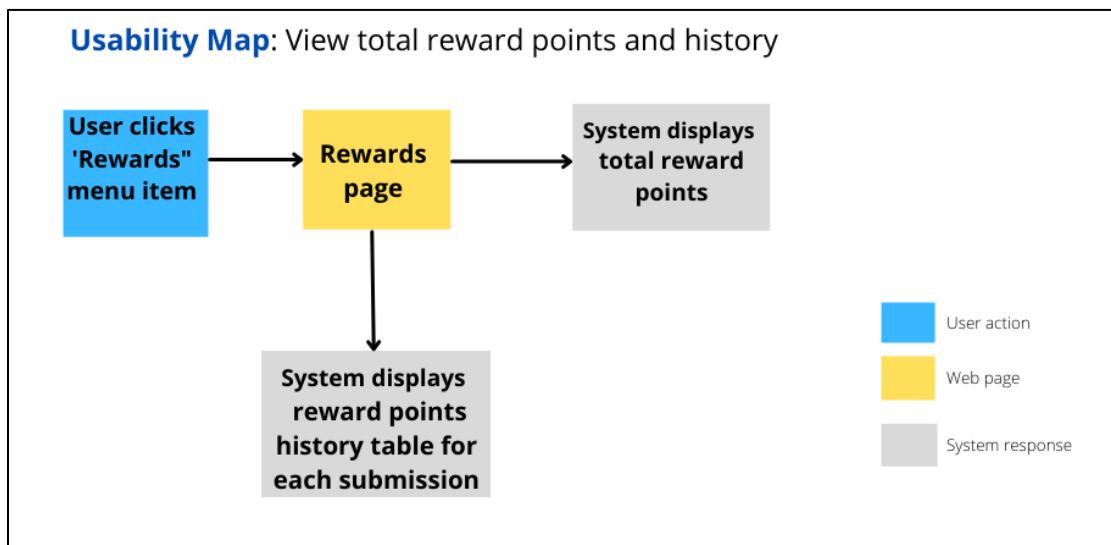


Figure 123: Task flow diagram to view total reward points and history – General user [7].

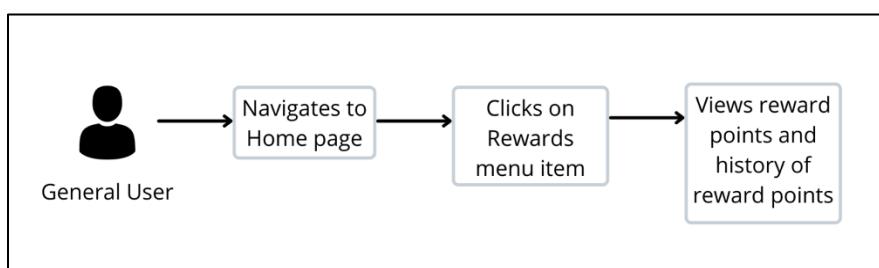


Figure 124: Clickstream - Rewards - General user [7].

5.7.2 Allocate Reward Points

1. Allocate Reward Points for each submission

Scenario 1: An admin wants the system to allocate reward points to the users based on the weight of the waste deposited by the user. The admin visits the website and assigns the

number of reward points per kg that the system will allocate to the user on the successful submission of waste.

Persona: Admin

Feature: Rewards

Need: Allocate reward points to the user.

Context: The admin is logged in to the system and wants the system to allocate the reward points to the user.

Use Case 1: Allocate Reward Points

1. The **User (admin)** opens a browser and the website.
2. The **User** logs in to the system with valid credentials.
3. The **System** displays the Admin Dashboard page.
4. The **User** selects the “Rewards” option from the navigation menu.
5. The **System** displays the “Rewards Point Settings” section.
6. The **System** displays a label “Reward Points per kg,” points value (initially 0), and an “Edit” button to update points.
7. The **User** clicks on the “Edit” button.
8. The **System** displays an input box.
9. The **User** enters the number of points in the input box. The system should allocate 1 kg of waste submission and hit the enter key.
10. The **System** validates the user input.
 - 10.1. The **System** displays an error message for invalid input.
 - 10.1.1. The **System** prompts the user to enter the correct input.
 - 10.1.2. The **User** updates the input.
11. The **System** successfully records the number of reward points allocated to the user on successful waste submission.

Figure 125 and Figure 126 describe the task flow and clickstream diagrams, respectively.

