

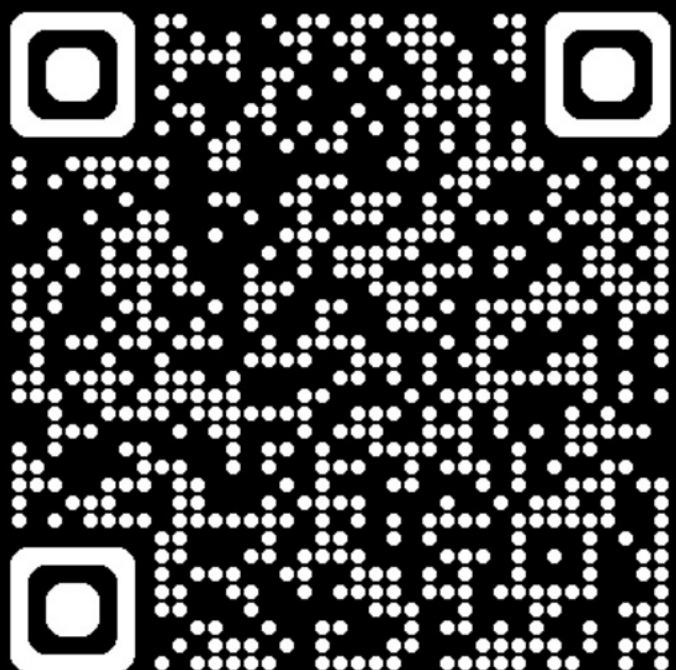
Team BlackBirds Presents



# Second Serving

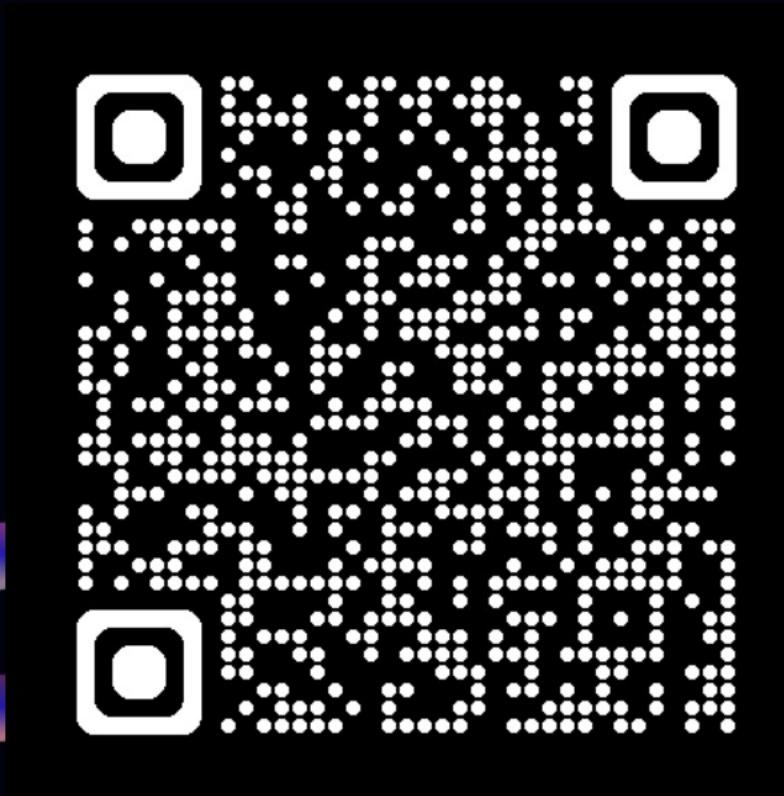
Bridging the gap between EXCESS and ACCESS.

←←← Scan Now to Access Live Version

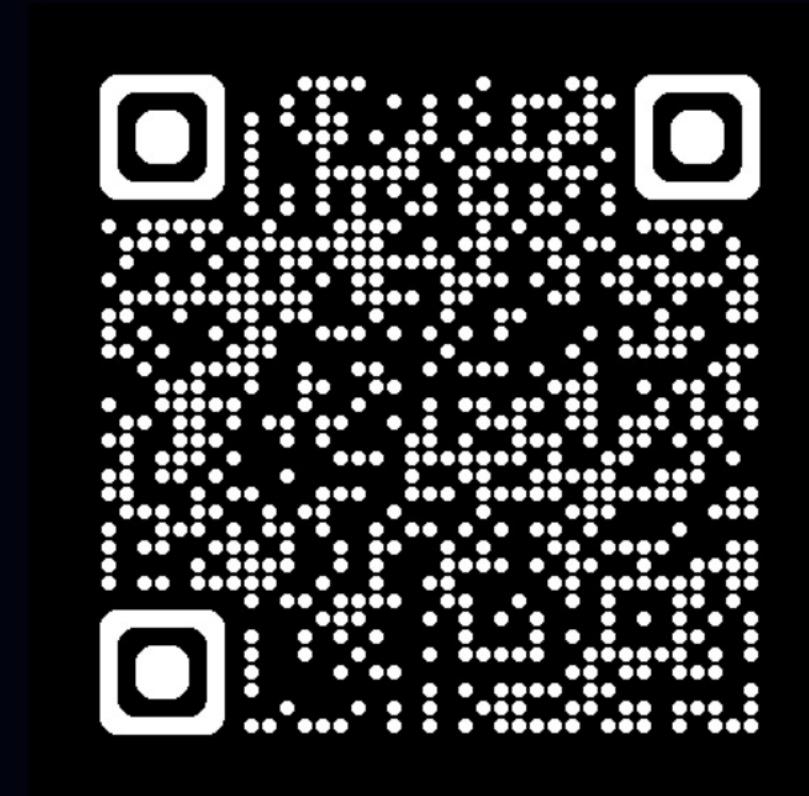


# Live Deployment and Source Code

↓Second Serving is Live↓



↓Source Code Available GitHub↓



# Need Analysis

- Hunger is a pervasive problem, but it's not a food shortage—it's a distribution issue.
- Various Households, restaurants, grocery stores, and food service providers have excess food that often goes to waste.
- At the same time, food banks and non-profit organizations work tirelessly to feed millions of people who are food-insecure.
- These organizations are heroes, but they're stretched thin with limited resources.

