



Smart Dustbin with IOT

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Abstract: Garbage bins are found at all the places in a particular collage, school, hospital, bank, shopping malls etc. Every time it is not possible to check whether the bin is full or empty, so in this paper we come up with a solution to monitor the status of every bin inside the campus area of any school, collage or any other place. Here we actually use arduino board connected to an ultrasonic sensor and a Wi-Fi module and this entire system is connected to every single bin inside the campus area. The ultrasonic sensor is directed towards the face of the bin and whenever the bin is less than 5 cm empty the status of the bin will be shown as full, otherwise it will be shown as empty. We actually aim to implement the system inside the campus of the VIT University. There will be a webpage displaying the status of the bin. There will be a centralized server which will access the status of the bins at regular intervals and inform the sweepers accordingly. The WiFi module will actually send the data to the nearest router and it is expected to route through the routers and send the correct data to the server every time. This is an IOT-Based Garbage system, and as a part of future work we hope to implement the payment module in this system, where the users using the bin have to pay online maybe weekly or monthly.

Keywords: Arduino UNO, Ultrasonic Sensor, Wifi ESP module, Garbage.

INTRODUCTION

There is yet another issue that must be managed. Garbage! Pictures of garbage bins being overfull and the refuse being spilled out from the containers can be seen all around. This prompts different ailments as extensive number of insects and mosquitoes breed on it. A major test in the urban areas is strong waste administration. Thus, smart dustbin is a framework which can annihilate this issue or if nothing else diminish it to the base level. Greater part of viruses and bacterial contaminations create in dirtied condition. Defending the Environment utilizing Technology sources is required at present. Dominant part of general society environment is by all accounts contaminated with the waste material. In this way, modernization of the restaurants is required by giving the smart technology food waste in landfills rot, attract pests and dirty our air and groundwater. By updating your kitchen dustbin to smart bin Air you keep 1500 kgs of nourishment waste far from landfills in a 10 years!

As per the UN, amongst now and 2025, the total populace will increment by 20% to achieve 8 billion tenants (from 6.5 today). With this expansion in populace, the duties towards waste administration additionally increments. Our waste organization systems and our financial circumstances, not withstanding doing what needs to be done, are unequipped for dealing with the creating measures of waste generally. So unless another worldview of worldwide collaboration and administration is embraced, a tsunami of uncontrolled dumpsites will be the vital waste administration technique, particularly in Asia. On the west bank of America, San Francisco drives the path with a landfill transfer redirection rate of 72% and the city has set itself an objective of zero waste to landfill by 2020. This paper gives us a standout amongst the most proficient approaches to keep our condition perfect and green.

The increasing number of population results in greater waste generated, which in turn results greater number of bins in a particular place to keep the place clean and healthy. Hence it becomes all the more difficult to monitor every time whether all the bins are full or empty and if it is full the waste must be released form the bin to some sanitary landfill. So this paper comes up with an efficient solution to smartly monitor the status of all the bins, how many it may be with help of Wi-Fi connection throughout the campus. In the further scope of the project we tend to add the payment module of the users to pay online as many times as they use the smart bin. This will reduce the workload of the people working under government officials who have the duty to collect the money from the daily customers dumping their wastes in the bins.



I. GOALS & OBJECTIVE

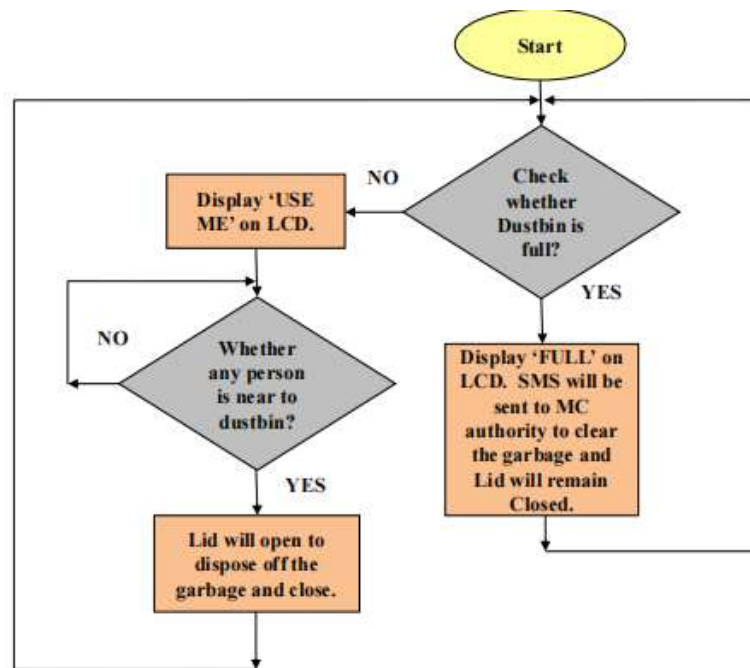
To design a “Smart Dustbin” which is a IoT featured bin which automatically detects the garbage level and sends message to respective municipal authorities updating the status of the bin.

