

## LOW COST SMART DUSTBINS

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### ABSTRACT

*The main aim of the project is to have a solution for detect, monitor and manage wastes. We are using sensor-based dustbins to resolve this solution. This project employs ultrasonic sensor to detect the filled/empty status of the dustbin and send the information to the concern authority using node MCU module. Using this advanced method, waste management is automated and it is very innovative system which helps to keep cities and villages clean. up to now there is no correct planning for collecting the wastes because of some problems which makes the place very unhygienic.*

### 1. INTRODUCTION

Now a days everything is getting smarter using internet of things and making man's life easier and comfortable. Every city is becoming smart city but no one is caring about the hygiene. As per statistics of our country, there are so many dirty cities and those cities are called as smart cities in our country. To make that so-called smart cities into clean cities, we are making smart dustbins using internet of things which is going to be cost effective one. This process can be achieved by the ultrasonic sensor which is interfaced with node MCU to check the percentage of garbage filled in the dustbin sends the alert to the authority server. After emptying the bin.

### 2. RELATED WORK

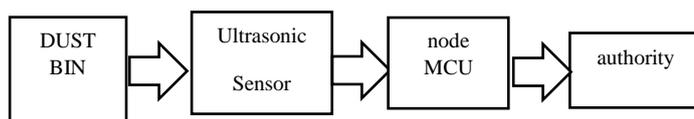
There are so many researchers and students who had done their projects similar to our project which are used to detect and notify the authorities about the dustbin level.

[1] Swathi Sharma proposed that The automation of the smart dustbin is achieved through the use of a power supply, Microcontroller (ATmega328P), APR module, PIR sensor, servo motor, and ultrasonic sensor all programmed using Arduino IDE.

[2] PSiva Nagendra Reddy proposed that Ultrasonic sensor is used to identify the waste percentage in the dust bin. Arduino is used to monitor the design. Whenever the Garbage in dust bin reaches the threshold level it will send the information to server node using Bluetooth.

### 3. PROPOSED MODEL

In this proposed method ultrasonic sensor is used to measure the levels of the waste in the dustbin. Node MCU is used as a controller in this design. Whenever the garbage in the dustbin reaches the threshold value, it will send the information to the sensing node.



**Fig 3.1: block diagram of smart dustbin**

receiving node receives the information from the sensing node and it alerts the user by sending an SMS to the concern authority using Node MCU module.

#### 4. DESCRIPTION OF KEY COMPONENTS:

**4.1 ULTRASONIC SENSORS:** It is used to measure the distance. In our project it is used to check whether the garbage bin is full or not.



Fig 4.1: ultrasonic sensors

**4.2 NODE MCU:** It is an open source IoT platform. It is a single board microcontroller with operating system XTOS, CPU version ESP8266. It consists of 128 Kbytes of memory with storage of 4Mbytes. It is powered by USB. It consists of 17GP i/o pins but we are using only 11 because 6 pins are used to connect the flash memory chip. It is breadboard friendly.



Fig 4.2: Node MCU

**4.3 UBIDOTS:** Ubidots is a internet of things data and analytics and also a visualization company. They are used to convert the sensors data into the information that is useful for business-decisions , machine-to-machine interactions, educational research and increase economization of global resources.

**4.4 GOOGLE CLOUD:** It is used to store the data's send by the ultrasonic sensors and send that data to control some device by a wireless connection. It is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end users' products like google search, YouTube, etc. We are using firebase here in our project.

#### 5. ALGORITHM:

1. Start the process.
2. Check the status of the dustbin.
3. If it is full, send the information to the concern authority else repeat step 2.
4. Empty the dustbin.
5. Repeat step 2.

6. Stop the process.

#### 6. RESULTS:

The proposed system low cost smart dustbins are very useful for the society. It has Node MCU which costs less than ₹400 and it is used to control and monitor the dustbin. The Ultrasonic sensor is used to measure the level of the dustbin.

#### CONCLUSION:

It concludes that, using this advanced method waste management is automated and it is very innovative system which helps to keep surroundings clean.

#### REFERENCE:

1. Swathi Sharma, Sarbjit Singh, " smart dustbin management system". issn: 2277-9655 [sharma \* et al., 7(5): may, 2018], impact factor: 5.164 ic<sup>TM</sup>, value: 3.00, coden: ijess7.
2. P. Siva Nagendra Reddy, R. Naresh Naik, A. Amareshwar Kumar, S. Nanda Kishor. "Wireless dust bin monitoring and alert system using Arduino", 2017 Second International Conference on Electrical, Computer and Communication Technologies (ICECCT), 2017