**SOFTWARE REQUIREMENT SPECIFICATION**

**SMART DUSTBIN MANAGEMENT SYSTEM**

**ANDROID APPLICATION**

GROUP MEMBERS

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SOFTWARE ENGINEERING PROJECT

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**1.Introduction:-**

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.

## 

## Purpose:

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. Now let us see the drawbacks of the management system from different perspective:

#### From CC3 building maintenance point of view,

* + - Many times it becomes difficult for the maintenance team to separate the dry and the wet garbage.
    - There are times when the dustbin is full and the garbage is falling out of the bin.
    - Sometimes the maintenance team is not on time for the collection of the garbage from the dustbins.

#### From the Student’s point of view,

* + - They have to look for empty dustbins for throwing the waste materials.
    - They usually don’t know where to throw wet garbage or dry garbage.
    - Even when the dustbin is full , some still put the garbage in them because they don’t have any other option in where to throw garbage.

#### From the Hygiene’s point of view,

* + - The wet garbage is usually mixed with the dry garbage in the dustbins giving birth to many germs.

When the bin is full and the maintenance team have not picked up the garbage , it start falling out of the bin creating unhygienic environment.

So, this project is an attempt to overcome these drawbacks in CC3 building in IIIT Allahabad.

## Scope:

We describe what features are in the scope of the software and what are not in the scope of the software to be developed.

* **In Scope:**

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

* **Out of Scope:**

1. To notify after how much time the bin is full.
2. It can only separate the wet and dry garbage and cannot tell the type. For example:- whether the garbage is a metal or not.

## Definitions, Acronyms, and Abbreviations:

**Acronyms and Abbreviations:**

1. "**SmtBin©":** Copyrighted app name.
2. SRS: Software Requirement Specification

* **Definitions:**

1. Maintenance team: A department in IIIT Allahabad which take care of the garbage management related issues of the CC3.
2. "SmtBin©": An Application for IIIT Allahabad’s Students and CC3 maintenance for effective administration and management of the dustbins related issues.

## References:

IEEE SRS Format

## Overview:

The rest of this SRS is organized as follows: Section 2 gives an overall description of the software. It gives what level of proficiency is expected of the user, some general constraints while making the software and some assumptions and dependencies that are assumed. Section 3 gives specific requirements which the software is expected to deliver. Functional requirements are given by various use cases. Some performance requirements and design constraints are also given.

# 2.Overall Description:-

## Product Perspective:

“SmtBin©” is aimed to provide greater accessibility to the dustbin. It performs intelligent compaction of waste by monitoring fill level in real-time using sensors to overcome the problems of waste management nowadays faced by people. The ultrasonic sensor measures the distance between the objects using sound waves and is attached to the cover and the moisture sensor checks if the garbage is wet or dry. This system will check the status and send the message to the admin that Dustbin is full, then the message is sent to the collection van then garbage collection is done, if the Dustbin is not cleaned in particular time then the message is sent to a higher authority and they will take appropriate action on it.

## Product Functions:

"SmtBin©" supports the following use cases:

|  |  |
| --- | --- |
| **Use cases** | **Description of use cases** |
| **Admin:** | |
| Authorized login | Allows Admin to login. |
| Van registration | New Van is registered by the authority in the system. |
| Dustbin registration | New Dustbin is registered by the authority in the system. |
| Status check | Admin can check the status of dustbin after receiving data from sensors. |
| Removing old dustbins | Admin can remove the data of old damaged dustbins. |
| Removing old damaged vans | Admin can remove the data of old damaged vans. |
| Message from dustbin to van | If the dustbin is full, it will send a message to van. |
| **Sensors:** | |
| Request moisture report from sensors. | It will send the moisture report of the dustbins to the authority. |
| Request status from ultrasonic sensors. | It will send the status from ultrasonic sensors to the authority. |

|  |  |
| --- | --- |
| **System :** |  |
| Sending mail complaints to higher authority. | If the dustbins do not get cleaned in particular time, mail will be sent to higher authorities. |
| **User :** |  |
| Show data | Users will get to know the conditions and data of the system. |
|  |  |

## User Characteristics:

a. The user should be familiar with the operation of Android Device and Applications.

