Software Design Specification

SMART DUSTBIN MANAGEMENT SYSTEM

GROUP MEMBERS

Nitesh Rawat : IIT2019099
Sanyam Agarwal : IIT2019129
Hafiz Ali : IIT2019159
Tejas Dutta : IIT2019160

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1. INTRODUCTION

1.1 Purpose

This document will define the design of our smart dustbin management system. It contains specific information about the expected input, output and functions. The interaction between the classes to meet the desired requirements are outlined in detailed figures at the end of the document.

1.2 System Overview

SmtBin© is basically an android-based GUI enabled system which uses ultrasonic sensors and moisture sensors on each dustbin in CC3 building to show the current status of garbage on the GUI.

1.3 Design Map

The design of this product utilizes an procedural approach

1.4 Definitions and Acronyms

- **IEEE:** Institute of Electrical and Electronics
- **SDS:** Software Design Specification
- **SmtBin:** The name of our android application**.**

2. Design Consideration

2.1 Operating Environment

The SmtBin© is intended to be operated in an android environment.

2.2 Fault Tolerant Design

Application errors will be handled by common fault detection services (e.g. common C++ exception handling, and error checking on task processing) .

2.3 Design Conventions

The SmtBin© design uses the Procedural methodology to have a backend model to predict changes and handle the changes.

2.4 Architectural Design

The software capabilities and requirements specified in the SmtBin© Software Requirements Specification are transformed into programs that will execute on an android. Software items are partitioned into classes and packages using procedural methodology to maximize encapsulation and minimize interfaces. Packages are then built (compiled and linked) into executable programs.

2.5 Product Functions :

- **2.5.1 Input data:**

  Input will be provided by the sensors.

- **2.5.2 Visualise Data:**

  The system will analyse the data sent to it by the sensors and hence will take appropriate actions.

- **2.5.3 Alert:**

  This function will send an alert message in case of any criticality.

2.5.4 Previous Records :

The user will be able to see previously stored data set from the Database

➢2.5.5 Compare:

This function will allow the user to compare the dataset with previously stored datasets.

➢2.5.6 User Characteristics :

The general characteristics of intended user include Users should have a basic understanding of Ultrasonic and Moisture sensors and should be able to use smartphone and android applications.

➢2.5.7 Constraints :

SmtBin© App can only run on android smartphones.