# How did we identify The Need

- One of the key strategies to achieve zero hunger is strengthening India's public food distribution system. Source - [KPMG Report](#) (Dated February 20, 2025)
- A food-sufficient India needs to be hunger-free too. Source - [The Hindi Article](#) (Dated October 16, 2024)
- In India, 40% of the food wasted is worth nearly Rs. 92,000 crore/year. This is equivalent to nearly 1% of the GDP which is depleted in the form of food wastage in India. Each person in India wastes 55 kg of food per year as per [UN Environment Programme's report](#). Source - [Times of Agriculture Article](#) (Dated May 29, 2024)

**ALL OF THESE CITATIONS HELPED US UNDERSTAND THAT INDIA IS FAIRLY FOOD SUFFICIENT HOWEVER THE DISTRIBUTION IS FLAWED. TO HELP THIS DISTRIBUTION SYSTEM WE DECIDED TO HELP THE HEROES WHO ARE ALREADY WORKING DAY AND NIGHT TOWARDS MAKING INDIA HUNGER FREE**

# Validating the Friction

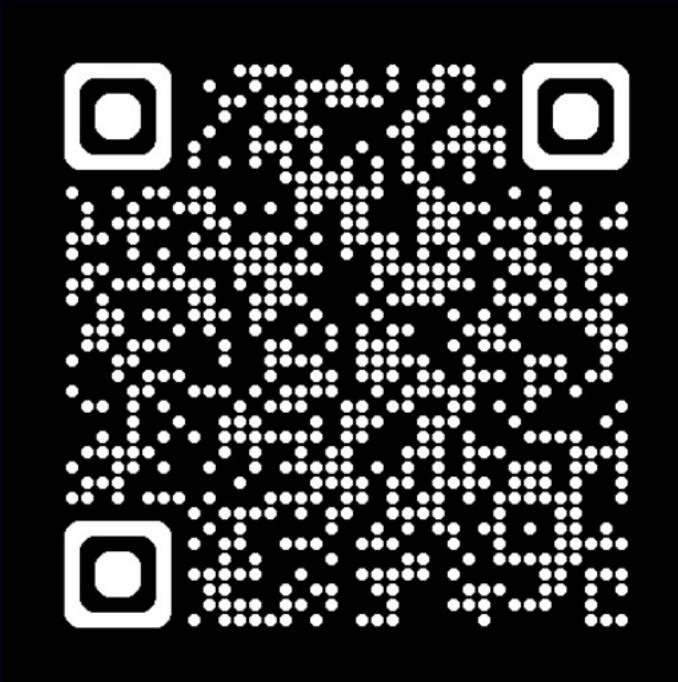
After surveying 50 potential donors, we gathered the following data :

**86%** cited "Lack of Logistics" as the #1 barrier.

**40%** stated they would donate if the process took <1 minutes.

**92%** stated they would donate if the process took <5 minutes.

**76%** find downloading complex apps for one-off donations a deterrent.



**CONCLUSION :** The solution must be fast, low-friction, and hyperlocal.

# Problem Statement

## Manual Processes

- Non-profit organizations are often overwhelmed by the manual processes involved in managing food donations.
- This includes tracking donations, coordinating with volunteers, and distributing food to those in need.
- These tasks are time-consuming and can lead to inefficiencies and errors.
- Limiting organizations' capacity of food donations.

## Under Utilization of Resources

- Despite having large volunteer networks, non-profits often lack the necessary tools and resources to effectively manage food donations.
- This results in a significant portion of excess food going to waste.
- Under-utilizing resources also hinder the ability to scale operations and reach more people in need.

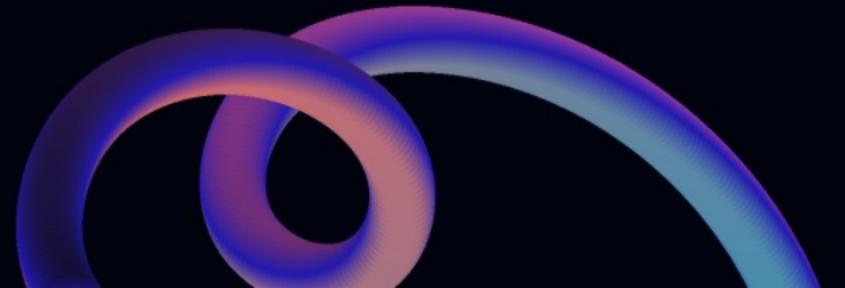
# The Solution

- **Vision:** To digitalize and automate the entire food donation process to significantly reduce food waste.
- **How it Works:** The platform is a structured service for non-profit organizations to automate their workflow from coordination to distribution.
- **Key Benefit:** It allows organizations to use their large volunteer network to retrieve smaller donations from individual households, which was previously not feasible due to the manual workload.
- By partnering with Second Serving, non-profits can enhance their operations and better serve their communities.



Assessing the Viability of Second Serving

# Feasibility Analysis



# Feasibility Analysis

The feasibility of the Second Serving platform is high, primarily due to its strategic approach of **digitizing existing operations rather than creating a new one from scratch**.

## Technical

- The system uses WhatsApp for user authentication and coordination, geospatial tracking for volunteer assignments, and automates tasks like donor and volunteer management. WhatsApp integration is handled through Twilio API.
- The system's ability to categorize food by age group preference is also technically plausible. Age Group categorization is achieved through Groq-SDK.

## Operational

- The platform's success hinges on its ability to integrate with and be adopted by existing non-profit organizations and their volunteer networks.
- By streamlining their current manual workflows, it promises to make their operations more efficient, which is a strong incentive for adoption.
- The platform also enables organizations to handle a wider range of donations, including smaller ones, which increases its operational value.

# Feasibility Analysis

## Market

- BlackBirds identifies a clear and widespread problem: a significant amount of food is wasted annually in India while millions of people are food-insecure.
- The platform directly addresses this by providing a solution for the key bottleneck—distribution.
- There's a definite market for a tool that helps bridge this gap efficiently.

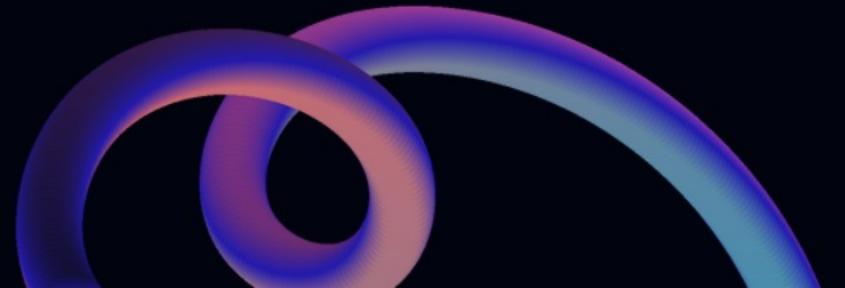
## Economical

- The platform is being built at absolutely zero-cost.
- All resources used are public and free of cost hence the system is highly feasible economically.
- All external APIs and Services are being used under provisional free tiers.



What happens behind the closed doors.

# Technical Deep Dive



# Tech Stack & System Architecture

- **Backend:** Node.js, Express.js, Mongoose
- **Database:** Mongo DB Atlas
- **Frontend:** React.js, Vite
- **AI/ML:** Groq SDK (Llama 3.3) for intelligent food categorization.
- **Maps:** React-Leaflet & OpenStreetMap for location services.
- **Communication:** Twilio API for Whatsapp integration

# Key Features

## Geospatial Querying

- **Problem:** Speed is critical for perishable food.
- **Solution:** MongoDB \$near operator with 2dsphere indexing.
- **Result:** Nearby volunteer can be found within 3 km radius (tunable parameter)

## Smart Sorting with AI

- **Problem:** Donated food might be for different age groups.
- **Solution:** Integrated Groq SDK (Llama 3) to analyze descriptions.
- **Outcome:** Auto-tags food as "Young" or "Everyone" to route it to the appropriate shelter.

