SIT HACK A VERSE 2025

TITLE PAGE

- **Problem Statement ID –** SIT_CES_HV_2025_13

- **Problem Statement Title-** DESIGN AND DEVELOP A DYNAMIC, ATTRACTIVE,AND EASY TO USE SMARTPHONE-BASED APPLICATION FOR MONTHLY PAID SUBSCRIPTION-BASED QUICK GARBAGE COLLECTION SERVICES TO PROMOTE A CLEANER AND MORE STRUCTURED WASTE MANAGEMENT SYSTEM.

- **Theme-** SUSTAINABILITY AND ENVIRONMENT

- **Team ID-** HV25_T15

- **Team Name (Registered on portal):** Team NexHack

IDEA TITLE

Explanation of the Proposed Solution

- **HOME TAB:** Users can schedule and track pickups, view collection trends, monitor impact, and manage flexible monthly subscriptions with auto-renewals and online payments.

- **REPORT TAB:** Report any instances of garbage dumping in your area by taking a photo, automatically attaching your GPS location, and selecting the waste type.

- **ECOBOT**: Supports multiple languages and offers both a standard text chat with a built-in read-aloud feature and a dedicated voice chat mode for seamless communication.

- We propose to develop an app called **"Ecopulse"**

Features:

- **User-friendly mobile app** for easy registration and subscription
- **Monthly subscription plans** along with **slot-wise pickup schedule**
- **Reward system** and community engagement.
- **Automated notifications** for collection schedules.
- **Secure payment gateway** with multiple payment options.
- **AI-powered chatbot system** for executing user commands, such as opening the home page or generating reports, and answering general queries through text, speech, or other input sources.

Innovation and Uniqueness of the Solution:

- **On-demand garbage collection** for urgent waste removal.

- **Eco-friendly approach** promoting waste segregation at the source

- **Special accessibility feature:** Read-Aloud support for users with reading difficulties.

> **" *I don't even know how to segregate trash* "**

> **"** *There is no fixed day for waste collection. They randomly come and expect us to be early* **"**

India ranked 176th out of 180 countries in the Environmental Performance Index (EPI) 2024

TECHNICAL APPROACH

Tech Stacks:

Programming Language:
Python (Backend)
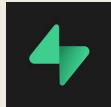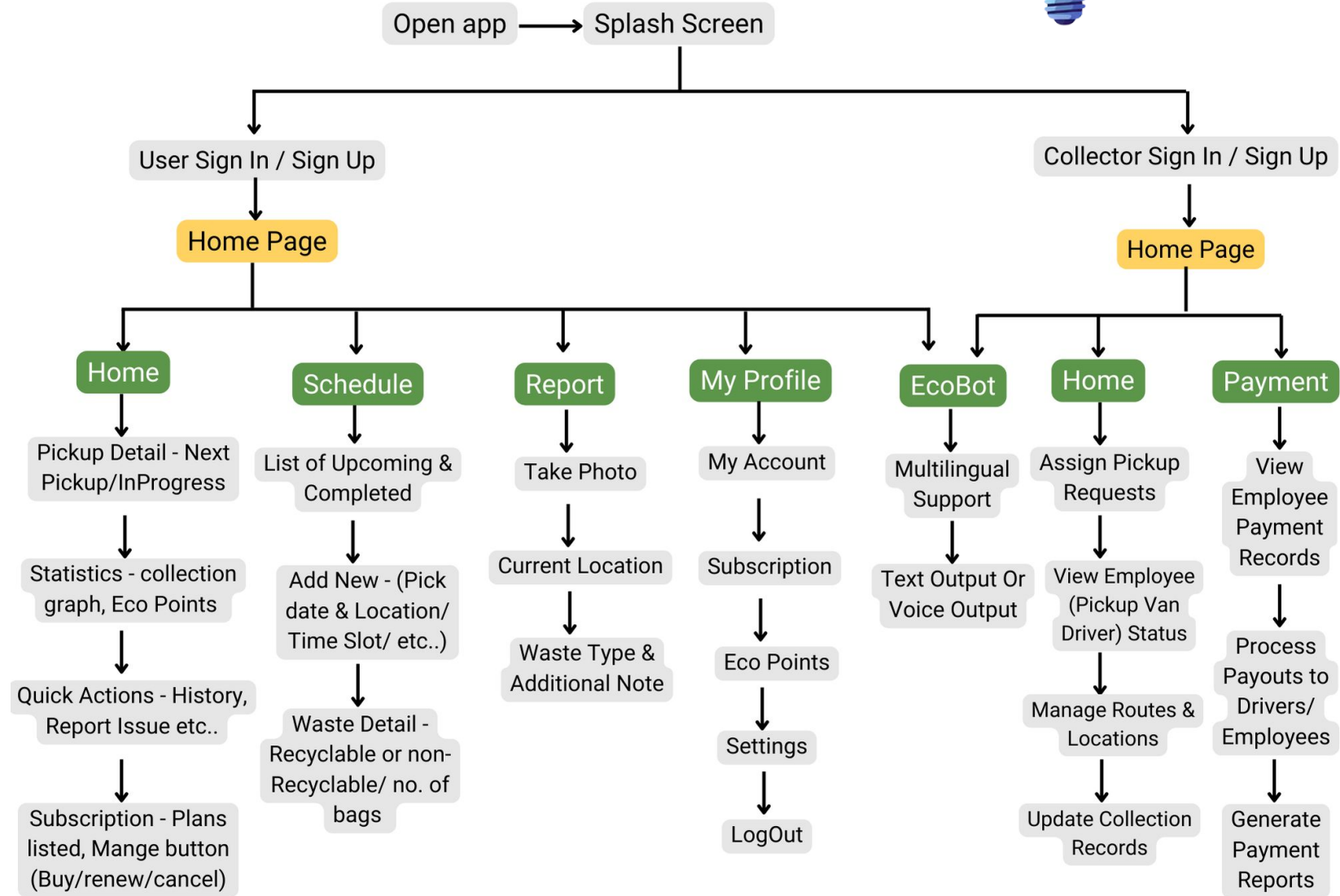
Framework:
Flutter

