

FOOD WASTE REDUCTION PLATFORM

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INDUSTRY PROBLEM STATEMENT & STAKEHOLDER ANALYSIS

- **Business Problem-**

A problem statement is a precise description of the underlying issue that a new software project seeks to solve, highlighting the current state, desired future state, and the gap between them.

The problem of large-scale food wastage affects restaurants, grocery stores, bakeries, and food retailers that are unable to redistribute surplus food in time, the impact of which is financial loss, environmental damage, and missed opportunities to support communities in need. A suitable solution is a digital food waste reduction platform that enables businesses to list surplus food in real time, allowing NGOs, shelters, and individuals to claim and collect it before it expires.

The problem of limited visibility and coordination between food donors and receivers affects NGOs and community organizations that lack timely information on available food stocks, the impact of which is inefficient redistribution, logistical delays, and underutilization of donated resources. An appropriate solution is to implement a smart matching system, where donors upload food details and the platform automatically notify nearby NGOs, suggests optimized pickup routes, and tracks donation activity for transparency.

The problem of absence of standardized tracking affects all stakeholders due to the lack of structured data around food waste, donations, and pickups, the impact of which is poor accountability, difficulty in auditing donations, and inability to measure the social impact created. A proper solution is a unified dashboard that records all donations, pickups, quantities, expiry times, ratings, and environmental impact metrics (e.g., CO₂ emissions saved).

- **Business Goals-**

1. Reduce food wastage by at least 30% in the first year of platform adoption.
2. Onboard 150+ restaurants, grocery stores, and bakeries within the first six months.
3. Enable real-time food listing and matching within the first three months of launch.
4. Achieve 15,000 active users within six months of release.
5. Attain 85% successful pickup rate for all listed donations within 24 hours.
6. Integrate live location-based matching, ensuring NGOs receive alerts within seconds of new listings.
7. Increase donor participation by 20% month-on-month through gamified reward points and recognition badges.
8. Implement a feedback and rating system that resolves 90% of discrepancies or user concerns within 48 hours.
9. Establish partnerships with at least 50 NGOs and community kitchens within the first year.
10. Publish an Impact Dashboard showing total food saved, meals provided, and carbon emissions reduced.
11. Incorporate an AI-based prediction system within 9 months to forecast surplus trends and optimize pickups.
12. Introduce multilingual support (Hindi, English, Marathi, etc.) within the first six months to increase accessibility.
13. Achieve a user satisfaction score of >4.5/5 through continuous UI/UX improvements and feedback loops.
14. Reduce NGO travel time for pickups by 25% through smart route optimization.
15. Expand the network to three major cities within 12 months of launch.

Stakeholder Mapping

Internal Stakeholders

- **Product Owner:** Defines the product vision and ensures the platform aligns with both business goals and social impact objectives. They prioritize features in the backlog and make critical decisions regarding scope, functionality, and release planning. Their direction is essential for shaping the long-term roadmap of the platform.
- **Business Analyst:** Acts as the communication bridge between all stakeholders. The BA gathers requirements from donors, NGOs, and logistics partners, refines them, and translates them into clear user stories and acceptance criteria. They play a crucial role in requirement validation, change management, backlog refinement, and ensuring alignment between technical and business needs.
- **Scrum Master:** Facilitates Agile processes, removes impediments, and ensures the development team adheres to Scrum practices. They support efficient sprint execution, promote collaboration, and help maintain transparency and continuous improvement across the team.
- **UX/UI Designers:** Design user workflows, visual interfaces, and user-friendly experiences for both donors and receivers. Their work directly impacts platform adoption, ease of use, accessibility across languages, and overall user satisfaction.
- **Development Team:** Responsible for building, testing, and deploying the platform. Their technical expertise ensures timely delivery of core features such as real-time matching, listing management, notifications, and analytics. They also handle integrations with maps, notification systems, and databases.

External Stakeholders

- **Donors:** These include restaurants, grocery stores, bakeries, and food outlets that list their surplus food on the platform. Their consistent participation drives the app's value. Their needs, speed, reliability, transparency, and easy listing, shape key feature decisions.
- **NGOs & Food Receivers:** NGOs, shelters, community kitchens, student groups, and individuals who collect donated food. Their feedback on availability, pickup times, and logistics plays a vital role in defining features like smart matching, priority lists, and route optimization.
- **Delivery Partners / Volunteers:** These may include in-house delivery staff, NGO volunteers, or third-party logistics. They ensure timely pickup and delivery. Their input influences features like live tracking, optimized routing, and verification processes.
- **Local Authorities & Regulatory Bodies:** Municipal corporations and food safety authorities ensure compliance with hygiene and donation standards. Their guidelines affect packaging requirements, expiration rules, and safety alerts within the platform.
- **Investors / Sponsors:** Organizations or individuals who fund the platform's development and expansion. Their involvement impacts financial planning, scalability, and long-term sustainability goals.
- **Competitors:** Apps or NGOs offering surplus food redistribution services. Their innovations influence market expectations, feature benchmarking, and strategic differentiation of the platform.

AGILE ROLES AND RESPONSIBILITIES IN THE PLATFORM

- **BUSINESS ANALYST**

The Business Analyst is a key member of the Scrum team, acting as the bridge between stakeholders and the development team. The BA ensures that the platform aligns with business goals, user needs, and regulatory requirements. Their work directly influences the clarity, accuracy, and success of the entire development process.

- **NEED IDENTIFICATION**

This involves understanding *why* the Food Waste Reduction Platform is being developed.

For example:

The primary need is to provide restaurants, grocery stores, bakeries, and NGOs with a reliable digital system that reduces food wastage, enables fast food donation listing, ensures timely pickups, and fosters transparent communication between donors and receivers. This platform helps transform surplus food into meals for the needy, while also supporting environmental sustainability.

- **REQUIREMENT ELICITATION**

The BA gathers and analyzes stakeholder requirements using interviews, questionnaires, workshops, and surveys.

For example: Donors share their challenges around inventory surplus and quick listing, NGOs provide insights about pickup challenges, timelines, and verification needs, Delivery partners highlight logistics requirements.

These inputs help define the platform's core features such as real-time alerts, expiry tracking, and route optimization.

- **REQUIREMENT COMMUNICATION**

The BA ensures that all stakeholders , developers, designers, testers, donors, NGOs, and regulatory bodies , share a clear understanding of requirements.

This is done through SRS (Software Requirements Specification) documentation, Regular refinement sessions, Meetings to clarify acceptance criteria, Diagrams and visual models. The goal is to eliminate communication gaps and ensure smooth development.

- **REQUIREMENT MODELING**

The BA creates structured representations of requirements to simplify understanding for the team. This includes Data Flow Diagrams, Process Flowcharts, Use Case Diagrams, User Journey Maps. These models are reviewed with developers, designers, and product owners to confirm accuracy.

- **REQUIREMENT MANAGEMENT**

The BA ensures that all requirements are tracked, prioritized, updated, and aligned with overall business objectives.