# Technical Challenges

## Challenge #1 - Race Conditions

- **Issue:** Two volunteers accepting the same donation simultaneously.
- **Solution:** Atomic Database Updates.
- **Implementation:** Backend checks if `(food.volunteerId)` exists before update. If true, returns `409 Conflict`.

## Challenge #2 - Deployment & Security

- **Issue:** Managing sensitive API keys in production.
- **Solution:** Docker Multi-stage builds and Environment Variable management.
- **Result:** Secure, reproducible production builds.

# Technical Challenges

## Challenge #3 - Address Inaccuracy

- **Issue:** Text addresses are often vague ("Near the blue gate").
- **Solution:** Implemented location fetching in browser with GPS for accurate location.
- **Technical:** The browser prompts for location access using GPS and fetches the coordinates of current location thus ensuring location accuracy

THIS CHALLENGE HOWEVER WAS FAR FROM COMPLETELY SOLVED

# Deployment

- The platform is currently entirely deployed on HEROKU barring the database.
- This has been achieved using Docker containerization.
- Dockerfile is included in GitHub Repo.
- A comprehensive README file with detailed instructions for self deploying is available on our GitHub Repository.

The Live Version of Second Serving is currently available at <https://vlib.eu.org>

# USABILITY

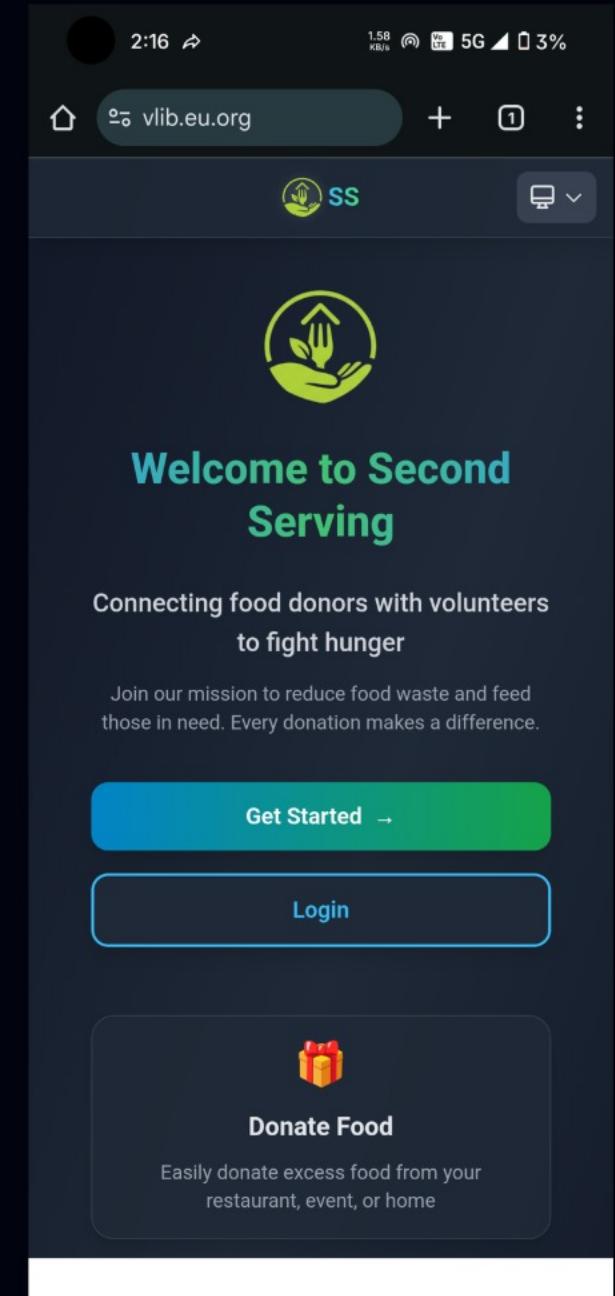
