IOT Based Garbage Monitoring System

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Abstract – *This project IOT Based Garbage Monitoring System is a very smart system which will help to keep our village and cities. We see that in our cities public dustbins are overloaded and it create unhygienic conditions for people and That place leaving a bad smell. To avoid all these things we are Going to implement a project IOT based garbage monitoring System. These dustbins are interfaced with Arduino base system having ultrasonic sensor along with central system showing the Current status of garbage on display and web browser HTML page with Wi-Fi module. To increase the cleanness in the country government started the various project. This project is helpful for government project of "SWACHH BHARAT ABHIYAN".*

Key Words: GSM, Arduino, Ultrasonic sensor,ESP8266, DC motor, power supply.

1. Introduction

IOT can be explained as a networking of physical object with the use of embedded electronic sensors and software that allows these devices to send and receive data from each other. The IOT performs sensing, gathering data, store the data and processing by connecting physical devices to the internet. In this paper we are going to purpose a system for the collect the garbage time to time if not possible then we are connected one mechanism to it for the pressing purpose. Because of mechanism, the dustbin has some space for more 2 days. In Indian cities, waste management is mainly handled municipal committees. When the garbage bins fill up for that matter here we use ultrasonic sensors for the indication of the garbage level in the dustbins. The sensors will be placed on the top of the bin which will help in sending the info to the municipal committee that the level of garbage has reached its maximum level. After this, the dustbin should collect as soon as possible.

2. Literature survey

The authors in have made an analysis of existing garbage bins and their population. The study analyzed the spatial distribution of garbage bin in some areas of any city using average nearest neighbor functions of GIS.[1] The spatial circulation of the current garbage bin has appeared to be dominatingly in the clustered pattern. An optimal number of additional garbage bin was calculated. It is shown that the number of existing garbage bin is insufficient in the area.[2].

The maximum of pollution caused by the existing garbage bin was calculated using spatial analyst functions of GIS. It is found that all the dustbins are burnt with wastes and causing pollution to the environment.[3] The results thus obtained would help to understand the present situation of the waste management of the city and also villages the required number of garbage bins to prevent pollution of the environment.[4]
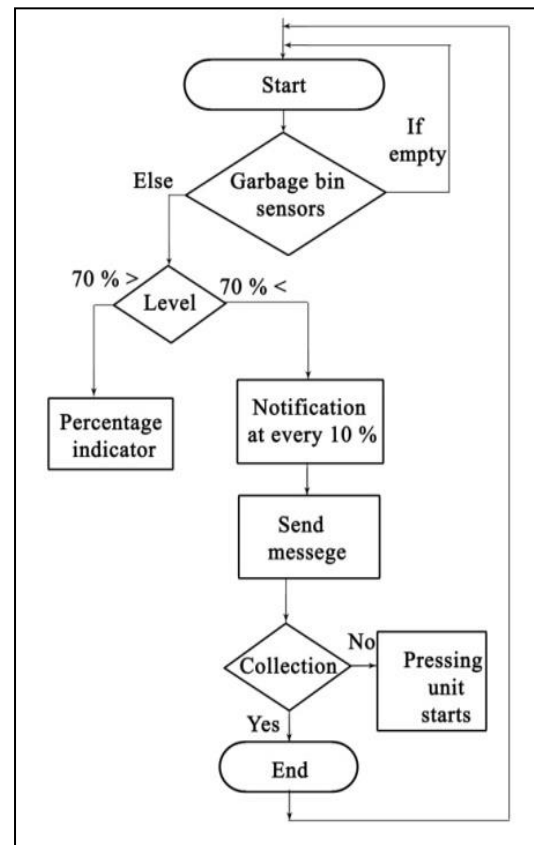
3.Flow Chart
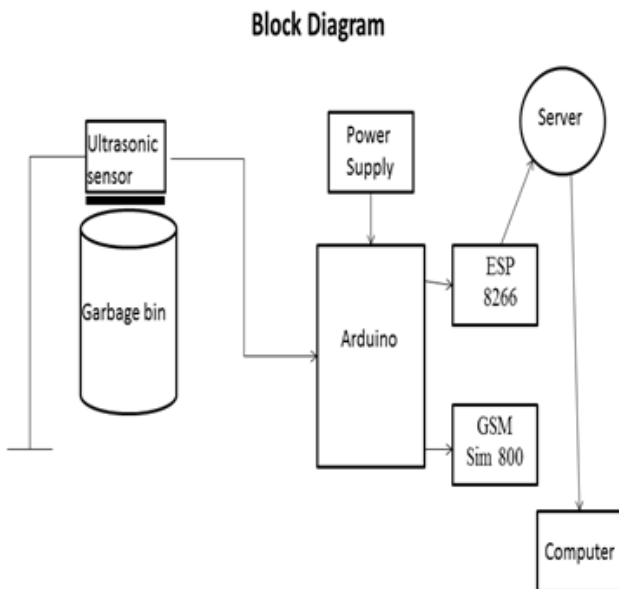

