

# Garbage Monitoring System Using IOT

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## Abstract

*In many cities overcrowded waste bins create an unpleasant environment. This leads to the emergence of a variety of diseases. To address this situation, Shree Narendra Modi, PM of India introduced a unique example of how to achieve cleanliness by launching a campaign known as the SWACCHHA BHARAT ABHIYAN (Clean India Mission) where all the posts have no authority and authority, with a clean record around them. In today's hectic world, it is almost impossible to keep nature clean and tidy. To overcome these situations, we need to use a high-quality waste management system, which will inform the municipal corporation or senior authorities about the current level of waste in different urban areas. As the level reaches its level of awareness it sends to Corporate. As the notice is received by the municipal corporation, a coal pick-up truck will reach the wagon and empty the barrel. So, the bins are released before the litter is filled.*

## 1. INTRODUCTION

A sound domain is required in the event that you need to remain solid. In spite of the fact that the world is improving there is another difficult still to be tended to call "Garbage". In numerous spots, trash dumps happen. This makes an assortment of illnesses as huge quantities of bugs and mosquitoes breed in it. In India the nonappearance of powerful waste administration has prompted some significant issues, it is a significant test confronting the greater part of the Indian locale. So, garbage smart is a checking program is a program that can either dispense with an issue or decrease it to a lesser degree.

For this task, we will propose a framework to rapidly tidy up the residue barrels. Since dustbin is viewed as an essential prerequisite for keeping up the degree of neatness in the city, so it is significant that you clean all the residue bottles when they are filled. We will utilize ultrasonic Sensors for this procedure. The sensor will be mounted on the highest point of the container which will assist with sending the data to the workplace that the trash level has arrived at its greatest. In the event that they are not accessible around then, the trash will press to a base until the city worker won't come. After this, the drums ought to be discharged as quickly as time permits.

The IoT idea when utilized in this field will bring about a superior spot for individuals to live. No more contamination in the city. With the assistance of this framework, few brilliant containers have been utilized around the city and the city will at present be spotless. There has been an exceptional development in the quantity

of Internet-associated gadgets from the most recent couple of years. These associated gadgets are a piece of an IoT framework that can speak with one another.

The IoT organize comprises of Electronics, sensors, and programming that permits these gadgets to transmit and get information between one another. That is the reason it is valuable to utilize the current framework to fabricate a security advancement plan. On the off chance that the barrel isn't diminished in time, nature won't change and the sickness may spread. The proposed framework will assist with taking out this malevolence. Constant data can be found about the full dustbin level in the framework itself. It will likewise assist with reducing expenses as laborers should leave just when the dustbin is full.

## 2. LITERATURE SURVEY

Related functions are [1], [2], [3]. [4] These dust layers interact with the microcontroller-based system with IR wireless systems and an intermediate system that displays the present position of the trash, in a web browser located on the html Wi-Fi homepage. Therefore, the position will be restructured in the html page. A large part of our project depends on the functionality of the Wi-Fi module; is essential for its use. The main purpose of this paper is to decrease human capitals and labors and to generate a smart city vision.

Automatic Trash Monitoring System Using the Arduino paper [1], the waste level is obtained with the aid of ultrasonic sensors and guided to the accredited waste collection agency through the GSM system. The PIR sensor is used to detect movement of people coming into the trash

bin while the bar is in full swing and prevents the addition of any other trash to the barrel by notifying us of the speaker. GSM and the active sensors used are connected through the Arduino microcontroller. The GUI was also developed to monitor desired information related to trash bins for various selected locations. Depending on the messages received by the GSM in the control room it is displayed on the LCD and the authorized person notifies the drivers that they will collect the trash on time.

IoT Trash Monitoring System [2], This program monitors trash bins and notifies the level of waste disposal in the trash bin via a web page. The system uses two HC-SR04 ultrasonic sensors mounted on top of the barrels to track down the trash volume and adjusted by pipeline depth.

Trash Monitoring System Using IoT [3], This system uses a microcontroller, LCD screen, a ZigBee way to send data. Ultra-sonic sensors are used to determine the level of waste collected in a container. The LCD screen is used to display the level of trash collected in the containers.

Smart Garbage Monitoring and Clearance System Using Internet of Things [4], In this system, a Force sensor is used to measure the weight of a dust pit.

When the estimated number of sensors exceeds a certain threshold value and the red lead is ON (indicates that the dustbin is filled with another green lead ON) this information about the GPS location where the dust bag is found is transmitted to the android device via the GSM. Various bins were placed around the city which were provided with an embedded device which was low in price and helped in tracking the garbage level in the bins [5]

## METHODOLOGY

Traditionally whenever large stone loads are found; however, they are not considered from time to time. It is very important to monitor the trucks from time to time and to record timely and collected information from a central location to ensure that the work is done correctly. This proposed system is designed in such a way as to prevent excessive air traffic by sending alerts to the municipal enterprise with the help of a microcontroller connected to a descriptive station using IoT. Ultrasonic sensor, Wi-Fi module ESP8266 where PIC16F877A is the main controller and all the remaining components overlap. Ultrasonic offers a measuring work of not less than 10cm, with accuracy up to 2mm. The amount of dust particles is calculated using an ultrasonic sensor.