## USABILITY PHILOSOPHY

CORE PHILOSOPHY => Speed and Simplicity

Time to List must be less than 60 seconds

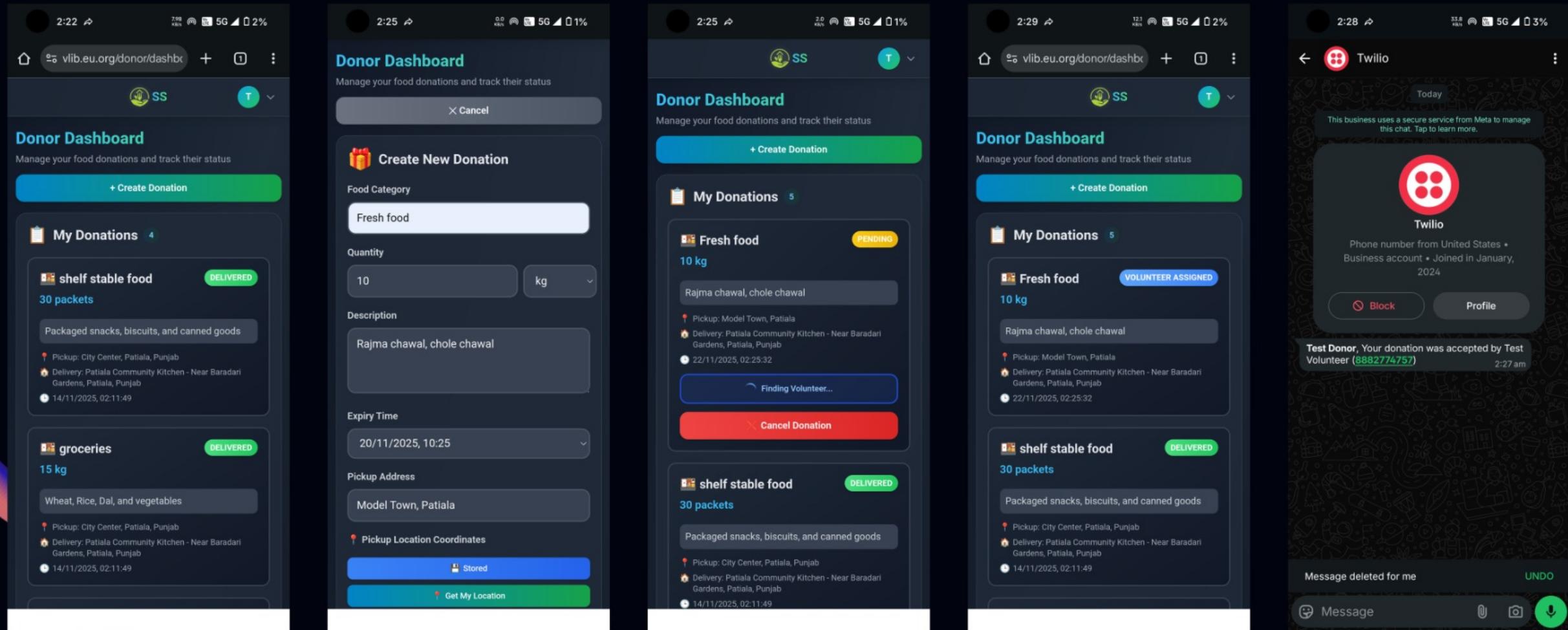
Mobile Friendly UI

Great User Experience with Themes



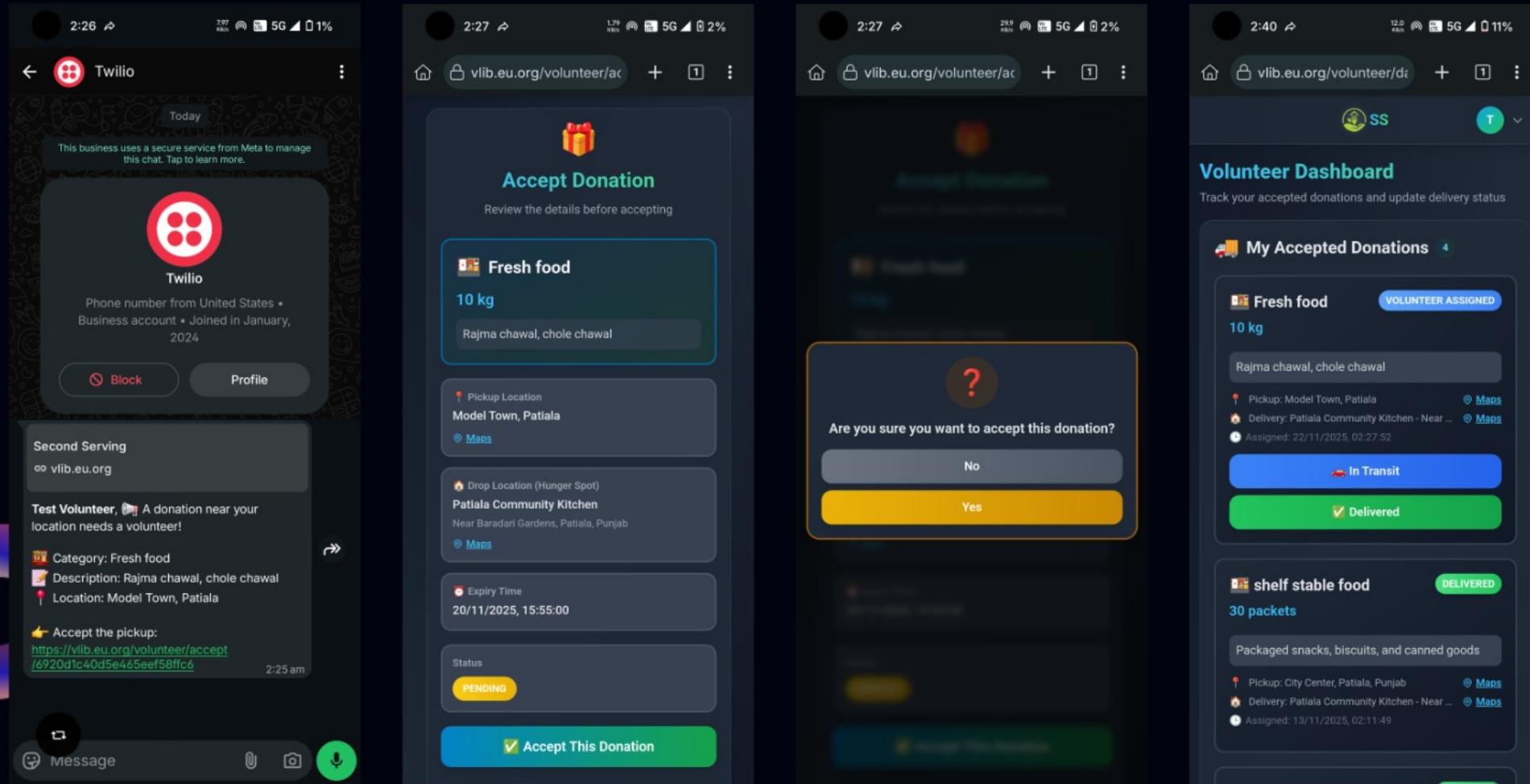
# USER JOURNEYS

## The Donor Journey - Listing a Donation



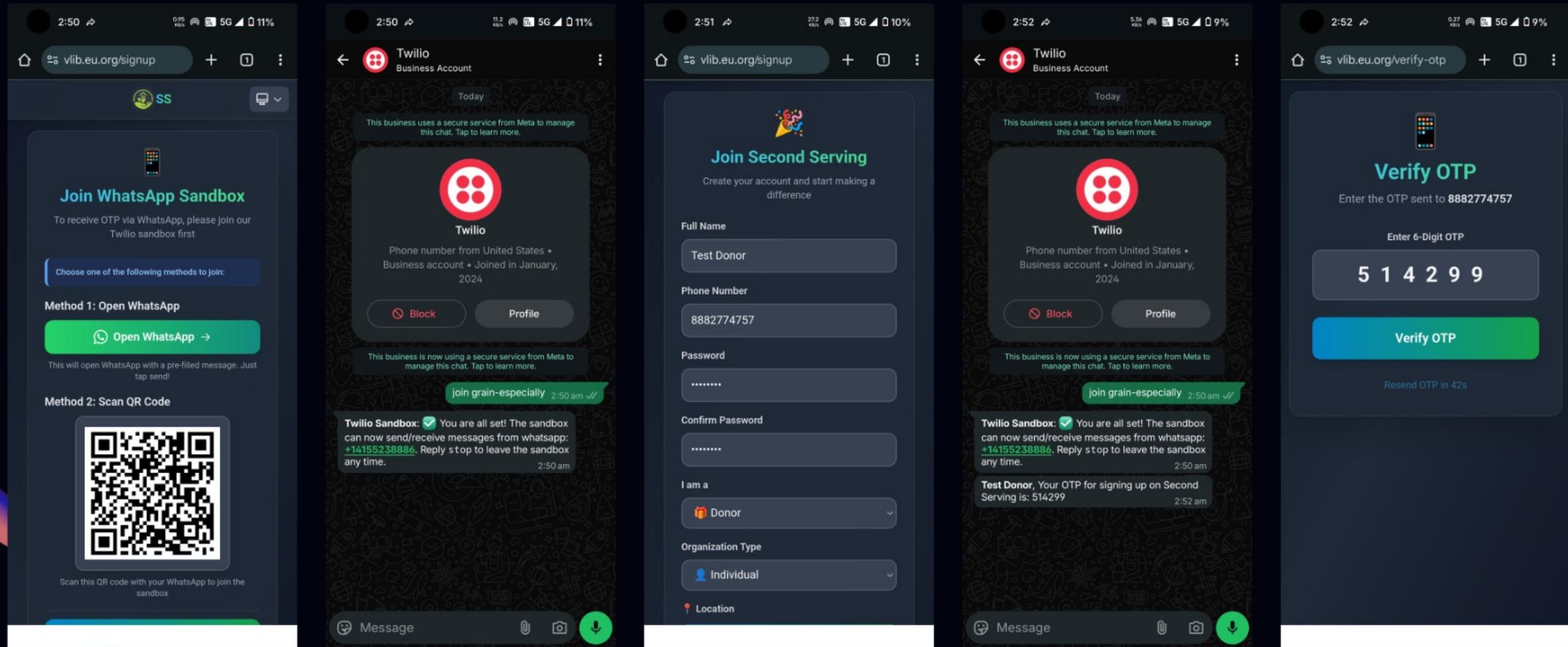
# USER JOURNEYS

## The Volunteer Journey - Accepting a Donation



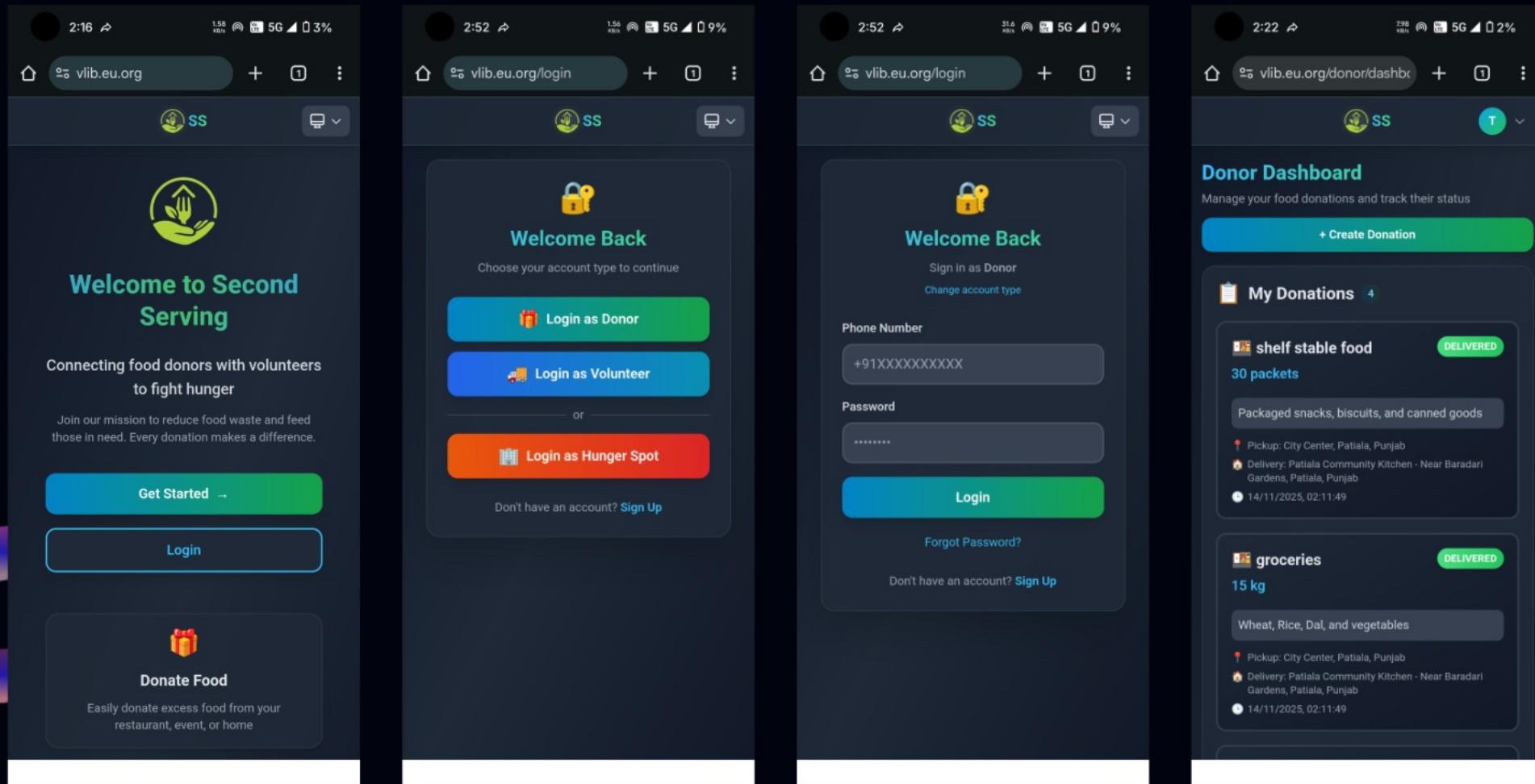
# USER JOURNEYS

## Signing UP



# USER JOURNEYS

## Logging IN



# USER JOURNEYS

## The HungerSpot Journey - Notified and Managing Donations

The image consists of four screenshots arranged horizontally, illustrating the user journey for managing donations on the HungerSpot platform.

- Screenshot 1: Twilio Message (2:29 AM)**

A Twilio message通知 (Notification) screen. It shows a Twilio profile icon and the text "This business uses a secure service from Meta to manage this chat. Tap to learn more." Below this is a message from "Community Manager, Volunteer assigned: Test Volunteer (8882774757)" at 2:27 am, stating "Volunteer assigned: Test Volunteer (8882774757)". At the bottom, there's a message input field with "Message deleted for me" and "UNDO" options.
- Screenshot 2: Hunger Spot Login (2:58 AM)**

A mobile browser screenshot showing the "Hunger Spot Login" page. It has fields for "Select State" (Punjab), "Select Hunger Spot" (Patiala Community Kitchen - Near Baradari Gardens, Patiala, Punjab), "Password" (redacted), and a "Login" button. Below the form is a link "← Back to User Login".
- Screenshot 3: Hunger Spot Dashboard (2:43 AM)**

A mobile browser screenshot of the "Hunger Spot Dashboard". It shows the "Patiala Community Kitchen" is "Near Baradari Gardens, Patiala, Punjab" and is "Active". The "Donations Received" section lists a single donation for "Fresh food VOLUNTEER ASSIGNED": "Rajma chawal, chole chawal" (Quantity: 10 kg). The donor is "Test Donor (restaurant) - 8882774757" and the volunteer is "Test Volunteer - 8882774757". The pickup location is "Model Town, Patiala" and the received date is "Nov 22, 2025, 02:25 AM". A green "Mark as Delivered" button is at the bottom.
- Screenshot 4: Twilio Message (2:47 AM)**

A Twilio message通知 (Notification) screen. It shows a Twilio profile icon and the text "This business uses a secure service from Meta to manage this chat. Tap to learn more." Below this is a message from "Community Manager, 📡 Donation Incoming!" at 2:47 am, listing the donor as "Test Donor" (Contact: 8882774757), the category as "Fresh food", the description as "Chole puri", the quantity as "5 kg", and the pickup location as "Model Town, Patiala". It also states "The donor will deliver directly to your location." At the bottom, there's a message input field with "Message" and other communication icons.

