

Detect Level of Garbage Dustbin and Separate Dry and Wet Garbage with IoT Technology

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Abstract –

Nowadays certain actions are taken to improve the level of cleanliness in the country. People are getting more active in doing all the things possible to clean their surroundings. Various movements are also started by the government to increase cleanliness. We will try to build a system which will notify the corporations to empty the bin on time. In this system, we will put a sensor on top of the garbage bin which will detect the total level of garbage inside it according to the total size of the bin. When the garbage will reach the maximum level, a notification will be sent to the corporation's office using telegram, then the employees can take further actions to empty the bin. This system will help in cleaning the city in a better way and they calculate the temperature and moisture using sensors. By using this system people do not have to check all the systems manually but they will get a notification when the bin will get filled. This system automatically separate dry and wet garbage using servo motors.

Key Words: IOT, Dustbin, Ultrasonic sensor, DHT11, Servo Motor, Raspberry Pi.

1. INTRODUCTION

Smart dustbin systems became essential for cities that aim to reduce cost and manage resources and time. Optimizing the process of trash collection is the main purpose of the smart solutions provided by industry. The purpose of this work is to present a cost-effective smart trash bin for localized and small-scale cases, such as small parks, university campus and hospitals.

Garbage Monitoring is a huge problem in maximum cities all over the world, without proper management of waste which in cause a major factor for environmental pollution resulting in several health issues. In the traditional system, the garbage use to be collected in a manual way. The workers who have to collect the garbage are unable to get proper information when would the bins are filled with a particular area, so they

use to fix some timings for collecting the wastage. Due to this sometimes the bins may be filled and overflowed and causes unhygienic conditions leading to pollution. A New Model for Smart Garbage Monitoring is introduced with replacing the bins with smart bins attached to an ultrasonic sensor which will detect the levels of waste in the bin, time to time and forward the information to Raspberry Pi attached to a WIFI module, the messages to the central monitoring system, showing the levels of bins in real time scenario with Webpage. Along with this segregation of waste is done with a moisture sensor which will sense the type on the moisture level and segregate atomically. Then trucks are attached to the particular industry so that they are also aware of the information of wastage that they are going to receive. With the invention of this system, there will be awareness making a healthy city with smart inventions. Detect the level of that garbage then its send the message to respected person that time it's indicate the buzzer. In that system its find out the moisture and temperature of that dustbin. In that system dry and wait garbage using plate flipping mechanism. Then we are show the graph for whole system.

2. LITERATURE REVIEW

[1]The paper by Vikrant Bhor, Pankaj Morajkar, Maheshwar Gurav, Dishant Pandya, –Smart Garbage Management System, March 2015. Published by international journal of engineering Research and Technology in Smart Cities utilizing IoT proposed a technique as takes after. The level of refuse in the dustbins is distinguished with the assistance of ultrasonic sensors framework, and conveyed to the approved control room through GSM framework. Arduino microcontroller is utilized to interface the sensor framework with GSM framework.[2] The researchers suggests the method for garbage management which is as follows. The bin was interfaced with a system based on microcontroller which had IR wireless systems with a central system that showed the current status of the