## Principal Actors:

The principal actor in "SmtBin©" is ***ADMIN.***

## General Constraints:

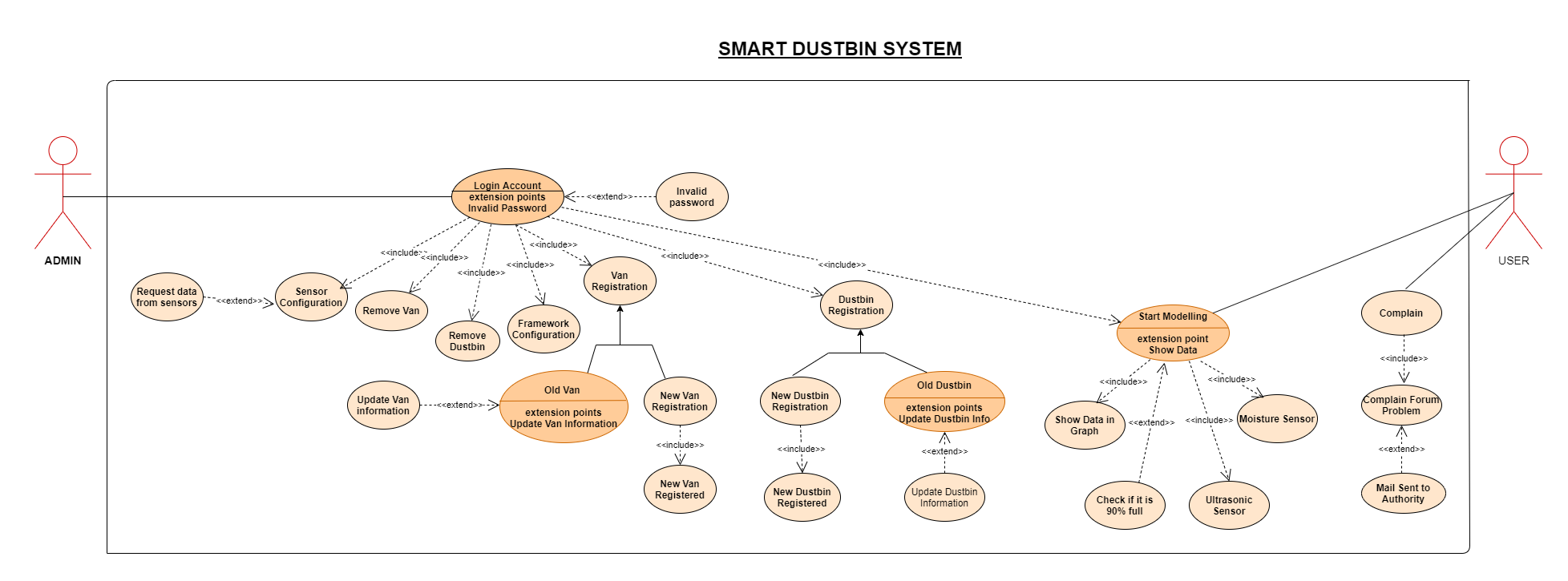
a. Using “SmtBin©" requires an Internet connection.

b. “SmtBin©" is an application for cleaning of the CC-3 building of IIIT Allahabad and all the employees related to the cleaning department should have this application in their phone.

## Assumptions and Dependencies:

1. Working of "SmtBin©” is dependent on the availability of Internet connection.
2. Ultrasonic and Moisture sensors should be in proper working conditions.
3. Admin must be active to insert all the required information on the app.

**USE CASE DIAGRAM:-**



* **Specific Requirements:**
  + **Functional Requirements:**

We describe the functional requirements by giving various use cases:-

## Use Case 1:-

**Name:** Authorized login

**Summary:** Allows Admin to login.

**Actors:** Department of Cleaning

### Pre-conditions:

* Internet connectivity.
* Only for allowed mail ids.

### Main success scenario:

* + - Admin clicks on login button.
    - App checks for the authorization of login.

### Extension:

Id or password incorrect. Shows error dialog box.

### Post-condition:

Admin can now access all features of the app.

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## Use Case 2:-

**Name:** Request moisture report from sensors.

**Summary:** Send the moisture report of the dustbins to the authority.

**Actors:** moisture sensors

### Pre-conditions:

* + - Internet Connectivity.
    - Sensors must be activate and working properly.

### Main success scenario:

* + - Sensor will send the report to the authority.
    - Authority/admin can view all data shown there.

**Extension:** NIL

### Post-condition:

### System will get to know whether dustbin is wet or dry.

## Use Case 3:-

**Name:** Request status of dustbin from ultrasonic sensors.

**Summary:** Send the status of the dustbins to the authority.

**Actors:** ultrasonic sensors.

### Pre-conditions:

* + - Internet Connectivity.
    - Sensors must be activate and working properly.

### Main success scenario:

* + - Sensor will send the status to the authority.
    - Authority/admin can view all data shown there.

**Extension:** NIL

**Post-condition:** NIL

**Use Case 4:-**

**Name:** Van Registration

**Summary:** new van is registered by the authority in the system.

**Actors:** Authority/Admin

### Pre-conditions:

* + - Internet connectivity.
    - Admin must upload a proper and correct information of the van.

### Main success scenario:

* + - Admin clicks on register van icon/tab.
    - Admin chooses required details for the registration of the van.
    - Admin save the details of the van.

