

Smart Dustbin for Economic Growth

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Abstract— In this paper, smart bin is built on a microcontroller based which is interfaced with Ultrasonic sensor. Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. In this to separate dry waste and wet waste we use two separate buttons. When we press the button, the lid of the dustbin is open then we putout the garbage to the dustbin. Here we use microcontroller which will programmed in such a way when dustbin is full. In microcontroller we use inbuilt Wi-Fi. Through the Wi-Fi we send message to the sweeper's mobile phone and after that sweeper comes to the destination and collect the garbage. Once the garbage reaches the threshold level ultrasonic sensor will trigger the cloud network which will continuously alert the required authority until the garbage in the dustbin is squashed. Once the dustbin is squashed, people can reuse the dustbin. At regular intervals dustbin will be squashed.

Keywords: Smart Dustbin, Economic Growth

I. INTRODUCTION

Our project consists of a "Smart Dustbin for Economic Growth". In this, Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. In this to separate dry waste and wet waste we use two separate buttons. When we press the button, the lid of the dustbin is open then we castrate the garbage to the dustbin. Here we use microcontroller which will programmed in such a way when dustbin is full. In microcontroller we use inbuilt Wi-Fi. Through the Wi-Fi we send message to the sweeper's mobile phone and after that sweeper comes to the destination and collect the garbage. Once the garbage reaches the threshold level ultrasonic sensor will trigger the cloud network which will continuously alert the required authority until the garbage in the dustbin is squashed. Once the dustbin is squashed, people can reuse the dustbin. At regular intervals dustbin will be squashed.

Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside. Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems. Breeding of insects and mosquitoes can create nuisance around promoting unclean environment. This may even cause dreadful diseases.

Though the world is in a stage of up gradation, there is yet another problem that has to be dealt with. Garbage! Pictures of garbage bins being overfull and the garbage being spilled out from the bins can be seen all around. This leads to various diseases as large number of insects and mosquitoes breed on it. A big challenge in the urban cities is solid waste management. Hence, smart dustbin is a system which can eradicate this problem or at least reduce it to the minimum level. Our present Prime Minister of India, Sri Narendra Modiji has introduced the concept of implementing 100 smart

cities in India. "Swachha Bharat Abhiyan" was initiated to ensure a clean environment.

II. EXISTING SYSTEM



Fig. 1: Existing system

This is a existing system of smart dustbin for economic growth. Here button is used to separate the wet waste and dry waste. In this we use two buttons when user press the any one button respected to dry to dry and wet waste the lid will be open and user can put-out the waste in the dustbin. Next we use Ultrasonic sensor to get status of the dustbin like if dustbin is full or dustbin is empty.

Node MCU is a microcontroller which has inbuilt Wi-Fi. In programming we will connect it to the cloud, So that the status of the dustbin is uploaded on the cloud. If dustbin is full then microcontroller will notify to the cloud that is dustbin is full then with the help of cloud we will send message to the respected government worker, that dustbin is full please collect it. Again servo motor is used to segregate waste in the form of dry and wet. This is used to switch the door between wet dustbin and dry dustbin. Smart phone is used to collected data by node MCU which is uploaded from cloud to the smart phone. After that, sweeper comes and collects the garbage from bins. Then people can reuse the dustbins.

Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside. Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems.

III. METHODOLOGY

A. Block Diagram

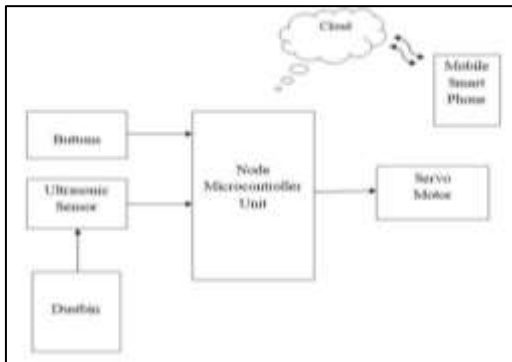


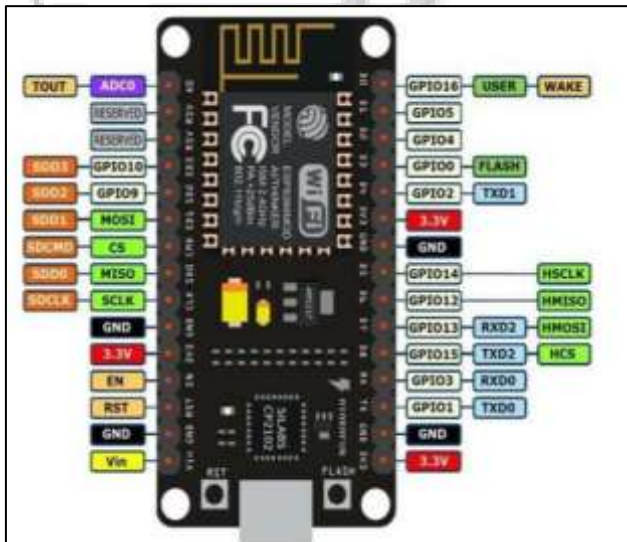
Fig. 2: Block diagram of Smart Dustbin

This is a block diagram of smart dustbin for economic growth. Here button is used to separate the wet waste and dry waste. In this we use two buttons when user press the any one button respected to dry to dry and wet waste the lid will be open and user can put-out the waste in the dustbin. Next we use Ultrasonic sensor to get status of the dustbin like if dustbin is full or dustbin is empty.