Flask API

Razorpay

MapMyIndia

ChatGPT API

Database:
Supabase

available in: android iOS

Open app → Splash Screen

User Sign In / Sign Up → **Home Page**

Collector Sign In / Sign Up → **Home Page**

User Home Page

Home
- Pickup Detail - Next Pickup/InProgress
- Statistics - collection graph, Eco Points
- Quick Actions - History, Report Issue etc..
- Subscription - Plans listed, Mange button (Buy/renew/cancel)

Schedule
- List of Upcoming & Completed
- Add New - (Pick date & Location/ Time Slot/ etc..)
- Waste Detail - Recyclable or non-Recyclable/ no. of bags

Report
- Take Photo
- Current Location
- Waste Type & Additional Note

My Profile
- My Account
- Subscription
- Eco Points
- Settings
- LogOut

Collector Home Page

EcoBot
- Multilingual Support
- Text Output Or Voice Output

Home
- Assign Pickup Requests
- View Employee (Pickup Van Driver) Status
- Manage Routes & Locations
- Update Collection Records

Payment
- View Employee Payment Records
- Process Payouts to Drivers/ Employees
- Generate Payment Reports

Analysis of Feasibility

- **Urban Waste Challenges:** Rapid urbanization increases waste, creating *demand* for efficient solutions..

- **Government Support:** Aligns with Swachh Bharat Abhiyan, gaining credibility.

- **Market Positioning:** *Fills gaps* left by quick-commerce platforms.

- **Social Impact:** Promotes *sustainable habits*, supports environmental conservation, and formalizes roles for informal waste workers.

Challenges

- **Technical Glitches**: Payment gateways may face outages or bugs, causing transaction failures during high traffic.

Analysis of Viability

- **Demand for Convenience**: Consumers increasingly prefer *reliable and convenient waste management services*.
- **Unique Selling Proposition (USP):** The app differentiates itself by offering *on-demand emergency waste pickups*, addressing an unmet consumer need.
- **Subscription-Based Income:** Tiered monthly pricing options provide predictable revenue streams while catering to different customer needs.
- **Operational Expenses:** Recurring expenses include salaries, fuel, vehicle maintenance, and customer service infrastructure
- **Phased Growth:** Initial focus on Tier 1 cities with expansion guided by demand analytics ensures efficient scaling.

IMPACT AND BENEFITS

🌱 Environmental
- Reduces landfill pressure (40% diversion via segregation).
- Cuts emissions with optimized collection routes.