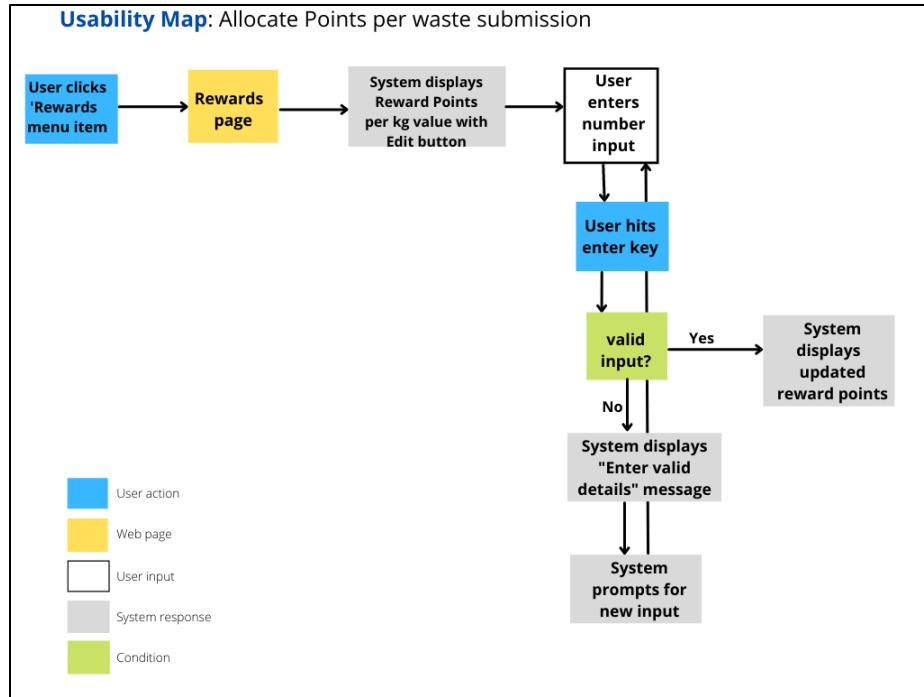


Figure 125: Task flow diagram to allocate points per waste submission - Admin [7].

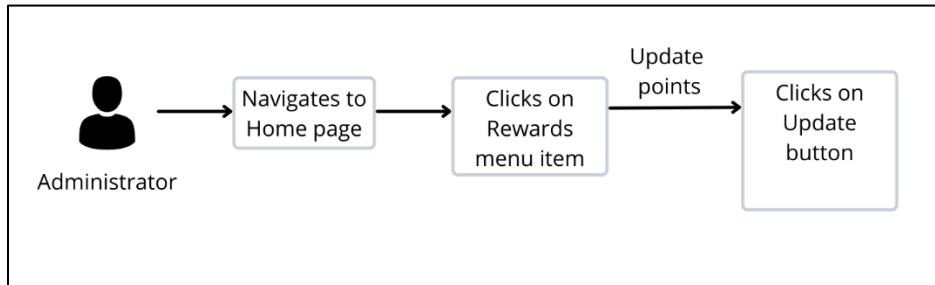


Figure 126: Clickstream - Allocate reward points – Admin [7].

2. Allocate Reward Points for complaints

Scenario 2: A system user registered a complaint about unfair treatment by the pickup person. On successful investigation, the complaint was valid, and the admin decided to compensate the user by giving double reward points to that user. The admin visits the website and allocates double reward points to that user based on the complaint number.

Persona: Admin

Feature: Rewards

Need: Allocate reward points for complaints.

Context: The admin is logged in to the system. One user has submitted a valid complaint. The admin wants to allocate double reward points to that user.

Use Case 2: Allocate Reward Points for complaints

1. The **User (admin)** opens a browser and the website.
2. The **User** logs in to the system with valid credentials.

3. The **System** displays the Admin Dashboard page.
4. The **User** selects the “Rewards” option from the navigation menu.
5. The **System** displays the “Rewards Point Compensation” section.
6. The **System** displays a list of complaints received from the users.
7. The **User** clicks on the complaint, which needs compensation in reward points.
8. The **System** displays complaint details and an input box for reward points allocation.
9. The **User** enters the number of points in the input box and hits the enter key.
10. The **System** validates the user input.
 - 10.1. The **System** displays an error message for invalid input.
 - 10.1.1. The **System** prompts the user to enter the correct input.
 - 10.1.2. The **User** updates the input.
11. The **System** successfully allocates the number of reward points to that user.

Figure 127 and Figure 128 describe the task flow and clickstream diagrams, respectively.

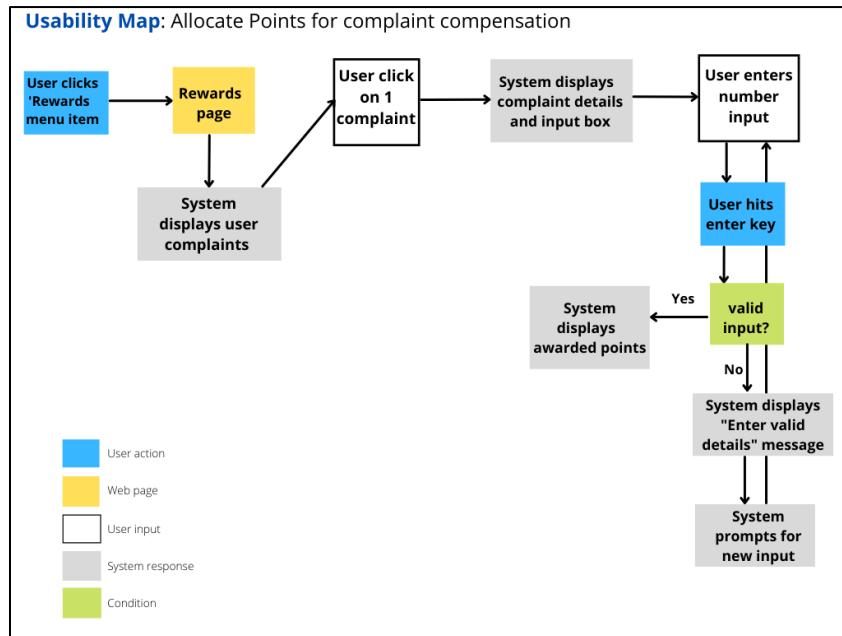


Figure 127: Task flow diagram to allocate points for complaint compensation - Admin [7].

