

# **Garbage Management System Using Salesforce**

## **Phase 4 – Requirement Analysis**

The Requirement Analysis Phase is critical to ensure that the system meets the needs of all stakeholders. It involves gathering, analyzing, and documenting functional, non-functional, and technical requirements. This phase bridges the gap between ideation, planning, and design, ensuring Salesforce implementation aligns with project objectives.

### **4.1 Objectives of Requirement Analysis**

The main objectives of this phase are:

1. Identify functional requirements to define system behavior.
2. Identify non-functional requirements to define system performance, usability, and reliability.
3. Specify technical requirements including integrations, hardware, and tools.
4. Document requirements in a structured format to guide development and testing.
5. Validate requirements with stakeholders to avoid ambiguity or misalignment.

### **4.2 Stakeholder Requirements**

<b>Stakeholder</b>	<b>Requirements</b>
City Authorities	Ability to track bin status, monitor collection efficiency, generate reports and dashboards, receive alerts for overflow or missed collections.
Field Staff / Garbage Collectors	View daily schedules, update bin status in real-time, receive notifications and route details, capture collection proof.

Citizens	Report overflowing bins, illegal dumping, or missed collections via portal/mobile app, track status of complaints, receive notifications upon resolution.
Environmental Agencies	Access reports on waste patterns, recycling statistics, and sustainability metrics.
IT/Admin Team	Configure Salesforce objects, automate workflows, maintain data security, monitor system integrations.

## 4.3 Functional Requirements

Functional requirements define what the system should do. Key functional requirements for the Garbage Management System include:

### 1. Garbage Bin Management:

- Create, update, and monitor bins.
- Track bin type (organic, plastic, general) and fill levels.
- Store bin location (GPS coordinates/address).

### 2. Collection Scheduling & Routing:

- Generate collection schedules automatically based on bin status.
- Assign tasks to field staff and trucks.
- Update collection status in real-time.

### 3. Citizen Complaint Management:

- Allow citizens to submit complaints with location and description.
- Track complaint status (open, in progress, resolved).
- Notify citizens upon updates.

#### **4. Automation & Notifications:**

- Automatically assign tasks to field staff using Salesforce Flows.
- Escalate unresolved complaints to supervisors.
- Notify staff and citizens via email or portal notifications.

#### **5. Data Analytics & Reporting:**

- Generate reports on collection efficiency, complaint resolution, and recycling trends.
- Display dashboards with real-time operational data.
- Support decision-making and policy planning.

#### **6. Integration with IoT Devices:**

- Receive fill-level data from smart bin sensors.
- Update bin status automatically in Salesforce.

### **4.4 Non-Functional Requirements**

Non-functional requirements define how the system should perform.

<b>Category</b>	<b>Requirement</b>
Performance	System should support at least 500 simultaneous users (field staff + citizens) without lag.
Reliability	System uptime should be 99.5% or higher.
Usability	Citizen portal and mobile interface should be intuitive with minimal training required.
Scalability	System should scale to manage multiple cities or regions in the future.

Security	User data should be encrypted; access controlled using Salesforce profiles and permission sets.
Compliance	Comply with local privacy and environmental regulations.

## 4.5 Technical Requirements

Technical requirements specify tools, technologies, and platforms needed:

1. Salesforce Clouds: Service Cloud, Field Service, Experience Cloud
2. Salesforce Tools: Flows, Process Builder, Reports & Dashboards, Lightning App Builder
3. Integration Tools: REST API or IoT platform for sensor data integration
4. Mobile Access: Salesforce mobile app for field staff
5. Database & Storage: Salesforce standard and custom objects with adequate storage for large-scale data
6. Mapping & Routing: Salesforce Maps or external GIS API for route optimization

## 4.6 Requirement Validation

Requirement validation ensures that all gathered requirements are complete, consistent, and aligned with stakeholder expectations:

1. Conduct workshops with stakeholders to review functional requirements.
2. Create use cases and user stories for key processes.
3. Prioritize requirements based on business value and feasibility.
4. Finalize requirements in a Requirements Specification Document (RSD).

## **4.7 Use Case Examples**

### **Use Case 1: Bin Overflow Complaint**

- Actor: Citizen
- Description: Citizen reports an overflowing bin via portal.
- System Actions: Record complaint, notify municipal team, assign task to nearest collection truck, update status.
- Outcome: Bin is collected, citizen receives resolution notification.

### **Use Case 2: Automated Collection Scheduling**

- Actor: Field Staff / System
- Description: System analyzes bin fill levels and schedules collection routes automatically.
- System Actions: Assign tasks to trucks, notify staff, log completion in Salesforce.
- Outcome: Optimized collection routes, reduced operational cost.

## **4.8 Conclusion**

- The Requirement Analysis Phase ensures that all stakeholder needs are clearly documented and agreed upon before system development begins. It defines the functional, non-functional, and technical requirements for the Garbage Management System and serves as a reference for design, development, and testing.
- The next phase would be System Development & Implementation, where Salesforce objects, flows, dashboards, and integrations are built according to these requirements.