🏥 Community Health
- Minimizes disease vectors from stagnant waste.
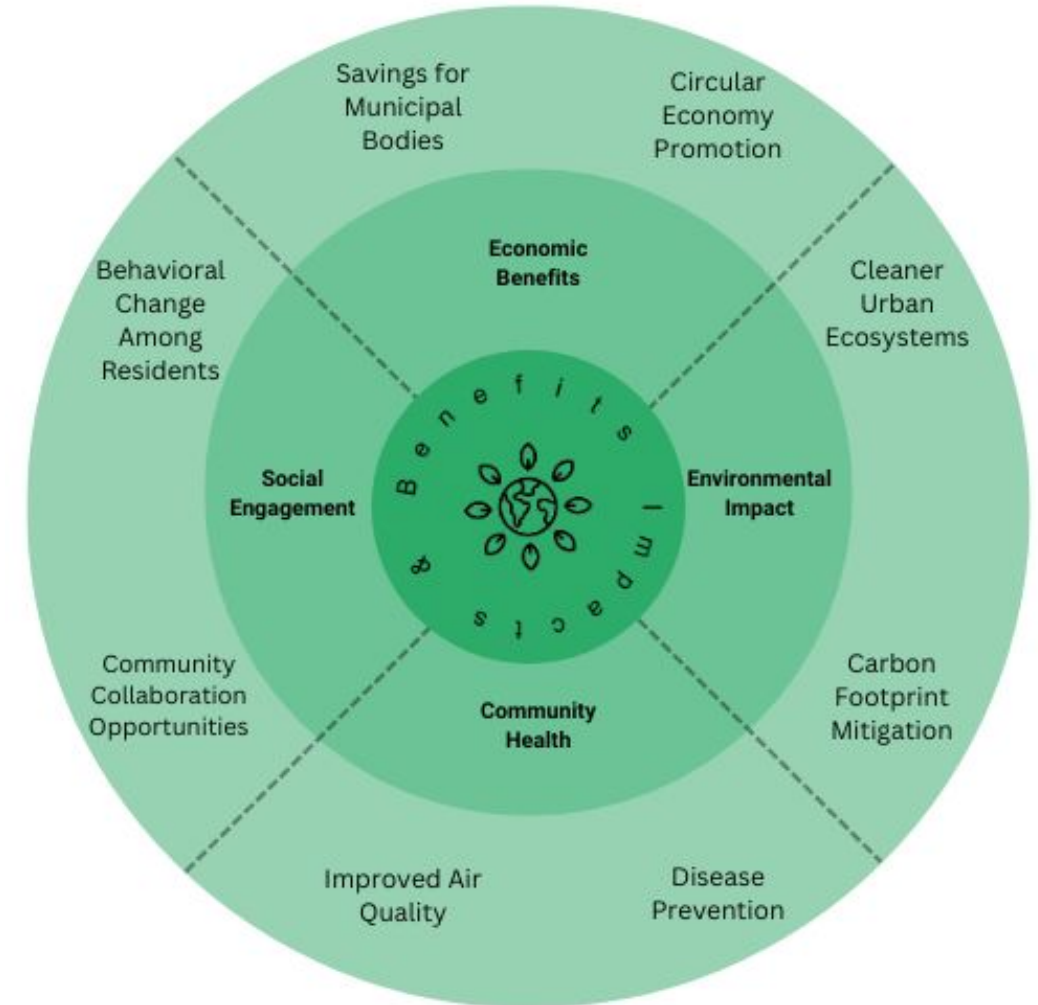- Lowers air pollution via reduced open dumping.

💰 Economic
- Creates jobs in waste logistics & recycling.
- Saves municipal costs; boosts circular economy.

🤝 Social
- Encourages waste discipline via app nudges.
- Strengthens resident-authority partnerships.

🌍 Long-Term
- Boosts civic pride & tourism.
- Secures a sustainable legacy.

RESEARCH AND REFERENCES

- Solid Waste Tracking App: https://www.curbwaste.com/glossary/solid-waste-tracking-app
- Waste Collection Service Scheduling Software: https://routeware.com/products-calendars-and-schedules/
- The Mounting Problem: https://www.unep.org/news-and-stories/press-release/mounting-problem-worlds-cities-produce-10-billion-tonnes-waste-each
- Waste Management App Development: Trash & e-Waste Recycle: https://emizentech.com/blog/waste-management-app-development.html

Research Work:
https://drive.google.com/file/d/1UPJILabfjmTX5WurtxIMof3m84WB2Cac/view?usp=sharing