

# Garbage Bin Monitoring System for Dry Waste

Akshatha.C.S<sup>1</sup>, Apeksha.A.Kotian<sup>2</sup>, Maithri.Rao.K<sup>3</sup>, Shabana Sultana<sup>4</sup>

*Department of Computer Science and Engineering*

*The National Institute Of Engineering*

*Mysore, Karnataka, India.*

\*\*\*

**Abstract-** Commonly, in our city we see that the rubbish receptacles or dustbins put at open spots are over-burden. It makes unhygienic conditions for individuals and in addition offensiveness to that place leaving awful stench. To maintain a strategic distance from such circumstances the proposed venture will be actualized for productive dry waste administration utilizing IOT. These dustbins are interfaced with Arduino based framework having weight sensors alongside focal framework demonstrating current status of refuse, on versatile web application with Android application by Wi-Fi. Subsequently the status will be refreshed on to the App. Major some portion of the proposed extend relies on the working of the Wi-Fi module; fundamental for its usage. The fundamental point of this venture is to diminish HR and endeavors alongside the upgrade of a keen city vision.

**Keywords:** Pressure Sensor, IOT, FCM, Notify, Android.

## 1. INTRODUCTION

Every one of us lives in an area or encompassing. We should keep our surroundings slick and clean. This will help us to live sound and better lives. Keeping our environment clean will just help in the improvement of society.

With innovation, industry flourishing increment in the populace; and urbanization it is winding up plainly progressively hard to keep the earth clean. Normal natives, when cooperating, have an enormous effect on the earth in either a positive or negative way. Strong waste that is shamefully discarded can bring about various issues. It can make a rearing ground for pathogenic microorganisms and vectors of ailment, and cause an open irritation because of unattractiveness and awful stench. It can bring about sully of encompassing soil, groundwater and surface water, and it can likewise make fire risks, physical perils and have harming impacts (from pesticides and bug

sprays). In any case, these issues can be maintained in a strategic distance from by utilizing fitting administration strategies.

The venture proposed here for the most part handles the administration of trash containers for dry waste. Dry waste incorporates all things that are not viewed as wet or dirtied things. This incorporates both recyclable and non-recyclable materials. Dry waste incorporates things, for example, bottles, jars, apparel, plastic, wood, glass, metals and paper. The framework screens the refuse canisters and advises about the level of waste gathered in the rubbish receptacles by means of a versatile application.

The trash container observing framework utilizes weight or weight sensors put over the canisters to distinguish the waste level and contrast it and the limit of the refuse receptacles. The information is then sent to the equipment module which comprises of Arduino Uno microcontroller. The equipment pushes the information from the sensor to the distributed storage. This information from the cloud is then sent to the director through a versatile application as a push warning.

The goal of the proposed framework is to screen the refuse gathering process and oversee general accumulation. It would give in time refuse accumulation coming about into clean condition, fuel sparing and critical efficient too. The target likewise incorporates the plan of observing framework with focal points of minimal effort and exactness.

## 2. LITERATURE SURVEY

This is not an original idea, for the implementation of smart garbage bin; the idea has existed for many years, after the IOT field finding its grip in our lives. This is, however an original plan for designing smart garbage in with ultrasonic sensor and Wi-Fi module for transmission of data maintaining the Integrity of the Specifications.

Waste Bin Monitoring System Using Integrated Technologies 2014 proposed by Kanchan Mahajan, Prof.J.S.Chitode. This project deals with the design of a system based on Arm 7 for collecting the garbage. A combination of two trending technologies i.e. Zigbee and Global System for Mobile Applications (GSM) are used in this project. The sensors are placed in the common garbage bins placed at the public places. When the garbage reaches the level of the sensor, then that indication will be given to ARM 7 Controller. The controller will give indication to the driver of garbage collection truck as to which garbage bin is completely filled and needs urgent attention. ARM 7 will give indication by sending SMS using GSM technology.

Smart Dustbin- An Efficient Garbage Monitoring System proposed by Monika K A, Nikitha Rao, Prapulla S B, Shobha G. In this paper, smart bin is built on a microcontroller based platform Arduino Uno board which is interfaced with GSM modem and Ultrasonic sensor. Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin.

Smart Bin Implementation for Smart Cities proposed by Narayan Sharma, Nirman Singha, Tanmoy Dutta This paper describes the application of our model of "Smart Bin" in managing the waste collection system of an entire city. The network of sensors enabled smart bins connected through the cellular network generates a large amount of data, which is further analyzed and visualized at real time to gain insights about the status of waste around the city. This paper also aims at encouraging further research in the topic of waste management.

SMART DUSTBIN proposed by Twinkle Sinha, K.Mugesh Kumar, P.Saisharan The authors have designed a model for a 'Smart Dustbin' which indicates directly that the dustbin is filled to a certain level by the garbage and cleaning or emptying them is a matter of immediate concern. This prevents lumping of garbage in the roadside dustbin which ends up giving foul smell and illness to people. The design of the smart dustbin includes a single directional cylinder and an Arduino Uno. The circuit to power up the mechanical devices is also assembled to obtain the desired simulation.