The effectiveness of the proposed sewage system

The program is as follows:

Initially, the level or height of the waste in each container is measured using an ultrasonic sensor.

Create a kit that will be placed in the space needed to look for waste levels.

The kit will include the Arduino UNO R3, where it

will upgrade the ultrasonic sensor, Wi-Fi data transfer and collect the correct readings and test it to the threshing floor.

If the garbage dump falls to the limit, then a warning message is issued and sent to the connected authorities using WIFI Module.

### 2.1. Ultrasonic Sensor

The Ultrasonic Sensor is used to measure distance with high accuracy and stable readability. It can measure the distance from 2cm to 400cm or from 1 inch to 13 feet. It emits an ultrasound wave at a frequency of 40KHz in the air and when an object arrives its way it will return to the senses. By using the time required to hit an item and then return, you can calculate the distance. The distance can be calculated by the equation 1. Distance = Time of the speed of sound / 2. (1) When the Time = time between the ultrasonic wave is received and transmitted. It has four pins. Two are VCC and GND which will be connected to 5V and GND for Arduino while the other two pins are Trig and Echo pins that will be connected to any Arduino digital pins.



Fig 2.1: Ultrasonic Sensor

### 2.2. ESP8266 (Wi-Fi Module)

ESP8266 is a Wi-Fi module that will give your projects access to Wi-Fi or the Internet. It is a very cheap tool but it will make your projects more powerful. It can communicate with any microcontroller and perform wireless projects. List of leading devices in the IoT platform. It runs at 3.3V and if you give it 5V it will get damaged. ESP8266 has 8 pins; The VCC and CH-PD will be connected to 3.3V to enable wifi. The TX and RX pins will be responsible for the ESP8266 and Arduino connectivity. The RX anchor is running at 3.3V so you will need to do it with a variety of power as used for launch. ESP8266 is shown in Figure 2.2.

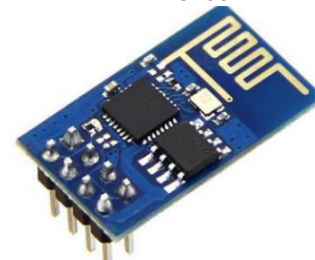


Fig 2.2; Wi-Fi Module

### 2.3. Arduino Uno

Arduino is an open source, PC paraphernalia and organization of systems, efforts, and a team of customers that build and manufacture microcontroller packs for object-building devices and sensors that can detect and control queries in the real world. The launch of the Arduino expansion began at the Interaction Design Institute in Ivrea, Italy. Performance plans are allocated under the Creative Commons Attribution budget. Arduino Uno is shown a number.

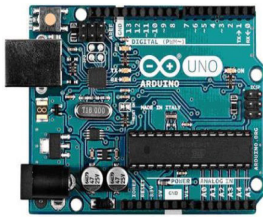


Fig 2.3: Arduino Uno

### 2.4. Hydraulic Motor

A hydraulic motor is a mechanical motor that converts hydraulic pressure and flows in torque and angular dragment (rotation). The hydraulic motor is a rotating cylinder of the hydraulic cylinder as a direct activator. The hydraulic motor works in another way as it converts hydraulic power into mehendi power: a spinning wheel. It uses hydraulic pressure and flow to produce the required torque and rotation. The power produced by the hydraulic motor is determined by the flow and deceleration of the motor.



Fig 2.4: Hydraulic Motor

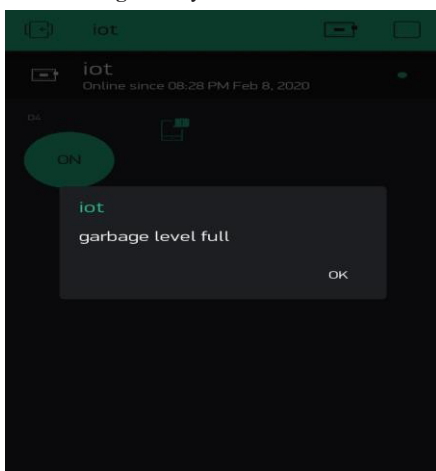


Figure 3.1: Screenshot of output in blynk app



Figure3.2 : Connection of ultrasonic sensor with node ncu



Fig3.3: Connection with dustbin

### 3. RESULT

### 4. CONCLUSION AND FUTURE SCOPE

#### 4.1. Conclusion

In this paper a waste monitoring system is used which uses a waste assessment sensor. This system works best to inform municipalities about the status of waste where waste is being monitored. To assess the level of waste and to inform municipalities of what level of waste is located in the area of the landfill that crosses the boundary, and then a warning message is sent to the concerned authorities using the WIFI Module. If that time is not available, then the garbage will compress until the garbage collector does not come to come as the basic development element in the project that makes the system more reliable and efficient.

#### 4.2. Future Scope

We have to use this system in many places in the cities, so one place may not have enough electricity to run this system properly. This problem can be solved by using solar panels in the future. Solar panels can be used with solar batteries that do not require continuous electricity. Second, we can add compressor pipes to the bottom of the containers, which will directly drain the liquid from the bin and drain it into the dump.

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