

## Garbage Collection Using IOT

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**Abstract** –The most serious issues faced in India is the collection of garbage. The most challenging issue in cities is to manage waste with cost-effective way with high-performance. The major issue now-a-days is the process of collecting garbage containers, segregate waste, and transport it, which is time consuming. This paper discusses the solution for smart waste management in cities which will provide great benefits to society. The proposed garbage collection system that will employ various sensors to detect the type of waste and categorized it, as well as an actuator to alert management to collect the waste container.

**Key Words:** IOT, Waste management, Segregation, Sensors, GPS and Monitoring.

### 1.INTRODUCTION

Management and disposal of waste is a challenge in today's world. Disposing of waste in open landfill is a common method in today's world. The disposal method of dumping in open land sites has an adverse effect on the environment. This Garbage collection using smart IOT which is designed specially in a way to collect dry and wet waste separately, it also solves issues of hygiene in the cities. The IOT technology is slowly emerging in all fields of city administration. Our youth of nation are interested in propagating it. Rag pickers play important role in India, for re-cycling of solid waste, also waste is segregated by hands. Due to hand picking and separating the solid waste and wet waste rag pickers have high morbidity rate due to which it leads to infections, respiratory problems. The garbage collection is way to attract people to dispose of waste properly, which will lead us to a step towards clean and green environment. This is also a step towards sustainable practices.

### 2. LITERATURE SURVEY

**Paper Name 1:** -IOT BASED SMART GARBAGE MONITORING SYSTEM USING ZIG- BEE

Author: -V. ASWIN RAAJU, J. MAPPILLAI MEERAN, M. SASIDHARAN, MR.K. PREMKUMAR.

**Abstract:** - The future IoT-based smart waste management system that uses sensor systems to check the waste altitude

over the dustbins in urban areas. An android application with desired information related to the various levels of waste dustbins in various locations has been developed to check and join together. Once the waste bins are full, they send notifications to the truck drivers with location information. The higher official will be notified and they can monitor and track the respective employees. This system is powered by a solar panel, which is another source of renewable energy. We present a smart garbage collection management solution based on providing intelligence to waste dust bins via the Internet of Things (IoT) and ZigBee, as well as sensors and modules. Over an ad hoc network, it can read, collect, and transmit massive amounts of data. When stored in the cloud, this information can be used to dynamically supervise waste collection systems.

**Paper Name 2:** -AUTOMATION OF SMART WASTE MANAGEMENT USING IOT TO SUPPORT "SWACHH BHARAT ABHIYAN" – A PRACTICAL APPROACH

**Author:** -1Bharadwaj B, 2M Kumudha, Gowri Chandra N, Chaithra G

**Abstract:** - The "Swachh Bharat Abhiyaan" is a national campaign launched by the Indian government to clean the country's streets, roads, and infrastructure. It covers 4,041 cities and towns. The mission's main goal is to cover all of the country's rural and urban areas. With the rise of Internet of Things (IoT) devices like Smartphone sensors, this paper explains how to collect dry and wet dirt using an embedded system. The application's main goal is to collect dry and wet waste separately, which is done via a conveyor belt with dry waste collected dust bins on the left side and wet waste collected bins on the right.

The system will receive data from the dust collector via switches and sensors a message is sent to the microcontroller

The dust bin's lid closes automatically when the belt starts rotating clockwise, and the waste is dumped into the underground garbage container on the ground floor. Here, an IoT module is used to control and monitor waste,

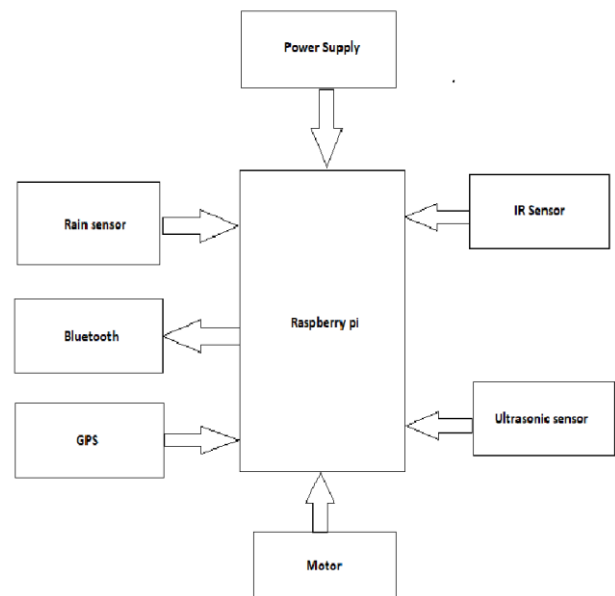
with data being sent to the appropriate organization and the general public. The waste collection, as well as the specific date and time of the vehicle's arrival, are all displayed on the mobile app.