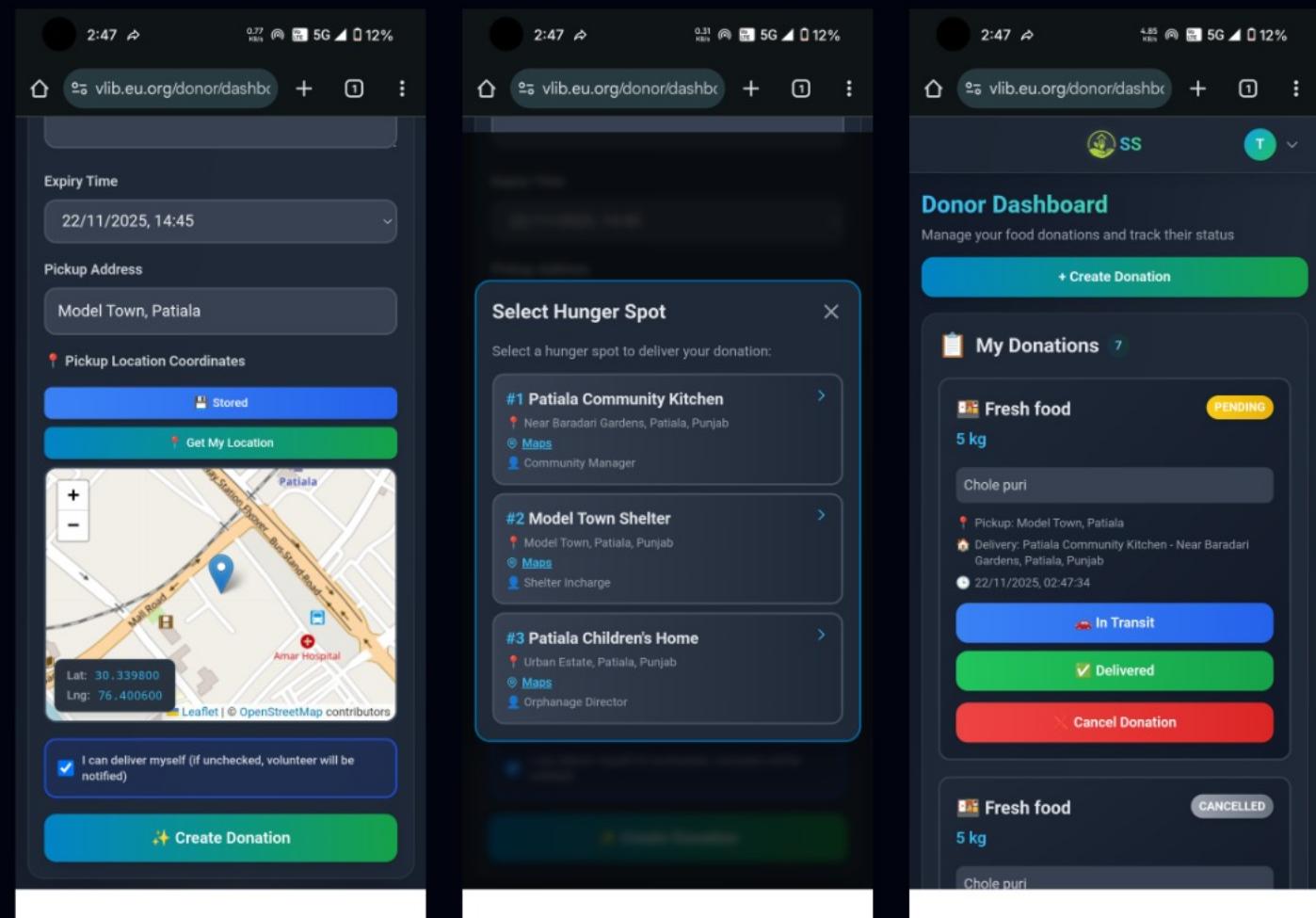


# Evolution with Feedback

We beta tested the program with 10 users and the User Feedback is what evolved the product into being what it is now.

# User Feedback #1 – Self Delivery

- **FEEDBACK:** I have a vehicle and don't always need a volunteer.
- **BEFORE:** System forced a volunteer search for every donation.
- **AFTER:** Added "I can deliver myself" toggle.
- **IMPACT:** Faster delivery for nearby locations; reduced volunteer load.



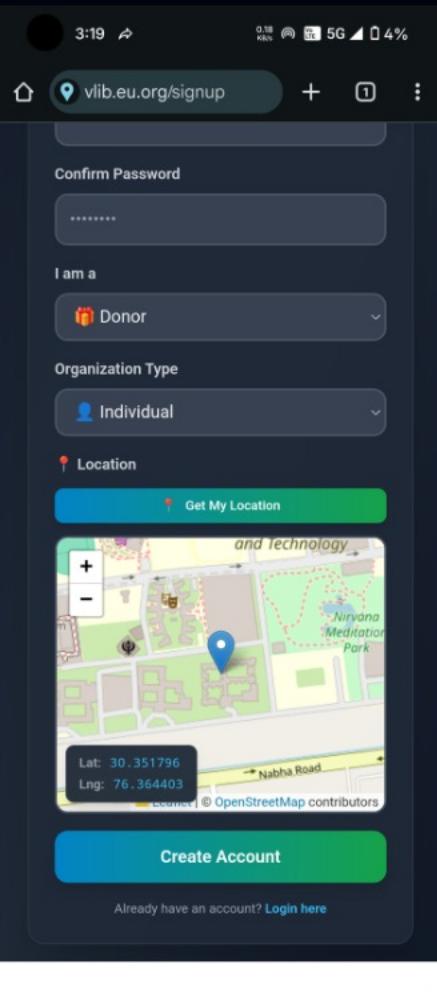
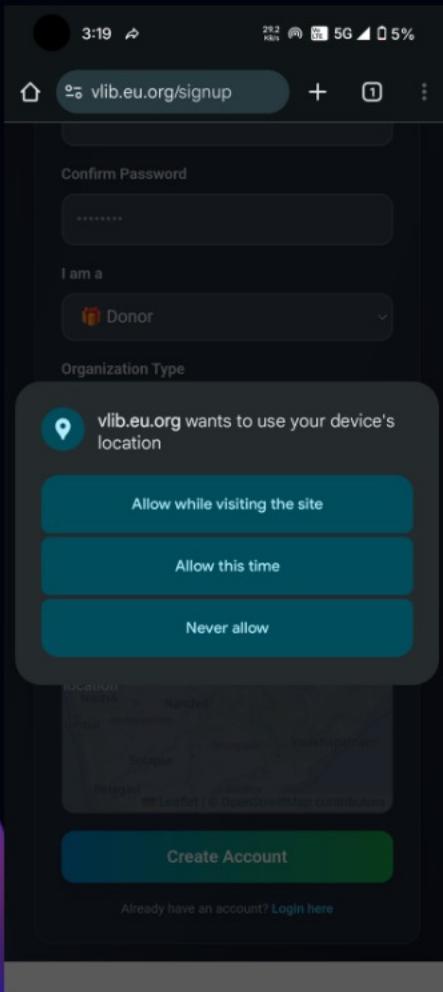
# User Feedback #2 - Location

- **FEEDBACK 1:** Specifying demographics manually is tedious and non intuitive.
- **Before:** Manual Coordinate Entry.
- **After:** "Get My Location" button using Browser Geolocation API and GPS.
- **Impact:** Zero address errors in testing.
- **FEEDBACK 2:** I don't always want to use my current location for pickup and i can't be sure if my coordinates are correct.
- **Before:** Only coordinates based location fetching
- **After:** A visible map with a pin on the fetched location.
- **Impact:** Users now had control over location.

