

DATA FLOW DIAGRAMS & USER STORIES

To Supply Leftover Food to Poor - System Design Documentation

Project Design Phase-II: Data Flow Diagrams & User Stories

Date: November 1, 2025

Team ID: NM2025TMID08527

Project Name: To Supply Leftover Food to Poor

Maximum Marks: 4 Marks

DATA FLOW DIAGRAMS (DFD)

DFD Overview

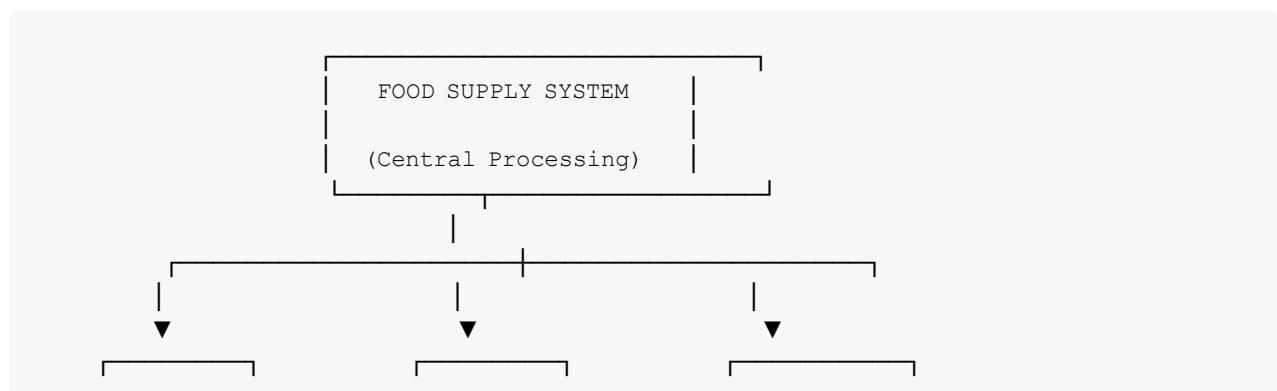
A Data Flow Diagram (DFD) is a traditional visual representation of information flows within a system. It depicts:

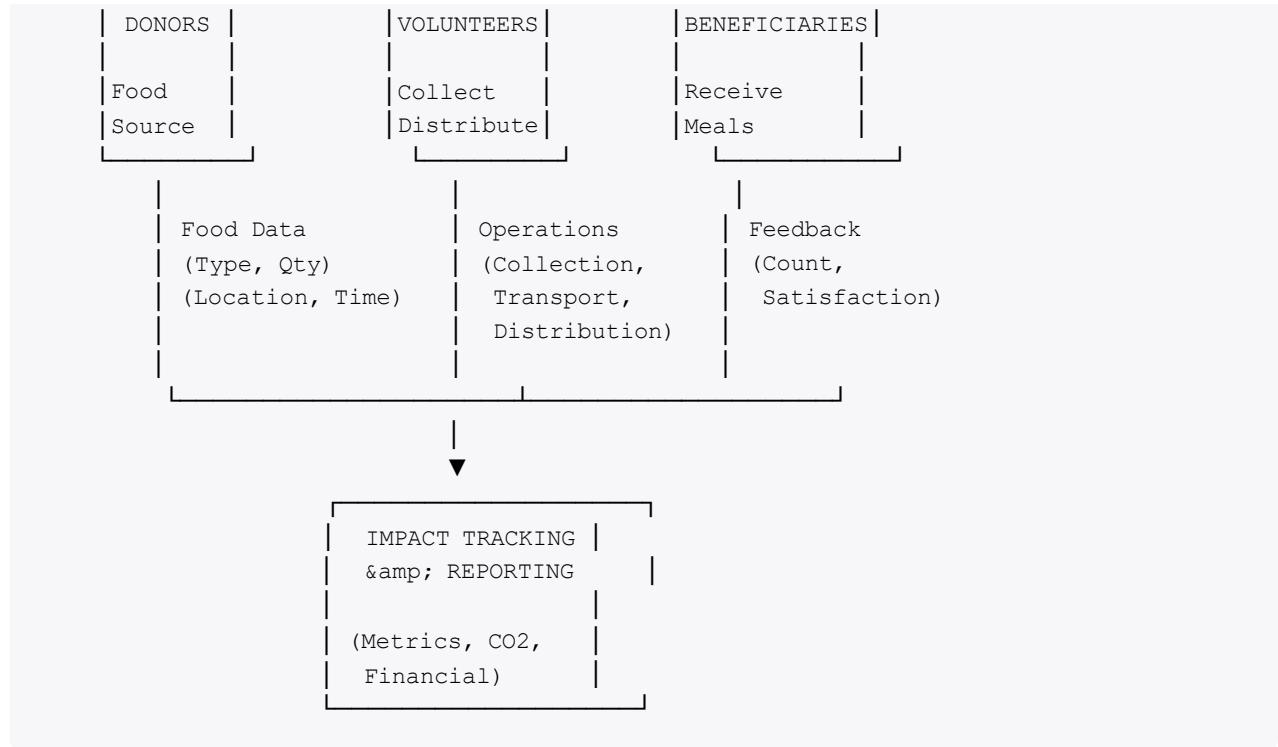
- How data enters and leaves the system
- What changes the information
- Where data is stored
- How different actors interact with the system

For the "Supply Leftover Food to Poor" project, DFDs illustrate:

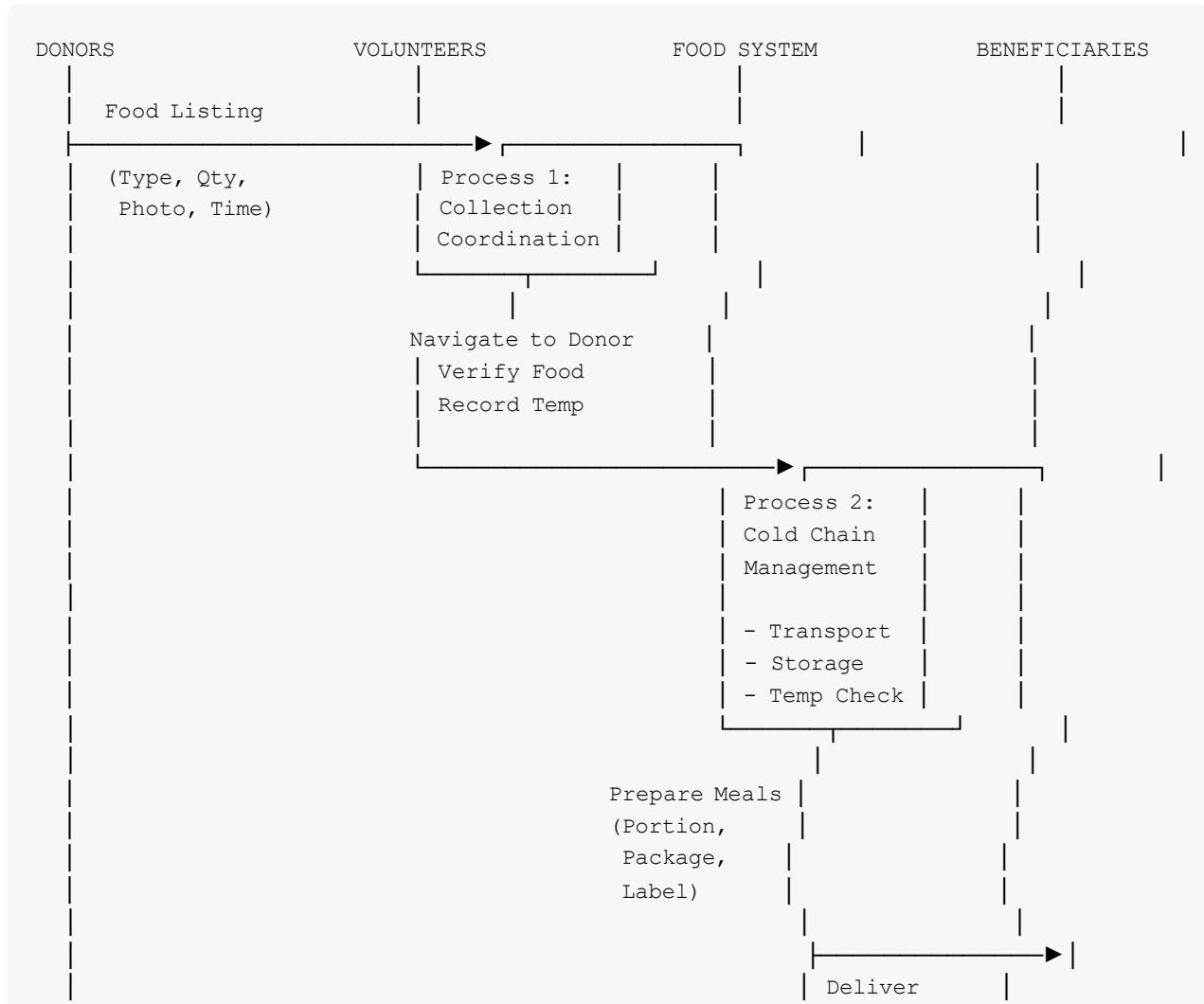
1. How donors list available food
2. How volunteers collect and verify food
3. How food is transported and stored
4. How beneficiaries receive meals
5. How impact data is tracked and reported