3.System Architecture

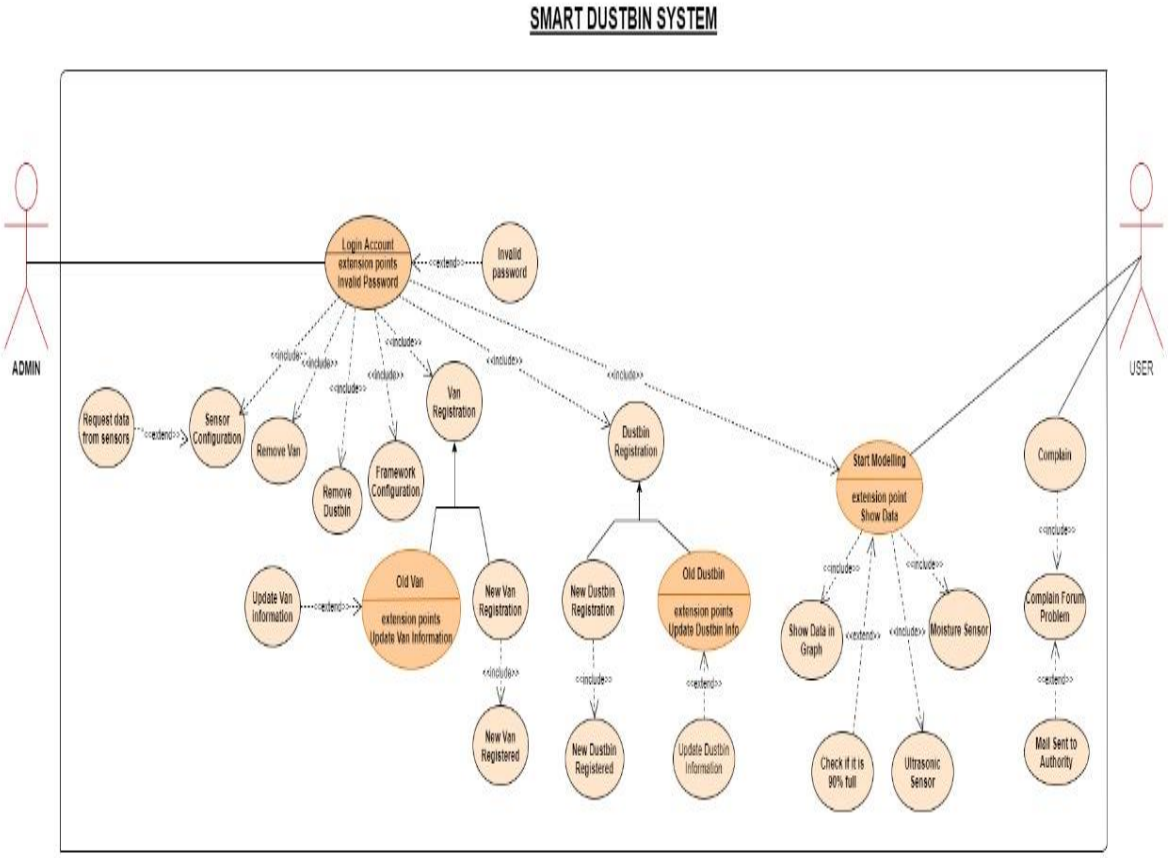
3.1 Overview

SmtBin© is basically an android-based GUI enabled system which uses ultrasonic sensors and moisture sensors on each dustbin in CC3 building to show the current status of garbage on the GUI.

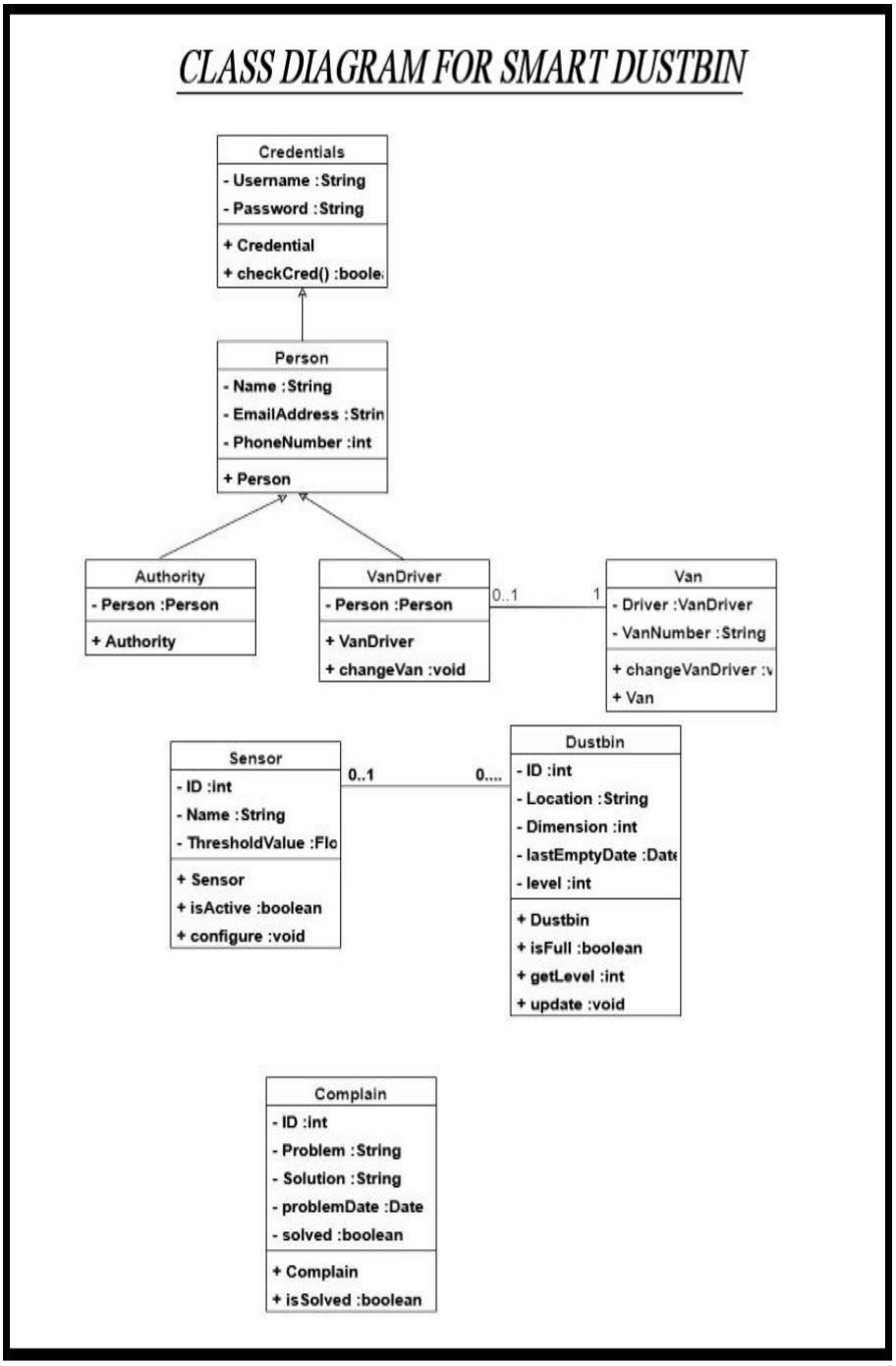
The main purpose of this is to help in maintaining the cleanliness in CC3 building in an effective and in a much more convenient way.

