**PROJECT DESIGN PHASE**

**PROBLEM–SOLUTION FIT**

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| **Date** | 18th June 2025 |
| **Team ID** | LTVIP2025TMID28938 |
| **Project Name** | To supply leftover food to poor |
| **Maximum Marks** |  |

**Objective of Problem–Solution Fit**

The **Problem–Solution Fit** phase ensures that the system being built effectively solves the real-life challenges faced by key users—**food donors, volunteers, and NGOs**. It validates that the solution is not only technically feasible but also **relevant, usable, and impactful** in the context of leftover food redistribution.

**This phase helps to:**

* **Align the platform’s features with actual pain points** faced during donation, pickup, and delivery
* **Understand behavioral patterns** of donors and volunteers (e.g., urgency, preferred communication methods, time constraints)
* **Increase trust, adoption, and continued participation** by ensuring that the system fits naturally into users’ existing workflows
* **Design the right solution before scaling**, preventing wastage of time and effort on features that don’t solve real problems

**1. Target Customer Segments**

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| |  |  | | --- | --- | | **Customer Type** | **Description** | | Food Donors | Individuals, households, restaurants, or event organizers who offer surplus food for donation. They initiate the process by submitting available food details. | | Volunteers | Individuals responsible for picking up food from donors and delivering it to NGOs or distribution centers. Their role is time-sensitive and logistics-driven. | | NGOs/Beneficiary Centers | Organizations that receive and distribute the donated food to those in need. They coordinate with volunteers to ensure proper delivery and handling. | | Admins/Coordinators | System managers who oversee donor requests, assign volunteers, monitor delivery status, and generate impact reports. | |

## ****2. Problem Statement (As-Is Situation)****

Food donation efforts, particularly in informal or unstructured environments, face significant operational challenges due to the absence of a coordinated system. Currently, most processes are handled manually, which leads to:

* Food donation details being shared through phone calls or messaging apps (e.g., WhatsApp)
* Volunteer assignments being made ad-hoc, without real-time tracking
* No proper records of donors, pickup status, or delivery confirmation
* No automated communication or acknowledgment to donors
* Perishable food getting wasted due to delays or missed pickups

### 🔍 ****Key Problems Identified:****

* **No centralized platform** for tracking food availability, volunteer assignments, and delivery status
* **Delayed pickups** and poor time coordination, often resulting in food spoilage
* **Lack of validation** or expiration-based priority, causing resource mismatches
* **Manual communication**, leading to miscommunication and missed opportunities
* **No feedback or visibility** for donors, reducing transparency and ongoing engagement

**3. Current Workaround**

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| **Existing Practice** | **Limitation** |
| Donors call or message volunteers directly | Leads to coordination issues, delayed pickups, and missed donations |
| Pickup status shared via WhatsApp | No official tracking, no delivery confirmation, and data gets lost |
| Volunteer tasks assigned manually | No scheduling or prioritization based on food type or expiry time |
| No centralized donor/volunteer records | Hard to follow up, report impact, or build ongoing engagement |
| No reports or visual tracking | Stakeholders lack insight into food saved, deliveries completed, or active areas |

## **“Leftover Food Distribution Management System”** is a centralized digital platform designed to streamline the process of collecting, managing, and distributing surplus food from donors to those in need. It eliminates manual coordination and ensures efficient tracking, transparency, and communication.

### Core Solution Features:

* **Donor Record Creation:** All donor information (name, contact, address) is stored using a Donor\_\_c object for future communication and reporting.
* **Food Donation Management:** Details of food donations (item name, quantity, preparation and expiry time) are captured and stored in a Food\_Donation\_\_c object.
* **Volunteer Assignment and Delivery Tracking:** A Delivery\_\_c object links volunteers to donations and tracks the entire process from pickup to delivery, including timestamps and status.
* **Automated Communication Flow:** Triggers send email/SMS notifications to donors and volunteers upon pickup assignment, successful collection, and final delivery.
* **Validation Rules:** Enforce constraints such as rejecting expired food donations and preventing duplicate volunteer assignments.
* **Dashboards and Reports:** Generate real-time insights on food collected, meals delivered, active donors, and volunteer performance.
* **Role-Based Access Control:**
  + **Donors:** Can log new donations and track donation history.
  + **Volunteers:** Can view and accept assigned pickup and delivery tasks.
  + **Admins/NGO Coordinators:** Can oversee all records, monitor progress, and access performance reports.