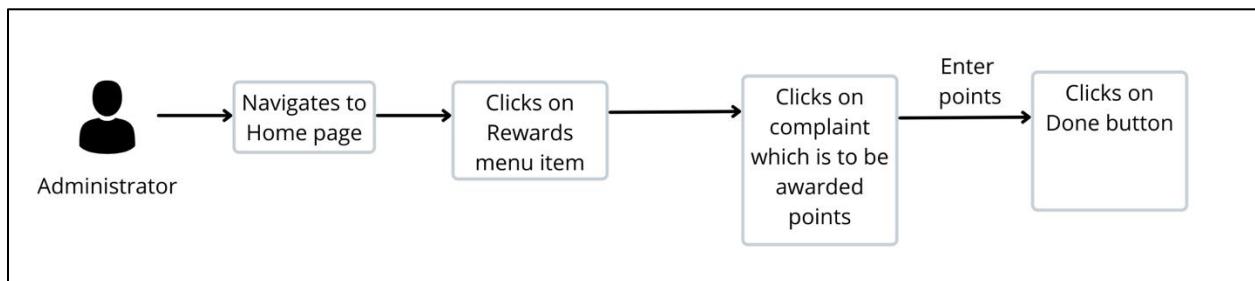


Figure 128: Clickstream - Allocate complaint reward points – Admin [7].

5.8 Feature: Reward Store

5.8.1 The users can view & purchase the vouchers with the reward points

Scenario: The user has regularly given garbage to several vendors for the past five months. He has collected a certain number of points, so we want to use them to redeem a PizzaPizza voucher.

User persona: User

Use Case: User purchasing a voucher from the reward store

1. The User opens the browser and logs in to our website as a user.
2. The System displays the home page.
3. The User selects the “Rewards” option from the navigation menu.
4. The System displays the Reward Store navigation link.
5. The User selects the “Reward Store” option.
6. The System opens the reward store with all voucher listings.
7. The User selects the “PizzaPizza” voucher they want to purchase and clicks on the Purchase button.
8. The System validates whether the reward points available with the user account are sufficient for the value of the voucher.
 - 8.1. The System displays “Not sufficient points available to redeem the voucher.”
 - 8.2. The User selects different vouchers with lesser values.
9. The System displays a success message for vouchers purchased.

Figure 129 and Figure 130 describe the task flow and clickstream diagrams, respectively.

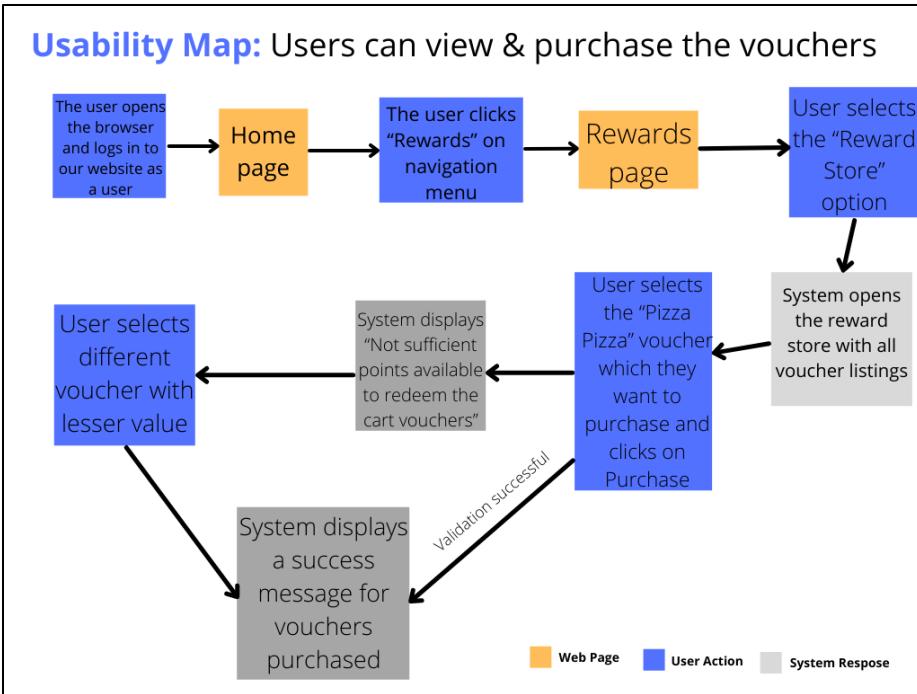


Figure 129: Task flow diagram for users to view and purchase vouchers [7].

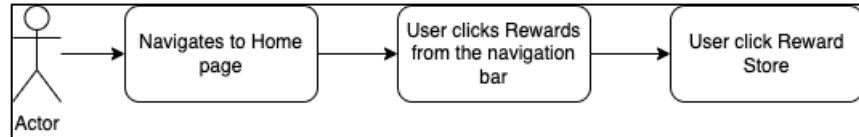


Figure 130: Clickstream for Reward Store [5].

5.8.2 The user receives a notification about the transaction and voucher details

Scenario: The user redeemed a voucher from Redeem Store, so they receive a notification about the transaction and voucher details.