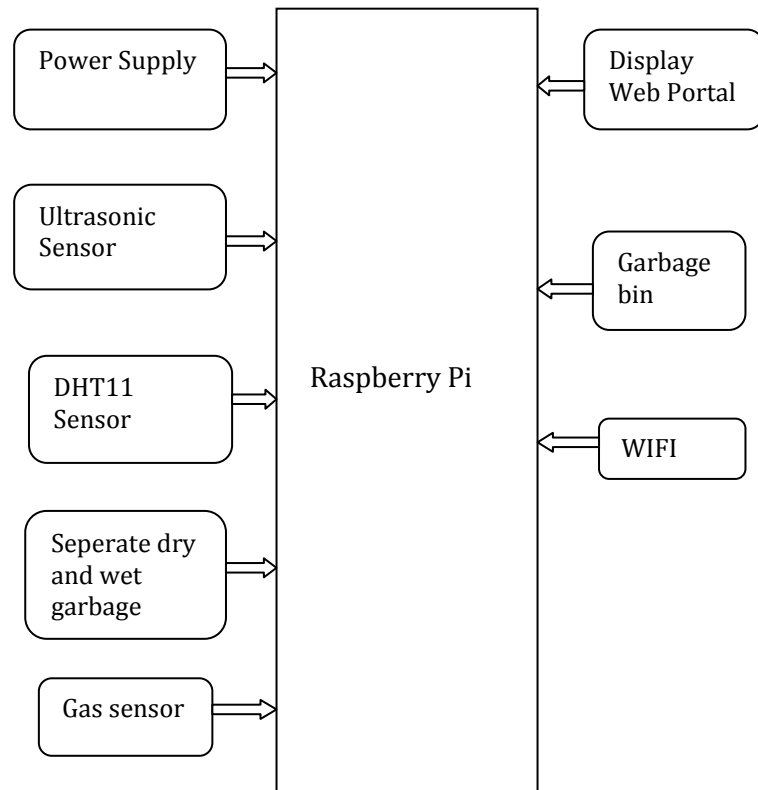
garbage in the bin. The status was seen on a mobile based web browser with a html page by using Wi-Fi. To reduce the cost, they only used weight based sensors and on the sender's side they only used a Wi-Fi module to send and receive the data. In the end the sensor could only detect the weight of waste present in the bin but not the level of waste.[3] One of the papers by Ghose, M.K., Dikshit, A.K., Sharma, S.K. –A GIS based transportation model for solid waste disposal – A case study on Asansol municipality published in the Journal of Waste Management. An upgraded steering and planning waste gathering model is proposed for the Eastern Finland, including the use of a guided variable neighbourhood thresholding metaheuristic. The truck driver doesn't sit around idly to wait, he/she goes to the following point and the course is powerfully described. It is joined with dynamic directing calculations to boost the effectiveness of waste gathering.

2.1 SYSTEM ARCHITECTURE:

[1]Ultrasonic Sensor: An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It is possible to calculate the distance between the sonar sensor and the object.

[2] Servo Motor: A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor.

[3] The DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). Its fairly simple to use, but requires careful timing to grab data.



2.2 ALGORITHM:

Start.

Detect the garbage level for dustbin.

If Garbage level is full then send the notification.

Else

Go to the first step.

Calculate the moisture and temperature inside the dustbin. If Temperature is high then get notification to firm alarm. Else Go to the fourth step.

Calculate the moisture. If Moisture is dry then plate rotate in left direction. Else Moisture is wait then plate rotate in right direction.

Find out the unhygienic gas.

Stop.