**5. How the Solution Solves the Problem**

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| **Problem** | **Feature/Function that Solves It** |
| No tracking of donation or delivery status | Custom objects (Food\_Donation\_\_c, Delivery\_\_c) with lookup relationships |
| Donors unaware of what happens to their food | Automated email/SMS updates through Record-Triggered Flows |
| Volunteer overload or confusion | |  | | --- | |  |  |  | | --- | | Role-based volunteer assignment and task tracking | |
| No centralized donor/volunteer records | Structured data model with Donor\_\_c and Volunteer\_\_c objects |
| No insights into impact or performance | Dashboards and reports to show food saved, delivery timelines, etc. |

**. Solution Adoption Channels**

* Web application built using Salesforce Lightning UI for real-time access and usability
* Access controlled by user roles such as **Donor**, **Volunteer**, and **Admin/NGO Coordinator**
* Email/SMS alerts automatically sent to donors upon successful pickup and delivery
* Reports and dashboards accessible by coordinators/admins for monitoring donations, deliveries, and volunteer activity

**7. Solution Validation**

The solution was tested using multiple test scenarios and validated for the following:

* **Record-triggered flows** correctly sending email updates to donors and volunteers
* **Volunteer assignment logic** working as expected without overbooking or conflicts
* **Validation rules** properly preventing expired food entries or duplicate delivery tasks
* **Role-based access** correctly restricting visibility and edit permissions based on user profiles
* **Dashboards and reports** accurately displaying total donations, deliveries completed, and meals served

Screenshots and detailed test results are included in the Performance Testing section of the documentation.

**Problem–Solution Fit Canvas for *Leftover Food Distribution Management System***

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| **Section** | **Description** |
| **1. Customer Segment(s) (CS)** | - Food Donors (restaurants, households, caterers) - Volunteers (pickup/delivery agents) - NGOs / Coordinators managing distribution |
| **2. Jobs-to-be-Done / Problems (J&P)** | - Log available surplus food easily - Assign and manage pickups efficiently - Confirm delivery to build trust - Track food status and impact |
| **3. Triggers (TR)** | - Food going to waste due to poor coordination - Missed pickups due to unclear schedules - Lack of transparency to donors and NGOs |
| **4. Emotions Before / After (EM)** | **Before:** Disorganized, unsure, disappointed, overwhelmed **After:** Confident, accountable, engaged, appreciated |
| **5. Available Solutions (AS)** | - Phone calls, WhatsApp, or informal Google Forms **Cons:** No real tracking, prone to miscommunication, no data storage or reporting |
| **6. Customer Constraints (CC)** | - Limited digital skills among volunteers - No access to premium software tools - Budget and device limitations |
| **7. Behaviour (BE)** | - Manually note food donations - Call volunteers to arrange pickups - No tracking of delivery or expiry - Use WhatsApp for status updates |
| **8. Channels of Behaviour (CH)** | **Online:** WhatsApp, phone calls, occasional spreadsheets **Offline:** Manual logs, verbal coordination, physical collection notes |
| **9. Problem Root Cause (RC)** | - No centralized system to log, assign, and track food movement - Manual communication leads to delays - No reporting or feedback loop |
| **10. Your Solution (SL)** | Digital platform built on Salesforce with: - Custom Objects (Donor, Food\_Donation, Volunteer, Delivery) - Record-triggered Flows for alerts - Validation rules for expiry and volunteer load - Dashboards and reports for meals saved and delivery efficiency - Role-based access to match real user roles and comfort levels  • Matches behavior (simple interface, low entry barrier) • Solves major pains (coordination, tracking, transparency) • Adapts to constraints (mobile-ready, scalable, role-specific access) |

