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WASTE MANAGEMENT SYSTEM WITH THINGSPEAK

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Abstract - *our aim of the project is to reduce the over flowing of garbage. T0.he waste management is very careless in our city. Waste management is very difficult. Over flowing of waste will causes dirty smells and unhygienic in nature, causes various diseases. Most of the time wet and dry wastes are not separately collected so the recycling is difficult in different kinds of waste. This paper deals with the system for garbage management based on IOT. The proposed systems use ultrasonic sensor, infrared sensor for detecting the level of waste, Raspberry Pi3Hardware section. Ultrasonic sensors to sense the level of garbage in the bin, Moisture sensor detect the wet and dry waste. A motor rotates to separately collect the wet and dry waste for corresponding bin. Things speak used to identify the level of the waste in the bin graphically .If the bin is filled and inform the concerned persons by email to collect the garbage. Large number of datas to be transmitted and processed fast by using Raspberry Pi3 as controlling Board.*

Key Words: IOT, Garbage, Thingspeak, Raspberry Pi, Mail

1. INTRODUCTION

The world causes a huge problem of waste management.it is very difficult in our nature. Today number of employers being appointed to attend the cleaning process in our locality but the improper collection of waste will causes uncleanness in our society. Here a waste management system is introduced in which each bin connected with a monitoring system which will notify the corresponding bin waste level .In this system, it is also separate wet and dry waste into two separate waste bins. This system provides an effective solution to waste management problem

1.1 Objective

The main objective of this paper is to observe the trash can and maintain the surroundings sensible and clean. Today folk's square measure victimization additional merchandise as well as food things, industrial merchandise, medicines and, plastic materials. Once expiration of those things they're replace it into a trash can for disposal. While not correct maintenance of dustbins, these expiration things will produce epidemic diseases among folks and pollution to the atmosphere. That the dustbins at cities, home, industries and hospitals have to be compelled to be maintained properly to make sure cleanliness. In this system we have a tendency to square measure attending to use Raspberry-Pi, Ultrasonic sensing element and Flame sensing element. The vision of our project is to form the environment clean in sensible method.

2. EXPERIMENTAL INVESTIGATION

2.1 Problem Definition

As we see many times the dustbin are get over flown and concern person do not get the information on a time and due to which unconscious condition form in the surroundings, at the same time bad smell come out from waste and spread out in surrounding . Due to the unclean environment some harmful diseases easily spreadable in given locality. The existing system used for cleaning the dustbin is not effective and which has some disadvantages which as follows,

- Less effective and time consuming.
- Cost is very high.
- Environment become unhygienic.
- Because of bad smell of garbage human beings may cause illness.
- More traffic and noise due to truck used to clean the dustbin.

2.2 Components Used

- Raspberry pi
- IR Sensor Module
- DC Motor module
- Moisture Sensor
- Utrasonic Sensor

2. PROPOSED SYSTEM ARCHITECTURE

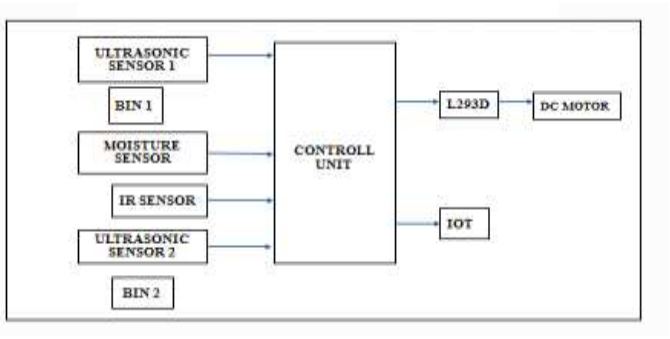

Fig.1: System Architecture

Figure shows the architecture of the proposed system. Ultrasonic sensor measure distances of moving object generally by using ultrasonic waves here it used to detects level of the garbage. The sensor emits an ultrasonic wave and receives the reflected wave back from the target.IR Sensor emits in order to sense whether there is an object present. Moisture Sensor measures the water content in the given waste. .DC motor which is connected to the Raspberry pi 3 control board. DC motor is used for segregating wet and dry waste with the help of moisture sensor. If the bin is full then an alert mail is sent to the concerned persons from server to take the filled waste (truck drivers from municipality).Employees clear the corresponding waste bin a clear mail will send from employees to server. All these sensors are connected to a Raspberry pi3 board. A push button is also placed here when the employee collect the waste properly he will pressed the switch to inform the server whether the bin is cleared. And the level of bin will viewed by thing speak up to date.

2.1 Hardware Requirements

2.1.1 Rasberry Pi

A minicomputer. Computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. Raspberry Pi 3 model board is used here. It is operates like a computer with the kelp of a monitor.

2.1.2 Ultrasonic Sensor

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets objected by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module. Ultrasonic sound vibrates at a frequency above the range of human hearing our ultrasonic sensors, like many others, use a single transducer to send a pulse and to receive the echo. The sensor determines the distance to a target by measuring time lapses between the sending and receiving of the ultrasonic pulse.