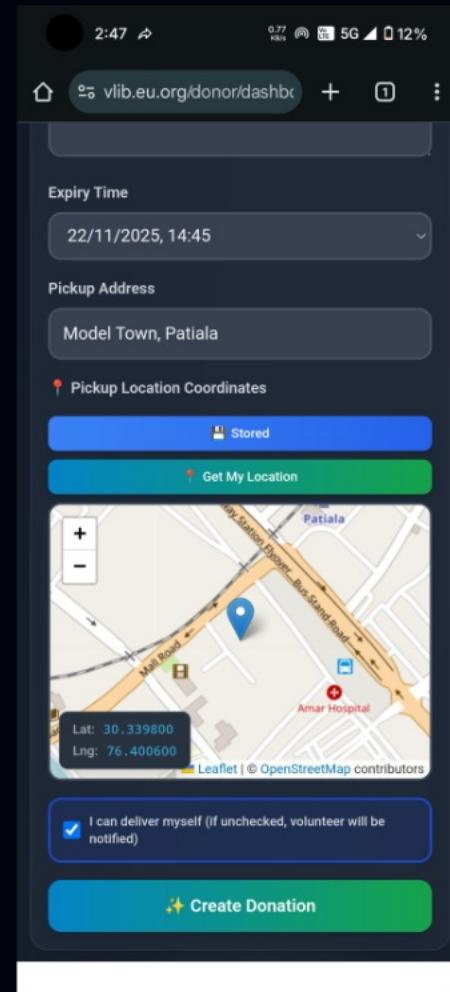
# User Feedback #2 - Location

Location Maps were added to :

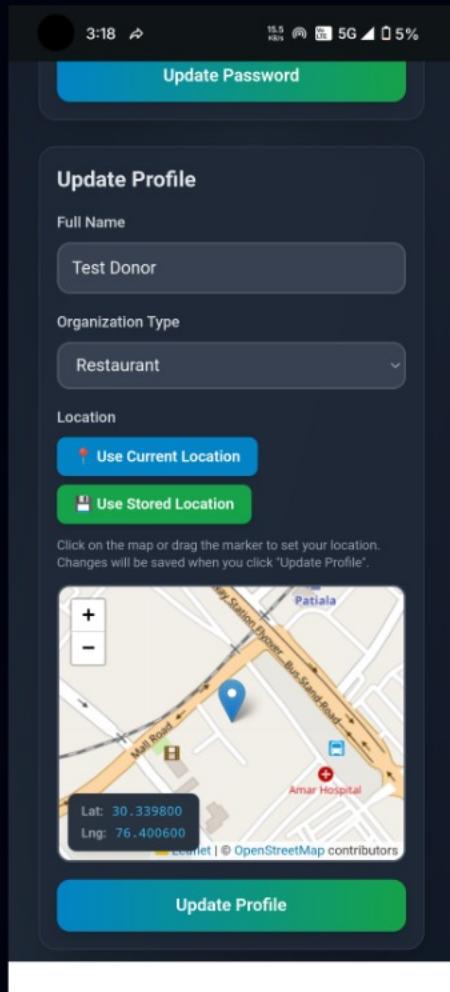
Sign Up Page (For Stored Location Quick Access)



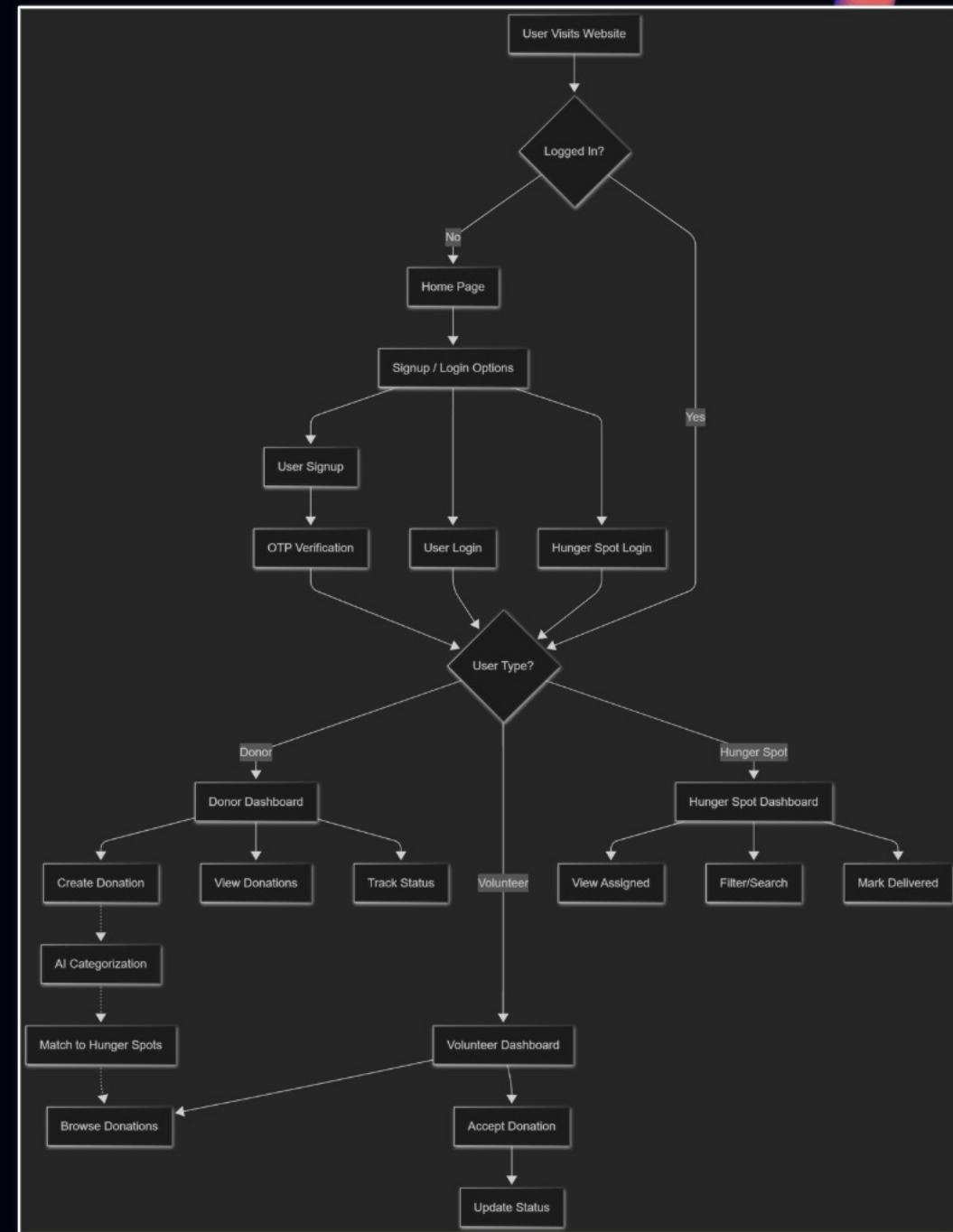
Donation Creation Page



User Profile Page



# User Flow Diagram





# Scalability and Future Scope

Our Vision for Second Serving's Future !

