A STUDY OF ULTRASONIC SENSORS IN GARBAGE MONITORING

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Abstract: **Owing to a paradigm shift toward Internet of Things (IoT), researches into IoT services have been conducted in a wide range of fields. As a major application field of IoT, waste management has become one such issue. The absence of efficient waste management has caused serious environmental problems and cost issues. Therefore, in this paper, an IoT-based smart garbage system (SGS) is proposed to reduce the amount of food waste. In an SGS, battery-based smart garbage bins (SGBs) exchange information with each other using wireless mesh networks, and a router and server collect and analyze the information for service provisioning. Furthermore, the SGS includes various IoT techniques considering user convenience and increases the battery lifetime through two types of energy-efficient operations of the SGBs: stand-alone operation and cooperation-based operation. The experiment showed that the average amount of food waste could be reduced by 33%.**

Keywords: **Internet of things (IOT), waste management, smart garbage system (SGS), smart garbage bins (SGBs), user convenience**

I. INTRODUCTION

We are living in an age where tasks and systems are fusing together with the power of IOT to have a more efficient system of working and to execute jobs quickly. The Internet of Things (IoT) shall be able to incorporate transparently and seamlessly a large number of different systems, while providing data for millions of people to use and capitalize. One of the main concerns with our environment has been solid/liquid waste management which impacts the health and environment of our society. The detection, monitoring and management of wastes is one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a cumbersome process and utilizes more human effort, time and cost which can easily be avoided with our present technologies, waste management has also become a significant issue in academia, industry, and government as major IoT application fields. An indiscriminate and illegal discharge of waste, an absence of waste disposal and management systems, and inefficient waste management policies have caused serious environmental problems and have incurred considerable costs for waste disposal.

II. WORKING ARCHITECTURE

I. The ultrasonic sensors sense the distance between the lid of the Smart Garbage Bin.
II. The data recorded by the ultrasonic sensors is sent to the wifi module through the Arduino uno
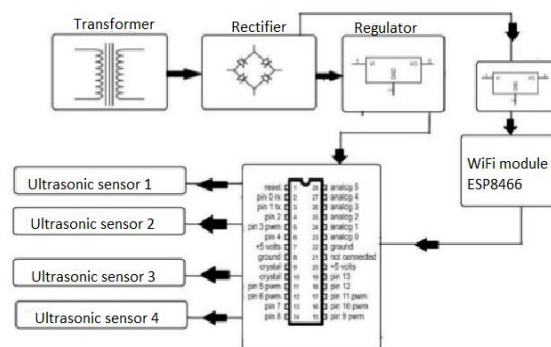III. The wifi module sends a notification to the servers in turn notifying the authorities with the required data.

Fig.1.0 Block diagram of working garbage monitoring system

III.WORKING COMPONENTS

Arduino UNO
Arduino is an open source, PC paraphernalia and programming organization, endeavour, and client group that plans and produce microcontroller packs for constructing programmed devices and intelligent object that can detect and control questions in the real world. The equipment reference plans are appropriated under a Creative Commons Attribution Share. Arduino Uno is as shown in fig-2

