SYMBIOSIS CENTER OF CORPORATE AND PROFESSIONAL LEARNING

(A Unit of Symbiosis Skills and Professional University)

SwachhSwarajya -

Smart Garbage Management System

Business Analysis Batch - 01

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SwachhSwarajya

Smart Garbage Management System
Business Requirement Document
Ver 1.0

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1. Executive Summary

SwachhSwarajya is a smart, digital waste management system developed for the city of Pune to tackle critical urban sanitation issues such as delayed garbage collection, overflowing bins, and improper street disposal. The platform aims to digitize every task and process associated with garbage management, ensuring more efficient communication, tracking, and resolution across all stakeholders.
The system is designed to serve 15 zones and wards, integrating a multi-role profile structure for citizens, garbage truck drivers, and municipal admins. **SwachhSwarajya** not only improves garbage collection efficiency but also promotes public participation and transparency in urban sanitation. It is a major step toward creating a cleaner, smarter, and more responsive Pune.

2. Project Description

The **SwachhSwarajya** project is a smart, integrated waste management system designed specifically for the city of Pune, addressing pressing sanitation challenges including delayed garbage collection, overflowing bins, and improper waste disposal on streets. As Pune expands in population and complexity, traditional waste management methods struggle to keep up. This project aims to digitize and streamline the entire garbage management workflow using mobile and web-based solutions.

3. Project Scope
3.1 In Scope

This document is solely intended for the first phase of the project. It outlines the work that will be carried out and the deliverables expected within this phase. It includes both functional and nonfunctional requirements to ensure a clear understanding of the project's goals and how these goals will be implemented. This document defines the specific features and functionalities that are covered in this phase and explicitly excludes any features or functionalities that are not listed. Any new requirements that arise in the future will be evaluated separately, considered only in subsequent phases, and reflected in an updated version of this document.

3.2 Out of Scope

The system does not incorporate any physical sensor technology to automatically detect whether a bin is full or empty; bin status updates rely solely on manual reporting by citizens or drivers through the app. Additionally, the system does not support garbage management or reporting functionalities outside the Pune area. Currently, it is configured to operate only within 15 specific wards or zones of Pune. Expansion to additional wards, other municipal areas, and the integration of physical sensor technology are planned to be addressed in future phases of the project.

4. Business Drivers

4.1. Improve urban cleanliness by addressing delayed garbage collection, overflowing bins, and improper street waste.
4.2, Promote digital transformation in municipal waste management through a mobile and GPS enabled solution.
4.3. Enhance citizen engagement by enabling real-time issue reporting and feedback.

4.4. Optimize resource allocation and garbage truck scheduling across 15 Pune wards for operational efficiency.

5. Functional Requirements

5.1 Priority

Value	Rating	Description
5.1.1.	Critical	User profile creation for Citizens, Drivers, and Admins for role-based access and operations.
5.1.2.	Critical	GPS-based real-time tracking of garbage trucks to monitor and manage collection.
5.1.3.	Critical	Garbage scheduling with calendar integration for 15 zones and wards, displaying type and timing.
5.1.4.	Critical	Issue reporting feature allowing users to log problems with image, location, and description.
5.1.5.	High	Bin management with complaint reporting for misplaced, broken, static, and mobile bins.
5.1.6.	High	Push notifications for collection delays, complaint resolution, and updates to users.
5.1.7.	Medium	Option to raise a request or schedule a date for special waste collection beyond regular types.
5.1.8	Medium	Campaign section to inform citizens about drives, events, and civic responsibilities.
5.1.9	Low	Minor improvements that can be implemented in future phases. Includes Sensor-based smart bin monitoring for automatic bin status detection.
5.1.10.	Low	Expansion additional wards beyond the current 15.

5.2. Requirements Category 1 (RQC)

ID	Requirement	Priority	Raised By
RQC-01	Role-based login for Citizens	High	Business analyst
RQC-02	Role-based login for Drivers	High	Business analyst
RQC-03	Role-based login for Admins	High	Business analyst
RQC-04	Citizens can report overflowing bins	High	Business analyst
RQC-05	Citizens can report missed garbage pickup	High	Business analyst
RQC-06	Citizens can report damaged bins	High	Business analyst
RQC-07	Citizens can request static bins	Medium	Business analyst
RQC-08	Citizens can request mobile bins	Medium	Business analyst
RQC-09	Citizens can upload images with complaints	High	Business analyst
RQC-10	Citizens can write address with complaints	High	Business analyst