# Built to Scale

## The 'HyperLocal Pod' Strategy

- **Concept:** The platform operates on independent, self-sustaining "pods" defined by a 3km service radius around a donation.
- **Mechanism:** Uses MongoDB's geospatial `$near` queries to instantly create a temporary network of the nearest donor, volunteer, and hunger spot.
- **Advantage:** This decentralized logic means we can launch in a new city (e.g., Mumbai or Bangalore) without changing a single line of code—we simply start registering users in that location.

# Built to Scale

## Technical Scalability (Horizontal Scaling)

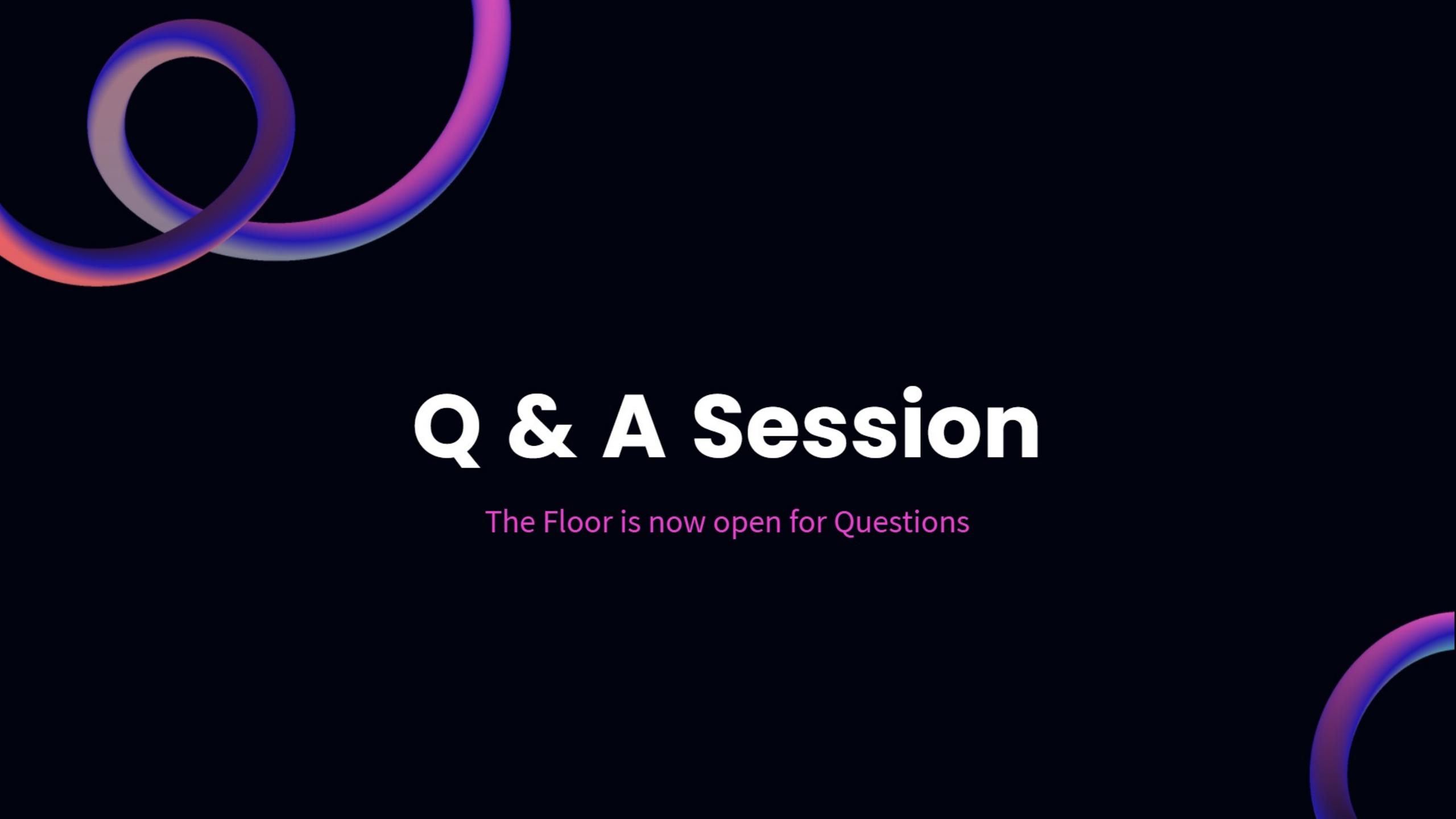
- **Containerization:** The entire application is Dockerized (Frontend + Backend), allowing us to deploy identical instances across multiple servers instantly.
- **Stateless Backend:** Our Node.js/Express API is stateless (uses JWT for Auth), meaning we can add more servers behind a load balancer during peak times (e.g., festivals like Diwali) to handle thousands of concurrent requests without data conflicts.
- **Database Performance:** MongoDB Atlas handles the heavy lifting of geospatial indexing, ensuring query speeds remain under 100ms even as the dataset grows to millions of users.

# Sustainability & Monetization

- Currently Second Serving is 100 % free and open source.
- While managing Second Serving for a small user base or 1 city is sustainable, as the user base expands and bigger NGOs start joining, sandboxing won't be sufficient.
- Our Future Plans for monetization include:
  - **FREEMIUM:** Becoming a Freemium platform staying free for individual and non-corporate donors.
  - **SUBSCRIPTIONS FOR CORPORATES:** CSR Reporting-as-a-Service for corporate. The platform would help corporates achieve their CSR Reporting goals and obtaining "**Green Certificate**".
  - **DATA LICENSING:** Anonymized Food Waste Reduction data shared with Government and Research Institutions.

# The Road Ahead

- Reducing Dependency on 3rd party services like Whatsapp.
- Mobile Application conversion for those willing to download an app.
- Use SMS sending verification instead of OTP (similar to how UPI verifications work).
- Monetization for Corporates.
- Automated Route Optimization - to enable multi donation pickup for single volunteer.
- Email Verification and Notification Services.
- Real Time Websockets and Push Notifications for app users.



# Q & A Session

The Floor is now open for Questions