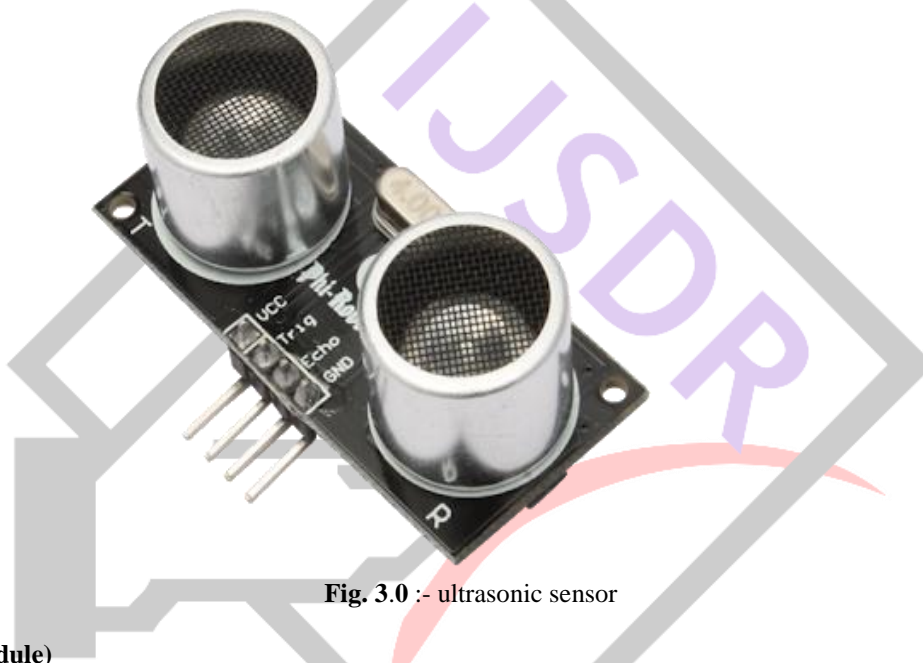**Fig. 2.0** Arduino UNO

ULTRASONIC SENSORS

Fig. 3.0 :- ultrasonic sensor

ESP8266(Wi-Fi module)
ESP8266 is a Wi-Fi module which will give your projects access to Wi-Fi or internet. It is a very cheap device but it will make your projects very powerful. It can communicate with any microcontroller and make the projects wireless. It is in the list of most leading devices in the IOT platform. It runs on 3.3V and if you will give it 5V then it will get damage. The ESP8266 has 8 pins; the VCC and CH-PD will be connected to the 3.3V to enable the wifi. The TX and RX pins will be responsible for the communication of ESP8266 with the Arduino. The RX pin works on 3.3V so you will have to make a voltage divider for it as it used for implementation. ESP8266 is shown in figure 4
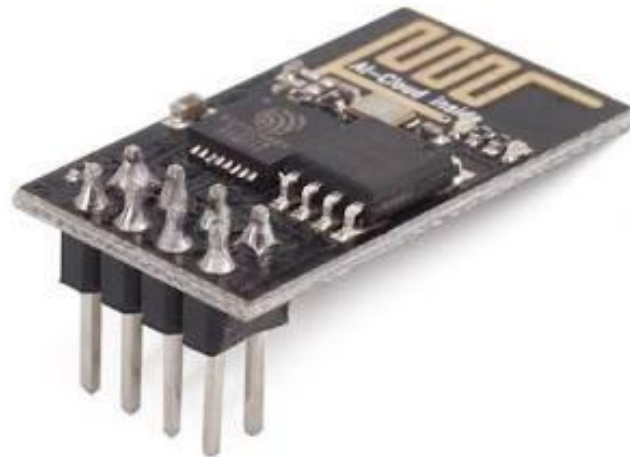
Fig. 4.0 wifi module ESP8266

IV.IMPLEMENTATION

I.Objectives

- Monitoring the waste management.
- Providing a smart technology for waste system.
- Avoiding human intervention.
- Reducing human time and effort
- To ensure the protection of the environment through effective waste management measures
- To protect the health and wellbeing of people by providing an affordable waste collection service

II.Advantages

- Monitors the garbage bins and informs about the level of garbage collected in the garbage bins.
- To keep our Environment clean & green.
- The cost & effort are less in this system.

V.Conclusion

In this paper we present, our work on developing an affordable and efficient method that can support to sort the dry and wet garbage. In this the new innovation is that we use the IOT (Internet of Things) from this we can monitor our system from any where using internet of thing. If we use this system in our home then the wet and dry garbage is separated from our houses this is the vital role plays in this system. Further, a wireless interface has been provided to control the system wirelessly and keep the cities clean from unhygienic and hazardous environments. The technologies which are used in the proposed system are good enough to ensure the practical and perfect for solid garbage collection process monitoring and management for green environment.

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