SMART GARBAGE MONITORING SYSTEM

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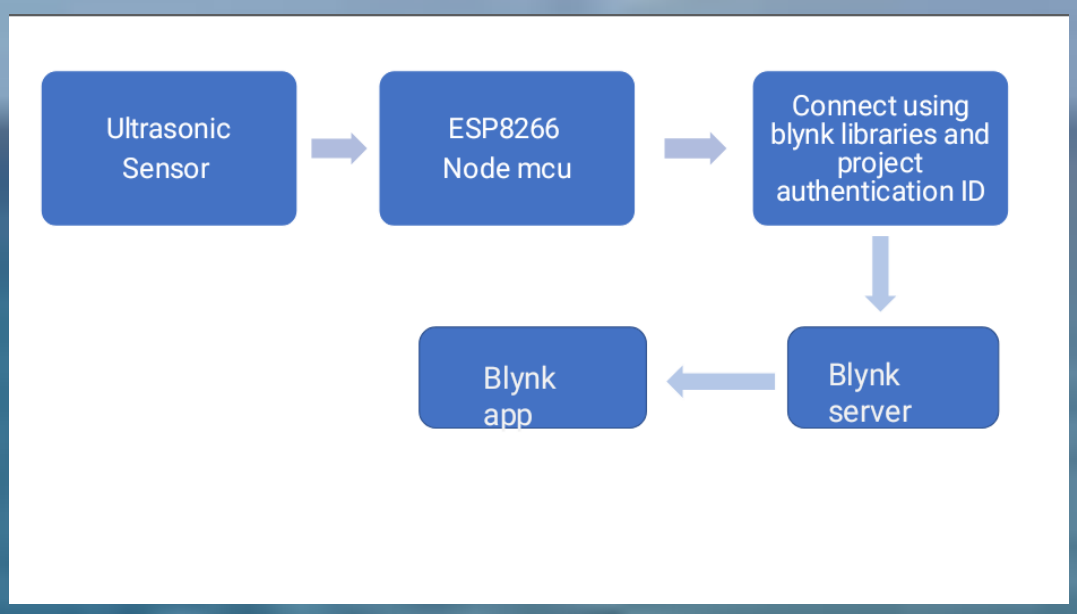
INTRODUCTION

The main objective is to maintain the level of cleanliness in the city and form an environment which is better for living. In this project, we are going to propose a system for the immediate cleaning of the dustbins. As dustbin is considered as a basic need to maintain the level of cleanliness in the city, so it is very important to clean all the dustbins as soon as they get filled. We will use ultrasonic sensors for this system. After this the bin should be emptied as soon as possible. The concept of IoT used in this field will result in a better environment for the people to live in. With the help of this system minimal number of smart bins can be used around the whole city and the city will still be much clean. The disadvantages of the existing system are that the employees have to go and check the bins daily whether they are filled or not, it results in high cost. If the bin doesn't get emptied on time then the environment becomes unhygienic and illness could be spread. The proposed system will help in removing all these disadvantages.

BLOCK DIAGRAM



COMPONENTS REQUIRED

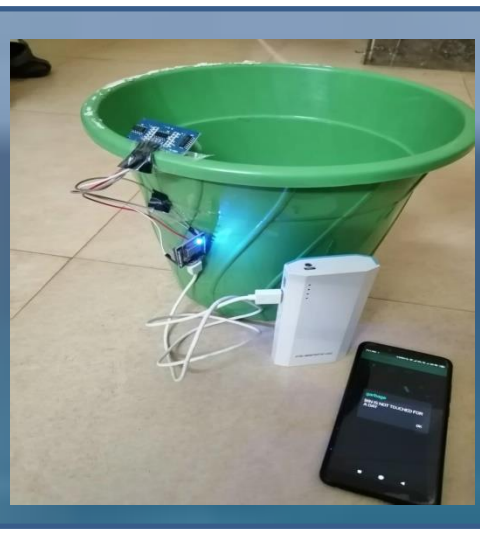
- NodeMCU – It is an open-source firmware and development kit that helps you to prototype or build IoT product. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.
- Ultrasonic Sensor – The Ultrasonic Sensor is used to measure the distance with high accuracy and stable readings. It can measure distance from 2cm to 400cm or from 1 inch to 13 feet. It emits an ultrasound wave at the frequency of 40KHz in the air and if the object will come in its way then it will bounce back to the sensor. The trig pin will send the signal and the Echo pin will be used to receive the signal. By using that time which it takes to strike the object and comes back, you can calculate the distance. Distance can be measured by

  Distance = Time * sound speed /2.
- Jump wires – They are generally used to establish connectivity between NodeMCU and Ultrasonic sensor.
- Blynk App – To connect to the internet we make use of a prebuilt platform called Blynk app.

WORKING PRINCIPLE

Create the blynk app. Then the NodeMCU will first read the ultrasonic sensor, It will send the signal with the speed of sound. The trig pin will send the signal and the Echo pin will be used to receive the signal. It revert back after striking the object and the travel time is store based on equation. Thus the distance of the object is calculated. Based on the distance we can identify the garbage level to be low or high. We used the term "overflow" to indicate the necessary for cleaning process. Thus the mobile is enable with the term as "Overflow". By this way if the bin is filled upto 75% then the notification through blynk app will be sent to all the workers and authority members. If the bin is not emptied within 4hrs again the notification will be sent to authority members. And also if the bin is not filled upto 75% in more than 2 days the message will be sent to authority members and it will be informed to clean the bin. By this way we can maintain the level of cleanliness in the city.

PROJECT MODEL



APPLICATIONS

It is applicable in places such as

- Schools and Colleges
- Public Places, Shopping Malls
- Hospitals , Industries
- Gardens, Railway Stations

ADVANTAGES

Manual checking of dustbins is not necessary. The garbage will be collected on time-to-time basis. There would not be any bad smell around the bin. Saving on fuel consumption, thus reducing the threats to the environment. It will also help in reducing the cost as the employees will have to go only at that time when the bin is full.

CONCLUSION

A proper waste management system is important for the development of any country. For a populated country like India, waste management is an important concern. We are trying to give an effective solution to the waste management issue by our project named smart bin.

REFERENCES

Monika K A, Rao N, Prapulla S B and Shobha G 2016 "Smart Dustbin - An Efficient Garbage Monitoring System International Journal of Engineering Science and Computing."