

# **AUTOMATIC GARBAGE FILL ALERTING SYSTEM**

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## **ABSTRACT**

*Many times, in our city we see that the dustbins placed at public places are overloaded. It creates unhygienic environment for people, as well as ugliness to that place creating bad smell and some deadly diseases. To avoid all such situations we are going to implement a project called "Automatic Garbage Fill Alerting System". These dustbins are interfaced with microcontroller based system having Ultrasonic Sensor along with central system showing current status of garbage, on Framework by Wi-Fi. Hence the status will be updated on to the Framework. These dustbins are provided with low cost embedded device which helps in tracking the level of the garbage bins. An unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. Major part of our project depends upon the working of the Wi-Fi module; which is essential for its implementation. When the level reaches the threshold limit, the device will transmit an alerting message along with the unique ID provided. These details can be accessed by the concern authorities from their place with the help of Internet and an immediate action can be made to clean the dustbins. The main aim of this project is to reduce cost, human resources and efforts along with the enhancement of a smart city vision.*

***Keywords: Arduino uno, Buzzer, Wi-Fi Adaptor, GSM module***

## **I. INTRODUCTION**

In order to preserve the environment from all the garbage that is spread over the area which causes some harmful diseases in the environment, We introduced this concept of Automatic Garbage Fill Alerting System. People are depositing their waste in the dustbin. In this dustbin, we are fitting ultrasonic sensor, at the top, middle and the bottom of dustbin. Now the ultrasonic sensor will sense the garbage level. If garbage quantity increases, soon it will reach the threshold level. As soon as the threshold value is attained, automatically alert will be sent using GSM module to the registered number, intimating that the garbage value has reach the level above 80%. If any of the person is trying to deposit their waste in the dustbin, even though the threshold value crosses the range then the buzzer in the garbage bin will give the beep sound stating that it has no space. Internet and its applications have become an integral part of today's human lifestyle. It has become an essential tool in every aspect. Due to the tremendous demand and necessity, researchers went beyond connecting just computers into the web. These researches led to the birth of a sensational gizmo, Internet of Things (IoT). Communication over the internet has grown from user - user interaction to device – device interactions these days. The IoT concepts were proposed years back but still it's in the initial stage of commercial deployment.

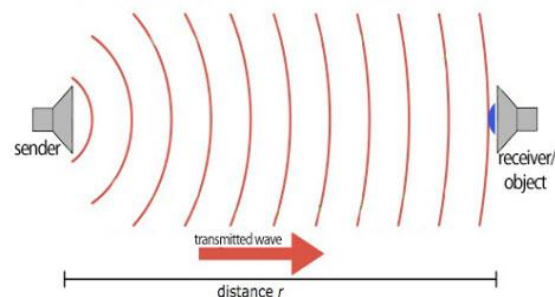
Home automation industry and transportation industries are seeing rapid growth with IoT. Yet not many articles have been published in this field of study.

## II. ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Using This Arduino Uno microcontroller we can reduce cost As well as We get better performance. To connect Sensors, buzzer, GSM module and WI-Fi module with IOT GECKO platform. Using this platform We can Monitoring Garbage levels in Internet.

## III. ULTRASONIC SENSOR



**Fig. Ultrasonic transmitter and receiver**

Ultrasonic sound is a cyclic sound pressure with a high frequency than the upper limit of human hearing equal to 20KHz. Some animals like dolphins, mice, dogs, and bats have a high-frequency limit that is larger than that of the human ear & thus can hear ultrasound.

This sound is very low in humans even at high intensities. Ultrasonic waves are found in wide industrial applications such as non-destructive testing of object is illuminated with ultrasonic waves and a repeat of the transmitted waves specifies a flaw, ball bearings, surgical instruments, Fine machine parts & several other objects can be cleaned ultrasonically. When the surfaces of metals can be placed in contact with each other, then the metals can be welded and illuminating the contact with ultrasound. The molecules are moved into relocated in the form of crystalline, making a long-lasting bond. Ultrasonic whistles cannot be received by human beings, but loud to dogs and are used to call them.