Persona: User

Use Case: User being notified about the transaction and voucher details

1. The User opens the browser and logs in to our website as a user.
2. The System displays the home page.
3. The User selects the "Rewards" option from the navigation menu.
4. The System displays the Reward Store navigation link.
5. The User selects the "Reward Store" options.
6. The System displays the notification about the transaction and voucher details.

Figure 131 and Figure 132 describe the task flow and clickstream diagrams, respectively.

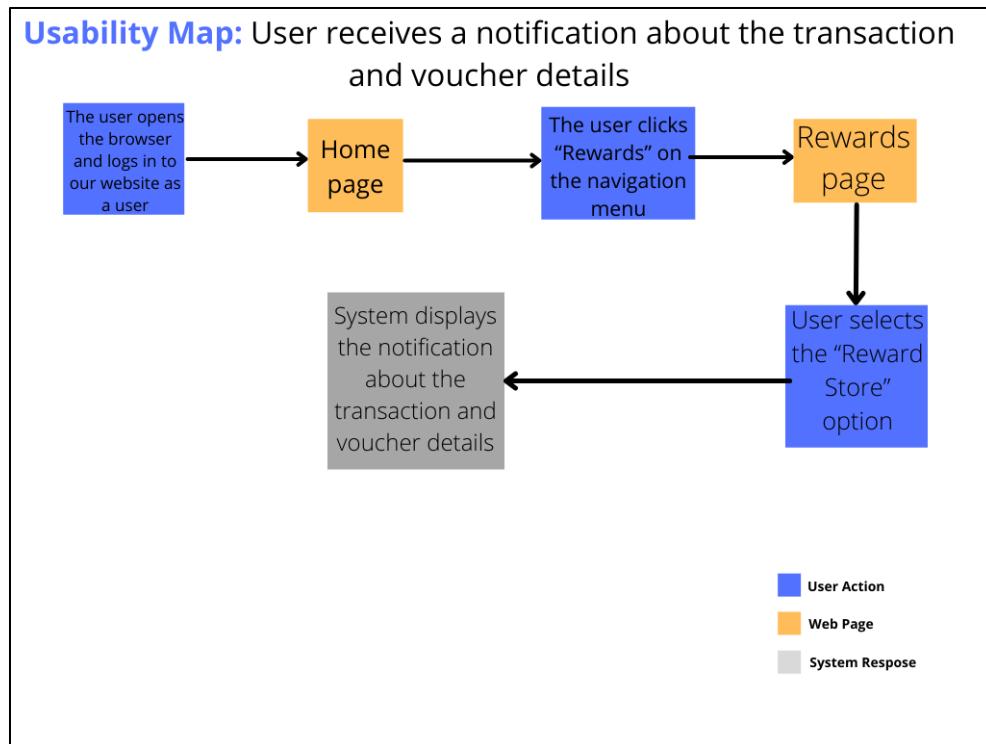


Figure 131: Task flow diagram for users to receive notifications about the transaction and voucher details [7].

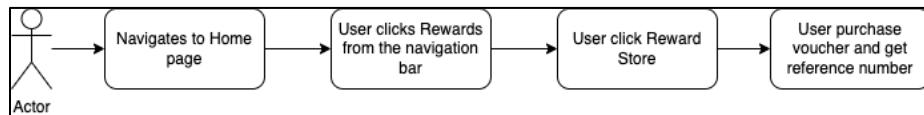


Figure 132: Clickstream for Voucher Purchase [5].

5.8.3 The admin can add or remove vouchers in the reward store

Scenario: Skip the Bins partners with a new food outlet and wants to list their voucher on Redeem Store. The admin gets details and adds a further voucher to the store.

Persona: Admin

Use Case: Admin adding a Tim Hortons voucher to the Redeem Store

1. The User opens the browser and logs in to our website as an admin.
2. The System displays the home page.
3. The User selects the "Rewards" option from the navigation menu.
4. The System displays the Reward Store navigation link.
5. The User selects the "Reward Store" option.
6. The System opens the reward store with an admin view.
7. The User enters details for the new voucher.
8. The System validates whether the details are added or not.
 - 8.1. The System shows an error to enter the name for the voucher.
 - 8.2. The User enters the name of the voucher.
9. The System adds the voucher to the Reward Store.

Figure 133 and Figure 134 describe the task flow and clickstream diagrams, respectively.

