



## SMART DUSTBIN USING VOICE CONTROL AND IOT

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### ABSTRACT

In recent times we all know the importance of cleanliness and hygienic environment. Dustbin is the one thing that should be used in all the places such as schools, markets, hotels, parks, campuses and other busy places.

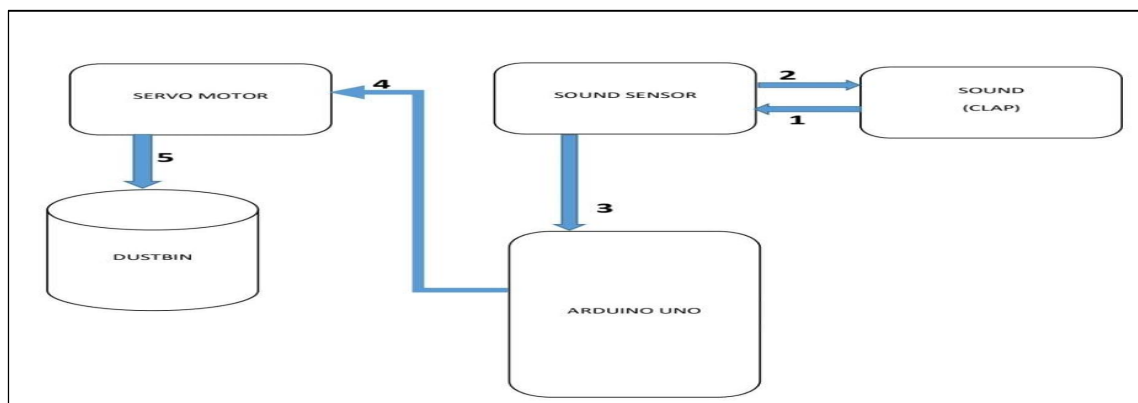
This project spread awareness of using dustbins in different ways, or in another words we say using growing technology such as IOT. We use different sensors such as ultrasonic sensors, Sound sensors, a microcontroller Arduino Uno, and Servo motor. This dustbin can be controlled using voice as well as it also detect's the person or object using ultrasonic sensors which after receiving the input sends the message to the servo motor and Arduino Uno. Smart dustbins can help's in keeping our habitable places and overall environment clean and hygienic.

Keywords: Arduino, sensors, Transmitter and Receiver, IOT indication, Ultra-sonic sensor, Schematic design

### Introduction

Due to increase in garbage this thing is risking the environmental issues. To keep environment away from open waste we use a container which is known as dustbin. But in today's world where everything is covered with the layer of technology our team decides to make a dustbin which acts smart as it can sense the object if it's nearby or also could sense the voice for opening the lid of the dustbin. It will bring a smart way to bring cleanliness in our surrounding's. It is a simple gadget that make our home, office, environment clean. Due to different way of using this smart dustbin it will help in maintain the dustbin easily.

### System Architecture



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## Requirement Analysis

In this project we are using ultrasonic sensor and sound sensor to detect the object. As soon as the sound sensor detects the sound the lid of the dustbin will open and after throwing the garbage it will get close. For this dustbin we used following sensors,

1. Arduino Uno ATmega328P
2. Sound sensor LM386
3. Ultrasonic sensor HC-SR04
4. Servo motor SG90
5. Resistors
6. Led bulb
7. Breadboard

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## 3. Future Scope

In future, we want upgrade this circuit with some sensor which can automatically stop the power supply of the driving pump or motor. As a result the future circuit is not very cheaper the present one, but we try our best to.

- Make it simple
- Easy to use
- Easy to install
- To make Available for all

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## 4. Market Potential

Market Potential of this water level indicator is very high for following reason:

- Simple circuit: This water level indicator consists with a simple circuit. It is so simple to install and it's so much easy to use.
- Low cost the equipment's required for this circuit are readily available in the market and of very low value.
- Low voltage consumption the circuit does not need any AC auxiliary supply, it operates on DC voltage source (9 V DC). Thus it is a very low consumption circuit.
- Pollution control Process Involved in the manufacturing of this item does not have any effect on environment.

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## 5. Advantage of Proposed System

1. Save Power: In an era of energy conservation, these devices are very beneficial to save energy. Hence electrical power wastage can be reduced. These sensor control water levels and minimize the usage of electricity.
2. Automatically works: These sensors can work automatically when connected to timer devices.
3. These are low cost and easy to install devices.
4. The design is compact and with low maintenance and can clearly indicate the water levels in the overhead tank.
5. AS they can be fully automatic, they save time and avoid seepage of roofs and walls due to overflowing tanks.

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## 6. Problem Definition

Everything is improving with smart technology for the benefits of the world. As there is an increasing in the number of garbage these days we come up with the idea of smart dustbin which will help in keeping our environment cleaner with a new and smart way of using the dustbin. We know the importance of cleanliness and hygiene that we cannot take it for granted as it is concerned with our health. Since this dustbin is sensor based it is accessible to peoples of all ages. During the implementation we also focused on making the dustbin more affordable so that it can give benefits to large number of peoples..

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## 7. Functional Analysis

This project is IOT based, we have used sensors and microcontroller in this project which will detect the human presence with the help of ultrasonic sensor or with the help of sound sensor it can detect the voice and sends the signals to servo motor through Arduino Uno which will sweep the servo meter in 180 degrees.

### **Operation:**

Object detection using HC-SR04

Step 1: start

Step 2: object comes closer to HC-SR04 (ultrasonic sensor)

Step 3: sensor calculate the object distance

Step 4: if distance is less than 30cm lid opens  
 Step 5: if distance is more than 30cm back to step 3  
 Step 6: Garbage thrown and lid gets closed  
 Step 7: Stop

Voice detection using LM386 sound sensor

Step 1: start  
 Step 2: sensor detects voice such as clap  
 Step 3: if sensor detects voice lid opens  
 Step 4: if sensor detects voice lid opens back to step 2  
 Step 5: Garbage thrown and lid gets closed  
 Step 6: Stop.

### **Durability**

The only problem can be occur was the ultrasonic sensor become rusted because of the high humidity inside the tank. So we had to change it into a waterproof ultrasonic sensor (JSN- SR04T).

Also, a buzzer may be included if LEDs are not preferred.

1. Hotels and restaurants, residential as well commercial complexes, factories, drainage etc can use these water level indicators. They can be fixed for any motor as they can be easily amalgamated into any circuit.
2. These sensors can be used as fuel level indicators in vehicles and as liquid level indicators in chemical industries.

### **Conclusion**

Purpose of this project is to make some improvements that will lead to a cleaner environment. This smart dustbin will give benefits to our social health and the sanitation. Everyone can get benefit from this dustbin as it is made in lower cost and due the fun that involves in this dustbin will encourage the children's and elders to make use of it.

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