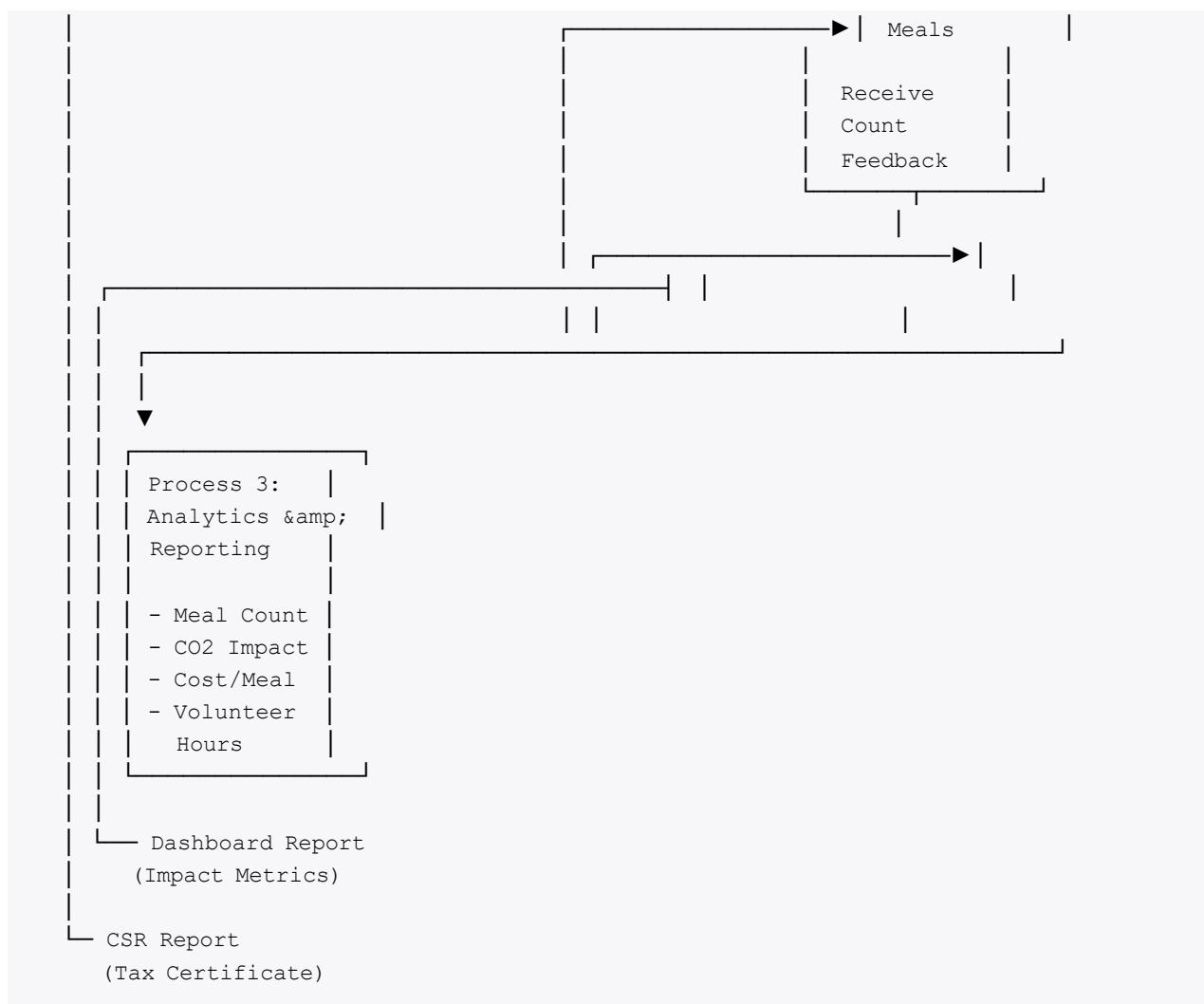
DFD LEVEL 0: CONTEXT DIAGRAM





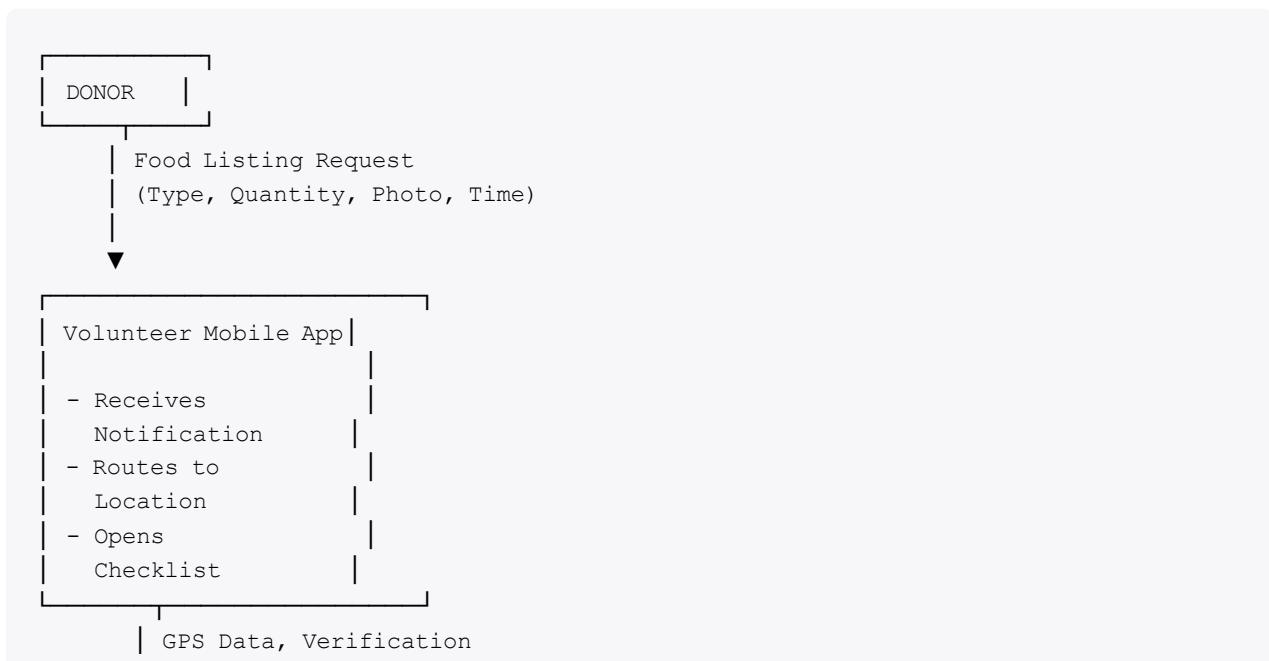
DFD LEVEL 1: MAJOR PROCESSES

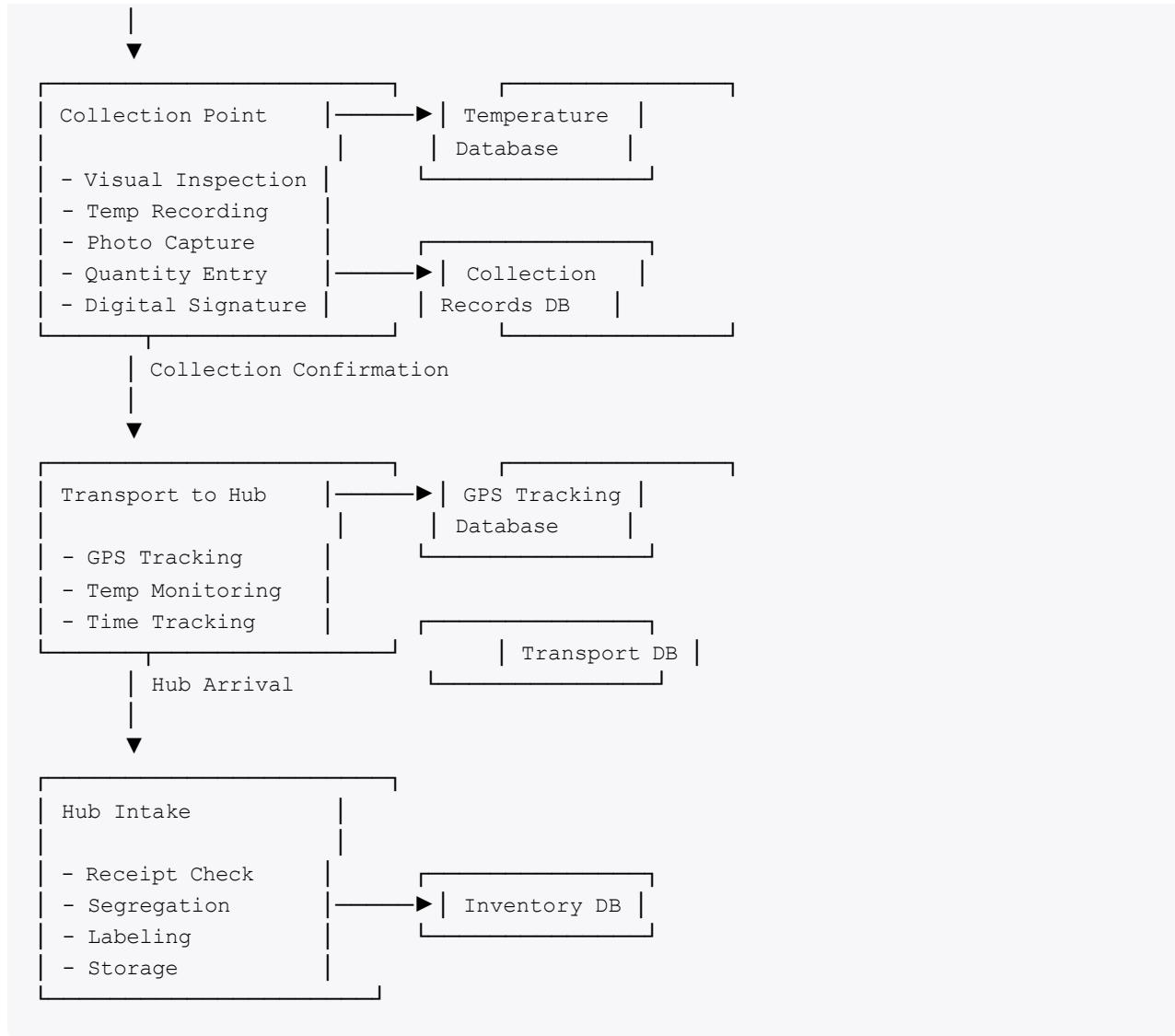




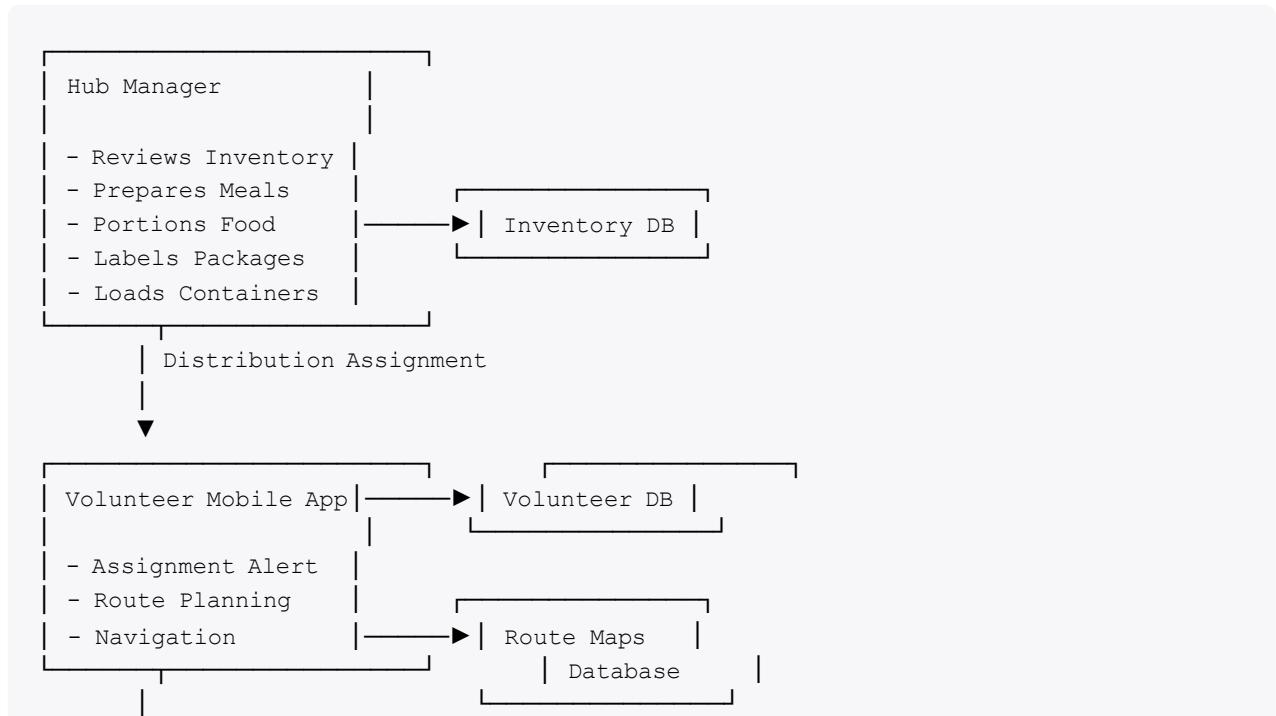
DFD LEVEL 2: DETAILED DATA FLOWS

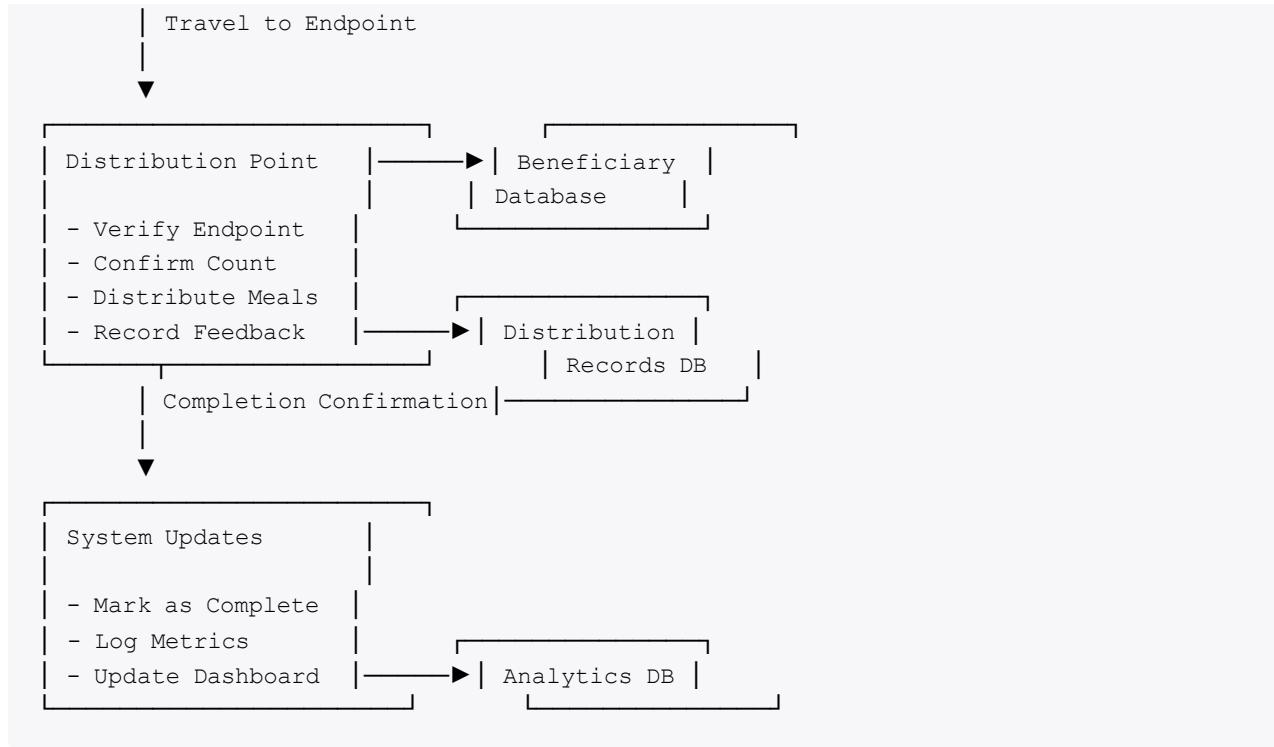
Collection Process Flow





Distribution Process Flow





DATA STORES

1. Donor Database

Data Elements:

- Donor ID (Primary Key)
- Organization Name / Individual Name
- Phone Number, Email, Address
- Food Categories Offered
- Preferred Collection Times
- Total Donations Count
- Last Donation Date
- Status (Active/Inactive)