Maintenance team will know the garbage is wet or dry. Message will be sent to notify the maintenance team when the garbage is full. If the garbage is full and maintenance team has not arrived than a message will be sent to higher authorities to do the needful.

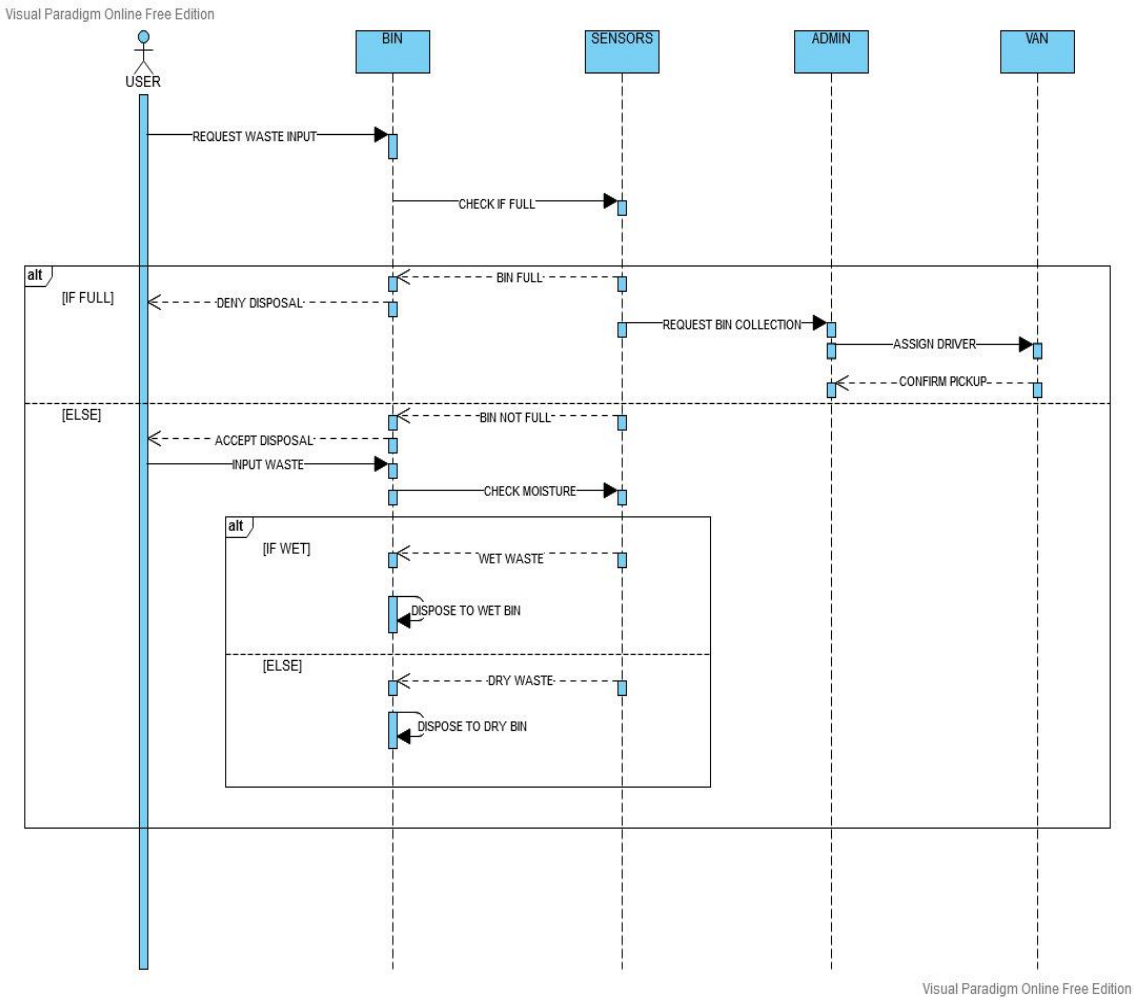
3.2 Use Case Diagram



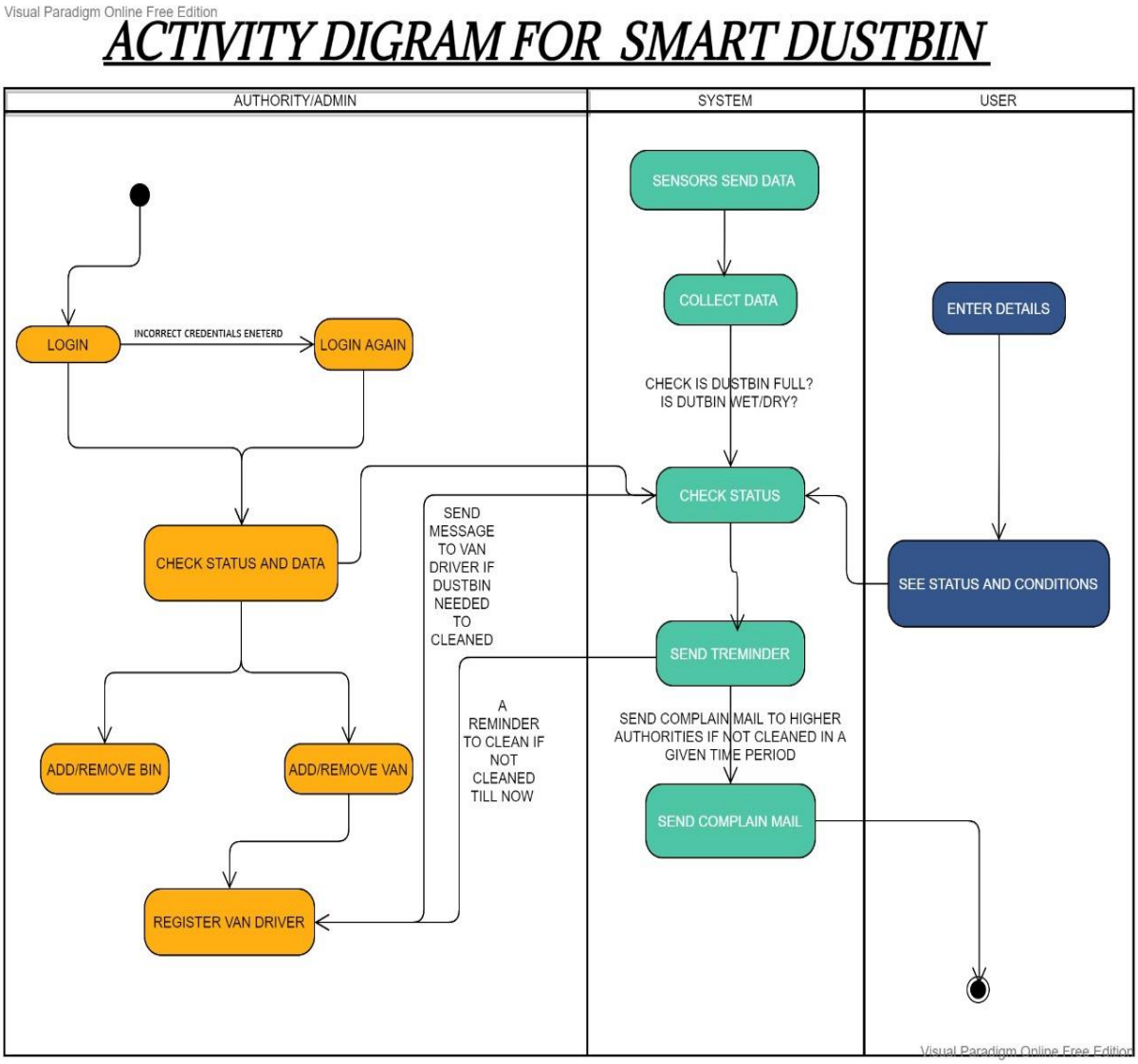
3.3 Class Diagram



3.4 SEQUENCE DIAGRAM



3.5 ACTIVITY DIAGRAM



4. Database Schema

4.1 Databases

4. 1. 1 Database used here for development, testing and production is

