

Phase 3: Project Design Phase

Project Title: To Supply Leftover Food to the Poor

Introduction

The design phase is a crucial part of project development that converts requirements into a practical and structured model. In this phase, the system design for “To Supply Leftover Food to the Poor” is developed to illustrate how the platform functions, its main components, and the flow of data between different modules. The design ensures that the system is easy to use, efficient, and capable of managing the collection and distribution of leftover food from donors to the needy through volunteers and NGOs.

System Design Overview

The system is designed to create a smooth and reliable connection between **Donors, Volunteers, and Receivers (NGOs or shelters)**. It includes modules for registration, food listing, tracking, notifications, and reporting. The design focuses on providing real-time coordination between donors and delivery agents, ensuring food safety, timely distribution, and minimal wastage.

Architectural Design

The system follows a Client–Server Architecture based on a cloud or web-based environment.

- **Client Side:**
Accessed by users such as donors, volunteers, and NGO staff through a mobile application or web portal.
- **Server Side:**
Stores and manages all information including user data, food listings, pickup and delivery records, and reports.
The server handles all requests, ensures data security, and updates the system in real time.

This architecture provides fast communication, easy scalability, and secure handling of food donation data.

Entity Relationship (ER) Design

The **ER Diagram** defines the logical structure of the system, showing the relationship between main entities:

- **Donor Entity:** Stores donor details such as Name, Contact Information, Address, and Type of Donor (Restaurant, Event, Individual).
- **Volunteer Entity:** Contains Volunteer ID, Name, Contact, Area, and Availability Status.
- **Receiver Entity:** Stores NGO or shelter details like Name, Contact, Location, and Capacity.
- **Food Donation Entity:** Includes Donation ID, Food Type, Quantity, Expiry Time, and Status (Pending, Picked, Delivered).

Relationships:

- A **Donor** can create multiple **Food Donations**.
- A **Volunteer** can handle multiple **Pickups and Deliveries**.
- Each **Food Donation** is linked to one **Receiver**.
- All transactions are recorded and monitored through the system dashboard.

This design ensures efficient management and tracking of food movements between all parties.

Data Flow Design

The data flow within the system follows these steps:

1. Donor lists leftover food details through the app or website.
2. The system notifies nearby Volunteers about the new donation.
3. A Volunteer accepts the pickup and collects the food.
4. The Receiver (NGO/Shelter) confirms the delivery and updates the status.
5. The system generates reports on donations, deliveries, and beneficiaries served.

This design ensures real-time coordination, reduces manual work, and promotes accountability.

User Interface Design

The user interface is designed to be simple, intuitive, and accessible for all users:

- **Home Page:** Displays total donations, active volunteers, and daily beneficiaries served.
- **Donor Page:** Allows users to post, view, or manage food donations.
- **Volunteer Page:** Shows nearby donations, pickup requests, and delivery status.
- **Receiver Page:** Displays expected deliveries and received food records.
- **Dashboard:** Summarizes real-time statistics such as total food donated, number of people served, and active deliveries.

The interface ensures that users with basic computer or smartphone knowledge can easily operate the system.

Functional Design

The main functions of the system include:

- **Donor Management:** Add and manage leftover food details and availability.
 - **Volunteer Coordination:** Assign and track pickup and delivery tasks.
 - **Receiver Management:** Manage NGO or shelter records and delivery confirmations.
 - **Notification System:** Send alerts to volunteers and receivers about new donations or completed deliveries.
 - **Reporting and Dashboard:** Display statistics, history of donations, and performance metrics.
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Security and Access Design

Security is a key focus in system design.

- Only registered users can log in to the system.
 - Donors, volunteers, and receivers have separate access privileges.
 - All data (user details, donation records, and delivery history) is securely stored in the database.
 - Authentication and encryption methods ensure safe and private data handling.
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Output Design

The expected outputs of the system include:

- **Reports** on total donations, food delivered, and beneficiaries.
 - **Dashboards** showing live status of donations and volunteer activities.
 - **Notifications** for new donations, pending pickups, and completed deliveries.
 - **Delivery Confirmations** recorded digitally for transparency.
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Conclusion

The Project Design Phase defines the structure and operation of the “To Supply Leftover Food to the Poor” system. The design provides clear data flow, user-friendly interfaces, and secure architecture for managing donations and deliveries. By linking donors, volunteers, and receivers through a digital platform, the system ensures that leftover food is distributed efficiently, reducing waste and hunger. This design lays a strong foundation for successful implementation and real-world impact.