II. SCOPE

- 1. Overflowing of dustbins can be stopped.
- 2. The overflowing and cleaning of smart bins will be continuously monitored and effectively managed thus making clean and empty bins available to common people.
- 3. Economically Effective technique if once implemented successfully.
- 4. It also intends at building a clean as well as green surroundings.

III. ALGORITHM

In this project we actually make use of 3 components arduino UNO, Ultrasonic sensor, and Wi-Fi ESP module. There will a centralized web server which will display the We have used 4 wires to connect the ultrasonic sensor to the arduino board correctly. There are 4 pins of the arduino board trigger, echo, Vcc and GND. The trigger and echo pins are connected to 12th and 13th analog pin of the board respectively. The Vcc pin is connected to the pin of 5 volts and GND pin is connected to the GND pin of the board respectively. Next we see WiFi module which is connected to the 3.5 volts in the arduino board. We can see the blue status of every bin in the campus whether it is full or empty. We make the connection of the arduino board to the ultrasonic sensor and Wifi modem and the laptop as shown below:.



Working of Smart Dustbin

led blinking in the module which tells us that the Wifi connection is able to send to the data to the required server ip address of 192.40.60.82 and is being able to show the status of the data whether it is full or empty. Finally we try to create an attractive front end design for the purpose of VIT university where the administrator will be able to monitor the status of all the bins inside the campus and report to the persons concerned immediately.

Pictures show the displays or the front end of the system when implemented. For the garbage being less than 5cm empty the status of the bin will show full else it will show empty. The centralized server will see the whole website which displays the status of each bin the university. The Wifi ESP modules attached to the UV sensor shows the display of the products. The status of the bin is either shown as full or empty, however it cannot predict the percentage



of how much full the garbage bin is, it just shows the extreme conditions either full or empty. Some limitations of this monitoring system are as follows;

1. It stops working entirely if the Wifi module gets damaged. □
2. Sometime it becomes difficult to load the data on the server due to some connection problem. □
3. There must be fast and efficient Wifi connection enough for the administrator to check the status of the bins every time.
4. The administrator cannot check the status of the bins if he is outside the campus, as the data is not uploaded in cloud, although we are trying our best to upload it.

IV. ADVANTAGES

1. Overflowing of dustbins can be stopped.
2. The overflowing and cleaning of smart bins will be continuously monitored and effectively managed thus making clean and empty bins available to common people.
3. Economically Effective technique if once implemented successfully.
4. It also intends at building a clean as well as green surroundings.