### 3. PROBLEM STATEMENT

The existing methods employed by the organizations have the following limitations:

1. The refuse continues lying close to the receptacle.
2. It fills in as a reproducing ground for stray canines and different creatures.
3. The gathering system is not effective and it is a monotonous employment.

The gathering will be done on opportune premise, so that the refuse does not continue lying close to the receptacles. It will be a productive framework and will spare enormous measure of fuel.

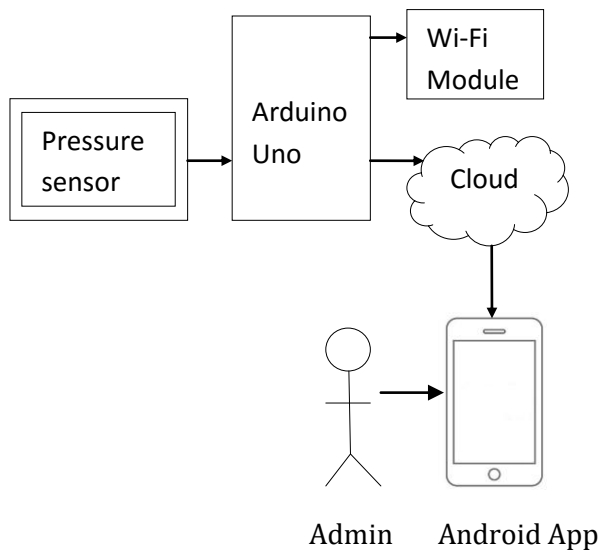
### 4. PROPOSED SYSTEM

A garbage management system is proposed here which involves building of the smart dustbins exclusively for dry waste. These dustbins are built using weight sensors. When the weight of the garbage collected inside the dustbins reach some calculated threshold notification is sent to the concerned authority through a mobile application. The mobile application in turn gets a push notification from the dustbins which are full. Using GPS technology the dustbins can be located and tracked. Notification is also sent when the sensor is tampered or when it stops functioning.

For the better implementation of locating dustbins using GPS one single smart dustbin is built and for the remaining dustbins simulation technique will be used so that the entire system will be equivalent to building of two to three smart dustbins. Some networking concepts will also be used for the communication between simulators and application. Laptops will be utilized for the simulation purpose.

### 5. SYSTEM ARCHITECTURE

The conceptual model of the entire system proposed here can be given by the system architecture. The pictorial representation of the system presented gives the clear picture of what and how the system is being developed.



**Fig-1:** System Architecture

1. The pressure sensor detects the level of garbage.
2. Whenever the garbage level reaches threshold the sensor notifies the Arduino Uno.
3. The data from Arduino is uploaded to the cloud storage.
4. The push notification is then sent to the android application running in the registered android mobile.

### 5.1 ADVANTAGES AND DISADVANTAGES

#### Advantages:

1. The system uses user friendly mobile application.
2. No one else other than concerned authority will have access to the mobile application.
3. The status of the dustbins can be identified in the application.
4. Sensors are safeguarded by informing the concerned authority in case if it is damaged.

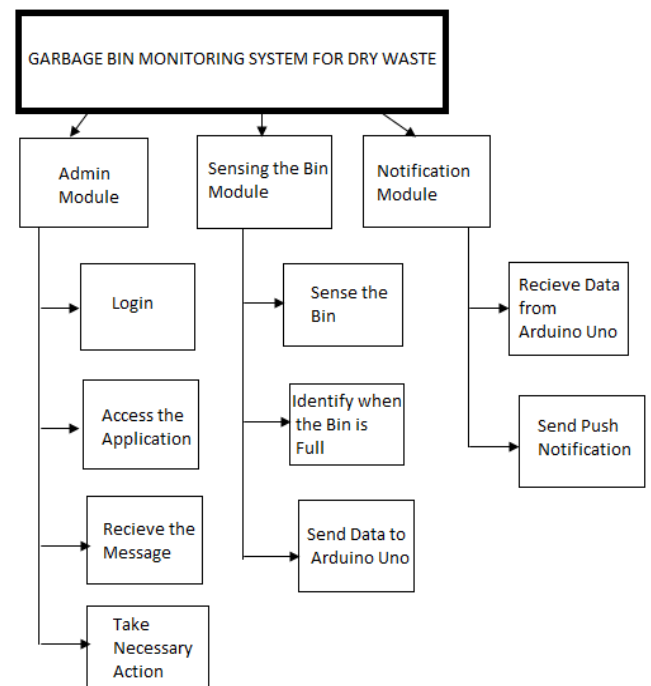
#### Disadvantages:

1. The system proposed consists of only pressure sensor to sense the bin which can be used only for dry waste. Different types of sensor like methane and wet sensor are to be used to sense different types of wastes like rotten and wet ingredients.
2. The proposed system has only admin module that can be logged in and monitor the bin. The users can also be made to register, login and get some credentials as a part of control.