**Paper Name 3:** -IoT Based Garbage Management (Monitor and Acknowledgment) System: A Review

**Author:** -Sudharani Ashok Ghadage, Dr. Mrs. Neeta Anilkumar Doshi

**Abstract:** Regardless of whether India is a developed or developing country, solid waste management is one of the most pressing issues it faces. It is seen that most of the garbage's across the roadside are overloaded because the waste is not collected periodically. It creates an unsanitary environment for people and a foul odor in the surrounding area. As a result, some deadly diseases and human illnesses spread. Wet and dry wastes are frequently mixed together, making it impossible to apply proper processing methods such as composting, recycling, or incineration to different types of waste. This paper examines current garbage management systems and proposes a system that will ensure proper garbage processing. The reviewed systems use ultrasonic sensors, infrared sensors [2][7], Arduino UNO [6], and other sensors to detect waste levels, as well as a microcontroller [3][11], Raspberry Pi2[7] as control boards. Ultrasonic sensors detect the amount of garbage in the bin, a flame sensor detects a fire, and a moisture sensor distinguishes between wet and dry garbage in the proposed system. The concerned persons (driver of garbage collection vehicle as well as concerned authority) will be notified via SMS using the global system for mobile (GSM). The status of the waste bins will be monitored by officials via a web page. Because large amounts of data must be transmitted and processed quickly, the Raspberry Pi3 is the preferred control board.

a difficult job. Trying to keep track of all dustbins in many cities with a great amount of them is a difficult task. Human interrogation is not as efficient as IOT in handling a large number of garbage cans. For that, an adequate IoT framework is needed. The waste management system's efficiency isn't up to par. It will be hard to locate the dustbin if it is filled before the deadline. So, proper infrastructure is required to know location and collecting waste from dustbin which is developed as follow



**Fig -1:** Component diagram of present system

### • PROBLEM STATEMENT

Developing a system to segregate dry and wet waste using rain sensor. Detecting waste level in dustbin using ultrasonic sensor. GPS for detecting location.

### • PRESENT STATEMENT

The system intends to examine the already available waste management system and collect the data to create more optimized waste management system. The system not only notifies the trash level but also alerts the person working on it. It will benefit municipal corporations, government organizations, and individuals who currently collect garbage from dustbins in manual ways. It also aims at minimizing the process time and the interference of humans in the processes. It may also be used to file complaint on application if the garbage is not collected. In today's growing world continuously managing the rapidly increasing waste is

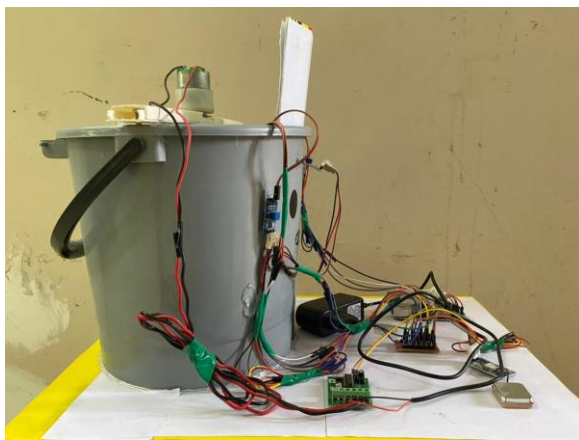
### • HARDWARE DESIGN

Each Dustbin contains one ultrasonic sensor and segregator using moisture sensor with motor. For data gathering, these dustbins are all situated on a domain controller. After distance measurement from ultrasonic sensor cross specific limit, it will show Dustbin is full with a mail sent to nearby vehicle with location. This will carry out using path optimization method which is used Cab services. Updating of dustbin empty will be automatically updated on server. Fig.1 specifies the components of proposed system.

- Following are the details of the components used in the Fig.2.
- Ultrasonic Sensor: The level of waste in the dustbin is estimated using an ultrasonic sensor mounted on the top of the bin.

- **Moisture Sensor:** Dustbin will have various types of waste. Hence, it will detect wet waste and segregate it.
- **Raspberry pi:** The Raspberry pi is background framework for sensors in the system. It will connect different sensors which are working together to form the system.
- **DC Motor:** The separation of waste is carried out in different compartments in dustbin. So DC motor is used to separate waste in dustbin.

## • Result



**Fig 2:-** Garbage collection dustbin

## • DISCUSSION

This concept is used to provide easy collection of garbage and segregate the garbage. In the cities we see lots of dustbins overflows and thus diseases also spread. Only by segregating the garbage half of the problems which cause due to the garbage will reduce. The project segregates the garbage into wet and dry. Also monitor the dustbin status and sends the notification if dustbin is full. The project's block diagram and circuit diagram have been created. The system runs on its own. The project's software is designed using Proteus software.

## • CONCLUSIONS

The burden on local governments can be reduced if this system is implemented at a local level, such as through societies, educational institutes, and so on. The automatic waste segregator is a first step toward creating a waste collection system that is both efficient and cost-effective, with minimal human intervention and no risk to human life. The use of a conveyor belt improves the accuracy, cost-

effectiveness, and ease of installation and use of the system on a domestic level. Separating all of these wastes at the household level will also save time. While putting our system together, we ran into a number of issues, including the inductive proximity sensor's sensing range, adjusting the range of IR sensors, and so on. However, with a few tweaks, we were able to make the system as reliable as possible, though not perfect.

## • FUTURE SCOPE

The current system uses sensors to sort trash into two categories: wet and dry. More segregation parts, such as metals and nonmetals, as well as dry and wet, should be added to future work. Also, a website can be hosted so that municipal corporation can collect data of various

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