



Patuakhali Science and Technology University

Faculty of Computer Science and Engineering

CCE 310: Software Development Project-I

Sessional Project Proposal

Project Title: Reuse Hub

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Reuse Hub



1. Abstract

Reuse Hub is a cross-platform application designed to promote sustainable living through community-driven item reuse. It connects donors and seekers, enabling free exchange of usable goods with an intuitive and secure interface. Built using Flutter and powered by Supabase, the app ensures real-time interactions and platform independence. Key features include item listings, request handling, messaging, and role-based access. Reuse Hub aims to reduce waste while fostering a culture of sharing and environmental responsibility.

2. Objectives

- To develop a unified, cross-platform platform for donating and requesting reusable household items.
- Implement secure login and user roles.
- Enable item listing, browsing, and filtering.
- Support direct requests and real-time messaging.
- Ensure responsive design across mobile and web

3. Problem Statement

Existing item reuse and donation platforms are often fragmented, platform-dependent, or limited in functionality. Many rely on outdated interfaces, lack mobile responsiveness, or operate through third-party social groups with no automation. Key features such as real-time messaging, role-based access, and location-aware discovery are often missing. There is a clear need for a modern, cross-platform solution that streamlines item reuse while promoting sustainability and user convenience.

4. Related Work

- [1] **OLIO**- A widely-used food and item sharing app. However, it is heavily localized and lacks full-featured support for non-food items.
- [2] **Freeecycle** - A nonprofit global network for item reuse, but suffers from outdated UI, limited mobile experience, and lacks in-app messaging.
- [3] **Letgo(Now OLX)** - Supported local item sharing. Shifted focus to resale, reducing emphasis on community reuse.
- [4] **Trash Nothing** -Focused purely on free giving, but lacks a modern UI, role-based access.
- [5] **Facebook Marketplace** -Highly popular and lacks filters for free.
- [6] **Buy Nothing Project** – A community-driven model restricted to Facebook Groups, lacking automated request handling and notifications.
- [7] **Too Good to Go** – Focuses only on surplus food donations, with no support .

5. Scope

Reuse Hub is a cross-platform application built using Flutter, designed to facilitate the reuse and redistribution of pre-owned items within communities. The platform will enable users to donate or request items through a streamlined, user-friendly interface. Core functionalities include user authentication, item listings, request handling, messaging, and category-based browsing. The application ensures accessibility across Android, iOS, and web platforms.

In future iterations, Reuse Hub can be expanded to support location-based recommendations, donation history tracking, user reviews, item delivery logistics, and integration with local NGOs or sustainability programs.

6. Methodology

6.1. Technology Stack

The development of Reuse Hub will follow an agile methodology, allowing for iterative improvements and user feedback. Our technology stack will include,

Frontend	Flutter[8] (Dart)
Backend	Supabase
UI/ UX Design	Figma
Database	PostgreSQL
Authentication	JWT or OAuth2
Hosting (web app)	Vercel or Netlify
CI/CD	GitHub Actions, Docker (optional)

Table 1: Technology Stack for Reuse Hub

6.2. Design Principles

The design of Reuse Hub will adhere to the following principles,

Material Design	Adopts Google's Material Design guidelines to ensure a consistent and modern UI/UX across Android devices.
Responsive Design	Guarantees seamless performance across various screen sizes and orientations, including desktop, tablet, and mobile views.
User-Centric Design	Prioritizes user experience with intuitive navigation, minimal steps, and clear visual elements for both donors and receivers.
Cross-Platform	Ensures consistent design and functionality across Android, iOS, and web platforms using a unified development approach.
Documentation	Provides thorough documentation for developers (e.g., API docs) and end-users (e.g., help guides, FAQs).