2.1.3 L293D Motor Driver IC

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit(IC).The l293d can drive small and quiet big motors as well, check the Voltage Specification at the end of this page for more info

2.1.4 IR Sensor Module

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, The resistances and these output voltages, change in proportion to the magnitude of the IR light received.

2.1.5 Moisture Sensor

This is a simple water sensor can be used to detect soil moisture when the soil moisture deficit module outputs a high level and vice versa output lowUse this sensor produced an automatic plant water device, so that the plants in your garden without people to manage Sensitivity adjustable the blue digital potentiometer adjustment .Operating voltage 33V-5v.Power indicator (red) and digital switching output indicator (green).

3. RESULTS AND DISCUSSION

Waste management is very difficult. Over flowing of waste will causes dirty smells and unhygienic in nature, causes various diseases .The result of our project is that basedon IoT garbage is collected simultaneously with the help of a smart bin.The below figure shows the graphical representation of levels of waste in both containers as uploaded to the thingspeak cloud. This page can be accessed by any person who has the username and password of the account.

3.1 Waste Detection

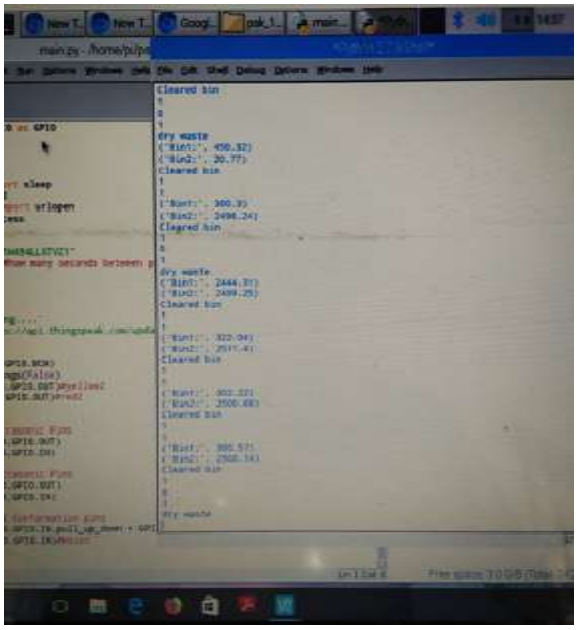

Fig.2: Dry waste detection

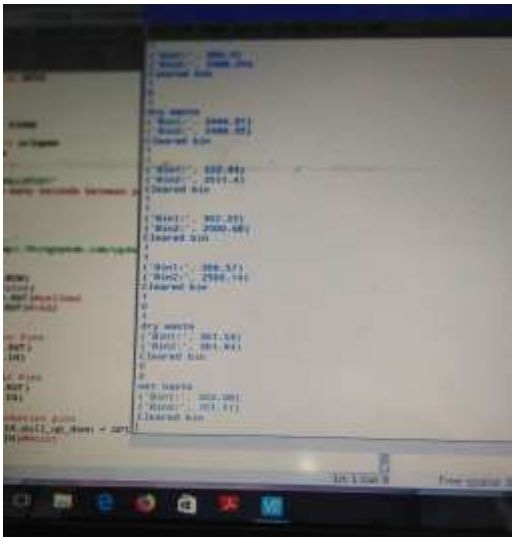

Fig.3: Wet waste detection

Here wet and dry waste are sep;arated by using moisture senasor. And the sepatated waste will collected to different bin respectively.

3.2 Graphical View

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualizations of live data, and send alerts using web services like Twitter® and Twilio®. With MATLAB® analytics inside ThingSpeak, you can write and execute MATLAB code to perform preprocessing, visualizations, and analyses. ThingSpeak enables engineers and scientists to prototype and build IoT systems without setting up servers or developing web software.

Fig.4:Thingspeak output when the waste bin cleared

Fig.5:Thingspeak output when the waste bin filled

3.3. Advantages

- The garbage will be collected on time-to-time basis.
- There would not be any bad smell around the bin.
- Real time notification to collect the garbage.
- Easy collection & minimal time.

4. CONCLUSION

This project incorporates IOT solutions to implement a system that provides the municipal council with a system that better equips them to handle the garbage problem in a smart city. Every party is interacting with this system, that is the citizens, the workforce, and the admins. Mainly this system is aimed at a city with a high or growing population. This system is built to adapt to growing populations, i.e. the number of bins is increased until the amount of garbage collection can be satisfied. The route calculation makes sure that bins are never overflowing. The government can use this system to keep an eye on the levels of use of harmful materials generated and apply techniques to reduce these levels. They can also use this system to confirm that the applied techniques are actually effective. The government can set up recycling stations and the profit to be gained can be calculated. All these components of the system ultimately lead to a cleaner city, citizens getting a convenient method to dispose of their day to day garbage and the government saving resources and even making a profit from recycling in the long term.

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