Garbage Management System Using Ultrasonic Sensors

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Abstract- *The abysmal state and challenges in municipal solid waste management in urban India is the motivation of the present study. Urbanization contributes enhanced municipal solid waste generation and unscientific handling of Municipal solid waste degrades the urban environment and causes health hazards. In this paper, an attempt is made to evaluate the major parameters of municipal solid waste management, in addition to a comprehensive review of municipal solid waste generation, its characterization, collection, and treatment options as practiced in India. By using of IOT(Internet of things) we tried to implement better organization of garbage management by the municipal corporation.*

I. INTRODUCTION

Due to the increase in population in developing cities their has been an increase in the garbage waste that is generated by each and every house hold. Due to the increase in garbage the government bodies is not able to maintain the garbage waste and as a result the many air borne diseases are spread. In metropolitan or city areas, the clearance of waste management is one of the challenging tasks for the majority of the country all over the world. There is need of a well organized waste clearance system is mandatory by keeping green environment.

Due to the increase in the development of technology and planning of smart cities in many developing countries the garbage management system should also be upgraded and they should remove the old and monotonous way of collecting garbage. The major challenge is the lack of coordination and information, due to the lack of coordination between the local people and the authority who are dumping and recycling the waste and the lack of information leads to not upgrading the garbage management system in the smart city.

II. PROBLEM DESCRIPTION

The major cities the garbage monitoring authority is not able to manage the garbage in the city. Let's take a simple example, the garbage collecting trucks collect the trash from the prescribed routes on a daily basis and the street were the dustbins are not full or half empty the trucks go to the location to pick up the trash and as a result many things are wasted like time, fuel etc. Rather, there should be an algorithm which can decide the path for collecting the waste bins and notify the driver to collect the garbage where the dustbins are full.

III. PROPOSED SYSTEM

Due to the existing problem, the proposed system is developed with the following objectives:-

1. Develop a device (Sensor Node) that can monitor the state of a garbage bin and relay the monitored state to a central database.
2. Collect Sensor data from each bin and display it on a webpage to alert the relevant authorities of the states of the various garbage bins in a given area.
3. Store sensor data for each of the garbage bins to provide analytical information for each of the garbage collection areas.
4. Lock the garbage bins when the red light is turned on and navigating the user to throw their garbage in the next dust bins.
5. Provide route planning for the collection based on the selected fill level and priorities of each bin.

IV. MATERIALS AND METHODOLOGY

1. Arduino Uno

Arduino is an open source, PC paraphernalia and programming organization, endeavor, 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 arduino uno board is the bridge between the ultrasonic sensor and the wifi module instructs the wifi module to send signal to the data base.

2. ESP8266(*Wi-Fi Module*)

ESP8266 is a Wi-Fi module that provides wireless connection and internet connection to the whole project. It can communicate with of the microcontroller and make the

projects wireless. This Wi-Fi module will send the information to the database about the status of the dustbin.

3. Ultrasonic Sensor

The ultrasonic sensor provides the accurate depth with stable reading. It can measure the distance from 2 cm to 400 cm. It emits an ultrasound wave at a frequency of 40KHz in the air. If the object comes in contact with the wave it will bounce back to the sensor. By using the time taken to strike the object and comes back, you can calculate the depth of the garbage bins.

The depth is calculated by the following formula:-

$$Distance = Time*sound\ speed/2$$

Where time = the time between an ultrasonic wave is received and transmitted

4. Bread board and Jump wires

A breadboard is a solder less device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate. Jump wires are generally used to establish connectivity with bread board.

V. LITERATURE SURVEY

The common problem we face during this year is growing economy and population which inversely affects the environment we live in and the pollution is increasing day by day. The paper aims to clear such pollution problem and it is effect on the economy.

In the previous papers they developed a system where we can track the amount of garbage filled on timely bases and when it's full the garbage trunk will pick it up for the disposal. The major drawback of this device is that once the garbage is full and the notify doesn't reach the garbage truck people in time then it again create overflow of garbage which is intent affect the environment and the living conditions of the people.

This intent gives rise to one another problem where the garbage is full but a person has to throw his garbage quickly because he has the work and have no idea where to throw the garbage because of this he has no other choice than to thrown it over the overflowing garbage.

The main of this project is to create a pollution free environment but if we use chemical sensor how can we overcome the main criteria of the project by this. So we intent to use chemical free eco-friendly sensor to create this project successfully.

The cost of this project is minimized as much as possible and for a brighter and better living environment we intent to create this paper which is fully eco-friendly.

VI. FLOW CHART
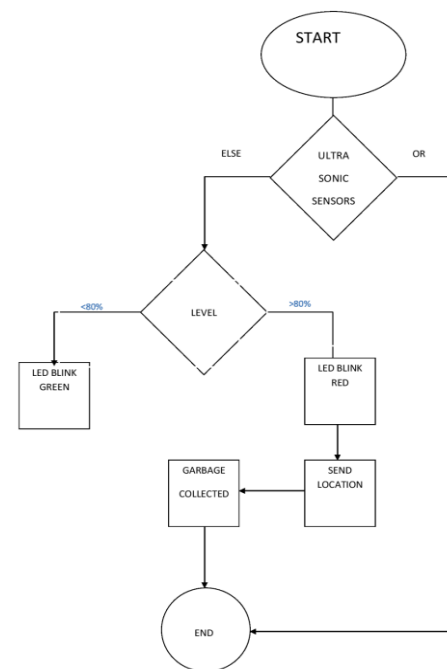
VII. CONCLUSION

The main objective is to maintain the level of cleanliness in the city and form an environment which is better for living. By using this system we can constantly check the level of the garbage in the dustbins which are placed in various parts of the city. If a particular in this system to check the level of garbage in the dustbins but in future various other types of sensors can be used with the ultrasonic sensor to get more precise output and to take this system to another level. Now this system can be used in certain areas but as soon as it proves its credibility it can be used in all the big areas. As this system also reduces manual work certain changes can be done in the system to take it to another level and make it more useful for the employees and people who are using it. In future, a team can be made which will be in charge for handling and maintaining this system and also to take care of its maintenances.

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