### 6. DESIGN OF THE SYSTEM

The system has been designed in a modular way. There are 3 main modules being implemented in the entire system. They are,

1. Admin module.
2. Sensing the bin module.
3. Notification module.



**Fig-2:** Design of the system

### 7. IMPLEMENTATION DETAILS

The working of the whole framework can be appeared in a basic stream or flowchart. The framework starts with the sensor being connected to the dustbin making it a smart dustbin. The information from sensor is sent to the Arduino Uno micro controller. From the equipment the information is pushed into the cloud. The information that is should have been sent as a push notice to the enlisted versatile application is sent from the cloud utilizing the idea of Firebase Cloud Messaging.

The implementation details can be given as,

1. A database must be created which stores the pick point location, log details.
2. The android application is built to receive push notification.
3. The android device is registered to access the built application.

4. The sensor data is transferred to Arduino Uno on timely basis.
5. The data from the microcontroller i.e. Arduino Uno is pushed to the cloud constituting the android.
6. The data from cloud is sent to the android application running in the registered mobile device.
7. The necessary action is taken by the admin.
8. If no notifications or results come from the sensor for many days, it's assumed that the sensor might be damaged.
9. A website is also created for the users to access, and to submit their complaints or queries.

administration framework makes the rubbish accumulation more effective. Brilliant dustbin makes a difference us to diminish contamination. The system guarantees squander accumulation on time which in turn guarantees less pollution of condition, no spread of illness and a cleaner encompassing.

**ACKNOWLEDGEMENT**

Authors would like to thank Smt.Shabana Sultana, Associate Professor, Department of Computer Science, The National Institute of Engineering, Mysore for the support and guidance.

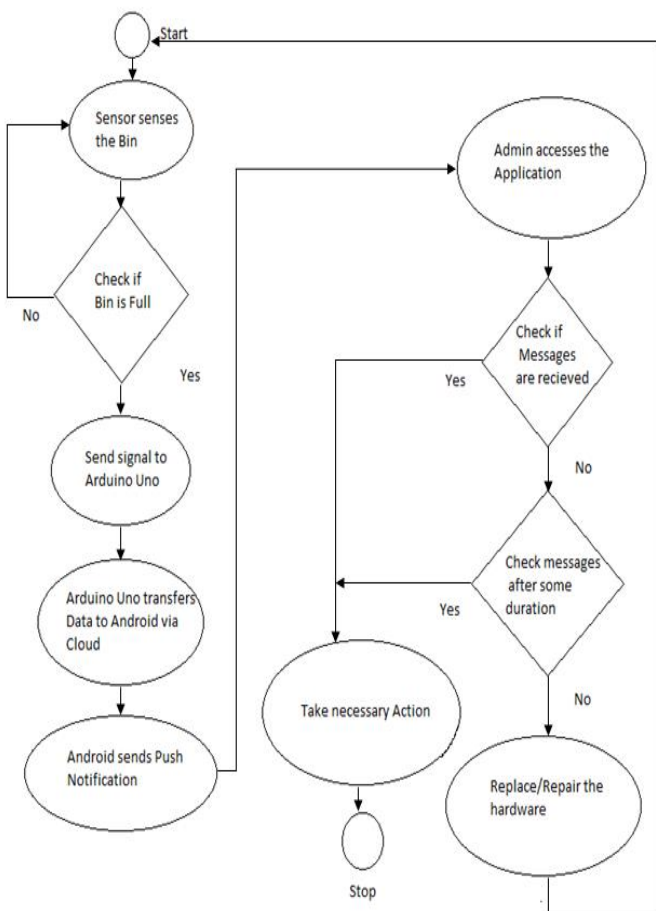
**REFERENCES**

[1]Kanchan Mahajan, Prof.J.S.Chitode, "Waste Bin Monitoring System Using Integrated Technologies", International Journal of Innovative Research in Science,Engineering and Technology, Vol. 3, Issue 7, Jul. 2014, ISSN: 2319-8753.

[2]Monika K A, Nikitha Rao, Prapulla S B, Shobha G, Smart Dustbin-An Efficient Garbage Monitoring System, International Journal of Innovative Research in Science,Engineering and Technology,2016 Research Article, Volume 6 Issue No. 6, ISSN: 2321 3361.

[3]Narayan Sharma, Nirman Singha, Tanmoy Dutta, Smart Bin Implementation for Smart Cities, International Journal of Scientific & Engineering Research, Volume 6, Issue 9, September-2015, ISSN 2229-5518.

[4]Twinkle Sinha, K.Mugesh Kumar, P.Saisharan, SMART DUSTBIN, International Journal of Industrial Electronics and Electrical Engineering, Volume-3, Issue-5, May-2015, ISSN: 2347-6982.



**Fig-3:** Working of the system and its flow diagram

**8. CONCLUSION**

The system proposed is the execution of shrewd trash administration framework utilizing pressure sensor, Arduino and Wi-Fi module. The framework guarantees the cleaning of dustbins soon when the refuse level achieves its greatest. This decreases the aggregate number of treks of rubbish gathering vehicle and thus lessens the by and large use related with the waste accumulation. It at last keeps cleanliness in the general public. Along these lines, the savvy waste