RQC-11	Citizens can track complaint status in real-time	High	Business analyst
RQC-12	Citizens can request special waste collection	Medium	Business analyst
RQC-13	Citizens can schedule special waste pickup	Medium	Business analyst
RQC-14	Drivers can view assigned routes	High	Business analyst
RQC-15	Drivers can report bin issues	High	Business analyst
RQC-16	Drivers can update task status as completed	High	Business analyst
RQC-17	Drivers can update task status as incomplete	High	Business analyst
RQC-18	Drivers can upload proof of task completion	High	Business analyst
RQC-19	Admins can add users	High	Business analyst
RQC-20	Admins can update user details	High	Business analyst
RQC-21	Admins can delete users	High	Business analyst
RQC-22	Admins can assign tasks to drivers	High	Business analyst
RQC-23	Admins can configure collection schedules	High	Business analyst
RQC-24	Admins can configure schedules for each of 15 zones	High	Business analyst
RQC-25	Admins can configure schedules for each of 15 wards	High	Business analyst
RQC-26	GPS tracking of garbage trucks	High	Business analyst
RQC-27	System can monitor truck routes	High	Business analyst
RQC-28	System can monitor truck timing	High	Business analyst
RQC-29	Admins can view all citizen complaints	High	Business analyst
RQC-30	Admins can assign staff to complaints	High	Business analyst
RQC-31	System supports Dry Waste category	High	Business analyst
RQC-32	System supports Wet Waste category	High	Business analyst
RQC-33	System supports Special Waste category	High	Business analyst
RQC-34	Cleanliness campaign section available	Medium	Business analyst
RQC-35	Admins can upload campaign photos	Medium	Business analyst
RQC-36	Admins can upload campaign notices	Medium	Business analyst
RQC-37	System sends push notifications about delays	High	Business analyst
RQC-38	System sends push notifications about campaigns	High	Business analyst
RQC-39	System sends push notifications about pickups	High	Business analyst

5.3 Ward & Zone Table

Ward Office	Probable PMC Zone
Aundh	West Zone
Kothrud Bavdhan	West Zone
Shivaji Nagar	Central Zone
Deccan Gymkhana	Central Zone
Wanowrie	South Zone
Bibwewadi	South Zone
Yerawada Kalas Dhanori	East Zone
Sinhagad Road	South Zone
Hadapsar	South/East Zone
Katraj	South Zone
Pimple Saudagar	North/West Zone
Baner	West Zone
Viman Nagar	East Zone
Kalyani Nagar	East Zone
Kondhwa	South Zone

6. Non-Functional Requirements

ID	REQUIREMENT
NFR-01	The system must be available 24/7.
NFR-02	System End of Day (EOD) will be performed at 12:00 AM.
NFR-03	The system will be back online by 12:05 AM after maintenance.
NFR-04	All screens should be responsive and mobile-friendly.
NFR-05	Screens should load within 5 seconds.
NFR-06	Lock screen status should retain user data when reactivated.
NFR-07	Navigation between screens should not exceed 5 seconds.
NFR-08	The system should handle 1,000 concurrent users at peak times.
NFR-09	Daily backups should be performed at 11:45 PM to prevent data loss.

NFR-10	The system must comply with data security and regulatory standards.

7. Constraints and Assumptions

7.1. Constraints

ID	Constraint
C-01	The system must be developed within the approved budget and timeline.
C-02	Only users with internet access can use the mobile application.
C-03	Integration with GPS hardware in garbage trucks must follow standard APIs provided by the vendor.
C-04	Data storage must comply with municipal data protection and retention policies.

7.2. Assumption

ID	Assumption
A-01	Citizens, drivers, and admins will receive adequate training to use the application.
A-02	Garbage trucks will have functional GPS devices installed and maintained regularly.
A-03	The admin team will actively monitor the system and address issues as they arise.
A-04	All required zone/ward data will be provided by the municipality before system deployment.
A-05	Citizens will have smartphones and basic technical literacy to use the mobile app.
A-06	The server infrastructure will be hosted securely with daily backups enabled.
A-07	Citizens will have internet connection.

8. Conclusion

The current phase of the system marks a significant step toward digitizing and streamlining waste management within select wards of Pune. By enabling manual bin status reporting through the app, it empowers both citizens and drivers to actively participate in maintaining cleanliness. While advanced features like sensor integration and broader geographical coverage are not part of this phase, the system is designed with scalability in mind. These enhancements are planned for future phases, ensuring continuous improvement and long-term impact on urban waste management.

