Anna Mitra

Waste Management System

By Team EcoVision

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Executive Summary

Anna Mitra is a technology platform that rescues surplus cooked food from restaurants, events, hostels, and households and redistributes it to people in need through a verified network of NGOs and volunteers. The solution streamlines the end-to-end donation lifecycle—from posting a donation, matching it with the nearest NGO, assigning a volunteer for pickup, ensuring safe handling, and confirming delivery—while maintaining transparency and traceability at every step. The platform prioritizes speed, food safety, and accountability, and is intentionally designed around the actual screens and flows we have: Home, About, Contact, Login, Account, Donation creation & details, Donations list, and dashboards for Donor, NGO, Volunteer, and Admin.

1. Problem Statement

Large volumes of edible food are discarded daily while nearby communities remain food-insecure. Existing donation efforts are informal and fragmented, leading to:

- No central place to **announce surplus food** and make it discoverable.
- **Coordination gaps** between donors, NGOs, and volunteers; pickups are often late or duplicated.
- **Food safety risks** due to unclear handling practices and time limits.
- **Lack of transparency**—donors rarely know whether their food was collected and delivered on time.

Anna Mitra addresses these gaps with a single coordinated system.

2. Goals & Objectives

1. **Fast, reliable matching** of surplus food with nearby NGOs/volunteers before it expires.
2. **End-to-end visibility** of the donation lifecycle for all stakeholders.
3. **Built-in food safety** through checklists, time windows, and handling guidelines.
4. **Trust & accountability** using verification, ratings, and delivery proofs.
5. **Actionable insights** via dashboards and reports to increase impact over time.

3. Stakeholders & Roles

- **Donor** (restaurant/event/household): creates donations, lists items, preferred pickup window, contact/location.
- **NGO**: views nearby donations, claims suitable ones, coordinates volunteer pickup, confirms delivery.
- **Volunteer**: accepts/gets assigned pickups, sees route/map, follows safety checklist, marks handover.
- **Admin**: monitors Donations, manages users, moderates content, and monitors platform metrics.

4. Core Features (Mapped to Screens We Have)

4.1 Public Site

- **Home**: mission, quick stats, "Donate Food" CTA, testimonials.

- **About (Who We Are)**: story, vision, sustainability focus—no IoT bins; purely donation & redistribution.
- **Contact**: contact form and support details.

4.2 Access & Accounts

- **Login/Signup**: email/OTP based; role selection (Donor/NGO/Volunteer).
- **Account**: profile info, addresses/locations, organization documents (for NGO verification), notification settings.

4.3 Donation Lifecycle (Donor → NGO → Volunteer)

- **Create Donation (Donation Page)**
  - Add pickup location and donation & contact details.
  - **Add Items (New Item Modal)**: item name, quantity/units, packaging, best-before time, dietary tags.
  - Save draft or publish.
- **Donations List (for Donor & NGO)**: status filters (Open, Claimed, In Pickup, Delivered, Expired/Cancelled).
- **Donation Details**: complete timeline, items list, map, action buttons (Claim, Schedule Pickup, Mark Picked, Mark Delivered).
- **Notifications**: real-time alerts for nearby NGOs when a donation is posted; donors receive claim/pickup/delivery updates.
- **Proof of Delivery**: volunteer uploads photo + recipient NGO signature/OTP; auto-closes donation.

4.4 Role Dashboards

- **Donor Dashboard**
  - Quick action: Create Donation.
  - History: Past donations, Pending confirmations, Recent deliveries.

- ○ Manage Profile

- **NGO Dashboard**
  - ○ Nearby open donations.
  - ○ One-click Request; assign to available volunteer; set delivery destination (shelter/community point).
  - ○ Compliance tracker: food safety checklist completion.
- **Volunteer Dashboard**
  - ○ "My Assignments" with pickup & drop addresses, ETA, map link.
  - ○ Stepper flow: Start → At Donor → Picked → At NGO → Delivered.
  - ○ Upload proof (photo + OTP).
- **Admin Dashboard**
  - ○ User/NGO verification (documents & status).
  - ○ Monitor Donations
  - ○ Control over all users
  - ○ Create other admin profiles (if Super Admin)

5. Detailed Workflow

1. **Post**: Donor publishes donation with items and pickup window.
2. **Notify**: Nearby NGOs receive push/email/ SMS alerts; list shows freshness/time remaining.
3. **Request**: NGO request; donor receives the donation requests from multiple ngos and accepts one.
4. **Assign**: NGO assigns a volunteer (or volunteer self-accepts from open pool).
5. **Pickup**: Volunteer follows in-app checklist (packaging, vehicle hygiene), marks Picked.

6. **Handover**: At delivery point, volunteer records photo as proof; marks Delivered.
7. **Close & Rate**: System closes donation, updates metrics; donor/NGO can rate the experience and leave feedback.

6. Food Safety & Compliance

- Time-bound pickups based on best-before and ready-on fields.
- Mandatory safety checklist for pickup (packaging intact, temperature safe, vegetarian separation).
- Educational hints on the donation form (e.g., cool food to safe temperature before dispatch).

7. Data Model (High-Level)

- **User** {id, name, role, phone/email, verified, addresses[]}
- **Organization (NGO)** {id, name, docs, service area, rating, verified}
- **Donation** {id, donorId, location, readyBy, pickupWindow, notes, status}
- **DonationItem** {id, donationId, name, qty, unit, vegFlag, allergens, bestBefore}
- **Assignment** {id, donationId, ngoId, volunteerId, status, timestamps}
- **Proof** {assignmentId, photos[], otp/signature, deliveredAt}
- **Notification** {userId, channel, payload, sentAt, readAt}
- **Feedback** {fromUserId, toEntityId, rating, comment}

8. Non-Functional Requirements

- **Performance**: publish→notify latency < 5s in target city.
- **Availability**: 99.5% during peak donation hours.

- **Security**: JWT auth, encrypted PII at rest, audit logs.
- **Privacy**: donors can hide phone; communication via masked calls/OTP.
- **Localization**: multi-language strings (English/Hindi/Gujarati initially).
- **Accessibility**: readable contrast, large tap targets, offline-first volunteer app.

9. Technology Stack (Planned)

- **Frontend**: React (web).
- **Backend**: Node.js + Express (REST).
- **DB**: PostgreSQL or MongoDB.
- **Location/Maps**: Google Maps Platform.
- **Notifications**: Firebase Cloud Messaging + email/SMS gateway or other.
- **Storage**: Cloud object storage for proofs or other.
- **Deployment**: Docker + Cloud VM/Containers (AWS/GCP) or other.

10. Risks & Mitigations

- **Late pickups / expiries** → SLA timers, auto-reassign, reminder bursts.
- **Food safety incidents** → strict checklist + education + audit trail.
- **Low volunteer supply** → open pool + incentives/badges + NGO escalation.
- **Duplicate claims** → lock window + atomic status transitions.

11. Future Enhancements

- Event-mode bulk donations; recurring schedules for hostels/messes.
- Corporate CSR dashboards and impact certificates.
- Route batching for volunteers; basic route optimization.
- In-app chat with masking; multilingual voice prompts.

12. Conclusion

Anna Mitra is a practical, screen-aligned platform to reduce hunger and food waste by connecting donors, NGOs, and volunteers and managing the full

donation lifecycle with safety and accountability. The design mirrors the actual functionality present in our current screens: public pages (Home/About/Contact), authentication and account management, Donation creation + items modal, Donations list & details, and role‑specific dashboards (Donor/NGO/Volunteer/Admin). This proposal lays out the path to deliver a usable, impactful system within the semester.