They also Maintain the product backlog, manage changes, Validate completed features against acceptance criteria, Ensure compliance with food safety and donation regulations

- **PRODUCT OWNER (PO)**

The Product Owner represents business interests and end users. They define the product vision and ensure the platform delivers maximum value.

The PO is responsible for Prioritizing features in the backlog, approving requirements and changes, making key decisions about scope, ensuring donor and NGO needs are met, their leadership helps shape the direction of the Food Waste Reduction Platform.

- **SCRUM MASTER**

The Scrum Master ensures the Scrum team follows Agile principles and practices. They help maintain a productive environment and smooth development cycle.

Their responsibilities include removing blockers, facilitating agile ceremonies, ensuring continuous delivery and improvement, supporting collaboration between BA, developers, and designers. They ensure that the team can release incremental platform updates efficiently.

- **PROJECT MANAGER**

the project manager ensures that the food waste reduction platform is developed within the approved cost, time, and scope.

their focus includes monitoring timelines and deliverables, managing resources, ensuring KPI's such as pickup time, donor participation, and user retention remain on track and coordinating with external partners (ngos, government bodies, sponsors).by keeping the project aligned with the roadmap, the pm ensures timely and successful delivery.

Requirements Elicitation

Interview-

The interview method involves asking a predefined set of open-ended questions directly to stakeholders. The interviewer adjusts follow-up questions based on the responses given.

The first step is identifying which stakeholders should be interviewed. Since the Food Waste Reduction Platform affects multiple groups , such as restaurants, grocery stores, NGOs, delivery volunteers, and end users , interviews are essential to understand their real challenges and expectations.

Justification:

Interviews were selected because the problem involves diverse stakeholders with different operational workflows. Restaurants understand food preparation, surplus timing, and storage constraints. NGOs understand pickup timing, urgency, and logistic limitations. Delivery volunteers provide insights into route challenges and time constraints.

These perspectives cannot be captured through surveys alone. Interviews help uncover hidden pain points, detailed workflows, and nuanced requirements.

Sample Interview Questions (for Donors, NGOs, Delivery Partners):

1. How do you currently handle surplus food at the end of each day?
2. What challenges do you face when trying to donate or collect leftover food?
3. How important is real-time notification for donations?
4. What type of food information (expiry time, quantity, packaging) do you need before accepting a donation?
5. Would automated pickup scheduling be useful for your organization?

6. What delays or obstacles cause missed pickups?
7. How do you currently track the donations made or received?
8. What safety or hygiene concerns should the platform address?
9. Would you prefer SMS alerts, app notifications, or both?
10. How often do you donate or collect leftover food per week?
11. What features would make the donation-collection process more convenient for you?
12. Would route optimization be helpful for your delivery workflow?
13. What languages would you prefer the app to support?
14. Do you face coordination issues between donors and volunteers?

Survey-

Surveys allow stakeholders to submit responses quickly and conveniently at scale. They help gather data from a large number of people , including small restaurants, occasional donors, NGOs, and even citizens interested in reducing food waste.

Justification:

Surveys were chosen because the platform has a large potential user base (restaurants, NGOs, volunteers, individuals). Surveys can reach many participants in less time. They help quantify preferences, such as notification frequency, preferred devices, and feature priorities. They help identify patterns across user groups (e.g., peak donation times, preferred pickup windows).

- Sample Survey Questions (Google Form):

1. How often do you have leftover or surplus food?

- a. Daily
- b. 2–3 times per week
- c. Occasionally
- d. Rarely

2. What type of organization do you represent?

- a. Restaurant
- b. Grocery Store
- c. Bakery
- d. NGO
- e. Volunteer
- f. Individual

3. Which features would be most useful to you? (Select all that apply)

- a. Real-time donation notifications
- b. Pickup scheduling
- c. Expiry-time tracking
- d. Route optimization
- e. Quantity estimation tools

f. Photo-based food listing

4. What is your preferred mode of receiving alerts?

- a. App Notification
- b. SMS
- c. Email

5. What is your biggest challenge in food donation today?

- a. Logistics
- b. Lack of coordination
- c. Time constraints
- d. No awareness of nearby NGOs
- e. Food spoils before pick-up

6. Which device will you primarily use?

- a. Smartphone
- b. Tablet
- c. Laptop/Desktop

7. Would you like a dashboard showing total food saved, meals donated, and carbon reduction?

- Yes
- No

8. Would multilingual support improve your experience?

- Yes
- No

9. How important is real-time pickup tracking? (Scale 1–5)

10. Would you pay a small fee for advanced features (analytics, advanced scheduling)?

- Yes
- No

11. Any suggestions or features you want to see?

Field Observation:

- Field observation involves visiting stakeholders such as restaurants, grocery stores, bakeries, NGOs, and volunteer pickup teams to understand their real-time processes and challenges.
- Because the Food Waste Reduction Platform deals with physical food handling, expiry constraints, and logistics, observing real-life environments provides insights that cannot be captured through interviews or surveys alone.

This method helps understand

- How fast different food types become surplus
- Existing food storage practices
- Hygiene and safety issues
- Time gap between surplus creation and donation

- Real-world obstacles during NGO collection
- Transportation delays
- Communication breakdowns between donors and receivers

Requirements

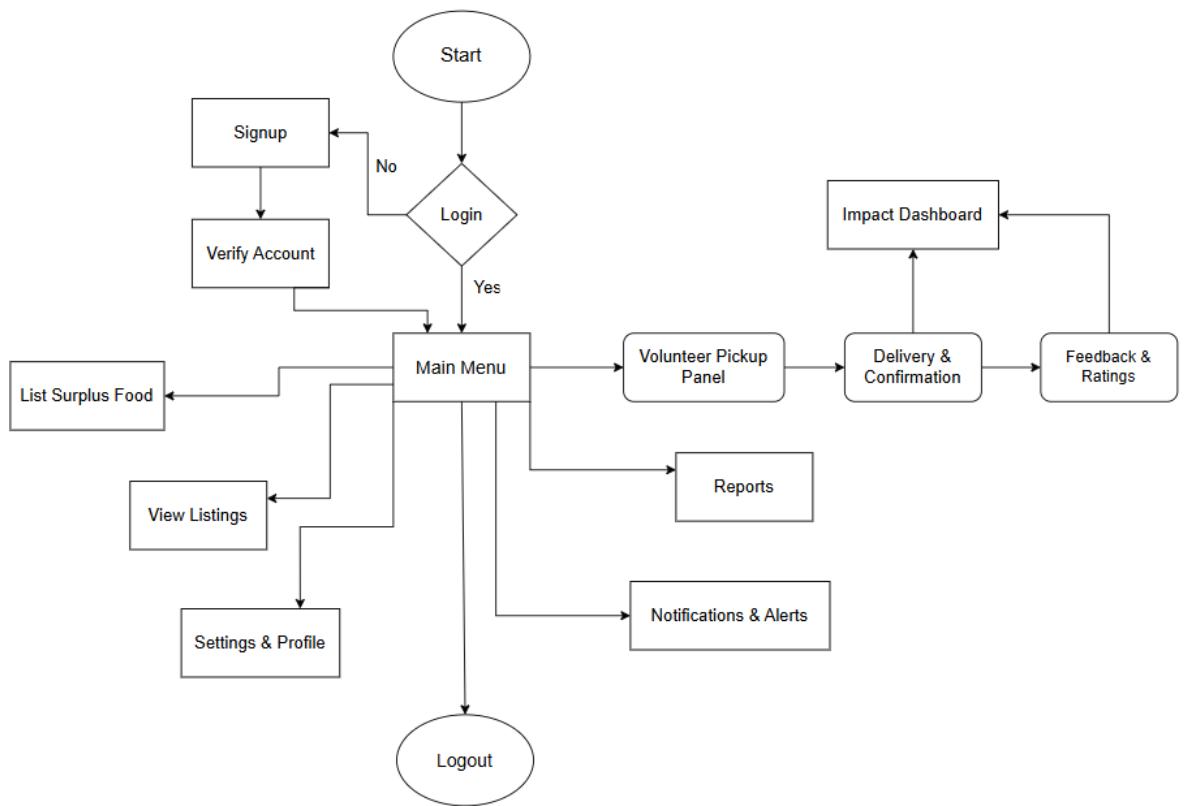
Based on the elicitation techniques above, the following requirements were captured:

1. Easy Log-In/Sign-Up with donor and NGO verification.
2. Ability for donors to list surplus food with details like quantity, category, and expiry time.
3. Real-time notifications to nearby NGOs when food is listed.
4. Pickup scheduling system with time-slot selection.
5. Route optimization for volunteers and NGO delivery teams.
6. Food image upload for better transparency.
7. Live pickup tracking.
8. Rating and feedback system for donors and receivers.
9. Expiry-time alerts and auto-removal of expired listings.
10. Dashboard showing total food saved, meals donated, and CO₂ reduction.
11. Multi-language support for better accessibility.
12. Secure login and data protection features.
13. Option for donors to set recurring donation schedules.
14. Analytics on donation patterns for NGOs.
15. Customer support and issue resolution system.
16. Integration with GPS and mapping services.
17. Volunteer management module (assigning pickups).
18. Intuitive visuals to improve user experience.

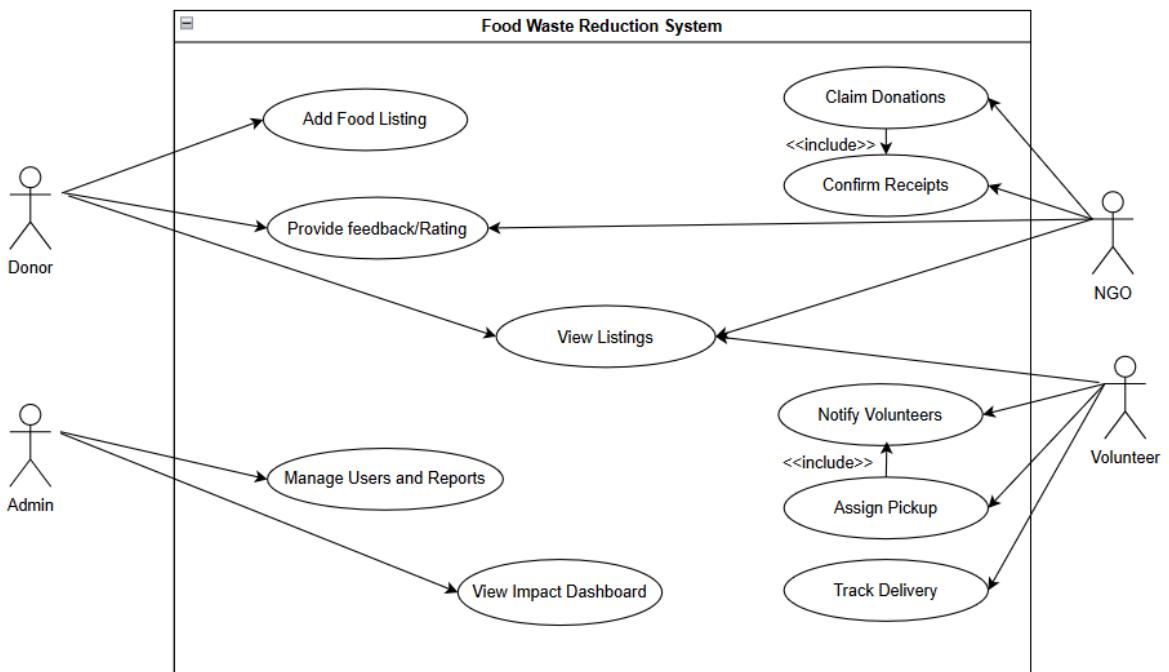
At this point, after the requirements are gathered, we record them in a formal document. Here a Business Requirement Document (BRD) will be maintained by the BA which focuses on Business requirements and Stakeholders requirements. It is used to record why the requirements are being taken. It helps align business objectives with project deliverables.

Agile Backlog Management and Visualization

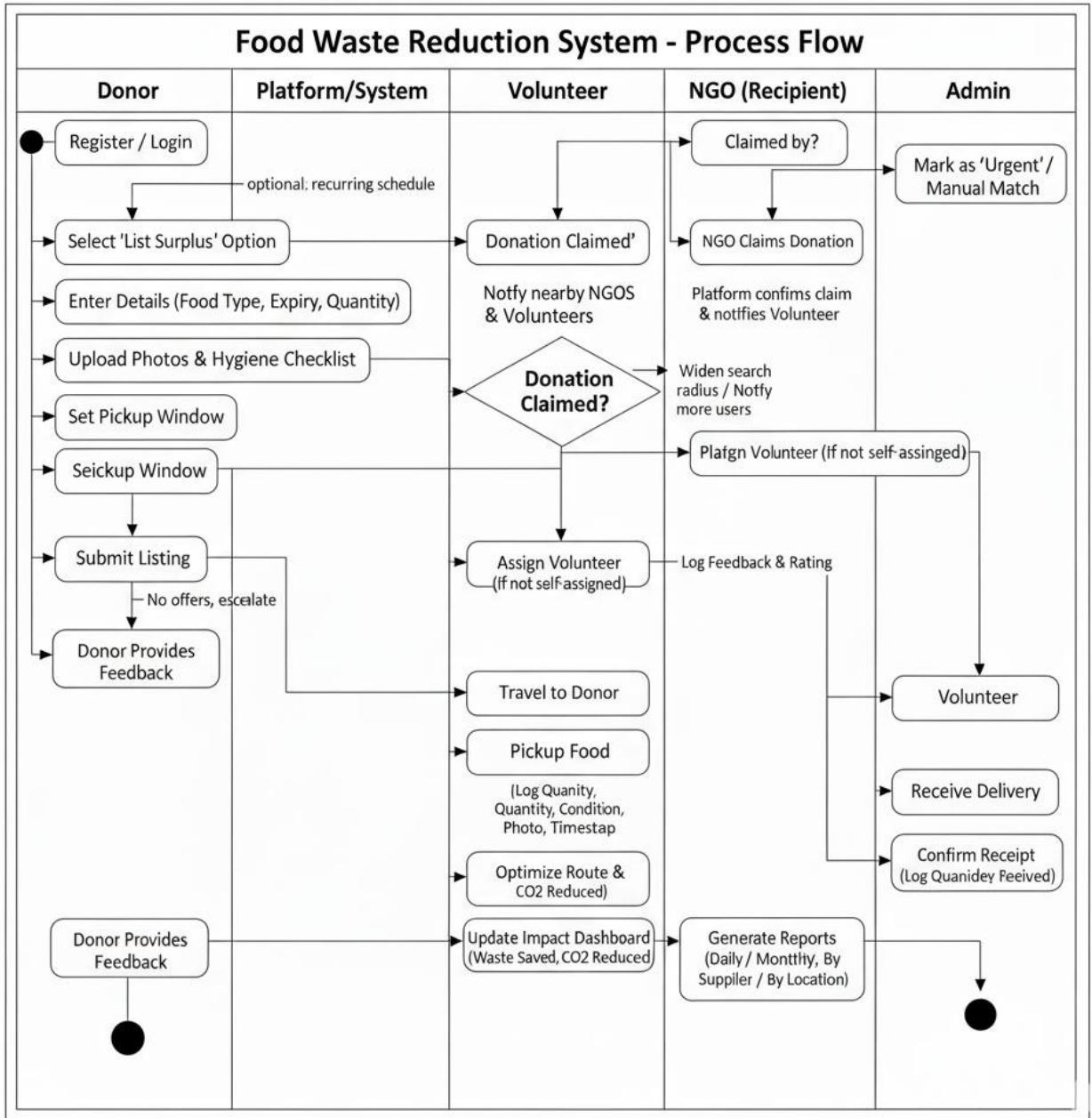
From the above requirements, a Process Flow Diagram is created like follows