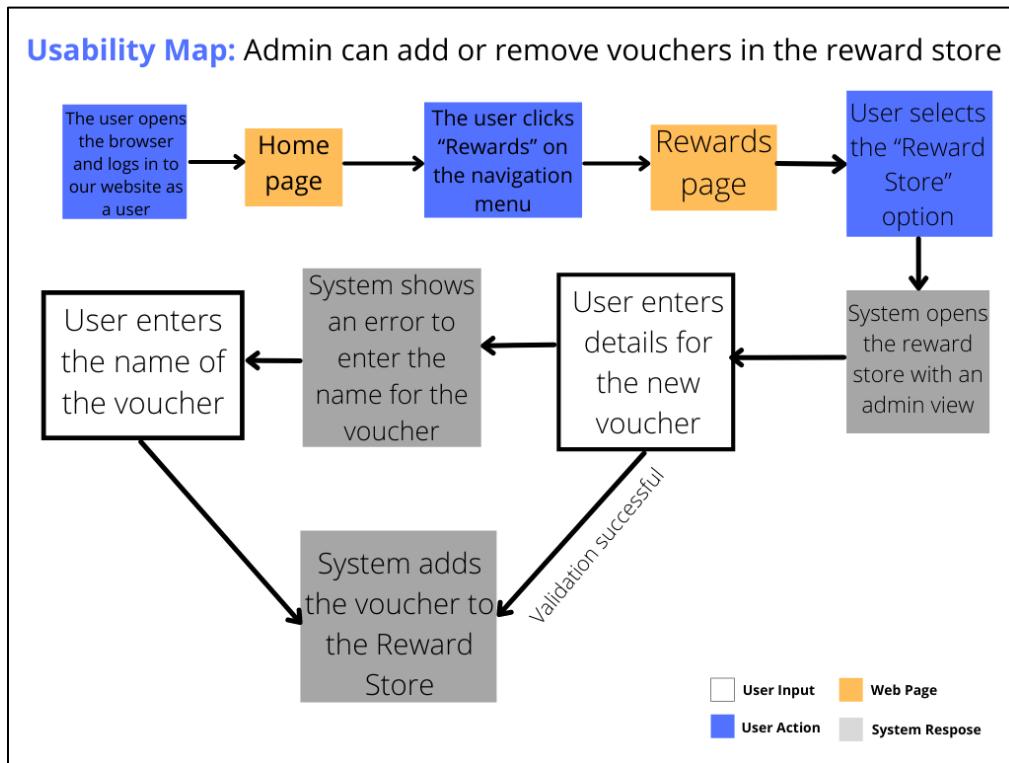


Figure 133: Task flow diagram to add/remove vouchers in reward store [7].

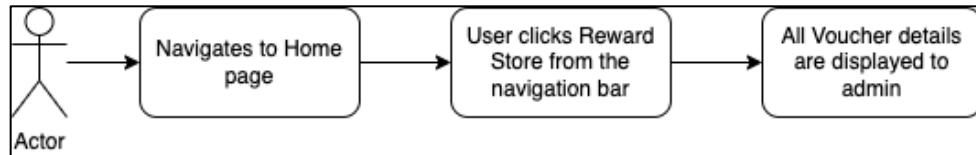


Figure 134: Clickstream for Reward Store with admin access [5]

5.9 Feature: Pickup History and Statistics

5.9.1 View Pickup History

Scenario: The user wants to see the details of the pickups that they scheduled in the past with the different vendors. So, the user visits the website and views the past pickup details.

Use case: View pickup history

1. The user visits the website dashboard page.
2. The user clicks on the View Pick-Up tile.
3. The website displays a list of past pickups of that user in tabular and graphical form.
4. If the user selects Tabular from the dropdown list.
 - 4.1.The website displays the list of past pickups in only tabular form.
5. If the user selects Graphical from the dropdown list.
 - 5.1.The website displays the past pickups in different charts.

Figure 135 and Figure 136 describe the task flow and clickstream diagrams, respectively.

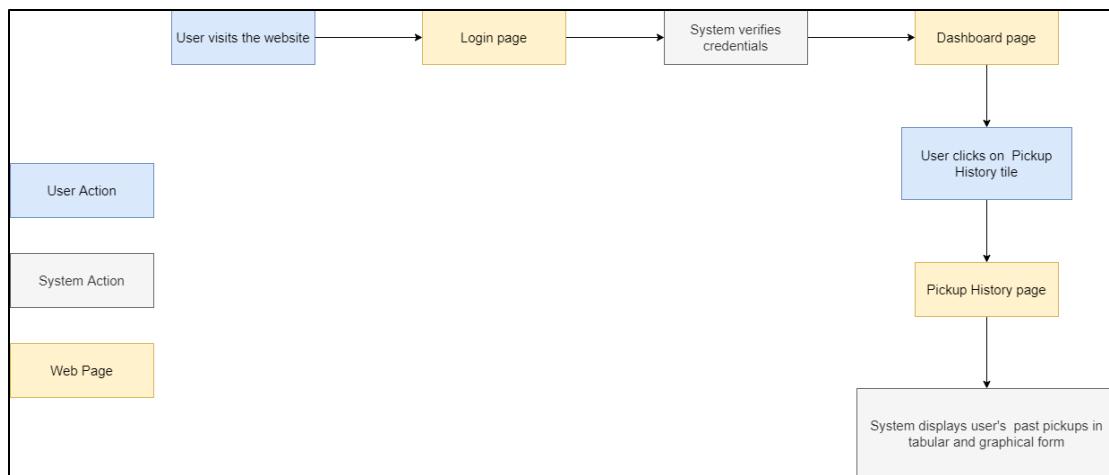


Figure 135: Task Flow diagram for View Pickup History [5].

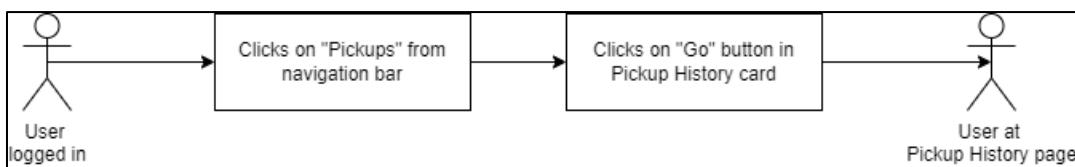


Figure 136: Click Stream for Pickup History - User [5].

