



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 2)

Available online at: [www.ijariit.com](http://www.ijariit.com)

## A Survey on IOT Based Smart Garbage Monitoring System

Sayali Suryakant Chalke

[sc771997@gmail.com](mailto:sc771997@gmail.com)

AISSMS College of Engineering, Pune, Maharashtra

Mohini Bhalerao

[mohinibhalerao02@gmail.com](mailto:mohinibhalerao02@gmail.com)

AISSMS College of Engineering, Pune, Maharashtra

Swapnali Bangar

[bangarswapnali@gmail.com](mailto:bangarswapnali@gmail.com)

AISSMS College of Engineering, Pune, Maharashtra

Dhanashree Gaikwad

[dhanno1997gaikwad@gmail.com](mailto:dhanno1997gaikwad@gmail.com)

AISSMS College of Engineering, Pune, Maharashtra

S. G. Dhengre

[sgdhengre@aissmscoe.com](mailto:sgdhengre@aissmscoe.com)

AISSMS College of Engineering, Pune, Maharashtra

### ABSTRACT

*Waste management is a big issue in the world. Many countries provide different methods for garbage management and maintain cleanliness of surroundings. In India there is improper waste management and people also not maintain the cleanliness of environment. At many places the garbage containers are overflow but GCT (Garbage Collection Truck) not arrives. Also with the increase in the population of country current garbage collection system not capable to maintain the green environment. There are many kinds of problems arises due to improper garbage collection like the ugliness of environment, spread many diseases. There are various techniques comes out for monitoring garbage collection. In this paper, we study and discuss this various technique for garbage monitoring.*

**Keywords:** GCT, Sensors, Dashboard, Garbage Container, IOT.

### 1. INTRODUCTION

Now a day's one of the major aspects of concern that causing on earth is pollution. Waste management is a big issue in today's world. Every city has special organizations and companies who manage the collection and removal of waste. But the issue arises when garbage container gets full before the arrival of the garbage collection truck. In conventional approach garbage bin at public places get overflow but not get collected at the proper time. There are many solutions are discovered for garbage collection problem. Many applications are available on the play store where the user can give alert to the municipal corporation about the status of the garbage container. But these are a somewhat long process that user gives alert to the corporation and Then Corporation orders GCT to collect the waste. An alternative solution for this problem is use sensors grab the garbage level information of garbage container and gives alert to the GCT about the level of waste in a garbage container.

### 2. LITERATURE SURVEY

[1] RFID technology is used for collection of data regarding garbage container. RFID tag detected within the frequency range and when any tag comes to the range of RFID reader, it automatically reads data from RFID reader, then filters collected data and arranges it into specific formatted SMS. After that, the data is sent to central server sends the information to the web server as well as authorized person's mobile phone.

[11] This Paper proposed a method as follows. The level of garbage in the bin is detected by using the ultrasonic sensor and communicates to control room using GSM system. Four IR sensors are used to detect the level of the garbage bin. When the bin is full the output of the fourth IR is active low and this output is given to microcontroller to send a message to control room through GSM

In this paper ZigBee, GSM and ARM7 controller is used to monitor the garbage bin level. When garbage bin is full, this message of garbage level is sent to ARM7 controller. Then ARM7 will send the SMS through GSM to authority as to which bin is overflowing and requires cleaning up.

[1] The paper proposed method as. Ultrasonic sensors are used to sense the level of bin and load cell are used as a secondary sensor. If the level sensors are failing then load cell can be used as a reference. When the bin is full GSM send the message to the server room. This message contains the coordinate of the bin which is provided by GPS module. The microcontroller receives the input from GSM and performs signal processing. Microcontroller communicates to GSM by using UART.

[10] In the paper the system is designed in such a way that it avoids overflow of the bin by sending an alert. It uses Arduino Uno R3 as a microcontroller for reading data from sensors. This technology mainly uses RFID reader which is interfaced with a microcontroller for the verification process. When RFID tag interrupts the RFID reader, the sensor will check the status of the bin and send it to the web server.

[3] Optimal Route:

To solving optimization problem is to Information about filling garbage containers handled automatically by the system during the development of an optimal route. A GSM module is used to communicate with server room. When the garbage containers about to overflow, with the help of GSM module, an alert will be sent. The GPS module will help to identify the location of the garbage container. The alert signal will also contain the coordinates of garbage container which will be provided by GPS module.