USE CASE DIAGRAM



SWIMLINE DIAGRAM



Backlog of Epics-

1. User Registration & Sign-Up
2. Food Listing & Expiry Tracking
3. Real-Time Notifications & Matching
4. Pickup Scheduling & Volunteer Assignment
5. Live Tracking & Route Optimization
6. NGO & Donor Dashboard (Analytics & Impact Metrics)
7. Feedback & Rating System
8. Multi-Language Support
9. Safety & Packaging Compliance Checks

10. Recurring Donation Scheduling

User Stories-

Epic 1- Food Listing & Expiry Tracking-

User Story 1 - Create Food Listing

As a donor, I want to create a food listing with quantity, expiry time, and photo so NGOs can evaluate it.

Scenario 1: Successful Food Listing Creation

Given the donor is logged in and verified

And the donor is on the “Create Listing” page

When the donor enters food type, quantity, expiry time, and uploads a photo

And clicks on “Submit Listing”

Then the listing should be saved successfully

And it should immediately appear to eligible NGOs.

Scenario 2: Validation Error

Given the donor has left a required field empty

When the donor clicks “Submit Listing”

Then the system should show a validation message

And prevent the donor from submitting the listing.

User Story 2 , Hygiene Checklist

As a donor, I want to include hygiene information so NGOs know the food is safe.

Scenario 1: Checklist Added Successfully

Given the donor is creating a listing

When the donor selects hygiene checklist items (Clean container, Freshly prepared, etc.)

Then the listing should save with the hygiene details included.

Scenario 2: Missing Preparation Time

Given the donor did not enter the food preparation time

When the donor submits the listing

Then the system should ask whether to auto-fill the current time.

User Story 3 , Pickup Window

As a donor, I want to set a pickup window so pickups happen on time.

Scenario 1: Valid Pickup Window

Given the donor enters a pickup time that is before the expiry

When the donor submits the listing

Then the listing should save with the selected window.

Scenario 2: Invalid Pickup Window

Given the pickup window ends after the expiry time

When the donor submits the listing

Then the system should show an error

And ask the donor to adjust the window.

User Story 4 , NGO Sees Eligible Listings

As an NGO, I want to see only relevant food listings.

Scenario: Preference-Based Filtering

Given the NGO has set preferences (food types, distance)

When the NGO opens the “Listings Near Me” page

Then the NGO should see only listings that match preferences.

User Story 5 , Edit/Cancel Listing

As a donor, I want to edit or cancel a listing before it is claimed.

Scenario 1: Edit Allowed

Given the listing is not yet claimed

When the donor edits details and saves

Then the system should update the listing.

Scenario 2: Cancellation Blocked After Claim

Given the listing is already claimed

When the donor tries to cancel the listing

Then the system should show an alert

And prevent cancellation.

User Story 6 , Auto-Expire Listing

As the system, I want to auto-expire listings past expiry.

Scenario: Listing Auto-Expires

Given the current time has passed the listing’s expiry time

When the system runs its expiry check

Then the listing should be marked “Expired”

And should no longer appear to NGOs or volunteers.

User Story 7 , Urgent Listing Report

As an admin, I want to see soon-to-expire listings.

Scenario: Urgent Listings Shown

Given there are listings expiring within 1 hour

When the admin opens the urgent listing report

Then all urgent listings should appear sorted by expiry time.

User Story 8 , Weight/Serving Estimation

As a donor, I want automatic serving estimation.

Scenario: Auto-Estimation

Given the donor enters “3 containers of rice”

When the donor saves the listing

Then the system should show estimated servings

And allow manual override.

User Story 9 , Multi-Language Labels

As a user, I want safety labels in my selected language.

Scenario: Language Translation

Given the user has selected Hindi as their app language

When they view a listing

Then all labels (expiry, hygiene, pickup window) should appear in Hindi.

User Story 10 , Expiry Reminder

As a donor, I want reminders before my listing expires.

Scenario: Reminder Sent

Given the listing will expire in 30 minutes

And reminders are enabled

When the reminder time is reached

Then the donor should get a push/SMS reminder.

Epic 2 - Real-Time Notifications & Matching

User Story 1 - NGO Receives New Listing Notification

As an NGO, I want to receive notifications when new nearby food listings are added so that I can claim relevant donations quickly.

Scenario: NGO Receives New Listing Notification

Given the NGO has enabled donation notifications

And a donor creates a new food listing within the NGO's preferred radius

When the listing is successfully submitted

Then the NGO should receive a push/SMS notification with listing details.

User Story 2 - Volunteer Receives Pickup Notification

As a volunteer, I want to receive notifications when a pickup needs to be assigned so that I can accept tasks that fit my schedule.

Scenario: Volunteer Receives Pickup Notification

Given a food listing has been claimed by an NGO

And the system requires a volunteer for pickup

When the matching engine identifies the volunteer as eligible

Then the volunteer should receive a notification containing pickup details.

User Story 3 - Timer-Based Re-Notification

As the system, I want to notify NGOs and volunteers again if a listing remains unclaimed so that urgent food does not go to waste.

Scenario: Timer-Based Re-Notification

Given a listing has no claims for 10 minutes

When the system checks listing status

Then it shall re-notify the top eligible NGOs and volunteers.