5.9.2 View Past Pickups

Scenario: The organization wants to see the details of the pickups that have been scheduled in the past. So, the organization visits the website and views the past pickup details.

Use Case: View past pickups

1. The organization visits the website dashboard page.
2. The organization clicks on View Past Pickups tile.
3. The website displays a list of past pickups of all users who scheduled the waste pickup for that organization in tabular and graphical form.
4. If the organization selects Tabular from the dropdown list.
 - 4.1.The website displays the list of past pickups in only tabular form.
5. If the user selects Graphical from the dropdown list.
 - 5.1.The website displays the past pickups in different charts.

Figure 137 and Figure 138 describe the task flow and clickstream diagrams, respectively.

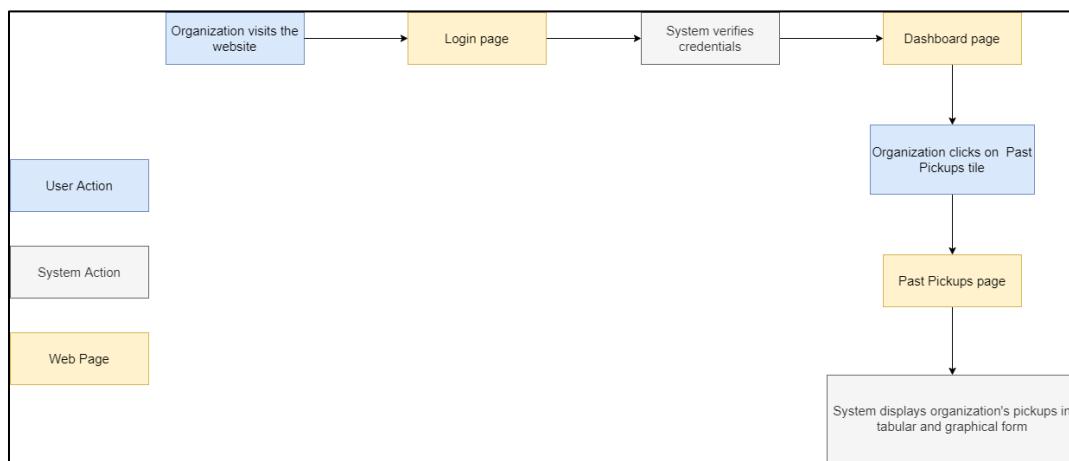


Figure 137: Task Flow diagram for viewing Past Pickups [5].

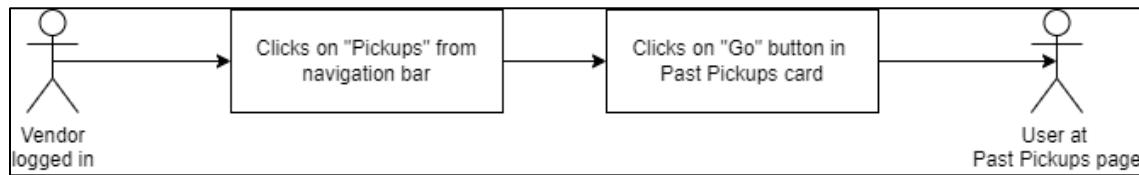


Figure 138: Click Stream for Past Pickups - Vendor [5].

5.10 Feature: Portal Analytics

5.10.1 User Analytics

Scenario: An admin wants to see all the users using the waste management system, then the admin will visit the website and log in to the system.

Persona: Admin

Feature: Portal Analytics

Need: To view all the user details

Context: Only the admin, after login, can view the user details.

Use Case: Admin can view all details of users who registered in the system. Assume that the admin is already logged in.

1. Admin clicks on the top left menu button
2. Admin can see the different options for analytics
3. It is by default user analytics after login
4. The system shows the dashboard page of all user's listing
5. Admin can view all user details like First name, Last name, Contact number, Email id, Status

Figure 139 and Figure 140 describe the task flow and clickstream diagrams, respectively.

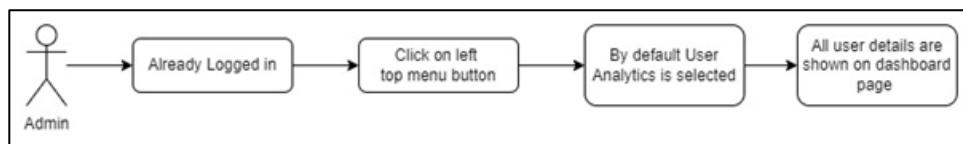


Figure 139: Task flow diagram to user dashboard [5].

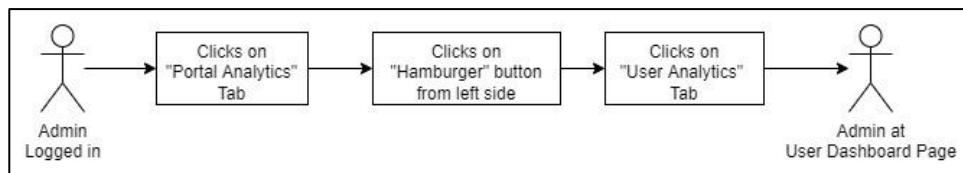


Figure 140: Clickstream – User Dashboard - Admin [5].

5.10.2 Vendor Analytics

Scenario: An admin wants to see all the vendors using the waste management system, then the admin will visit the website and log in to the system.