B. Ultrasonic Sensor

Ultrasonic sensor is placed at the top of the dustbin which measures the level of the dustbin. Ultrasonic sensor is used to measure the distance. Maximum limit of ultrasonic sensor is 1 meter. Actually theoretically limit of ultrasonic sensor is 4 to 5 meter but practically it is not possible. If we take a dustbin and we place ultrasonic sensor at the top of dustbin, then if dustbin is empty the distance is 1m and if dustbin is getting full and distance is near to 10 to 20 cm then ultrasonic sensor send the message to the node MCU.

C. Node MCU



Pin diagram of Node MCU

MCU stands for Micro Controller Unit - which really means it is a computer on a single chip. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output peripherals. They are used to automate automobile engine control, implantable medical devices, remote controls, office machines, appliances, power tools, toys etc.

D. Servo Motor

Servo Motor is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal. As long as the coded signal exists on the input line, the servo will maintain the angular position of the shaft. If the coded signal changes, the angular position of the shaft changes. [8] In practice, servos are used in radio-controlled airplanes to position control surfaces like the elevators and rudders. They are also used in radio-controlled cars, puppets, and of course, robots.

E. Battery

A 12-volt battery has six single cells in series producing a fully charged output voltage of 12.6 volts. A typical 12-volt battery used in a RV or marine craft has a rating 125 AH, which means it can supply 10 amps of current for 12.5 hours or 20-amps of current for a period of 6.25 hours. Lead acid batteries can be connected in parallel to increase the total AH capacity.

F. Battery charger

Most battery chargers stop charging the battery when it attains its maximum charging voltage set by the circuit. This 12V battery charger circuit charges the battery at a particular voltage, that is, absorption voltage, and once the maximum charging voltage is attained, the charger changes the output voltage to float voltage for maintaining the battery at that voltage. Absorption and floating voltages are dependent on the type of battery.

G. Push Buttons

A push button switch is a small, sealed mechanism that completes an electric circuit when you press on it. When it's on, a small metal spring inside makes contact with two wires, allowing electricity to flow. When it's off, the spring retracts, contact is interrupted, and current won't flow. The body of the switch is made of non-conducting plastic.

H. Android App

We created a one android app for all the information related to dustbin like a dustbin is getting full or empty this information comes to the android app. Then, that dustbin number 1 or 2, is getting full sweeper can see this information through created android app.

I. Flow chart

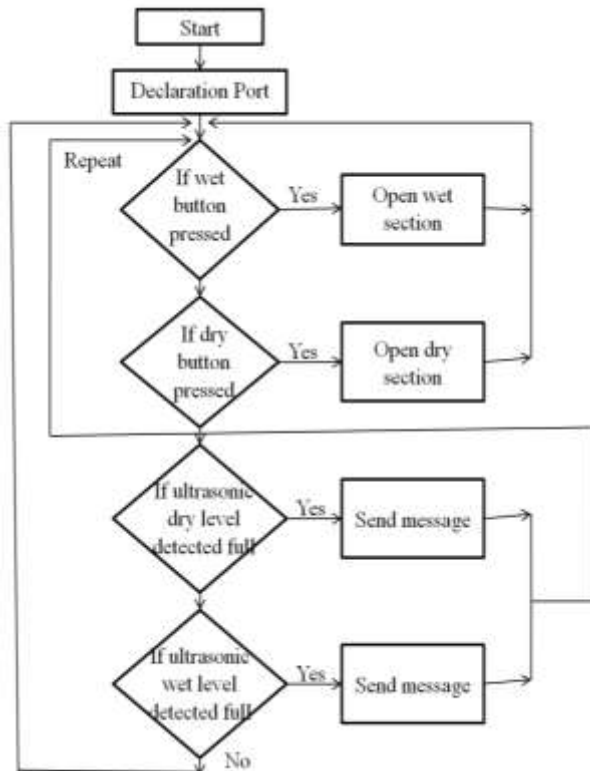


Fig. 3: Flow chart of Working Principle

The Ultrasonic sensor measures level of the dustbin. To separate Dry and Wet waste use two separate buttons. When we press the buttons, lid of the dustbin is open through servo motor. Dustbin placed in public place, people throws garbage in dustbin; place the ultrasonic sensor in top of the garbage bin. If dustbin reaches in 75% then node MCU send the message to the cloud network and sweeper comes and collect the garbage from bins. After that people can reuse the dustbins.

IV. RESULT

From above project we have successfully developed a new smart dustbin system for economic growth using node MCU, which has inbuilt Wi-Fi. And here we use a cloud network for sending dustbin progress to the sweeper and also we successfully run this smart dustbin system.

V. APPLICATIONS

It can be used to reduce the pollution.
It is easy to use because automatic lid open close system.

VI. CONCLUSION

From this project we conclude that, a simple but useful project called smart dustbin. By using this system the lid will be closed so waste can't be spilled from the bins. If we want to put waste in the dustbin only that time lid will be open. From this smart dustbin for economic growth makes the garbage collection more and more efficient and makes our city clean.

VII. FUTURE SCOPE

As per today's situation the dustbin are overflow and garbage spilled out from the bins and animals eat this spilled trash.

And also due to this garbage spilled mosquitoes and it is harmful for our health.

This project avoids this situation and when dustbin is full message can directly transfer to the sweepers mobile.

The "swachha bharat" mission is a government mission of India for approach this mission this smart dustbin is very useful to make our city clean and healthy.

In this system, smart dustbin is connected to the internet to get the real time information of smart dustbin for economic growth.

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