Table 2: Design Principles for Reuse Hub

7. Visual Models

7.1. Flow Chart Diagram

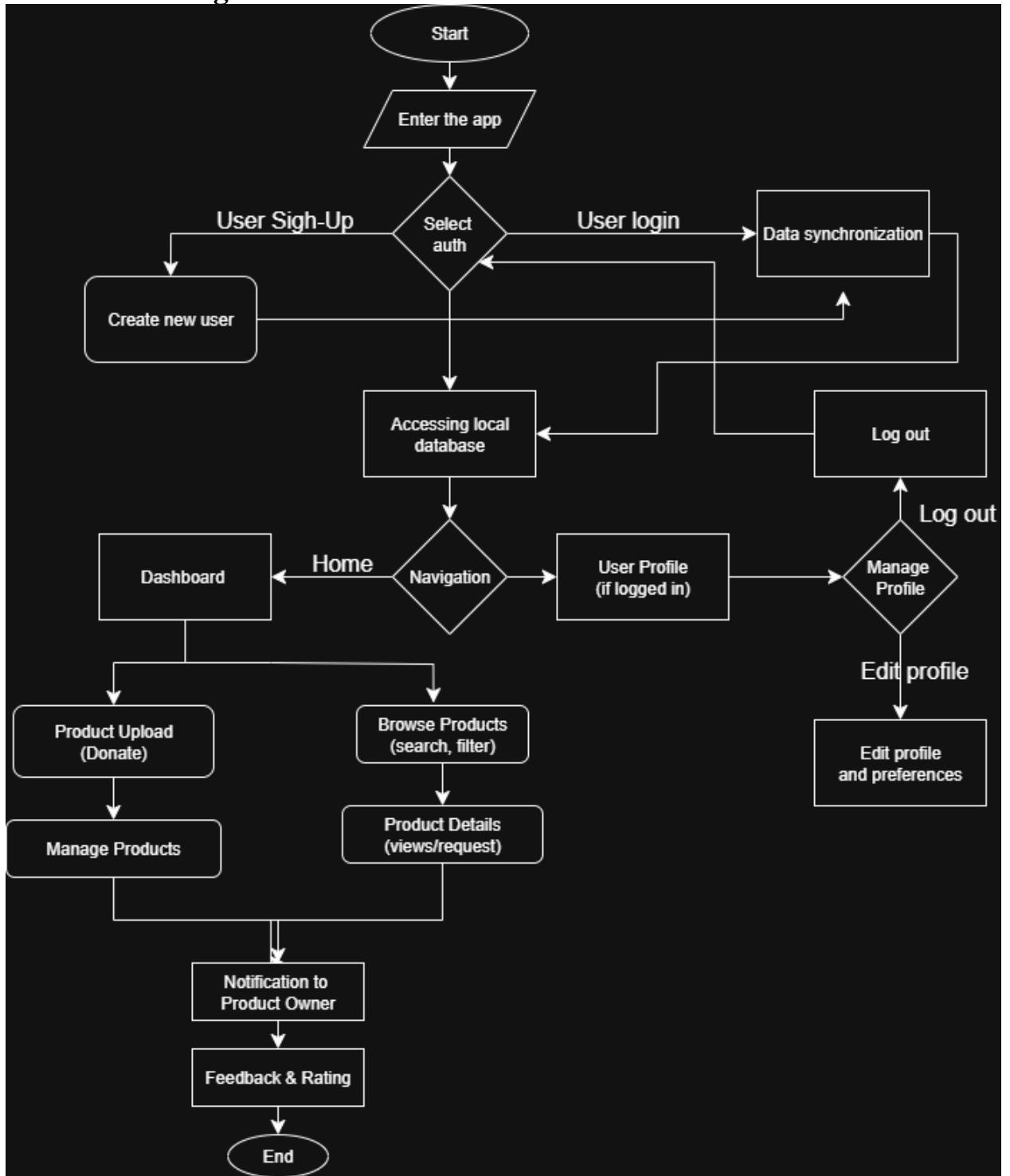


Figure 1: Flow Chart of Reuse Hub Architecture

Figure 1 illustrates the high-level user interaction flow of **Reuse Hub**, showcasing how various components such as item listing, request handling, and user roles (Donor and Seeker) operate within the app. The diagram primarily focuses on the frontend-driven flow, from authentication to donation completion.

