International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 09 | Sept-2021ISSN: 2582-3930

IOT based Garbage Monitoring System

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Abstract -As people are becoming smarter so are the things.For Smart cities there is a need of Smart waste management. The concept of Smart bin is everywhere like in Smart buildings, Colleges, Hospitals and Bus stands. Waste management is one of the major problem that the world faces irrespective of the case of developed or developing country. The key issue in the waste management is that the garbage bin at public places gets overflowed well in advance before the schedule of the next cleaning process. It resultsin various hazards such as bad odour & ugliness to that place which may be the root cause for spread of various diseases. To avoid all such situation and maintain public cleanliness and health this work is mounted on a smart garbage system. It is achieved by interfacing ultrasonic sensor with nodemcu to check the level of garbage filled in the dustbin and sends the alert to the municipal web server as well as to the blynk. After cleaning the dustbin, automatically application updates the status of dustbin.

Key Words:IOT, Nodemcu, Blynk ,Monitoring

INTRODUCTION

IOT means things that are connected to the Internet and controlled from the Internet is called Internet of Things. In this proposed system the smart bin is connected with the internet and controller to display the exact information about the dustbin level and its exact address.Due torapid growth in the population which leads to large quantity of waste disposal in the cities. The overflow of dustbin will create an unpleasant environment and it affects many people by spreading the disease. Moreover it is a waste of fuel to travel around a complex or an area to find that some of the garbage is filled and some are not

SYSTEM WORKING

The garbage dustbin transmit signals to indicate that they are fullempty or two days old garbage and should be emptied over internet, the signals are sent to a blynk . In the software, the status of the garbage in dustbin is indicated, which is taken as a reference to plan the route for waste collection garbage vehicle travel only to those dustbin that actually need to beclear . A ultrasonic sensor is used in the dustbinto detects the level regardless of what has been deposited inside. The systemiscomposedof hardware and software.

HARDWARE DESCRIPTIO

Nodemcu

Fig1.Nodemcu

The NodeMcu is an open-source Wi-Fi system on chip which provides full internet connectivity. It can be programmed by connecting it to pc or laptop through USB port using Arduino IDE which is installed on pc or laptop . It has a 9 digital and one analog pin it has total of 30 pins . It is a tool that is for Wi-Fi networking and low power consumption. In this project it is main microcontroller it has inbuilt Wi-Fi connecting capacity which emits the need ofextra wireless chip to transmit real-time monitored sensor data to mobile Applications and also to the web from where we can acces this data.

Ultrasonic Sensor:

Fig2.Ultrasonic Sensor

The ultrasonic sensor is employed for measuring distance between itself and the obstacle using ultrasonic

waves. The trigger in ultrasonic sensor emits a wave of ultrasonic wavelength and receives the reflected wave back from the object. The distance to the target is then calculated by measuring the time between the emission of the ultrasonic wave and reception of the same. It uses a single component for both sending and receiving the ultrasonic wave. The distance to the target is then calculated by using the formula: Distance = (Time * Velocity)/2 in this project it has been employed for measuring the distance between the lid of the bin containing the sensor and the garbage filled in the dustbin . The distance measured is then used for calculating the percentage of garbage level in the bin.

SOFTWARE REQUIREMENTS

1. Arduino IDE
2. Arduino Language
3. Blynk app
    - Arduino IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writinCode, a message area, a text console, a toolbar with buttons for common functions and a series of menus as shown in fig It connects to the Arduino and Genuine hardware to upload programs and communicate with them.

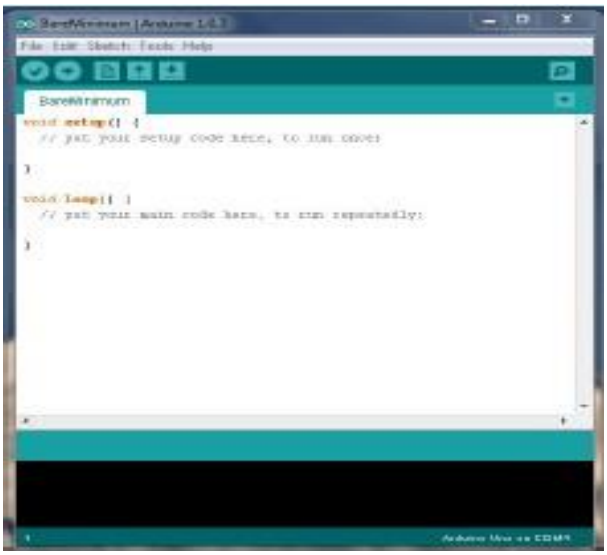
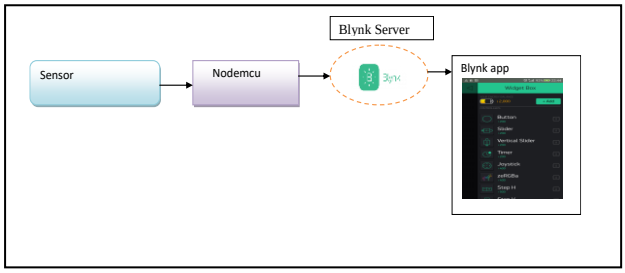