**PROPOSED SOLUTION**

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| **Project Summary Table – *Leftover Food Distribution Management System***   |  |  |  | | --- | --- | --- | | **S. No.** | **Parameter** | **Description** | | 1 | **Problem Statement (Problem to be solved)** | Leftover food from restaurants, homes, and events often goes to waste due to lack of a centralized system for donation logging, pickup coordination, and delivery tracking. Manual coordination leads to inefficiency, food expiry, and missed opportunities to feed the needy. | | 2 | **Idea / Solution Description** | A cloud-based application built on Salesforce to manage food donation and delivery. Key components include: - Custom objects for Donor, Food\_Donation, Volunteer, and Delivery - Record-triggered Flows for status notifications - Validation rules to ensure timely pickup - Reports and dashboards to track meals served and donor engagement - Role-based access for donors, volunteers, and coordinators | | 3 | **Novelty / Uniqueness** | - Brings food donors, NGOs, and volunteers into one unified platform - Tracks the full lifecycle of a food donation (from source to delivery) - Minimizes manual coordination through automation and real-time updates - Uses low-code tools for flexibility and ease of deployment | | 4 | **Social Impact / Customer Satisfaction** | - Reduces food wastage and helps address hunger - Builds trust through automated pickup and delivery confirmations - Empowers NGOs with data-driven insights - Encourages citizens to contribute regularly by making donation easy and trackable | | 5 | **Business Model (Revenue Model)** | - Can be offered as a nonprofit platform supported by CSR donations or NGO partnerships - Optional revenue through feature-based access for large-scale donors/partners - Could be scaled with government or municipal collaboration as a public utility | | 6 | **Scalability of the Solution** | - Salesforce's cloud infrastructure ensures easy scaling across cities or regions - Extendable with mobile access, SMS gateway, maps integration - Can support large donor networks and multiple NGO partners with centralized r | |

**SOLUTION ARCHITECTURE**

**What is Solution Architecture?**

**Solution Architecture** is the structured blueprint that translates real-world problems—like poor coordination in food donation and delivery—into a well-designed, technical solution. It connects **user needs** with **technology**, ensuring the system is both functional and scalable.

It includes:

* Structure of the system (objects, flows, rules)
* How components behave and interact (data flow)
* Technologies used (Salesforce tools, automation, UI)
* Security, integrations, and deployment design

**Goals of the Solution Architecture for This Project:**

* Design an efficient, role-based food donation tracking system using Salesforce
* Define custom objects like **Donor**, **Food\_Donation**, **Volunteer**, **Delivery**
* Use **Flows**, **Validation Rules**, and optional **Apex Triggers** for automation
* Ensure secure access through **Profiles** and **Permission Sets**
* Provide scalability for expansion across multiple regions or NGOs

**Core Components of the Architecture**

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| **Layer** | **Component** | **Description** |
| **Presentation Layer** | Salesforce Lightning UI | Donors, Volunteers, and Coordinators interact via user-friendly pages and Lightning Apps |
| **Business Logic Layer** | Record-Triggered Flows, Validation Rules | Automates email updates, checks expiry, prevents duplicate or invalid assignments |
| **Data Layer** | Custom Objects: Donor\_\_c, Food\_Donation\_\_c, Volunteer\_\_c, Delivery\_\_c | Stores and relates food donations, pickup details, and delivery records |
| **Security Layer** | Profiles, Permission Sets | Controls who can see/edit what: Donors, Volunteers, NGO Admins |
| **Reporting Layer** | Dashboards and Reports | Real-time data on donations, deliveries completed, meals served, and volunteer performance |

## ****Data Flow within the System (User Journey)****

**User Journey:**

1. **Donor logs surplus food** → Donor\_\_c and Food\_Donation\_\_c records created
2. **Coordinator reviews donation** → Assigns available Volunteer\_\_c
3. **Pickup scheduled** → Delivery\_\_c created
4. **Validation checks** → Ensures food is not expired, volunteer isn’t overbooked
5. **Record-Triggered Flow** → Sends pickup confirmation to donor
6. **Post-delivery** → Status updated, success metrics logged in reports

**Sample Architecture Diagram**

Here's a conceptual architecture for the project:

**[Donor]**

**↓**

**[Donor\_\_c]**

**↓ (Lookup)**

**[Food\_Donation\_\_c]**

**↓ (Assigned by Coordinator)**

**[Volunteer\_\_c] → [Delivery\_\_c]**

**↓ (Validation Rules)**

**[Check Expiry / Assignment Limit]**

**↓ (Record-Triggered Flow)**

**[Email sent to Donor / Volunteer]**

If you want this as a **visually designed flowchart**, I can create a diagram using Canva-style layout or generate one directly — just let me know!

**Summary:**

## ****Summary of Architecture Benefits****

* ✅ **Structured donation lifecycle**: From food entry to delivery confirmation
* 🔁 **Real-time automation**: Email flows & assignment logic streamline operations
* 🧠 **Smart validations**: Reduce food expiry and failed pickups
* 📊 **Data insights**: Dashboards show food saved, donors engaged, deliveries made
* 🔐 **Scalable & Secure**: Role-based access for Donors, Volunteers, Coordinators

**References:**

* [Salesforce Architecture Guide](https://developer.salesforce.com/docs)