7.2. ERD (Entity Relationship Diagram)

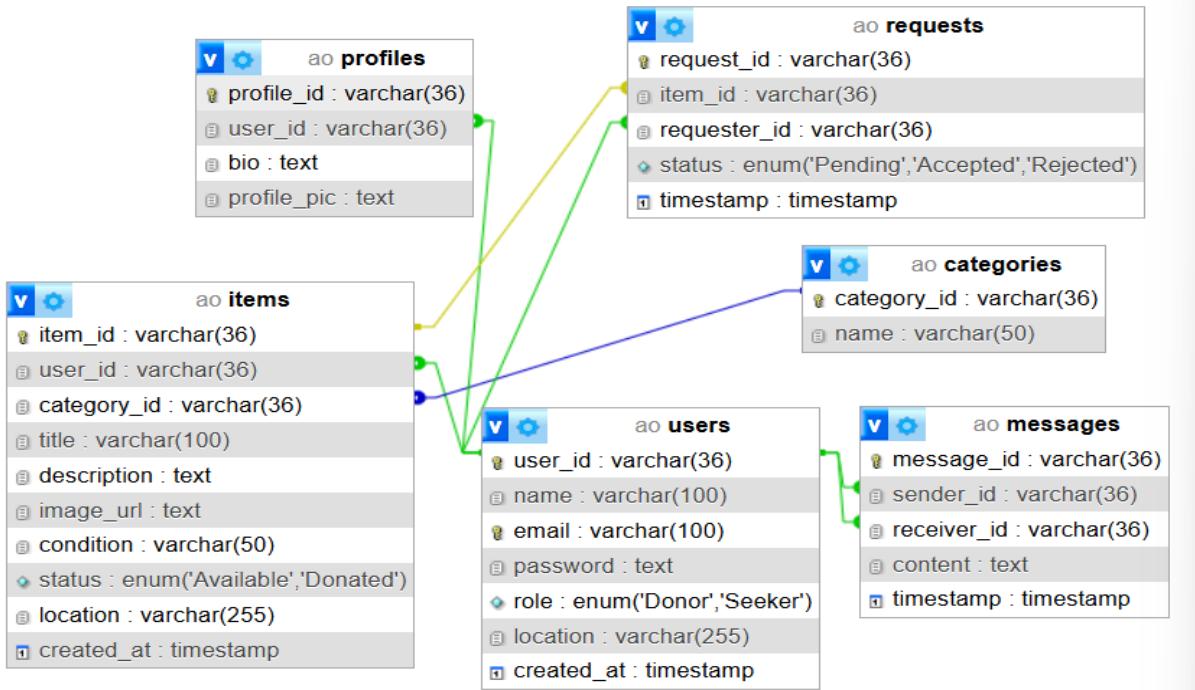


Figure 2: Entity Relationship Diagram of Reuse Hub

7.3. Timeline (Gantt Chart)

The base timeline for the development of ReuseHub is as follows,

Task	Week 1-4	Week 5-7	Week 8-9	Week 10-11	Week 12	Week 14	Week 15	Week 16
Requirements & UI Wireframing	✓		✓					
Authentication + DB		✓	✓					
Item Listing & Upload Module			✓	✓				
Nearby Item Discovery					✓			
Request & Donation Management			✓	✓	✓			
Chat & Notification System						✓		
UI Polish + Accessibility						✓	✓	
Final Testing & Deployment								✓

Table 3: Development Timeline of Reuse Hub

7.4. UI Mockups

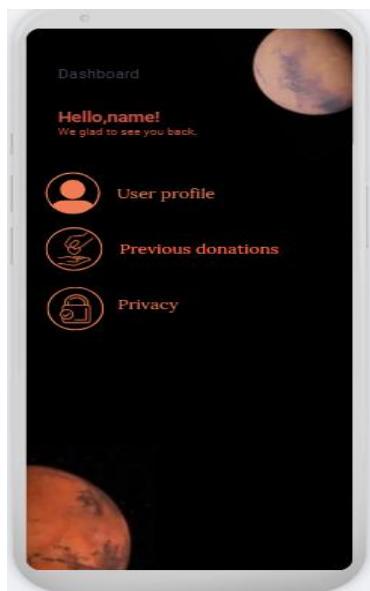


Figure 3: Dashboard

Two smartphone screens demonstrating the app's features. The left screen shows four donation categories: "Food Donation" (with a bowl icon), "Cloth Donation" (with a clothes icon), "Old Electronics Donation" (with a computer icon), and "Books Donation" (with a book icon). The right screen shows a "Donation Form" with fields for NAME*, PHONE NUMBER*, EMAIL*, ADDRESS*, PINCODE*, and ITEM AND QUANTITY*. It includes a "SELECT ITEM" dropdown set to 0, a plus sign to add more items, and a checkbox at the bottom accepting terms and conditions. A "DONATE NOW" button with a heart icon is at the bottom.