In this study, garbage collection routes optimization using Geographical Information System (GIS-Arc View) was studied. Many routes were selected in the different area of the city and the present routes were optimized to reduce the length of the routes and consequently the time is taken to complete the collection. We are using Bing Maps API to show the geographical location of the garbage container. Currently, the GPS techniques to automatically detect the location of the garbage container have not been used. The Admin can also get the shortest path comprising of all the filled garbage container by clicking on the ‘Show Path’ button and he can redirect the garbage collection vans along that path. For finding the shortest path Bing Maps Routing Engine has been used. *GSM & GPS*.

As we go through the introduction in next section we will discuss the proposed system in sub section.

### 3. PROPOSED SYSTEM

By considering survey based on garbage collection process we propose, a system which will contain dashboard as well as an android application for garbage status and also provide an optimal route to the driver for collecting the garbage. The dashboard will be monitored by an administrator with information status of garbage bin like its level of garbage, the temperature of the bin. The driver of garbage collection truck also have an android application, by using that application driver is able to know current location and status of the garbage bin. Then as per provided the optimal route by application driver will collect the garbage from the bin which will first get filled. This system will overcome the problem regarding current system.

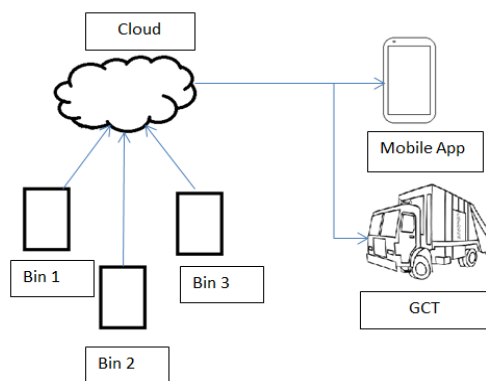


Fig: 1.1 Overall System Architecture

### 4. CONCLUSION

In papers, we studied the various technologies for garbage collection and management process. Various technologies are GPRS, GSM, RFID, IoT etc. This Smart Garbage Monitoring System designs will be very beneficial to our societies, economics development as the fuel, cost, transport system will be reduced. The system is efficient as it reduced human effort.

### 5. REFERENCES

[1] Dr.N.Satish Kumar, B.Vijayalakshmi, R. Jenifer Prathana, A.Shankar “IOT Based Smart Garbage alert system using Arduino UNO”, published in Region 10 Conference (TENCON) on 22-25 Nov 2016.ISBN 978-1-5090-0751-6/16/2016 IEEE.  
 [2] Andrei Borozdukhin, Olga Dolinina and Vitaly Pechenkin “Approach to the Garbage Collection in the Smart Clean City” in Information Science and Technology (CiSt) on 05 January 2017.  
 [3] Jetendra Joshi, Joshitha Reddy, Praneeth Reddy, Akshay Agar-wal, Rahul Agarwal, Amrit Bagga, and Abhinandan Bhargava “Cloud Computing Based Smart Garbage Monitoring System” in 3rd In-ternational Conference on Electronic Design (ICED), on 11 August 2016 IEEE.  
 [4] Pavithra “Smart Trash system An Application using ZigBee” in IJISET - International Journal of Innovative Science,Engineering and Technology on 8 October 2014.

- [5] Shambala S Salunkhe, Madhuri D Yadav, Vrushali V Kulkarni “IOT Based Waste Monitoring For Smart City” in International Journal Of Engineering And Computer Science on 4 April 2017.
- [6] Radek Fujdiak, Pavel Masek, Petr Mlynek, Jiri Misurec, Ekaterina Olshannikova “Using Genetic Algorithm for Advanced Municipal Waste Collection in Smart City” in 10th International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP) on 2016.
- [7] Narendra Kumar G., Chandrika Swamy, and K. N. Nagadarshini “Efficient Garbage Disposal Management in Metropolitan Cities Using VANET” in Journal of Clean Energy Technologies on 3 July 2014.
- [8] Shubham Thakker, R. Narayanamoorthi “Smart and Wireless Waste Management” in IEEE Sponsored 2nd International Conference on Innovations in Information Embedded and Communication Systems on 3 March 2015.
- [9] Kanchan Mahajan, Prof. J. S. Chitode “Waste Bin Monitoring System Using Integrated Technologies” in International Journal of Innovative Research in Science, Engineering and Technology on 7 July 2014.
- [10] Trushali S. Vasagade, Shabanam S. Tamboli, Archana D. Shinde “Dynamic Solid Waste Collection and Management System Based On Sensors, Elevator and GSMA” in International Conference on Inventive Communication and Computational Technologies on 17 April 2017.
- [11] Ruhin Mary Saji, Drishya Gopakumar, Harish kumar, Lakshmi “ A Survey on Smart Garbage management in cities using IOT” in international journal of engineering and computer science ISSN: 2319-7242 on 11 Nov 2016