Fig.1 – Flow Chart

4. Block Diagram

Fig.2 – Block Diagram

Working

This System monitors the garbage bin and informs the level of garbage bins collection how many garbage in the garbage bin. The system uses ultrasonic sensor placed over the bins to detect the garbage level and compare it with the garbage depth. If garbage level is 70% or less than 70% then it's ok. But if garbage level is above 70% their Arduino gives information above bin level to server ESP8266 01 module. A Server is used to store data and shows of all dustbins level on the web page. GSM used to send the text message to the mobile. Text message contains information about garbage level and location of a particular bin**.**

5. Hradware Description

Fig.3 – GSM Module

GSM (Global system for mobile communication) is a digital mobile telephony system used in all world. GSM uses TDMA system. In this project, we use SIM 800 GSM

module. It is capable of receiving information from GPS satellite and then calculates the device geographical position. When an accident occurs GPS tracks that location of the vehicle containing longitude and latitude details further send to controller and message to be sent through GSM module to the particular coded number.
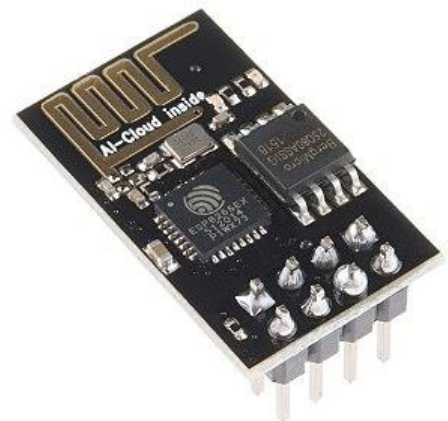
ESP 8266-01:

Fig.4 – ESP 8266

The ESP 8266 is a low power highly integrated microchip. It is mainly used in IOT based project because it consumes low power. ESP8266EX has been designed for mobile, wearable electronics and Internet of Things applications with the aim of achieving the lowest power consumption with a combination of several proprietary techniques. The real-time clock can be programmed to start the ESP8266EX 01at any required condition. The ESP8266EX 01 can be programmed to start up when a specified condition is detected. This minimal start-up time feature of the ESP8266EX 01 can be utilized by a mobile device, allowing them to remain in the low-power standby mode WiFi is needed. To satisfy the power supply requirements of a mobile device and another electronic device, ESP8266EX 01 can be used to reduce the output power to fithe various application, by off range for power consumption.
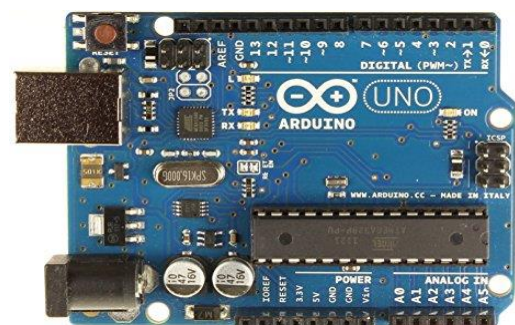
Ardiuno Board:

Fig.5 – Ardiuno Board

Arduino is an open source hardware and software company used for building electronics projects. Arduino board uses the variety of microprocessor and microcontroller. The Arduino board is the collection of digital and analog input-output pins. Arduino Uno is most popular board in Arduino family. Uno means one in Italian and was chosen to mark the release Arduino software(IDE)
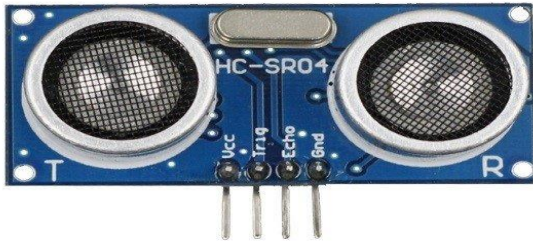
Ultrasonic Sensor:

Fig.6- Ultrasonic Sensor

As the name indicates, ultrasonic sensors measure distance by using ultrasonic waves. Ultrasound is used in many different fields. Ultrasonic devices are used to detect objects and measure distances. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between transmission and reception.

6.Software Description:

The displays text output by Arduino software (IDE), including the complete error message and other information.

7.Conclusion:

Development of application for city administrations, municipal staff.

IOT based garbage monitoring system is a very innovative system which will help to keep the cities clean.

8. Future Scope:

This project can also be used in the "SMART CITY".This project is also helpful in the government project of "SWACHH BHARAT ABHIYAN."

9. Acknowledgement

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