Solution Architecture Document

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Team ID	LTVIP2025TMID31579
Project ID	To Supply Le over Food to Poor
Maximum Marks	

1.Introduction:

This document outlines the solution architecture for the "To Supply Leftover Food to Poor" project. The goal is to create a centralized platform that connects food donors with recipients, automating the process of food donation and distribution while minimizing food waste.

2. Architecture Overview:

The architecture of the solution is designed to be modular, scalable, and user-friendly. It consists of the following key components:

2.1. System Components

- **Frontend Application**: A web and mobile interface for users (donors, recipients, and volunteers) to interact with the system.
- **Backend Services**: RESTful APIs to handle business logic, data processing, and integration with external systems.
- **Database**: A relational or NoSQL database to store user data, food donation records, and transaction logs.
- **Notification Service**: A service to send real-time notifications to users about food availability and requests.
- **Analytics Dashboard**: A reporting tool for tracking donations, food waste reduction, and user engagement metrics.

2.2. User Roles

- **Donors**: Users who provide food donations (e.g., restaurants, individuals).
- **Recipients**: Nonprofit organizations and individuals who receive food donations.
- **Volunteers**: Users who assist in the logistics of food pickup and delivery.
- **Administrators**: Users who manage the platform, monitor activities, and ensure compliance.

3. Features:

The solution will include the following essential features:

3.1. Core Features

- **User Registration and Authentication**: Secure sign-up and login for all user roles.
- **Food Donation Listings**: Donors can list available food items, including details such as quantity, type, and pickup times.
- **Recipient Requests**: Recipients can request food based on their needs and preferences.

- **Real-Time Notifications**: Automated alerts for donors about food requests and for recipients about available food.
- **Logistics Management**: Tools for scheduling pickups and deliveries, including route optimization.

3.2. Additional Features

- **Reporting and Analytics**: Dashboards to track food donations, waste reduction, and impact metrics.
- **Feedback Mechanism**: Allow users to provide feedback on the donation process and logistics.
- **Community Engagement Tools**: Features to promote awareness and encourage community participation in food donation efforts.

4. Data Flow:

The data flow within the system can be summarized as follows:

1. **User Registration**: Users register and create profiles.
2. **Food Donation**: Donors list available food items through the frontend application.
3. **Food Request**: Recipients submit requests for food through the application.
4. **Notification**: The system sends notifications to donors and recipients based on actions taken.
5. **Logistics Coordination**: Volunteers manage the logistics of food pickup and delivery.
6. **Reporting**: Data is collected and analyzed for reporting purposes.

5. Technical Specifications:

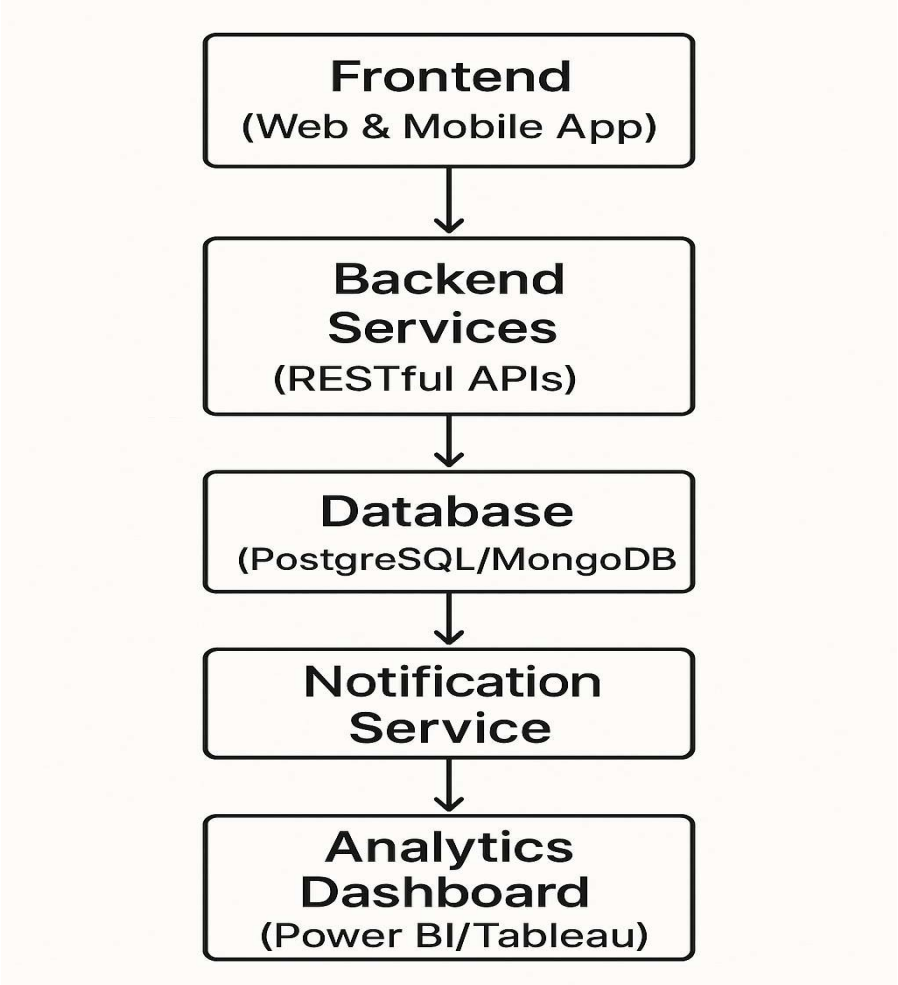
5.1. Technology Stack

- **Frontend**: React / Angular for web applications; React Native / Flutter for mobile applications.
- **Backend**: Node.js / Express or Python / Django for server-side processing.
- **Database**: PostgreSQL / MongoDB for data storage.
- **Cloud Infrastructure**: AWS / Azure for hosting and scalability.
- **Notification Service**: Firebase Cloud Messaging or Twilio for real-time notifications.
- **Analytics**: Power BI / Tableau for reporting and analytics.

5.2. Security Measures

- **User Authentication**: Implement OAuth 2.0 or JWT for secure user authentication.
- **Data Encryption**: Use HTTPS for secure data transmission and encrypt sensitive data in the database.
- **Access Control**: Role-based access control to ensure users can only access features relevant to their roles.

7. **Architecture Diagram:**



7. Conclusion:

The proposed solution architecture for "To Supply Leftover Food to Poor" aims to create a robust, scalable, and user-friendly platform that effectively connects food donors with recipients. By automating the donation process and providing real-time notifications, the system will significantly reduce food waste and improve food access for those in need.