User Story 4 - Updated Listing Notification

As an NGO, I want real-time notifications when a donor updates quantity or expiry so that I always see correct listing details.

Scenario: Updated Listing Notification

Given an NGO has viewed a listing

When the donor updates quantity or expiry time

Then the system should send a notification informing the NGO.

User Story 5 - Donor Notified of Claim

As a donor, I want notifications when an NGO claims my listing so that I can prepare the food on time.

Scenario: Donor Notified of Claim

Given the donor has an active listing

When an NGO clicks “Claim Donation”

Then the donor receives a notification with NGO details and pickup time.

Epic 3 - Pickup Scheduling & Volunteer Assignment

User Story 1 - NGO Schedules Pickup Slot

As an NGO, I want to schedule a pickup slot so I can plan timely collection of food.

Scenario: NGO Successfully Schedules Pickup

Given the NGO has claimed a food listing

And pickup slots are available

When the NGO selects an available pickup slot

Then the system should save the selected slot

And notify the donor and volunteer.

User Story 2 - Volunteer Accepts or Declines Pickup

As a volunteer, I want to accept or decline pickup tasks so that I can manage my workload.

Scenario: Volunteer Accepts Pickup

Given the volunteer receives a new pickup assignment notification

When the volunteer taps “Accept”

Then the system should confirm acceptance and assign the pickup.

User Story 3 - Auto Assignment

As the system, I want to automatically assign volunteers based on distance and workload so that pickups occur efficiently.

Scenario: Volunteer Auto Assignment

Given volunteers are available nearby

When auto-assignment runs

Then the system assigns the best volunteer based on ETA and workload.

User Story 4 - Donor Views Assigned Volunteer

As a donor, I want to see who is assigned for pickup so that I know who will arrive.

Scenario: Donor Views Volunteer Details

Given a volunteer has accepted the pickup

When the donor views listing details

Then the app should show volunteer name, photo, and ETA.

User Story 5 - Route Optimization

As a volunteer, I want optimized routes for multiple pickups so I can complete them faster.

Scenario: Route Optimization Successful

Given the volunteer has 2+ pickups

When route optimization runs

Then the system should generate an optimized pickup order.

Requirements Analysis -

Here, we will prioritize our deliverables to manage our resources and time. Later on, this will also help us manage changes.

We are going to use the **MoSCoW** Prioritization Technique. In this prioritization technique we build a hierarchy of our backlog.

The **MoSCoW** stands for-

- Must-Have- These are the core features of the app. These are Non-negotiable features.
- Should-Have- Important features that add value but aren't urgent.
- Could-Have- Extras that improve the user experience but aren't important right now.
- Won't-Have- Ideas that sound good but aren't part of the current plan.

Following is our distribution of our Epics according to the **MoSCoW** model:

Must-Have (M)

- Food Listing & Expiry Tracking
- Real-Time Notifications & Matching
- Pickup Scheduling & Volunteer Assignment
- Donor / NGO / Volunteer Onboarding & Verification
- Impact Dashboard & Reporting

Should-Have (S)

- Route Optimization & Live Tracking
- Safety & Packaging Compliance Checks
- Volunteer Management & Scheduling
- Fallback Communication (SMS / Email)

Could-Have (C)

- Predictive Analytics (surplus forecasting & recommendations)
- Gamification & Donor Recognition
- Multi-language & Accessibility enhancements
- Payment / Logistics Marketplace (paid pickup options)

Won't-Have (W)

- Full Food Processing / Repurposing Module
- Advanced IoT / Cold-chain Telemetry
- In-app Marketplace for Selling Surplus

Further, the User Stories Distribution according to the MoSCoW model are

Here we have used the notations as follows

Must Have (M)

Should Have (S)

Could Have (C)

Won't Have (W)

1. Food Listing & Expiry Tracking

1. As a donor, I want to create a food listing with type, quantity, expiry, and photo so that NGOs can evaluate the donation. **(M)**
2. As a donor, I want to add preparation time and a hygiene checklist so that receivers know the food safety level. **(M)**
3. As a donor, I want to set a pickup window so that NGOs/volunteers know when the food is available. **(M)**
4. As a donor, I want to edit or cancel my listing before it is claimed so that I can fix mistakes. **(M)**
5. As the system, I want to automatically expire food listings after the expiry time so that unsafe food is not shown. **(M)**
6. As an NGO, I want to see listings filtered by my preferred food types and distance so that I view only relevant items. **(S)**
7. As a donor, I want the system to estimate weight/servings based on volume input so that NGOs can plan better. **(S)**
8. As the system, I want to flag urgent listings that are close to expiry so that pickup can be prioritized. **(S)**
9. As a donor, I want to reuse recurring listing templates so that I can quickly post repeat donations. **(C)**
10. As a user, I want listing labels to appear in multiple languages so that more people can understand the details. **(C)**
11. As a donor, I want the system to remind me before my listing expires so that I can extend or update it. **(W)**

2. Real-Time Notifications & Matching

1. As an NGO, I want to receive instant notifications when a new listing is posted so that I can claim it quickly. **(M)**

2. As an NGO, I want to accept or reject donations directly from the notification so that I can respond easily. **(M)**
3. As the system, I want to widen the search radius and notify volunteers if no NGO accepts the listing so that food doesn't go to waste. **(M)**
4. As the system, I want to retry failed notifications and log failures so that important alerts are not missed. **(M)**
5. As an NGO, I want notifications that include photo, quantity, expiry, and pickup time so that I can evaluate quickly. **(S)**
6. As an NGO, I want priority-based notifications (perishable-first, nearest-first) so that I see urgent items first. **(S)**
7. As a user, I want fallback SMS/email notifications so that I don't miss updates in low-network areas. **(S)**
8. As a user, I want weather-based notifications so that I can adjust pickup plans during rain or heat. **(C)**
9. As a user, I want the system to limit spam notifications during high load so that I receive only important alerts. **(C)**
10. As a user, I want WhatsApp bot notifications so that I receive updates in my preferred messaging app. **(W)**

