Phase 3: Project Design Phase

Project Title: To Supply Leftover Food to Poor

Introduction

The project design phase is a pivotal step that translates the project's conceptual ideas and requirements into a technical blueprint. For the "To Supply Leftover Food to Poor" initiative, this phase outlines the system's operational logic, its core components, and the flow of data between various modules. The primary objective is to create a design that is efficient, intuitive for all users, and robustly meets the goal of curbing food surplus by ensuring timely delivery to those in need.

System Design Overview

This system is designed as a scalable, modular solution built on the Salesforce platform. The design integrates key components like custom objects, defined relationships, automated flows, and analytical reports. A central tenet of the design is ensuring that all key entities—donors, NGOs, volunteers, and the food donations themselves—are logically linked. This interconnected data model is essential for enabling a seamless operational flow, from the initial food registration to the final delivery confirmation. The architecture prioritizes automation and transparent communication for all stakeholders.

Architectural Design

The system's architecture leverages the native client-server model of Salesforce's secure cloud infrastructure.

- **Client-Side:** This consists of the user-facing interface (Salesforce Lightning or the mobile app) where donors, NGOs, and volunteers interact with the system.
- **Server-Side:** This is managed entirely by Salesforce, which securely handles all data storage, processing, and reporting functions.

This architecture ensures that all transactions, from data entry to delivery updates, are processed in real-time without requiring manual intervention.

Entity Relationship (ER) Design

The Entity Relationship (ER) design defines the database's logical structure within Salesforce. It establishes the key entities (objects) and their relationships:

Core Objects:

- **Donor (Object):** Stores key information such as Donor Name, Contact, Location, and Type (e.g., Restaurant, Hostel).
- **NGO (Object):** Contains the name, address, and contact details for all recipient organizations.
- **Volunteer (Object):** Manages volunteer names, contact info, and their assigned delivery zones.
- **Food (Object):** Captures details for each donation, including Food Type, Quantity, Expiry Time, and Availability Status.
- **Delivery (Object):** Tracks the logistics, such as Pickup Time, Drop Location, and the final Delivery Status.

Relationships:

- A Donor can be linked to many Food donations.
- An NGO can receive multiple Deliveries.
- A Volunteer can be associated with one or more Food donations.
- Each Delivery record links one NGO and one Volunteer.

This data model ensures every step is linked, providing complete traceability for all food movements.

Data Flow Design

The system's data flow is designed for automation and real-time tracking, following these steps:

1. **Donation Entry:** A Donor logs a new Food Donation record into the system.
2. **Automated Alert:** A Salesforce Flow instantly triggers, notifying nearby Volunteers and NGOs of the new donation.
3. **Acceptance:** A Volunteer accepts the pickup request.
4. **Record Creation:** A new Delivery Record is generated, automatically linking the Donor, Volunteer, and the designated NGO.
5. **Completion:** Upon successful delivery, the status is updated. This action feeds data into the reports and dashboards to reflect the impact.

This automated flow minimizes manual effort and enables real-time distribution tracking.

User Interface Design

The user interface (UI) will be built with the Salesforce Lightning App Builder for a clear, modern, and easy-to-use experience.

- **Home Page:** Provides a high-level overview with summary dashboards (total donations, active volunteers, etc.).
- **Donor Page:** Allows donors to manage their profile, submit new donations, and view their donation history.
- **Volunteer Page:** Lists assigned pickups and delivery route information.
- **NGO Page:** Displays food requests they have received, accepted, and that have been fulfilled.
- **Delivery Page:** Shows the status and details for all ongoing and completed deliveries.
- **Reports & Dashboards:** Offers graphical summaries of donations, volunteer activity, and beneficiaries.

The UI philosophy emphasizes simplicity to ensure adoption by users who may not be highly technical.

Functional Design

The system is designed to perform these core functions:

- **Donor Management:** Add, update, and track all donor information.
- **Food Donation Management:** Register and manage details of leftover food, including quantity and expiration.
- **NGO Coordination:** Notify NGOs about available food and track their responses.
- **Volunteer Assignment:** Automatically assign volunteers to nearby donations using automated workflows.
- **Delivery Tracking:** Record pickup/delivery details and monitor the completion status.
- **Automation:** Utilize Salesforce Flows to send real-time alerts and update records automatically.
- **Reporting and Analytics:** Generate analytical data to measure impact and performance.

Security and Access Design

Data security is enforced through robust access controls and permission sets to ensure secure handling:

- **Role-Based Access:** Donors, NGOs, and Volunteers will have restricted access based on their specific roles.
- **Admin Control:** System Administrators will have full access to all objects and settings.
- **Data Integrity:** Only authorized users will have permission to modify donation or delivery records.
- **Data Encryption:** Salesforce's native encryption will be used to protect all personal and sensitive data.

This security model guarantees that sensitive information is protected at all times.

Output Design

The primary outputs of the system will be analytical and action-oriented:

- **Live Dashboards:** Visualizing total donations, deliveries, and beneficiary numbers.

- **Impact Metrics:** Specific data points on total food saved and people fed.
- **Summary Reports:** Breakdowns of activity by volunteer, NGO, and donor.
- **Automated Notifications:** Real-time alerts for new food donations or completed deliveries.

Conclusion

This Project Design Phase establishes the complete technical and functional blueprint for the "To Supply Leftover Food to Poor" system. The design, with its clearly defined data model and automation, is built to facilitate efficient coordination between all stakeholders. By leveraging the Salesforce platform, the proposed system will be secure, scalable, and user-friendly, promoting transparency and accountability. This design provides the solid foundation necessary for implementing a real-world solution to help reduce both hunger and food waste.