Figure 4: Donation type and Donation Form UI concept

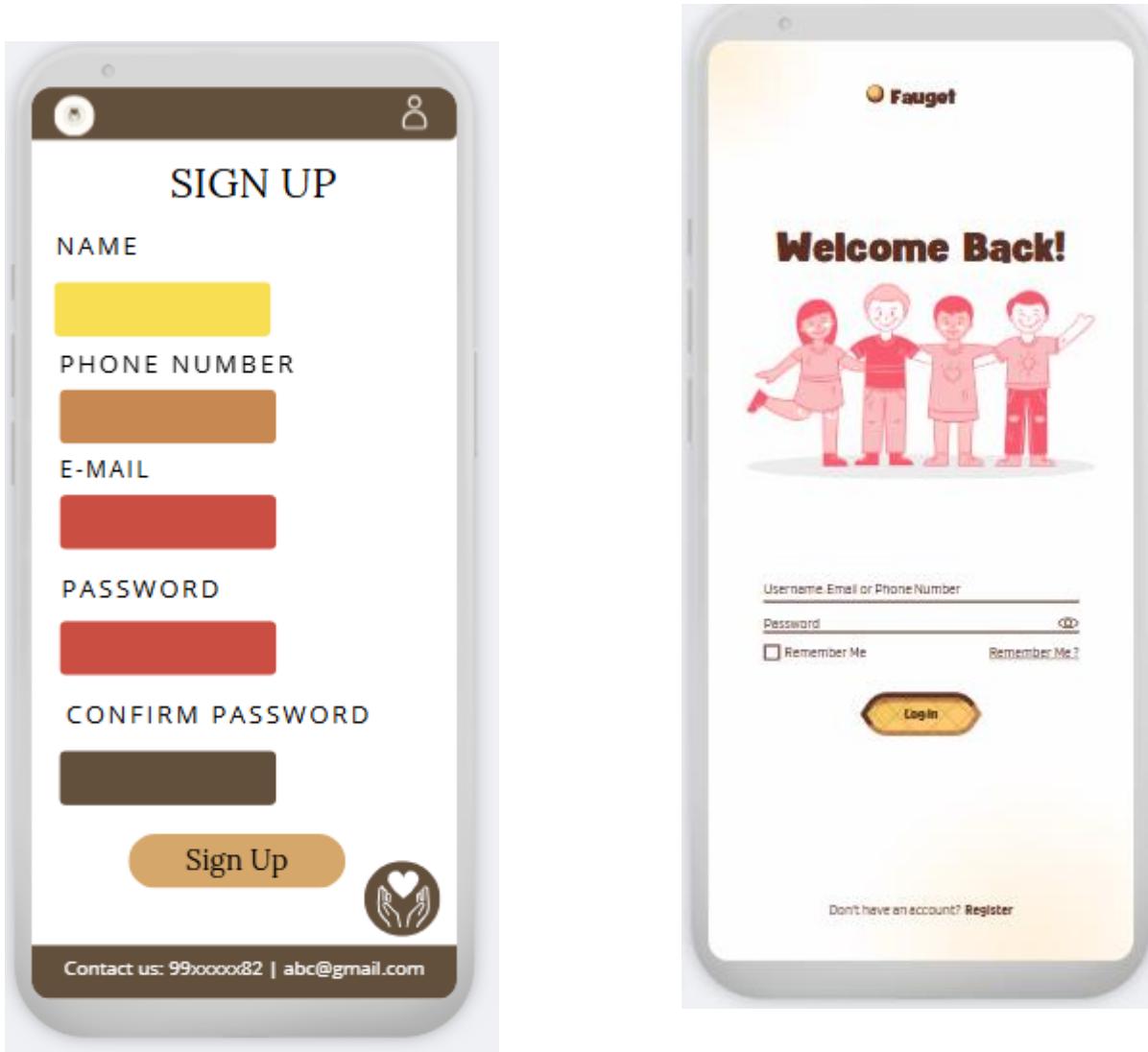


Figure 5: Login and Sign-Up page's UI concept

8. Limitations

1. User base growth is dependent on **community awareness and participation**, which may be slow initially.
2. The app relies on **accurate location data**; privacy concerns or GPS inaccuracies may affect user experience.
3. Lack of a **formal verification system** for item quality or donor credibility.

9. Result

The expected outcome of Reuse Hub is a fully functional, cross-platform application that enables users to donate and collect reusable household items efficiently.



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Weekly Report

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