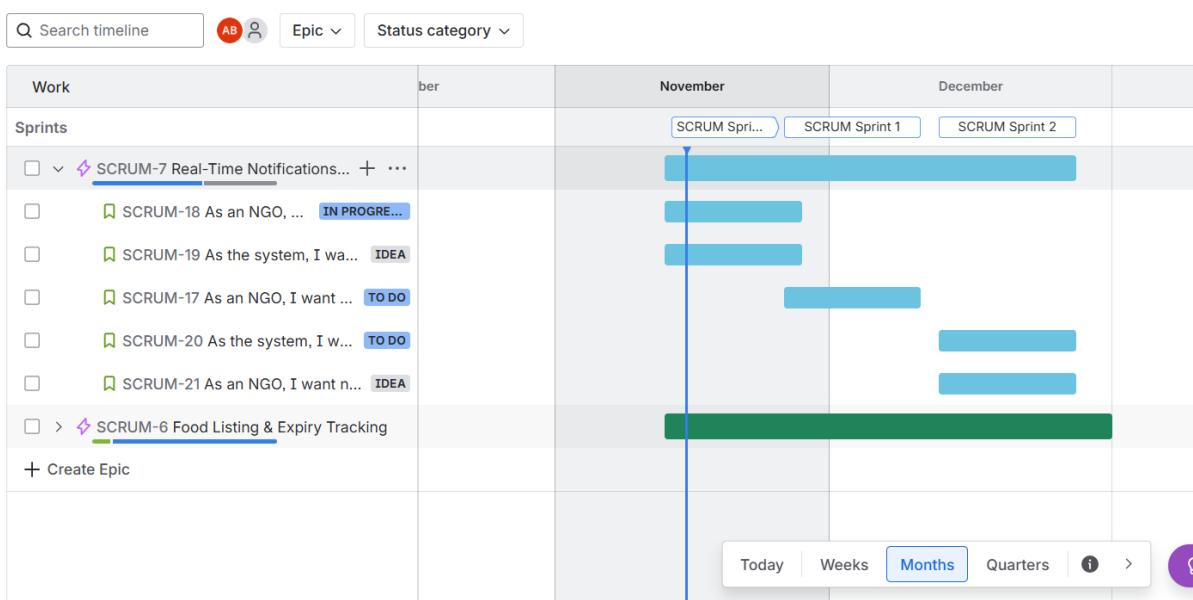
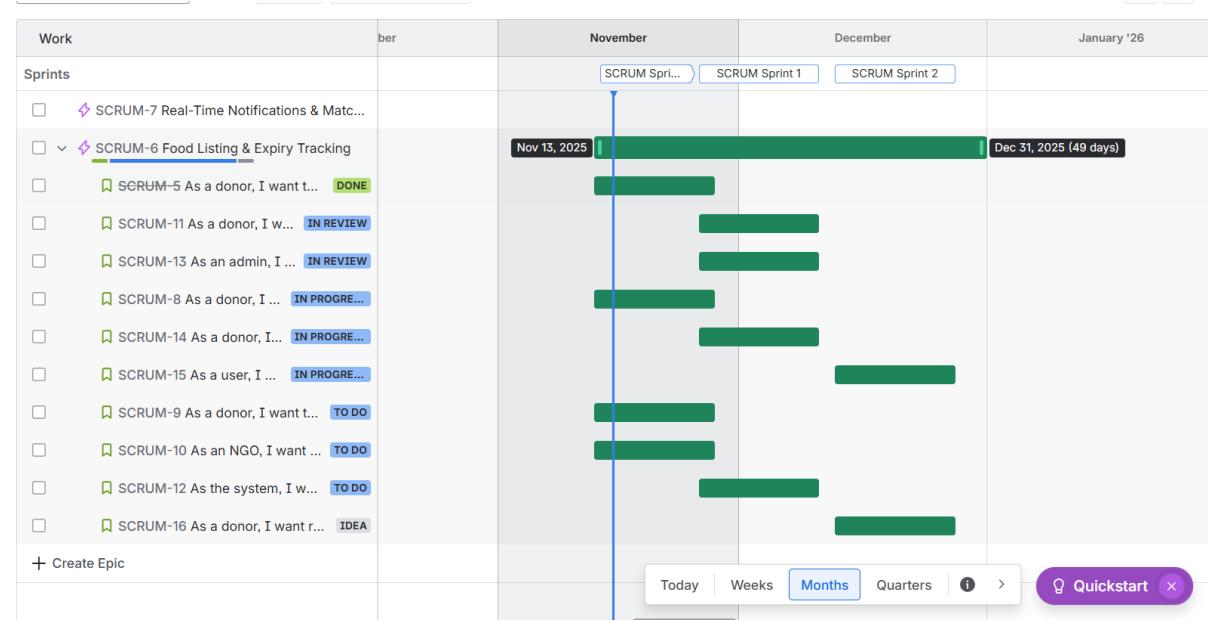
3. Pickup Scheduling & Volunteer Assignment

1. As an NGO, I want to schedule a pickup slot for the donation so that the donor and volunteer know the exact time. **(M)**
2. As the system, I want to auto-assign volunteers based on distance and availability so that pickups happen efficiently. **(M)**
3. As a volunteer, I want to accept or decline an assigned pickup so that I can manage my workload. **(M)**
4. As a volunteer, I want to upload pickup proof (photo + timestamp) so that the NGO can verify the pickup. **(M)**
5. As an NGO, I want to confirm delivery and record quantity received so that the donation is marked complete. **(M)**
6. As the system, I want to optimize the volunteer's route when multiple pickups exist so that travel time is minimized. **(S)**
7. As a donor and NGO, I want live tracking of the volunteer so that we know their ETA. **(S)**
8. As an admin, I want to manually reassign a volunteer so that exceptions can be handled. **(S)**
9. As the system, I want to enforce volunteer task limits so that no volunteer is overloaded. **(C)**
10. As the system, I want to generate SLA metrics (pickup time, delivery time) so that performance can be monitored. **(C)**

11. As a user, I want volunteers to schedule rest breaks so that long pickup days are managed safely. (W)

Scrum Backlog Creation and Prioritization in Jira

Current Timeline-



Current Backlog-

SCRUM Sprint 1 26 Nov – 10 Dec (5 work items)

- SCRUM-11 As a donor, I want to edit or cancel a listing before it is claimed. **FOOD LISTING & EXPIRY TRACKING** IN REVIEW 3 =
- SCRUM-13 As an admin, I want to see soon-to-expire listings. **FOOD LISTING & EXPIRY TRACKING** IN REVIEW 2 =
- SCRUM-14 As a donor, I want automatic serving estimation. **FOOD LISTING & EXPIRY TRACKING** IN PROGRESS 1 =
- SCRUM-12 As the system, I want to auto-expire listings past expiry. **FOOD LISTING & EXPIRY TRACKING** TO DO 3 =
- SCRUM-17 As an NGO, I want to receive instant notifications when a new listing is posted. **REAL-TIME NOTIFICATIONS & MATCHING** TO DO 1 =

SCRUM Sprint 0 13 Nov – 27 Nov (6 work items)

- SCRUM-5 As a donor, I want to create a food listing with quantity, expiry time, and photo. **FOOD LISTING & EXPIRY TRACKING** DONE 3 = Nov 17
- SCRUM-8 As a donor, I want to include hygiene information so NGOs know the food is safe. **FOOD LISTING & EXPIRY TRACKING** IN PROGRESS 5 = Nov 19
- SCRUM-18 As an NGO, I want to accept or reject donations directly from the notifications. **REAL-TIME NOTIFICATIONS & MATCHING** IN PROGRESS 2 =

