Team ID	NM2025TMID06277
Project Name	Apply Leftover Food to Poor
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4. Project Design Phase — Apply Leftover Food to Poor

4.1 Introduction

The Project Design Phase establishes a comprehensive blueprint for the leftover food redistribution system.

4.2 System Architecture

The system architecture follows a client-server model integrating the following layers:

Presentation Layer: User interfaces for donors, volunteers, NGOs, and beneficiaries accessible via mobile apps.

Application Layer: Backend services handling logistics, scheduling, food safety compliance, notifications, and data.

Data Layer: Centralized database storing donor data, donation records, volunteer schedules, delivery logs, and safety.

4.3 Data Flow Diagram (DFD) Overview

Level 0 (Context Diagram): Illustrates the system as a single process interacting with external entities like donors, NGOs, volunteers, and beneficiaries.

Level 1: Breaks down into subsystems such as Food Collection Scheduling, Donation Tracking, Volunteer Management, and Distribution Reporting.

4.4 Entity–Relationship (ER) Diagram Overview

Relationships: Donors provide Food Items; Volunteers are assigned to Vehicles and Delivery Schedules; NGOs coordinate Beneficiaries and Distribution Points.

Attributes include donor contact info, food type/quantity, volunteer roles, delivery timestamps, and safety compliance data.

The ER diagram supports normalization for efficient storage and retrieval.

4.5 Module Design

Food Safety Module: Tracks temperature, spoilage checks, and compliance reporting.

Volunteer Management Module: Handles recruitment, task allocation, and performance

Notification Module: Sends real-time alerts to donors, volunteers, and NGOs.

Reporting Module: Generates analytics on waste reduction, distribution efficiency, and user

4.6 User Interface Design

Intuitive, multilingual mobile and web platforms with role-based dashboards.

4.7 Database Design

Relational database with tables for each entity and foreign key constraints for relationships.

4.8 Security and Data Handling

Encrypted passwords, role-based access control, HTTPS.

Minimal retention of donor contact info; consent flow for contact use.

Documenting food-safety checks stored with each Donation record.