Persona: Admin

Feature: Portal Analytics

Need: To view all the vendor details

Context: Only the admin, after login, can view the vendor details.

Use Case: Admin can view all details of vendors who registered in the system.

1. Admin clicks on the top left menu button
2. Admin can see the different options for analytics
3. It is by default user analytics after login
4. Now, users can click on the vendor analytics option
5. The system shows the dashboard of all vendor's listing
6. Admin can view all vendor's details like Vendor Name, Contact number, Email id, Status

Figure 141 and Figure 142 describe the task flow and clickstream diagrams, respectively.

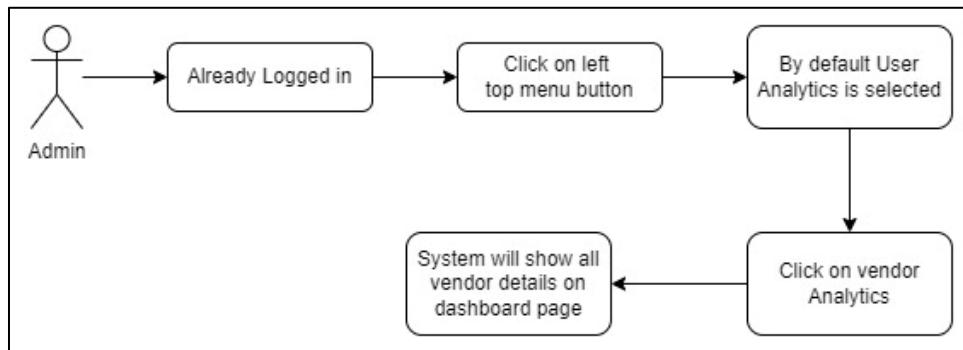


Figure 141: Task flow diagram to vendor dashboard [5].

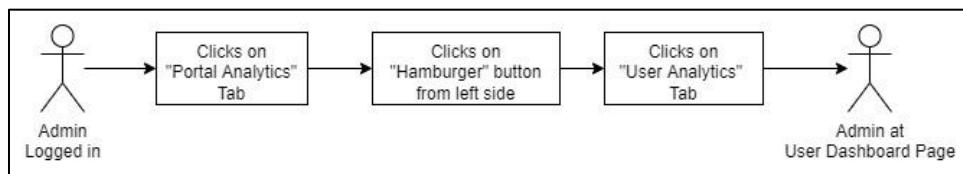


Figure 142: Clickstream – Vendor Dashboard - Admin [5].

5.10.3 Reward Analytics

Scenario: An admin wants to see all the rewards existing on the waste management system, then the admin will visit the website and log in to the system.

Persona: Admin

Feature: Portal Analytic

Need: To view all the reward details

Context: Only the admin, after login, can view the reward details.

Use case: Admin can view all details of rewards that are offered to users.

1. Admin clicks on the top left menu button
2. Admin can see the different options for analytics
3. It is by default user analytics after login
4. Now, users can click on the reward analytics option
5. The system shows the dashboard of all rewards listing

6. Admin can view all reward details like reward id, vendor name, and user count who used the reward.

Figure 143 and Figure 144 describe the task flow and clickstream diagrams, respectively.

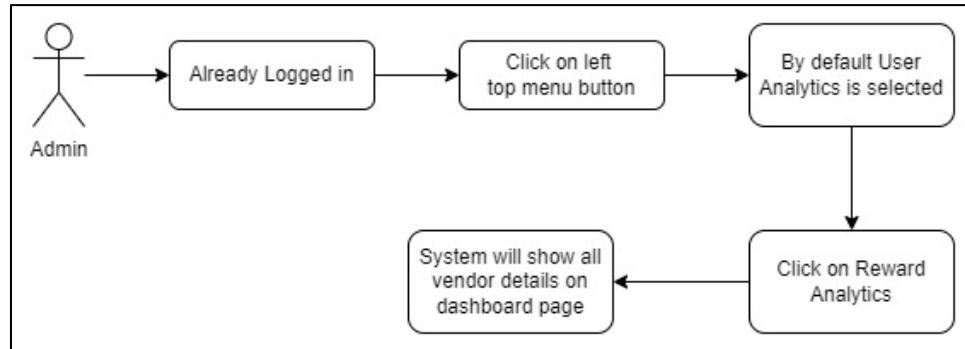


Figure 143: Task flow diagram to reward dashboard [5].

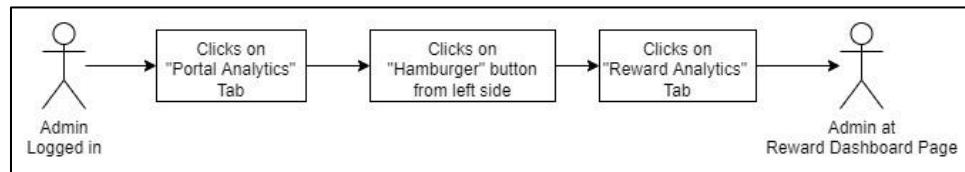


Figure 144: Clickstream – Reward Dashboard – Admin [5].

6. Process workflow

Figure 145 describes the process of the workflow of our application.

