**Software Requirements**

**Specification**

**for**

**Waste Level Detection**

**Version 1.1 approved**

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1. **Introduction**
   1. **Purpose**

This SRS document presents a detailed description of the Waste level Management System version 1.0. It represents the client requirements analysis that defines the functional and nonfunctional requirements of the waste management system and its different functionalities. It defines the abilities, reactions from stimuli, guidelines and limitations of the system. This document will be complete in its scope of the system and the functions required. The system provides a mobile application for waste collection drivers and Municipal Corporation to monitor and control solid waste collection as a service.

**1.2 Document Conventions**

The document follows the IEEE format standard (IEEE Std. 830 – 1998).

**1.3 Intended Audience and Reading Suggestions**

The intended audiences of this document are Municiple Corporation, who works for the society .

**1.4 Project Scope**

In the proposed system, garbage bins equipped with low cost embedded device are located at various places in entire city. Real time status of garbage level along with garbage bin location is sent to cloud. We have designed a cloud based system for organizing solid waste management process and mobile application for waste collection drivers and Municipal Corporation to monitor and control solid waste collection as a service. Mobile application facilitates the waste collection drivers to go to the garbage bins using dynamic and shortest route.

**1.5 References**

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**2. Overall Description**

**2.1 Product Perspective**

This project represents the initial version of the Waste collection system. All requirements listed here in describe a self-contained system to assist Municipal Corporation and garbage collector contactors to efficiently monitor and collect solid waste

from garbage bins in their region using IoT enabled solid waste management system.

To serve dynamic service, this shows status of each garbage bin in that region and an optimized route to reach fully filled garbage bins.

**2.2 Product Features**

We can subdivide the project into 4 main features. Details of each of the following functions:

**2.1.1 Garbage level**

Design of hardware prototype to indicate level of

garbage in the garbage bins.

At each location, two garbage bins (for wet and dry

garbage) are placed which contain ultrasonic sensors to

indicate level of garbage in the bin. Microcontroller and

RFID based circuitry is used to send the garbage bin status

to central cloud server.

**2.2.2 Cloud Server**

Development of software and hardware module at

central Cloud server.

This module will receive real time status updates from all

the garbage bins and continuously display it on web

application and also push the notifications on client side’s

(Municipal Corporation, Garbage collector truck drivers

etc.) mobile application.

**2.2.3 Mobile Application**

Development of Mobile application to show current

location and status of garbage bins on regional area

map.

Mobile application will show the real time status of

garbage bins which will be used by garbage collection

truck drivers to indicate that garbage bins are full or likely

to be full.

**2.2.4 Route**

Generation and display of dynamic shortest path from

garbage collector truck to fully filled garbage bins.

This module is also responsible to calculate shortest path

from garbage collector truck to garbage bins. Route

optimization is handled by central cloud server.

**3.System Features**

This section provides detailed requirements for the website design, including functional

requirements.

**3.1 General Requirements**

• Taking sensor reading from the Sensor Circuit

• Pushing the data to a MySQL database.

• Retrieving information from database for Calculation of the nearest garbage bin which fulfils the condition for garbage collection, example : Collect garbage from bins whose level is over 50% of bin.

• A client side script to get Garbage collection truck‟s live Geolocation.

**3.2 Non-functional Requirement**:

• The project requires a user interface for monitoring and manually intervening (if required) in the efficient and timely collection of garbage from the selected Garbage bins.

• Another user interface where Garbage collection truck‟s driver(s) can see their next stop location.