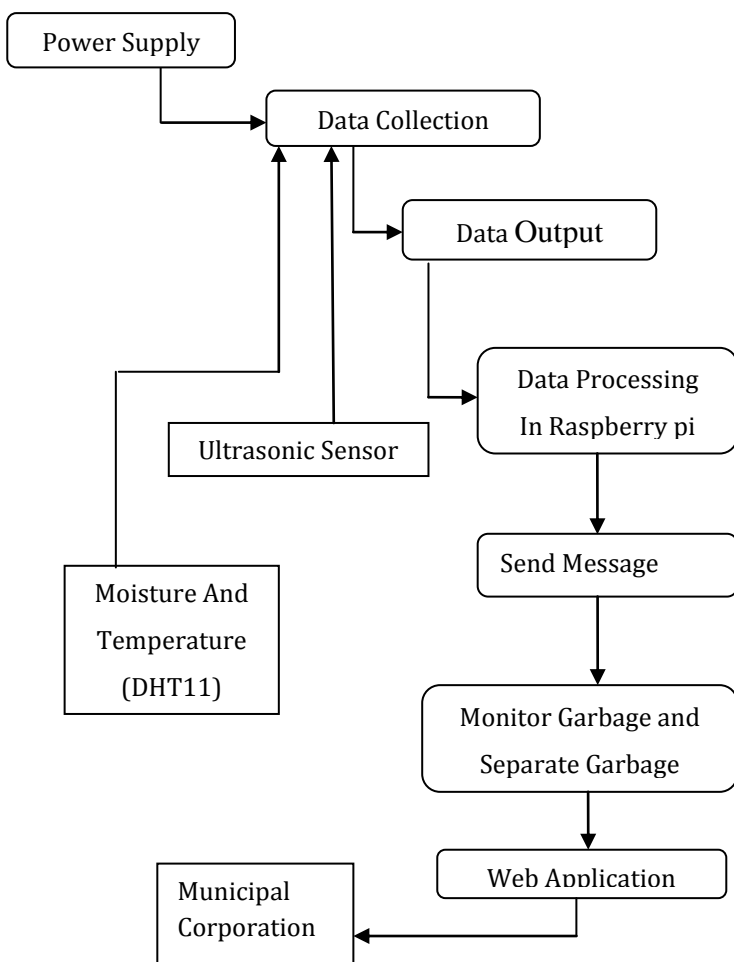
3. EXISTING WORK

In traditional method the Municiparty people check the dustbin manually in that system time and cost are very loss they not maintain the environmental cleanness.in existing system when sometime all the dustbin are overflow then it spread the unhuygenic gases and in environment some diseases are spread

4. PROPOSED WORK

We have proposed a IOT based garbage monitoring system. In that system we are detecting the level of that garbage dustbin. In that system if the garbage dustbin is full then its send the message using WIFI module for authorized person. In that system we are calculating the moisture and temperature inside the dustbin if the temperature is high then its gets the message to fire alarm. This system purpose that we are presenting the separation of wait and dry garbage. If garbage is wait then its go to wait dustbin then garbage is dry then its go to dry dustbin. Finally we are showing the graphical representation on whole garbage monitoring system

4.1. DETAILED DESCRIPTION



4.2. RESULT

```

Python 3.5.3 (default, Jan 19 2017, 14:11:04)
[GCC 6.3.0 20170124] on linux
Type "copyright", "credits" or "license()" for more
>>>
===== RESTART: /home/pi/ultra.py =====
Garbage Monitoring System
Calculating distance
Distance: 64839.7 cm
Dustbin is not full
Calculating distance
  
```

```

connected
Temperature: 29.0 C Humidity: 79.0 %
connected
Temperature: 29.0 C Humidity: 79.0 %
connected
Temperature: 29.0 C Humidity: 78.0 %
connected
Temperature: 29.0 C Humidity: 78.0 %
connected
Temperature: 29.0 C Humidity: 78.0 %
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connected
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connected
  
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5. CONCLUSION

In that project we are conclude the real time information on fill level of dustbin the deployment of dustbin based on the actual needs. In our project we are implementing the improves the environment quality, fewer smells, clean cities, efficient uses of dustbin and separating the dry and wet garbage.

5.1 Future Prospects:

This system is implemented with the help of Raspberry Pi, Ultrasonic sensor, Wi-Fi to collect and transfer the percentage of garbage in bin to the authorities. This helps to keep the city clean and helps in vision of Smart City. This works if the percentage of garbage in bin is greater than 75% then a notification will be sent to vehicle to clean the garbage bin. The percentage also can be seen by the authorities with the help of database and webpage developed. This can be extended by making the system global and all the garbage vehicles can know the status of the bin so that the nearest vehicle with the help of dynamic routing algorithm techniques can clean the bin fast to improve the efficiency of the system.

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[7] Videos: <http://nevonprojects.com/iot-garbage-...>
<https://nevonprojects.com/iot-garbage-monitoring-using-raspberry-pi/>