2. Collection Records Database

Data Elements:

- Collection ID (Primary Key)
- Donor ID (Foreign Key)
- Volunteer ID (Foreign Key)
- Collection Date/Time
- Food Type, Quantity

- Temperature Reading (Celsius)
- Storage Condition (Visual Inspection)
- Photo Path (Evidence)
- Status (Scheduled/Collected/Transported/Stored/Distributed)
- Notes/Deviations

3. Inventory Database

Data Elements:

- Item ID (Primary Key)
- Collection ID (Foreign Key)
- Item Type, Quantity Received
- Storage Location
- Condition Rating (1-5)
- Date Received, Expiry Date
- FIFO Rotation Status
- Waste/Usage Date
- Quantity Used, Quantity Discarded

4. Beneficiary Database

Data Elements:

- Beneficiary ID (Primary Key)
- Endpoint Organization Name
- Location (Coordinates)
- Contact Person, Phone
- Meal Capacity (Daily)
- Preferred Delivery Times
- Distribution History
- Last Distribution Date
- Status (Active/Inactive)

5. Distribution Records Database

Data Elements:

- Distribution ID (Primary Key)
- Beneficiary ID (Foreign Key)
- Volunteer ID (Foreign Key)

- Distribution Date/Time
- Meal Types Delivered, Quantity
- Recipient Count
- Satisfaction Score (1-5)
- Issues/Feedback
- Delivery Status (Pending/Completed)

6. Volunteer Database

Data Elements:

- Volunteer ID (Primary Key)
- Name, Phone, Email
- Skills/Certifications
- Availability Schedule
- Preferred Collection/Distribution Zones
- Total Hours Contributed
- Certifications/Training Dates
- Performance Rating
- Status (Active/Inactive/On Leave)

7. Temperature Logs Database

Data Elements:

- Log ID (Primary Key)
- Facility/Vehicle ID
- Temperature Reading (Celsius)
- Recorded Timestamp
- Status (Normal/Warning/Critical)
- Action Taken (if deviation)
- Responsible Person
- Resolution

8. Analytics Database

Data Elements:

- Metric ID (Primary Key)
- Date
- Meals Collected Daily

- Meals Distributed Daily
- Beneficiaries Reached
- Volunteers Engaged
- Cost per Meal
- CO2 Emissions Prevented (kg)
- Water Resources Saved (liters)
- Food Waste Diverted (kg)
- Volunteer Hours
- Incident Count
- Satisfaction Average

USER STORIES WITH ACCEPTANCE CRITERIA

DONOR USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Restaurant Owner	Food Donation	DS-1	As a restaurant owner, I want to list my surplus food available for pickup with type, quantity, photo, and preferred time window	<ul style="list-style-type: none"> • Food appears in app within 2 minutes of posting • Photo uploads successfully • Time window options clear (morning/afternoon/evening) • Confirmation notification sent to restaurant 	High	Sprint-1
Catering Service	Bulk Donation	DS-2	As a catering service coordinator, I want to notify the system when we have surplus food from events with exact quantities and special handling notes	<ul style="list-style-type: none"> • System accepts bulk quantity inputs (10-100+ portions) • Special notes field available (allergens, storage type) • Event location auto-populated • Coordinator contact pre-filled 	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Corporate Office	Regular Donations	DS-3	As a corporate office manager, I want to schedule recurring daily surplus meal donations from our cafeteria	<ul style="list-style-type: none"> • Recurring donation option available • Automatic collection times scheduled • Donation history visible • CSR impact report generated monthly 	Medium	Sprint-2
Event Organizer	One-time Donation	DS-4	As an event organizer, I want to immediately notify about surplus food after my event ends to minimize waste	<ul style="list-style-type: none"> • Emergency pickup option available • Response within 30 minutes for events in collection zone • Pickup confirmation sent • Photos of collection taken 	High	Sprint-1
Donor System	Donation Verification	DS-5	As a system, I must verify all donor-provided information is accurate and complete before assigning collection volunteers	<ul style="list-style-type: none"> • Temperature verification completed • Photo clearly shows food • Quantity matches initial estimate ($\pm 10\%$) • All required fields populated • Food source confirmed by volunteer 	High	Sprint-1
Donor Reporting	Impact Feedback	DS-6	As a restaurant donor, I want to see how my donated food impacted communities (meals served, people fed, CO2 saved)	<ul style="list-style-type: none"> • Monthly impact report generated • Report shows meals count, beneficiary numbers • CO2 prevented calculation shown • Downloadable CSR certificate • Shareable social media content 	Medium	Sprint-2

VOLUNTEER USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Collection Volunteer	Collection Assignment	VS-1	As a collection volunteer, I want to receive notifications of nearby food collection opportunities and accept assignments	<ul style="list-style-type: none"> Push notification sent within 2 minutes of food listing Location distance shown (km) Collection window displayed Accept/Decline buttons functional Assigned confirmation sent 	High	Sprint-1
Collection Volunteer	Collection Execution	VS-2	As a collection volunteer, I want clear in-app guidance through the entire collection process including navigation, verification, and documentation	<ul style="list-style-type: none"> Turn-by-turn navigation functional Food safety checklist displayed Temperature input field available Photo capture buttons working Signature capture functional Submit button saves all data 	High	Sprint-1
Collection Volunteer	Food Safety	VS-3	As a collection volunteer, I want to verify food quality and safety before collection with clear checklist items	<ul style="list-style-type: none"> Visual inspection checklist: appearance, odor, contamination Temperature measurement: required <5°C or within 2-hour safe zone Donor information confirmed Photo evidence captured Pass/Fail decision recorded 	High	Sprint-1
Distribution Volunteer	Distribution Assignment	VS-4	As a distribution volunteer, I want to receive route-optimized meal distribution assignments with beneficiary details and preferred times	<ul style="list-style-type: none"> Route assigned showing all stops Beneficiary contact info provided Meal quantity per endpoint shown Preferred delivery time window displayed ETA calculated to each stop 	High	Sprint-2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Distribution Volunteer	Distribution Execution	VS-5	As a distribution volunteer, I want to efficiently deliver meals with confirmation and feedback collection at each endpoint	<ul style="list-style-type: none"> • Route guidance to each endpoint • Beneficiary count entry field • Satisfaction feedback survey (simple 3-4 questions) • Issue/incident reporting option • Completion timestamp recorded 	High	Sprint-2
Volunteer System	Hours Tracking	VS-6	As a system, I must accurately track all volunteer hours contributed for recognition and impact reporting	<ul style="list-style-type: none"> • Time-in recorded when assignment accepted • Time-out recorded when shift completed • Break time deducted (if applicable) • Total hours calculated correctly • Monthly hours compiled • Volunteer dashboard shows cumulative hours 	High	Sprint-1
Volunteer Coordinator	Team Management	VS-7	As a volunteer coordinator, I want visibility into volunteer performance, availability, and scheduling efficiency	<ul style="list-style-type: none"> • Volunteer roster with status (active/inactive/on-leave) • Availability calendar by volunteer • Performance metrics: collections/distributions completed • Efficiency rating: time per collection • Attendance rate tracked 	Medium	Sprint-3
Volunteer Recognition	Rewards & Recognition	VS-8	As a volunteer, I want acknowledgment of my contribution through badges, hours tracking, and public recognition	<ul style="list-style-type: none"> • Achievement badges earned for milestones (10hrs, 50hrs, 100hrs) • Leaderboard showing top contributors • Monthly recognition report • Social media sharing of personal impact • Annual awards ceremony participation 	Medium	Sprint-3