III.GARBAGE LEVEL SENSING

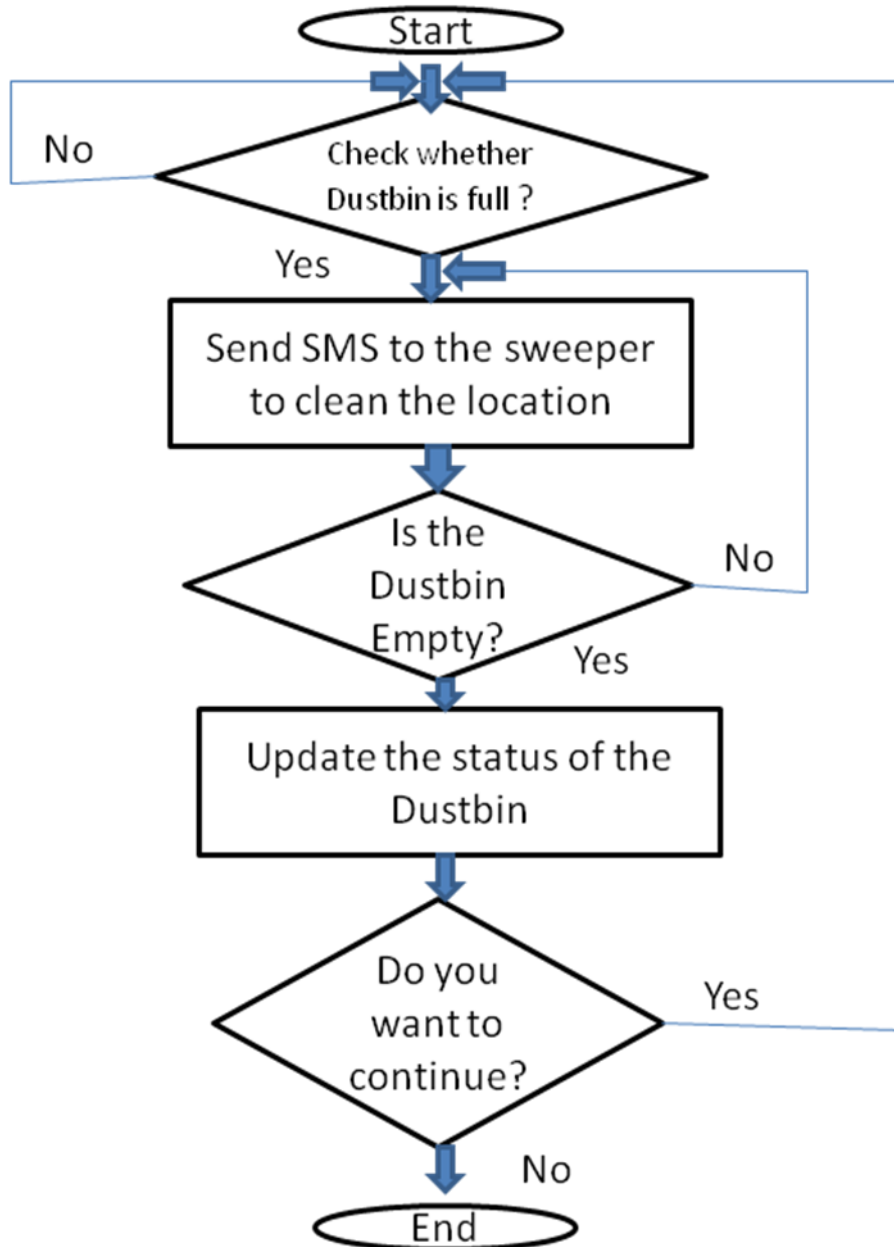


Fig 2. Architecture of Automatic Garbage Fill Alerting System

The starting state sensor will check the dustbin level is full or not ,if dustbin is full automatically sms is send to the sweeper or supervisor .The sms is contains the information about the particular dustbin id and location .If the dustbin is empty the control is back to previous state. Then update the status of the dustbin .then finally close the process. After this process is completed supervisor is check status of dustbin levels in website.

## IV.AUTOMATIC GARBAGE LEVEL MONITORING

We are connecting sensors with help of wifi Adaptor to IotGecko platform.using this platform we try to reduce time and monitoring multiple sensors placed over the cities.Allow to access this iotgecko webpage in global



Fig3- Garbage level

## V.EXISTING SYSTEM

Garbage has to be collected manually and periodically whether the dustbin is full or Not, so it is

### Disadvantages of the existing system

- Time consuming and less effective: trucks go and empty containers whether they are full or not.
- High costs.
- Unhygienic Environment and bad look of the city.
- Bad smell spreads and cause illness to human beings.

## VI. PROPOSED SYSTEM

Considering the need of modern technology the smart garbage bin can expensive but considering the amount of dustbin needed in India, expensive garbage bin would not be a prior experiment that is why we have decide to use Ultrasonic sensors to reduce its cost and also make it efficient in applications.Also we can use this **Piezoelectric Device** we can take the power supply from this device