9. Approvals

NA

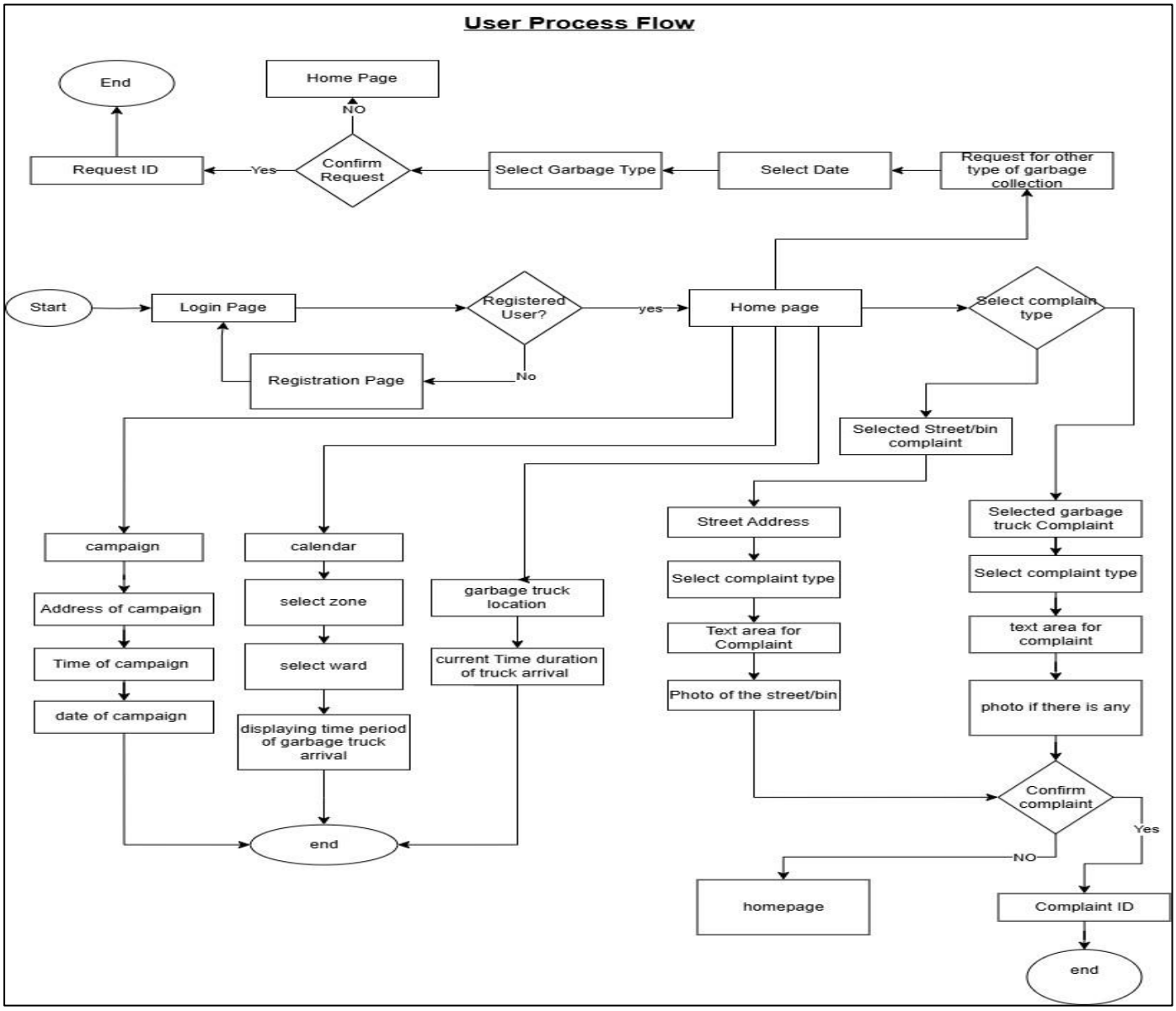
10. References

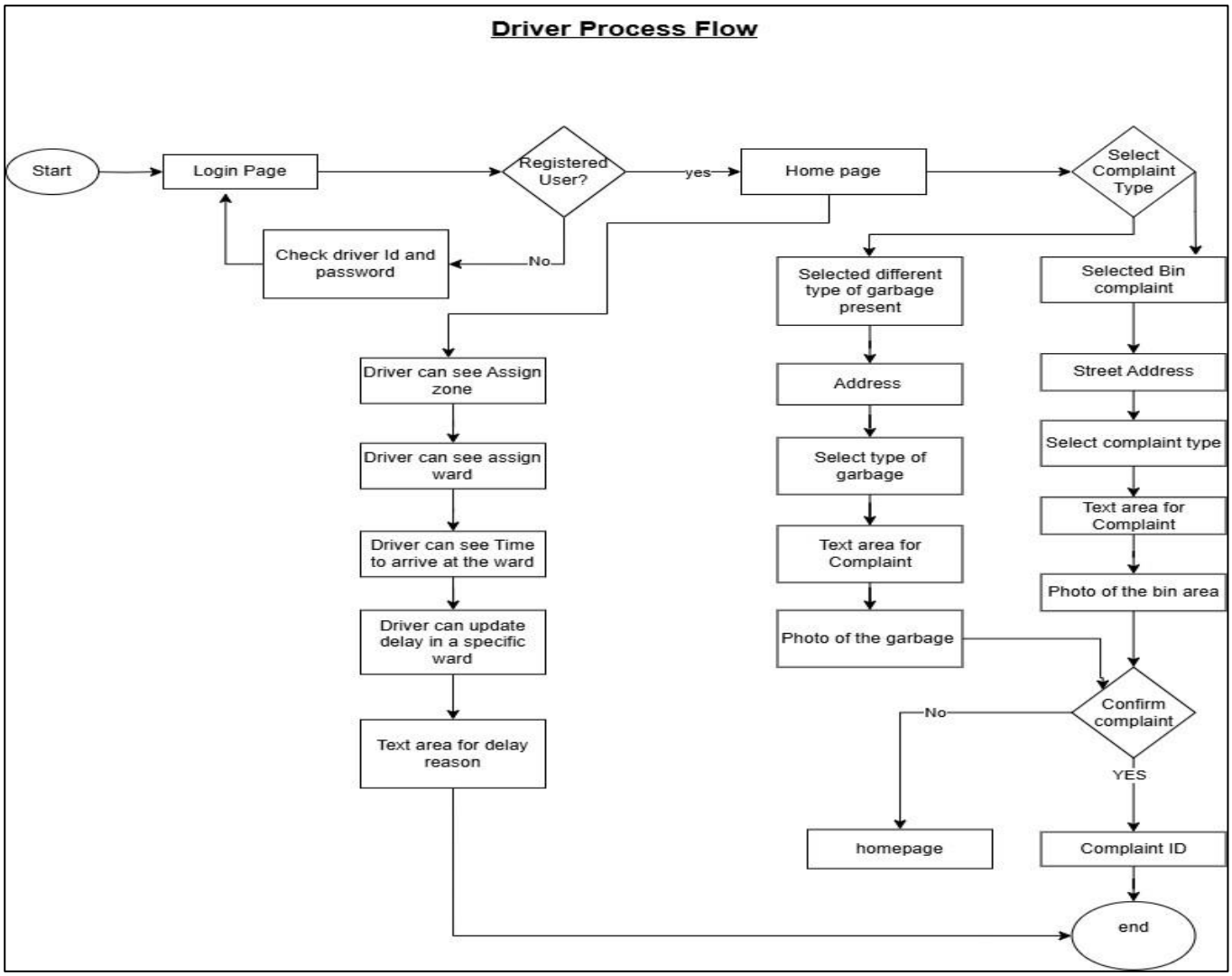
10.1. Smart City Mission documents (India).
10.2. Pune Municipal Corporation (PMC) official guidelines or reports.
10.3. Pune Municipal Corporation Solid Waste Management Policy.

11. Document History

Version	Date	Change	Author
Ver 1.0	26/05/2025	NA	BA

12. Process Flow





13. Snapshots of PPT & Dashboard

• DATA FACTS

•Pune generates approximately 2,258 tonnes of waste daily.
•Projections indicate this could rise to 3,600 tonnes per day by 2031, marking a 60% increase in just over a decade.
•150 Garbage Trucks every single day will required for one city.
•In 2024, the Pune Municipal Corporation (PMC) collected ₹1.94 crore in fines from 38,547 violators for illegal waste dumping
•Despite having over 3,000 Swachh workers under the SWaCH cooperative, only around 55% of Pune's garbage is properly segregated at the source.
— Source: SWaCH Pune Report, 2023.