Fig3: ArduinoIDE

Writing Sketches: Programs written using Arduino Software (IDE) are called sketches.These sketches we can edit .It has features of cutting ,pastingand searching/replacing text.These sketches are saved with the file extensions in.In message area errors and other informations are displayed.I n right side bottom corner of the window configuration board and serial port displyed.The toolbar buttons is used to verify and upload programs, create, open, and save sketches, and open the serial monitor.

MODULE DESCRIPTION



To detect level smart garbage bin we set three levels first red indicator which shows garbage bin is full second orange to show garbage is two days old and green for empty dustbin. Ultrasonic sensor measures distance and according to that sends signal to android application through controller.

Flowchart

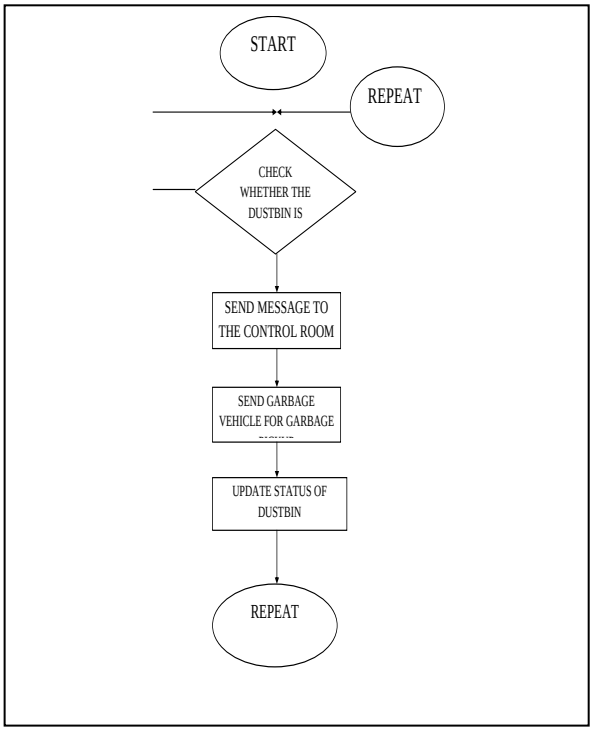


Fig.5 Flowchart

RESULTS AND CONCLUSION:

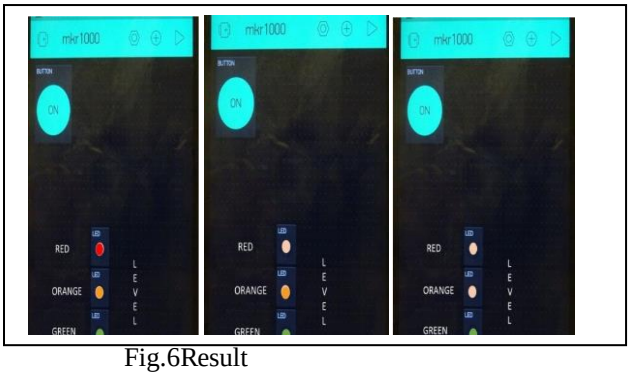


Fig.6Result

ADVANTAGE

•Time consumptionis less Fuel consumptionis optimized.Air pollution from garbage collection rucks and due to foul smell is reduced.Real time live data from the dustbin canbe obtained.collection and transportation is reduced•Introducing smart garbage system makes city'SMART'•Infrastructural needs such as garbage containers and trucks are reduced as the collection is based on fill level data and optimized route planning• Manpower required for waste collection and transportation is reduced

CONCLUSIONS

The main aim of the project is to obtain real time data of percentage of garbage from garbage bins placed in various parts of the city. Along with the fill level data other important parameters such as pollution in ppm, humidity, and temperature of the bin are monitored and sent to web and Blynk interface. When the garbage level in particular dustbin has reached the maximum level then the employees can be informed and they can immediately take certain actions to empty it as soon as possible. It will reduce the wastage of time, cost and energy of the human. It will also prevent the occurrence of any disease. The truck drivers easily get information about the clearing process and do their work immediately. Thus this method of monitoring garbage level enhances the overall efficiency of the whole process.

ACKNOWLEDGEMENT

We gratefully acknowledge the help & cooperation offered By Professor M.B.Joshi Principal of our college and Management of NMPI,Peth for providing help and support to carry out the project.

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