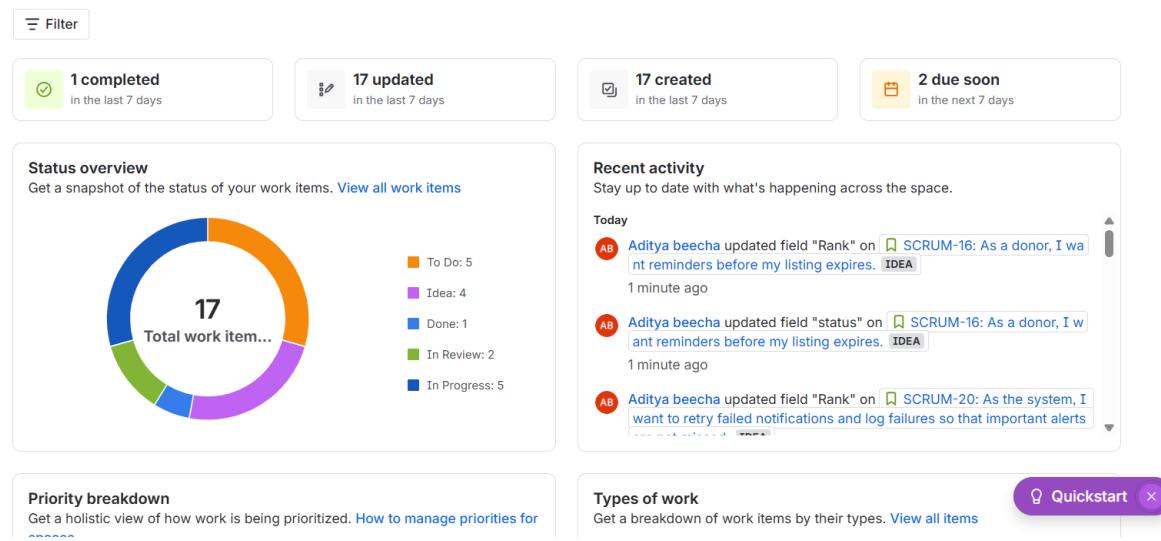
Current Board-

IDEA	TO DO	IN PROGRESS	IN REVIEW	DONE
As the system, I want to widen the search radius and notify volunteers if no NGO accepts the listing so that food doesn't go to waste. REAL-TIME NOTIFICATIONS & MATCHING SCRUM-19	As a donor, I want to set a pickup window so pickups happen on time. FOOD LISTING & EXPIRY TRACKING Nov 21, 2025 SCRUM-9	As a donor, I want to include hygiene information so NGOs know the food is safe. FOOD LISTING & EXPIRY TRACKING Nov 19, 2025 SCRUM-8	As a donor, I want to edit or cancel a listing before it is claimed. FOOD LISTING & EXPIRY TRACKING SCRUM-11	As a donor, I want food listing with quantity, expiry time, and photo. NGOs can evaluate. FOOD LISTING & EXPIRY TRACKING Nov 17, 2025 SCRUM-5
As an NGO, I want notifications that include photo, quantity, expiry, and pickup time so that I can evaluate quickly. REAL-TIME NOTIFICATIONS & MATCHING SCRUM-21	As an NGO, I want to see only relevant food listings. FOOD LISTING & EXPIRY TRACKING Nov 23, 2025 SCRUM-10	As a donor, I want automatic serving estimation. FOOD LISTING & EXPIRY TRACKING SCRUM-14	As an admin, I want to see soon-to-expire listings. FOOD LISTING & EXPIRY TRACKING SCRUM-13	
	As the system, I want to auto-expire listings past expiry. FOOD LISTING & EXPIRY TRACKING SCRUM-12	As a user, I want safety labels in my selected language. FOOD LISTING & EXPIRY TRACKING SCRUM-15		

Sprint Burndown chart-



Overall Summary-



Requirements Validation-

Requirements validation is the process of checking whether the documented requirements truly define the system that the stakeholders need. Once the customer or stakeholder gives approval, the team proceeds toward actual software development. Before beginning validation, it is important to identify the key stakeholders, which in this project include end users such as Donors (restaurants, grocery stores, food outlets), NGOs and shelters who receive surplus food, and Volunteers responsible

for pickups and deliveries. Business stakeholders include project owners, investors, and compliance authorities who ensure the platform operates within food safety regulations. The development team consists of engineers, designers, and testers, while food safety experts (such as nutritionists or regulatory consultants) help verify hygiene and expiry-related requirements. In this system, timely coordination, ease of use, and food safety are key factors that drive stakeholder satisfaction.

There are various methods used to validate the requirements:

1. **User Interviews & Surveys** – The purpose of this method is to gather direct feedback from the people who will use the platform. For example, before finalizing the Food Listing feature, interviews can be conducted with donors to understand how quickly they can enter details such as quantity, expiry time, and hygiene information during peak hours. Surveys can also be used with NGOs to confirm their expectations regarding real-time alerts, preferred notification channels, and sorting options for nearby listings. Volunteers can be interviewed to determine what information they need before accepting a pickup, such as distance, load size, and route clarity.
2. **Prototype & Wireframe Testing** – This method validates the UI/UX by presenting stakeholders with an early version of the system. For example, a clickable wireframe of the “List Surplus Food” screen can be tested with donors to ensure the interface is simple and efficient. NGO users can test prototypes of the Nearby Listings page to verify that filters (like expiry-based sorting) are easy to access. Similarly, volunteers can test mockups of the Pickup Assignment and Route Navigation screens. Business stakeholders may also review a prototype of the Impact Dashboard to validate whether the visual representation of meals saved, CO₂ reduction, and daily reports meets their expectations.
3. **Requirement Walkthrough & Feedback Sessions** – This method aligns business, technical, and operational needs. For instance, the Hygiene Checklist and Expiry Tracking requirements can be reviewed with food safety experts to ensure compliance with local food donation regulations. The Project Manager may conduct walkthrough sessions where developers evaluate the feasibility of real-time notifications, auto-assignment logic for volunteers, or integrating third-party map/navigation APIs. These collaborative reviews help identify misunderstandings or missing requirements early.
4. **Usability Testing & Focus Groups** – This involves testing the platform with a small sample group before full-scale development. For example, beta testing can be done with selected restaurants to observe how easily they manage the listing process during their closing hours. NGOs can be included in focus groups to evaluate how effectively they can claim donations and track delivery updates. Volunteers may participate in pilot testing of the pickup and route optimization module to ensure clarity and speed. This helps ensure that the system works smoothly even in time-sensitive situations.
5. **Agile Sprint Demos & Continuous Feedback** – This final validation method ensures that requirements are continuously reviewed as development progresses. During sprint demos, stakeholders can interact with newly developed features such as the Listing Module, Claiming System, or Pickup Workflow. If NGOs face issues while claiming donations, or volunteers find route navigation unclear, the Scrum Master organizes immediate feedback loops so adjustments can be made early in the sprint cycle.

Finally, once all feedback is collected, the Product Owner refines requirements and updates the backlog accordingly. The Development Team adjusts technical components, such as improving

notification delivery or enhancing data synchronization. The Business Analyst ensures that the refined requirements align with business goals, user needs, and regulatory standards. The Scrum Master and Project Manager continue monitoring progress, address blockers, and ensure smooth execution, keeping the project aligned with stakeholder expectations.