### Extension:

Error in registering. Shoes error dialog box.Occurs due to poor internet connectivity or wrong details filled.

### Post-condition:

### New Van is finally registered.

**Use Case 5:-**

**Name:** Dustbin Registration

**Summary:** new Dustbin is registered by the authority in the system.

**Actors:** Authority/Admin

### Pre-conditions:

* + - Internet connectivity.
    - Admin must upload a proper and correct information of the Dustbin.

### Main success scenario:

* + - Admin clicks on register Dustbin icon/tab.
    - Admin chooses required details for the registration of the Dustbin.
    - Admin save the details of the Dustbin.

### Extension:

Error in registering. Shoes error dialog box. Occurs due to poor internet connectivity or wrong details filled.

### Post-condition:

### New Dustbin is finally registered.

## Use Case 6:-

**Name:** checking status of dustbin after receiving data from sensors.

**Summary**: Admin/Authority will check the status of the dustbin and will take the required action.

**Actors**: Admin/Authority

### Pre - Conditions:

Admin clicks on the notification tab in the in the data collected section and will act further.

### Main Success scenario:

* Admin clicks on the notification tab in the in the data collected section.
* Admin will see the data/report sent by the sensors .

### Extension:

* Admin fails to see the report due to loss of internet connectivity. An error message is thrown which indicates the same.
* The administrator will check the details and hence will take further actions.

### Post condition:

Admin acknowledges the successful data received and checked.

## Use Case 7:-

**Name:** removing old dustbins

**Summary:** Admin will remove the data of old damaged dustbins.

**Actors:** Admin

### Pre - Conditions:

Admin will check the conditions of dustbins and will remove the old damaged dustbins from the records.

### Main Success Scenario:

* Admin will click on the remove dustbin icon.
* After giving reason of removal will removethe dustbin from records.

### Extensions:

NIL

### Post condition:

Old dustbins are removed.

## Use Case 8:-

**Name:** removing old damaged vans

**Summary:** Admin will remove the data of old damaged vans.

**Actors:** Admin

### Pre - Conditions:

Admin will check the conditions, running period ,and other needful information of the van and will remove the old damaged vans from the records.

### Main Success Scenario:

* Admin will click on the remove van icon.
* After giving reason of removal will remove the van from records.

### Extensions:

NIL

### Post condition:

Old damaged vans are removed.

## Use Case 9:-

**Name:** sending message to van if dustbin is full.

**Summary:** If the dustbin is full as per data given by the sensors then a message will be sent automatically to the garbage collecting van to clean and empty the dustbin.

**Actors:** Admin

### Pre-conditions:

Internet connectivity.

### Main success scenario:

* + - Message will be sent to the garbage collecting van that dustbin is full.

### Extensions:

NIL

### Post-condition:

Van will get the message/notification to empty and clean the dustbin.

## Use Case 10:-

**Name:** sending mail/complaint to higher authorities.

**Summary:** If the dustbins are not cleaned even after notifying within given time period the a complaint mail will be sent to higher authorities regarding the same.

**Actors:** System

### Pre-conditions:

Internet connectivity.

### Main success scenario:

* + - A mail consisting of the complaint will be sent to higher authorities.
    - If dustbins are not cleaned up in the given time period even after notification.

### Extensions:

Authorities will take necessary actions.

### Post-condition:

Higher authorities will get to know about the carelessness of the employees regarding cleanliness of the building.

**U se Case 11:-**

**Name:** Show data

**Summary:** A user will get to know the conditions and data of the system.

**Actors:** User

### Pre-conditions:

* + - Internet connectivity.
    - The user must enter tom the monitoring window to get to know about the system data.

### Main success scenario:

* + - User clicks on ‘Start Monitoring’ tab.
    - User will see and get the data on the screen of the current conditions of the dustbins.

### Extensions:

NIL

### Post-condition:

User will know about current conditions.

## Non-Functional Requirements:

* Opening any one of the menu options should take a maximum of 2 seconds.
* The users shall be able to reach the website within 3 sec.
* Loading speed should be less than 3 seconds.
* Connected 24 X 7 to server.
* Number of unsuccessful attempts must be recorded, and if try was for more than 4 trials it can lock and secure the profile details of the student, with email notification of such activity.
* The system must automatically log out all customers after a period of inactivity.
* The system’s back-end servers shall only be accessible to authenticated admin.

## Hardware Requirements:

Should run on android device. Requires minimum 2gb ram for smooth functionality of the app.

## Software Requirements:

Minimum SDK version: Android 4.0.3 (Ice Cream Sandwich).

## Design Constraints:

**Security:** The files in which the information regarding securities and portfolios should be secured against malicious deformations.

**Fault Tolerance:** Data should not become corrupted in case of system crash or power failure.