V. SYSTEM STRUCTURE

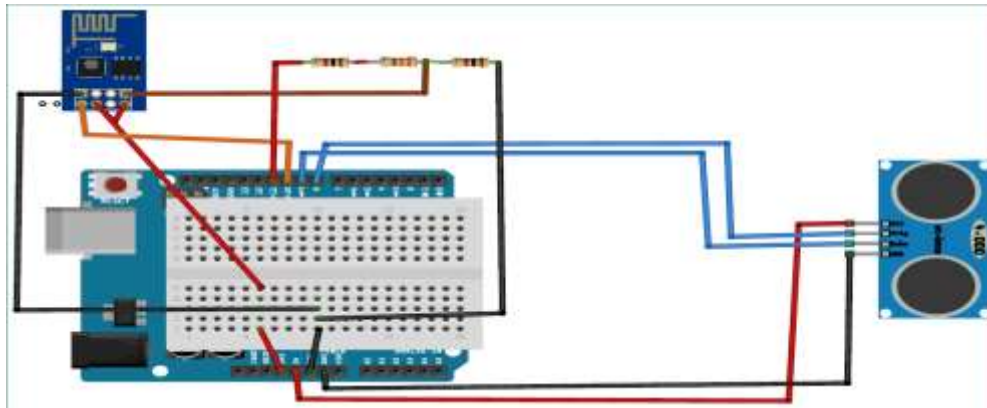


Fig. Smart Dustbin With IoT Blueprint

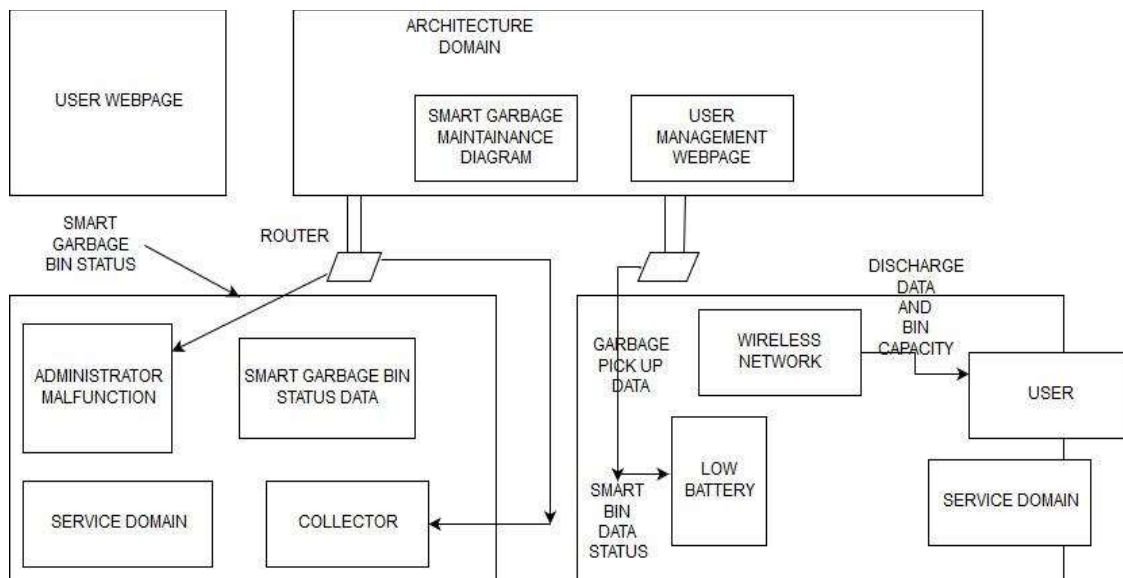


Fig. Smart Dustbin with IoT Block Diagram



VI. SYSTEM REQUIREMENT

1.	Hardware Requirements :	Ardiuno, Plastic Dustbins with Lid (capacity-approx 300 L), Ultrasonic sensor SR-04, Miscellaneous.
2.	System Processors :	Intel i5 5 th Gen
3.	Speed :	3.2 GHz
4.	Hard Disk :	500 GB
5.	Software Requirements :	Chrome, Ardiuno etc.

1. Operating system : 64 bit Windows 10.
2. Coding Language : Ardiuno

VII. CONCLUSION

Different features, for example, durability, affordability, prevention against harm and support issues are tended to when these smart dustbins are manufactured. This smart dustbin can contribute a great deal towards spotless and clean condition in building a smart city. In any case, since the innovation is new in India, appropriate awareness ought to be made among general society before it is executed on a substantial scale. Something else, sensitive devices like sensors may be harmed because of activities of the dustbin users.

As a scope of the future work we tend to implement the payment module in the entire monitoring system. We hope to develop an android application where the people will be able to access from their mobiles, two things mainly, the location of the nearest bin, and also whether it is full or empty. We also hope to put the entire thing in cloud, so that people from anywhere can check the status of the bins, and the limitation of constrained area is removed.

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