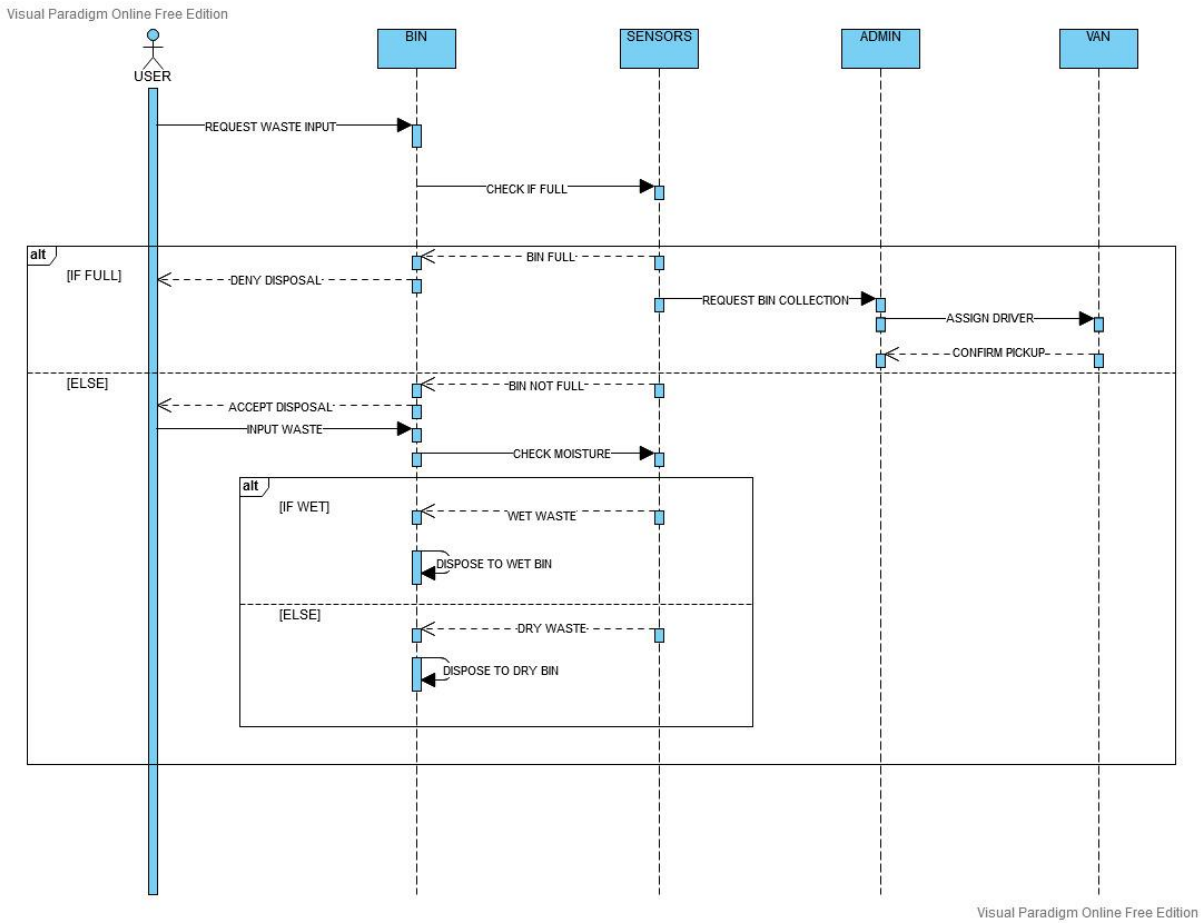
4. 1. 2 Firebase.

4. 1. 3 Sensors detect whether the garbage is wet or dry.

4. 1. 4 Send a message to the authority when the garbage is full.

4.2 Data Migration

Data Migration has been shown in sequence diagram



4.3 ER DIAGRAM