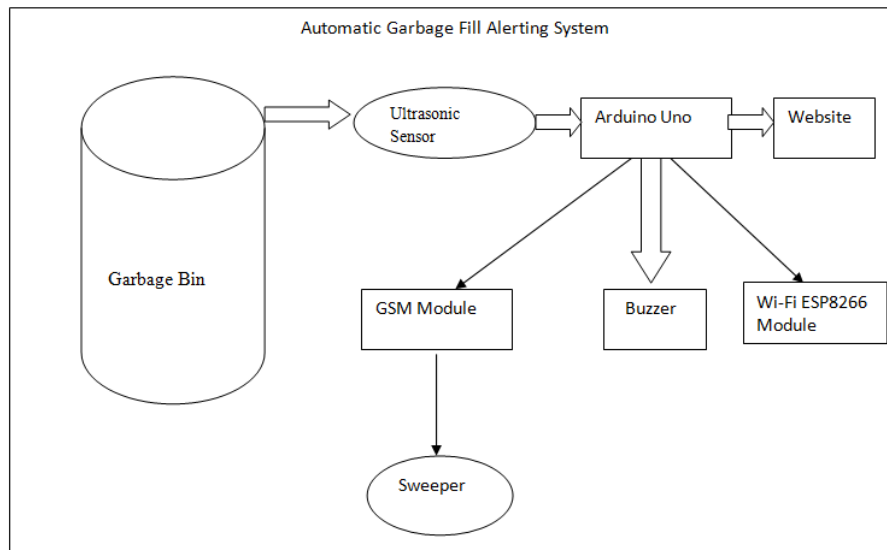
- We can get electric power very easier in a low cost.
- Real time information on the fill level of the dustbin.
- Cost Reduction .
- Improves Environment quality.

- Intelligent management of the services in the city.
- We can Monitor the garbage level details in IOT Gecko website.

## VII.WORKING PROCESS STRUCTURE

Dustbin placed in public place, people throw garbage in dustbin ,place the ultrasonic sensor in top of the garbage bin. If dustbin reach in 75% then arduino send message through GSM module.

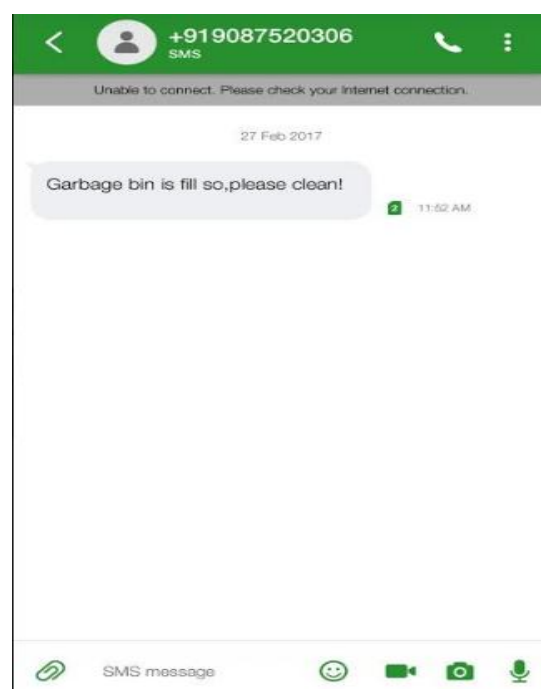
When dustbin level is reach threshold level buzzer will give alert sound for don't again put waste in dustbin. This all process updated in IOT GECKO platform for monitoring garbage bin.



## VIII.OUTPUT

When the garbage gets overflow a message will be generated and sent to the sweeper indicating that the garbage is fill.

After the message sweeper will go to the concerned zone to clean the garbage bin.



## IX. TEST CASES AND RESULTS

- 1) Dustbin when empty - 0% ( Ultrasonic Sensor Update the information to Website)
- 2) Dustbin Level – 75% (when Threshold level is Reached the Ultrasonic Sensor will send message to sweeper Mobile)
- 3) Dustbin When reach – 90% ( Ultrasonic sensor will give a Alert buzzer sound )

## X. FUTURE ENHANCEMENT

Automatic Garbage Fill Alerting system helps us to reduce the pollution. Many times garbage dustbin is overflow and many animals like dog or cow enters inside or near the dustbin. Also some birds are also trying to take out garbage from dustbin. This project can avoid such situations. And the message can be sent directly to the cleaning vehicle instead of the contractor's office.

Apart from this, differentiation can be made between dry trash bin and wet trash bin collecting plastic dry waste and biodegradable waste respectively. To implement this methane and smell sensors can be used. This helps in distinguishing the waste at the source and hence reducing the requirement of manpower.

To enhance it further, an automated system can be developed which is able to pick up waste in and around the bin, segregate them and put them in respective bins.

## XI. CONCLUSION

This project work is the implementation of Automatic Garbage Fill Alerting system using Ultrasonic sensor, Arduino uno, Buzzer and Wi-Fi module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum. It will take power supply with the help of **Piezoelectric Device**. If the dustbin is not cleaned in specific time, then the record is sent to the Sweeper or higher authority who can take appropriate action against the concerned contractor. This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. It ultimately helps to keep cleanliness in the society. Therefore, the Automatic Garbage Fill Alerting system makes the garbage collection more efficient.

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