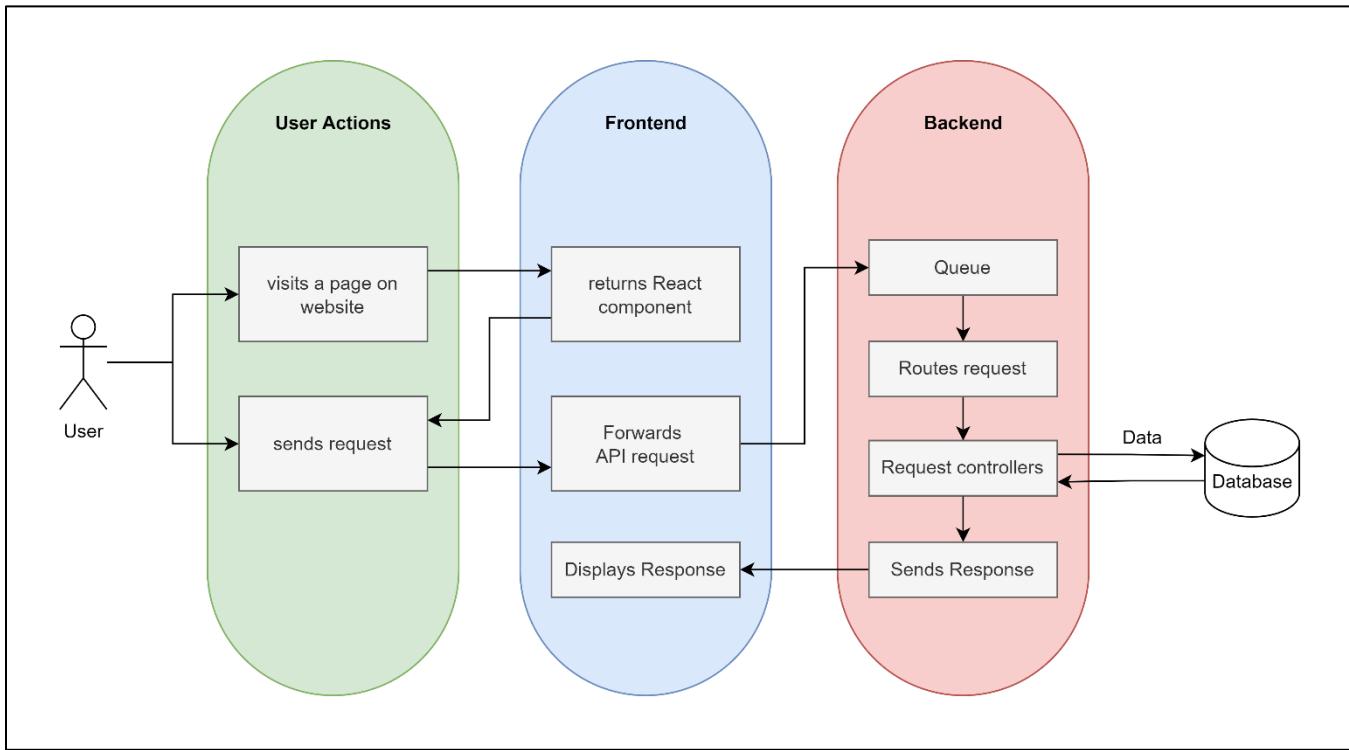


Figure 145: Process workflow of application [5].

7. Future Scope

In terms of future work, we look forward to implementing the following changes, which could add much value to our deliverables:

- Integrating a careers page that both the admin and vendors could leverage to hire new employees.
- Incorporating third-party advertisements on our website which could add to our profits.
- Modifying our reward store. Rather than only giving coupons, we would sell products and 'Skip the Bins' merchandise which could turn profitable and open several opportunities.
- Enhancing our analytics podium to leverage that for offers and rewards.
- Add an E-mart feature where reusable waste like electronics, furniture, etc., could be refurbished and sold.

8. Conclusion

We have developed the SkipTheBins web application and a platform for modern waste management systems. Our application provides a digital platform between waste pickup vendors and end-users. The user can schedule a waste pickup from their specified location. After a successful waste pickup, the user will receive reward points which can be claimed to redeem different vouchers, which would keep our users motivated and simultaneously reduce the carbon footprint in our ecosystem.

We are helping our environment by creating a modern platform between vendors and users to book a slot quickly and conveniently for their garbage pickup. Users get tracking for each pickup, and only reward points are issued after success. Vendors benefit from our platform by getting regular garbage which they can recycle to generate money and save the environment. It will reduce the environmental pollution caused by no or improper recycling which is essential for our coming generations. By proper recycling, we can conserve our natural resources, which would reduce the need to harvest new materials from nature.

9. Recommendations

The following are suggestions for ongoing support and future development:

- The same directory structure should be maintained when adding new features. It is recommended to use libraries used in the existing system to develop new features for homogeneity of the system. Using new libraries that are not even thoroughly tested can increase the bundle size and make the code vulnerable.
- To perform thorough testing on new features individually and after integrating them with the existing system.
- REST conventions should be strictly followed while creating Backend API, and API should be tested thoroughly.
- The commit message in Git should be relatable to the commit and descriptive. So that others can also understand what changes have been made.
- The code commenting should be done correctly and should be descriptive as well. So that it is easy for other members and new developers to understand the functioning of the code quickly.
- We can write unit test cases to perform unit testing of the system and configure CI/CD pipeline for continuous integration and deployment.

10. References

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