BENEFICIARY USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Shelter Manager	Meal Scheduling	BS-1	As a shelter manager, I want to schedule regular meal deliveries with consistent timing and communicate special needs to food coordinators	<ul style="list-style-type: none"> • Delivery schedule calendar visible • Daily meal capacity specified • Preferred delivery times selected • Special dietary requirements noted • Coordinator contact information provided • Changes can be scheduled in advance 	High	Sprint-1
Shelter Staff	Delivery Verification	BS-2	As shelter staff receiving meals, I want to verify delivery details including meal count, type, and condition before acceptance	<ul style="list-style-type: none"> • Meal count confirmed matches expectation • Visual inspection for quality/safety • Temperature verification (if applicable) • Any issues documented • Signature/confirmation recorded • Feedback provided to volunteer 	High	Sprint-2
Beneficiary Recipient	Feedback & Satisfaction	BS-3	As a meal recipient, I want to provide feedback on meals received and suggest improvements	<ul style="list-style-type: none"> • Simple satisfaction survey (1-5 scale) • Comment field for suggestions • Allergy/dietary concerns noted • Feedback visible to coordinators • Responses acknowledged 	Medium	Sprint-2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Orphanage Director	Meal Customization	BS-4	As an orphanage director, I want to request specific meal types suitable for children's nutrition and cultural preferences	<ul style="list-style-type: none"> • Meal type preferences documented • Age-appropriate nutrition guidance available • Cultural/religious dietary requirements specified • Confirmation that preferences noted • Consistent adherence to preferences 	Medium	Sprint-2
Community Center	Distribution Hub	BS-5	As a community center manager, I want to serve as meal distribution point for neighborhood residents with proper tracking	<ul style="list-style-type: none"> • Meal storage facility requirements met • Beneficiary check-in system available • Meal count tracking • Recipient privacy protected • Feedback compilation supported 	Medium	Sprint-3
System (Auto-verification)	Food Safety Check	BS-6	As a system, I must verify all meals meet food safety standards before distribution to beneficiaries	<ul style="list-style-type: none"> • Temperature maintained 0-5°C during storage • Expiration date not exceeded • No contamination evidence • Proper labeling present • Items segregated appropriately 	High	Sprint-1

OPERATIONS/ADMIN USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Hub Manager	Inventory Management	OS-1	As a hub manager, I want to track all food in storage including quantities, types, dates, and rotation status in real-time	<ul style="list-style-type: none"> • Food items logged upon arrival • Quantities tracked (kg or portions) • Expiration dates recorded • FIFO rotation status visible • Automatic alerts for items expiring soon • Waste tracking logged 	High	Sprint-1
Hub Manager	Cold Chain Monitoring	OS-2	As a hub manager, I want continuous temperature monitoring with alerts if refrigeration deviates from target (0-5°C)	<ul style="list-style-type: none"> • Temperature readings logged every 6 hours • Alert sent if temp >5°C • Backup generator status visible • Manual override capability • Historical temperature graph available • Incident response documented 	High	Sprint-1
Operations Coordinator	Collections Coordination	OS-3	As an operations coordinator, I want to match food collection requests with available volunteers based on location and capacity	<ul style="list-style-type: none"> • Collection request list displayed • Volunteer availability filtered by zone • Distance calculations automatic • Assignment notifications sent • Backup assignments if volunteer declines • Collection status tracked 	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Operations Coordinator	Route Optimization	OS-4	As an operations coordinator, I want system-optimized collection and distribution routes minimizing travel time and maintaining cold chain	<ul style="list-style-type: none"> Collections grouped by geographic zone Recommended route sequences shown Travel time estimates calculated Route modifications accepted Real-time updates as conditions change 	High	Sprint-2
Quality Officer	Food Safety Audit	OS-5	As a quality officer, I want to conduct regular audits with complete access to food safety records, temperatures, and incident logs	<ul style="list-style-type: none"> Complete audit trail available All collection records retrievable Temperature logs comprehensive Incident reports accessible Non-conformance tracking Corrective action status shown 	High	Sprint-2
Financial Manager	Cost Analysis	OS-6	As a financial manager, I want to track operational costs including labor, fuel, storage, and calculate cost per meal for efficiency monitoring	<ul style="list-style-type: none"> Daily cost data compiled Cost per meal calculated Trend analysis over time Budget variance tracked Revenue sources documented Financial reports generated monthly 	Medium	Sprint-2
Analytics Lead	Impact Reporting	OS-7	As an analytics lead, I want to compile impact metrics including meals served, beneficiaries reached, CO2 prevented, and financial efficiency	<ul style="list-style-type: none"> Meals collected/distributed daily Beneficiary count tracked CO2 calculations accurate Water conservation estimated Volunteer hours aggregated Reports generated on demand 	Medium	Sprint-3

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
System Administrator	Data Management	OS-8	As a system administrator, I want user access control, data backup, and security protocols to ensure system reliability and data protection	<ul style="list-style-type: none"> • User roles and permissions configured • Login authentication functional • Daily automated backups running • Data encryption enabled • Access logs maintained • Security patches applied 	High	Sprint-1

USER STORY MAPPING

FOOD SUPPLY PROJECT USER STORY MAP

JOURNEY STAGES: DISCOVERY → REGISTRATION → ASSIGNMENT → EXECUTION → COMPLETION

DONOR PATH:

Discovery → Register/Profile → List Food → Receive Updates → Impact Report
 (DS-1) (DS-1) (DS-1) (DS-6) (DS-6)

VOLUNTEER PATH:

Discovery → Sign Up → Get Assignment → Complete Task → Log Hours
 (VS-1) (VS-1) (VS-1 or VS-4) (VS-2 or VS-5) (VS-6)

BENEFICIARY PATH:

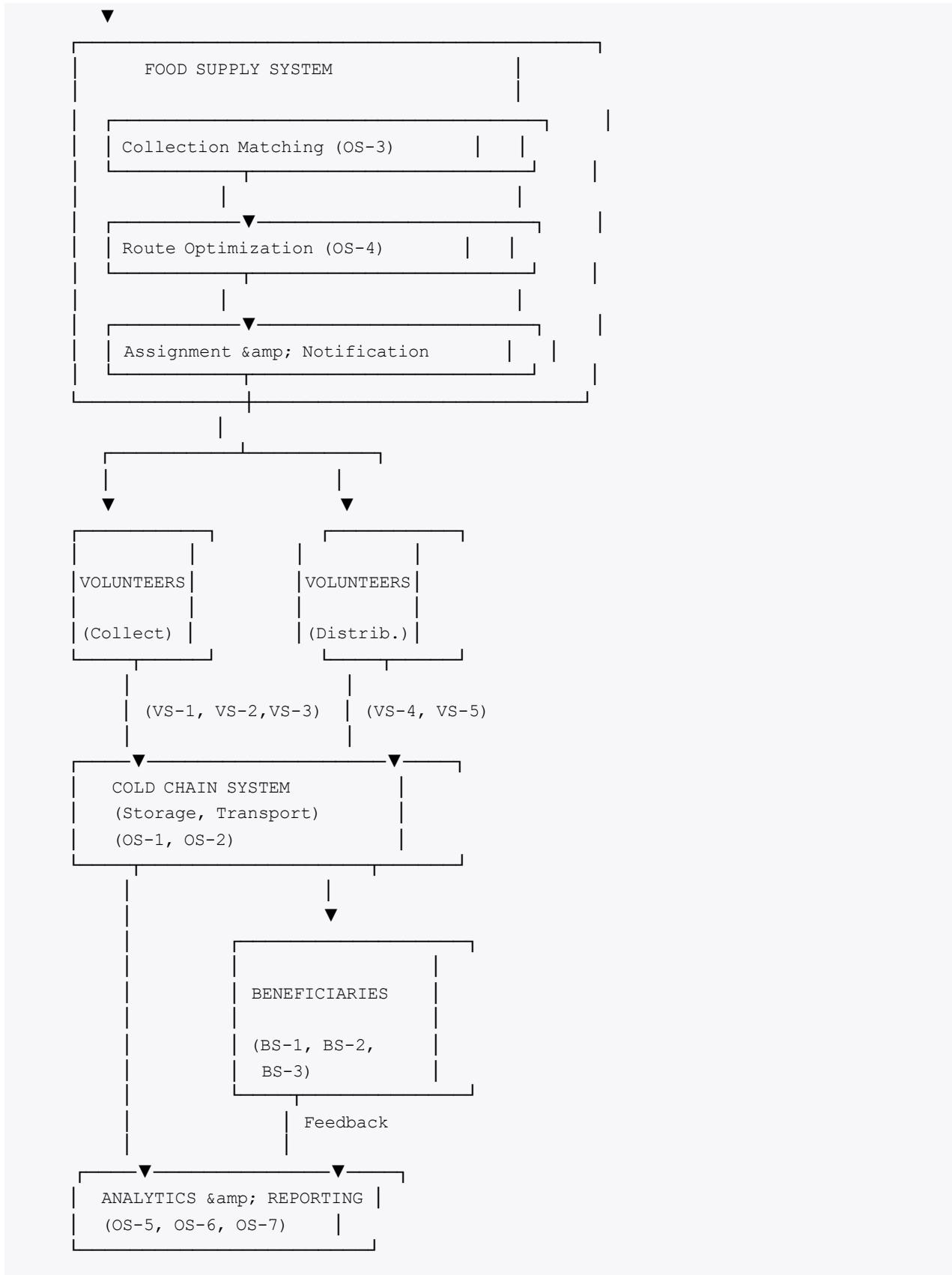
Receive → Check Items → Provide Feedback → Receive Next Meal
 (BS-2) (BS-2) (BS-3) (BS-1)

ADMIN PATH:

Monitor → Manage Inventory → Coordinate Routes → Audit & Report
 (OS-1/2) (OS-1) (OS-3/4) (OS-5/7)

SYSTEM INTERACTIONS DIAGRAM





ACCEPTANCE CRITERIA VERIFICATION

For each user story, acceptance criteria verification follows this process:

- 1. Functional Testing:** Verify each acceptance criterion is met
- 2. Performance Testing:** Ensure response times meet targets
- 3. User Testing:** Validate user experience matches expectations
- 4. Data Testing:** Confirm data accuracy and completeness
- 5. Integration Testing:** Verify system component interactions
- 6. Acceptance Sign-off:** Product owner approval before release

Example: User Story DS-1 Verification

Acceptance Criteria	Test Method	Verification Status
Food appears in app within 2 minutes	Functional test: time from posting to app display	✓ Pass
Photo uploads successfully	Functional test: upload different file sizes	✓ Pass
Time window options clear	UI test: verify all time options visible	✓ Pass
Confirmation notification sent	Integration test: notification system triggered	✓ Pass