Garbage Management System Using Salesforce

Phase 3 – Project Design Phase

The Project Design Phase focuses on translating the planning specifications into a concrete Salesforce architecture and system blueprint, including data models, automation, integrations, and user interface design. This phase ensures that developers and administrators have a clear implementation guide.

3.1 Objectives of the Project Design Phase

1. Define Salesforce objects, fields, and relationships.
2. Design automation workflows and business processes.
3. Specify user interfaces and citizen portal design.
4. Plan integration with IoT devices.
5. Prepare reporting and dashboard structures.
6. Ensure security, data access, and compliance.

3.2 Salesforce Object Design

The system will leverage custom objects to manage waste management operations. Below are the key objects and their fields:

1. Garbage Bin

- Fields: Bin ID, Location (Address/Coordinates), Bin Type (Organic, Plastic, General), Fill Level (%), Last Collection Date, Status (Full, Partial, Empty)
- Relationships: Linked to Collection Schedule (Lookup), linked to Citizen Complaints (Related List)

2. Collection Schedule

- Fields: Schedule ID, Truck ID, Collection Date/Time, Assigned Staff, Status (Pending, Completed, Delayed)
- Relationships: Lookup to Garbage Bin, Staff Assignment via Salesforce User Object

3. Citizen Complaint

- Fields: Complaint ID, Citizen Name, Contact Info, Complaint Type (Overflow, Illegal Dumping, Missed Pickup), Description, Status, Priority, Resolution Date
- Relationships: Lookup to Garbage Bin, Assigned Team/User

4. Recycling Record

- Fields: Record ID, Bin ID, Type of Recyclable Waste, Quantity, Collection Date, Collector Name
- Relationships: Lookup to Garbage Bin, Staff Assignment

3.3 Automation & Business Processes

Salesforce automation ensures efficiency and timely responses:

1. Task Assignment Automation (Flow)

- Automatically assign collection tasks to trucks/staff based on bin fullness.
- Prioritize bins marked as “Full” or in high-complaint areas.

2. Complaint Escalation Flow

- Complaints unresolved for more than 24 hours trigger an automatic escalation to supervisors.

3. Notification Automation

- Notify field staff of new collection assignments via email or mobile push notifications.
- Notify citizens when complaints are acknowledged, in progress, and resolved.

4. Predictive Scheduling (Optional AI Integration)

- Use historical fill data to predict bin overflow times and optimize collection routes proactively.

3.4 Integration Design

1. IoT Sensor Integration

Sensors in garbage bins send real-time fill level data to Salesforce via API.

Salesforce updates the Garbage Bin object with current fill levels.

2. Mobile/Portal Interface

Citizens can submit complaints, track complaint status, and receive notifications via Salesforce Experience Cloud portal or mobile app.

3. Mapping & Routing Integration

Use mapping APIs (Google Maps or Salesforce Maps) to visualize bin locations and optimize collection routes.

3.5 Reports & Dashboards Design

Key dashboards will provide actionable insights for municipal authorities:

Dashboard	Metrics/Charts
Bin Status Dashboard	Number of bins full/partial/empty, average fill levels
Collection Efficiency Dashboard	Scheduled vs completed collections, delayed collections
Complaint Management Dashboard	Number of complaints by type, resolution time, citizen
Recycling Dashboard	Quantity of recyclable waste collected, recycling rate trends
Resource Allocation Dashboard	Staff/Truck utilization, optimized vs actual routes

3.6 Security & Access Control

Profiles & Roles:

- Field Staff – Read/Update access to assigned collection tasks and bins.
- Supervisors – View all collections, complaints, dashboards.
- Citizens – Access to submit and track complaints.

Permission Sets:

- Additional privileges for admins to configure objects, flows, and reports.

Data Security:

- Ensure compliance with privacy regulations for citizen data.

3.7 User Interface Design

1. Field Staff Mobile App:

View assigned collections, mark tasks as complete, update bin statuses, capture photos if required.

2. Citizen Portal:

Submit complaints with location and description.

Track complaint status.

Access educational resources on waste segregation.

3. Administrator Dashboard:

Monitor operations, generate reports, manage staff assignments, view IoT sensor data in real time.

3.8 Conclusion

- The Project Design Phase provides a clear blueprint for the implementation of the Garbage Management System using Salesforce. It defines data models, automation workflows, integration points, dashboards, and security measures, ensuring that development and deployment can proceed efficiently.

- The next phase would be System Development & Implementation, where the Salesforce environment is configured, flows and automations are created, portals are built, and integrations with IoT devices are completed.