Change Management-

Change management is the process of managing evolving requirements during the software development lifecycle, where new needs emerge either while the platform is being developed or after it has already been deployed and used by real stakeholders. In this project, the Business Analyst (BA) plays a key role in capturing, documenting, and analyzing requested changes, while the Product Owner (PO) makes the final decision on whether the change should be accepted and prioritized within the backlog. Since the Food Waste Reduction Platform serves multiple user groups, donors, NGOs, volunteers, admins, and regulatory bodies, changes are natural and expected as the system grows, new scenarios arise, or process improvements become necessary.

Changes can be triggered by many factors. For example, NGOs may request a new feature to filter listings by “Urgency Level” so they can prioritize items close to expiry. Donors might ask for a recurring donation schedule if they have predictable surplus every day. Volunteers may need more accurate route optimization or a bulk-pickup option during peak hours. Additionally, regulatory changes from food safety authorities may require modifications to the hygiene checklist or expiry validation steps. These types of evolving requirements make change management essential to ensure that the platform remains safe, usable, compliant, and efficient.

There are multiple sources that may trigger requirement changes for the Food Waste Reduction Platform, such as:

- New market or operational conditions (e.g., rising food donations requiring automated assignment rules)
- Integration of new tools or equipment (e.g., map APIs, digital thermometers for food temperature checks)
- Fixing bugs or addressing unexpected system behaviour
- New customer or NGO preferences
- Improved performance, faster notifications, or enhanced tracking
- Budget limitations or timeline adjustments

Plan for Change Management

Below is the stepwise plan for managing requirement changes in this project. Since the platform is community- and safety-driven, many requested changes will be centered around reliability, transparency, and user convenience. Each change must be evaluated carefully to ensure that it genuinely improves the system.

1. **Identify the change need** – The first step is to clearly identify what needs to be changed. This may come from donors (e.g., difficulty in uploading photos), NGOs (e.g., needing expiry-based sorting), volunteers (e.g., unclear pickup navigation), or admin/regulatory requirements.
2. **Analyze and validate the change request** – Once a request is received, the BA validates whether the change is genuine, feasible, and aligned with user needs. The BA may ask follow-up questions, gather data, or request clarification from the change requestor to ensure the requirement is precise and meaningful.

3. **Impact and feasibility analysis** – After validation, the next step is evaluating the impact of the proposed change on the overall system. This includes technical impact, workflow changes, data model updates, and the effect on existing features. Cost and effort estimation are also performed to check whether the change is financially and technically feasible within the project constraints.
4. **Decision making** – Once the analysis is complete, the PO makes the final decision on whether the change should be implemented.
 - a. If the change is approved, the requirements document, user stories, acceptance criteria, and system design are updated accordingly.
 - b. If the change is not approved, the request is recorded with justification, and the team moves forward without incorporating that requirement.

BA's Role in Agile Ceremonies & Communication-

After the approved change is implemented, the entire update, along with impact notes, decisions, and modified requirements, is documented for future reference, audits, and continuous improvement. This structured approach ensures that the Food Waste Reduction Platform evolves responsibly while maintaining system stability and stakeholder satisfaction.

In an Agile environment, the Business Analyst (BA) plays a central role in ensuring that the team fully understands the requirements and that the delivered product aligns with user and stakeholder expectations. For the Food Waste Reduction Platform, this becomes even more important because the system deals with multiple roles, donors, NGOs, volunteers, and admins, each with unique workflows, compliance needs, and operational constraints.

1. Sprint Planning:

Sprint planning marks the beginning of each sprint. Here, the team decides which user stories from the product backlog will be completed. The BA collaborates with the Product Owner (PO) and development team to ensure that user stories such as "*List Surplus Food*", "*Claim Donation*", "*Pickup Scheduling*" and "*Delivery Confirmation*" are clearly understood. The BA clarifies food safety rules, expiry logic, volunteer workflow, and notification triggers so the team knows exactly what needs to be built.

2. Daily Scrum:

The daily scrum is used to maintain smooth progress. Team members share what they accomplished yesterday, what they plan to do today, and what obstacles they're facing. The BA's role here is to assist in resolving requirement-related blockers, for example, clarifying NGO acceptance criteria, confirming how auto-assignment logic works, or addressing doubts about hygiene checklist validations. The BA ensures the team never stalls due to requirement confusion.

3. Sprint Review:

During the sprint review, the BA helps demonstrate completed features to stakeholders such as donors, NGOs, volunteers, and admin representatives. The BA collects feedback on features like "*Real-Time Notifications*," "*Route Optimization*," or "*Impact Dashboard*." Any suggestions or additional needs identified during these reviews are recorded. The BA ensures that stakeholders' expectations are met while capturing new requirements for future sprints.

4. Sprint Retrospective:

In the retrospective, the team reflects on what went well and what could have been improved. The BA contributes by evaluating how effectively requirements were communicated and clarified. If misunderstandings arose around workflows like *pickup confirmation* or *urgent*

listing escalation, the BA identifies communication gaps and improves documentation and clarification methods for future sprints.

5. Product Backlog Refinement:

The BA plays a major role in continuously refining and updating the backlog. For the Food Waste Reduction Platform, this includes re-prioritizing epics like “*Food Listing*”, “*Volunteer Assignment*”, “*Impact Dashboard*”, and “*Notifications*” based on evolving feedback from donors, NGOs, and volunteers. The BA ensures user stories remain clear, testable, and aligned with compliance requirements such as expiry rules and hygiene guidelines.

Communication with Stakeholders

A key responsibility of the BA is ensuring effective communication of requirements across all stakeholders. Whether it's explaining expiry validation to developers, clarifying donation workflows to designers, or discussing new NGO needs with the PO, the BA ensures the entire team understands the real-world problem they are trying to solve. In a system involving live pickups, food safety, and time-sensitive decisions, clear communication becomes critical.

The BA uses several communication techniques to maintain alignment:

- **Requirements Documentation**

These documents formally capture the entire requirements process and ensure clarity from business need to implementation:

- **Business Requirements Document (BRD):** High-level goals such as reducing food waste and connecting donors with NGOs.
- **Functional Requirements Document (FRD):** Detailed features like food listing fields, pickup scheduling, escalation rules, and tracking.
- **Software Requirements Specification (SRS):** Technical and system-level details including expiry logic, API communication, notification flows, data models, and user permissions.

- **Visuals and Diagrams**

Visual tools help stakeholders and developers understand complex workflows:

- **BPMN Diagrams:** Used to map processes like “*Donation → Claim → Pickup → Delivery → Feedback*.”
- **Data Flow Diagrams (DFD):** Describe how information moves between donors, NGOs, volunteers, and admin modules.
- **Process Flow Diagrams:** Represent end-to-end flows such as listing creation, claim matching, and volunteer assignment.
- **Customer Journey Maps:** Illustrate how each user interacts with the platform, from a donor listing surplus to an NGO receiving the food.

These communication techniques help the team stay aligned, reduce misunderstandings, and ensure that the platform is built exactly as intended.