Garbage Managing Smart System using-IOT

Asha. R, Nirdosh Mahajan, Abhiraj Yadav, Balamurugan K.S

Abstract: The new time of Web and Internet of Things (IOT) worldview is being empowered by the usage of different gadgets like sensors, RFIDs, and actuators. Brilliant (gadgets having noteworthy computational capacities, changing them to 'smart things') are inserted in the earth to screen and gather encompassing information. In this modern restless world where people don't have proper time to eat and to sleep, they almost forget about how much proper garbage management is important for their healthy being. In this paper we have discussed about how Internet of Things can help us to solve a major problem of proper garbage management using various Wireless sensors. This paper guides about how these sensors and IOT can together be used to properly optimize the various challenges of proper Garbage Management and give the best of the results with efficiently evaluated distribution of the containers.

Keywords: Internet of Things (IOT), Ultrasonic sensor, Humidity sensor, Gas sensor, ESP-8266

I. INTRODUCTION

Since day by day people are moving towards internet and technology , even the people from villages are now moving towards technology and in coming few years most of the population of world will shift to urban lifestyle which will eventually increase the demand of internet and the various wireless sensors will be related to it , which is eventually going to help in the building of Internet Of Things paradigm .When the wireless sensors start building their place in the society then that helps to grow the city infrastructural outlook and the city is also considered to be a smart city. A smart city can be defined as an urban area that uses different kinds of Internet of Things sensors to intervene data and then utilize this data to manage resources and assets efficiently and effectively. This definition mainly focuses on how smart cities can actually contribute in redefining the ways to control pollution and help the residents of the city to live with peace and hygiene along with latest access to different technological components which might actually help people to keep pace with the growing world. The wireless sensors used in smart cities can basically help in different aspects of daily life as well,

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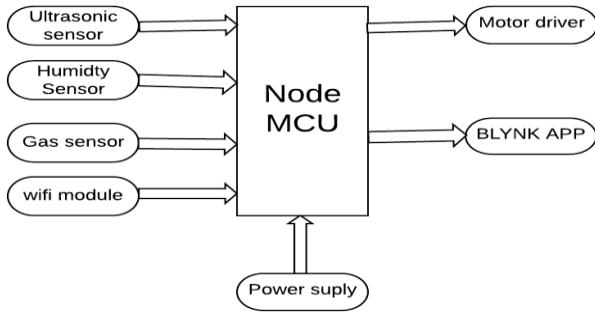
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Proper Garbage management is one of the most important aspects of our daily life. As Proper garbage management impacts on the quality of life the citizen has. The truth behind this fact is that waste disposal is a leading factor in any person's well-

being, to live a healthy life proper waste disposal is important. In this paper, we take benefit of our study of the garbage management problem in the city Chennai of India. In Chennai on an average 0.71 kg per capita waste is generated per day which is highest in the country and due to

lack of proper garbage disposal system much of the waste is left untreated which is a great threat to the well-being of the citizen. As a Smart city, garbage management is an intimidating challenge for the public. In this paper, we have designed a model for the real time monitoring and management of the garbage in the city. This model proposes, the way of managing garbage levels and its treatment inside the garbage bin itself with the help of combination of sensors and node MCU microcontroller. The data generated will be sent to the control unit, which will help in the real time monitoring.

II. EXISTING SYSTEM

The existing system assures the collection of garbage soon when the garbage level reaches its maximum level. The system will thus provide accurate reports, increasing the efficiency of the system. The real time monitoring of the garbage level with the help of sensors and wireless communication will reduce the number of trips required by the garbage collection vehicle and thus will reduce the total expenditure associated with the Garbage bin. This system consists of an single ultrasonic sensor to collect information on the level of garbage.

III. PROPOSED SYSTEM

The proposed system is an subtle yet an major improvement over the existing system mentioned above. This system adds few more sensors that provides much more information about garbage present in garbage bins like the humidity content of the garbage. This system also provides information about the gases produced by these garbage over time and their level of toxicity. Using these information garbage collection schedule to reduce the risk any disease spreading. This proposed also mentions about an improved wifi module which uses lower power and has better communication capabilities.

IV. BLOCK DIAGRAM


V. COMPONENTS AND SPECIFICATIONS

The main components used in our system are:

A. **Node MCU**: Node MCU is generally a device which work mainly on IOT platform. The data traffic between the sensors and the firebase is managed by Node MCU. Node MCU is a microcontroller Unit which is based on the 12E version of the Esp-8266.

B. **Ultrasonic Sensor**: These sensors are used in measuring the distance up to next obstacle. Thus we can use them in order to check the level of the dustbin.

C. **Humidity sensor**: This sensor is used to distinguish between dry and wet waste. This sensor will detect the humidity of the garbage and produce an output. Based on this output the waste can be easily differentiated. We will use DHT11 humidity sensor which will update the data every 2-5 seconds.

D. **Gas sensor**: The gas sensors will be used to detect the gases produced by the garbage. These sensors can detect carbon monoxide, methane, hydrogen sulfide etc. which will easily detect the toxicity of the garbage.

E. **ESP 8266 – 01**: It is a low powered microcontroller developed by Espressif System. It helps in making low power communication devices such as the Bluetooth and Wi-Fi chipsets. It requires a 3.3 v input and draws low current which can work for a long time at a stretch.

F. **Motor driver**: Motor driver is used to move or rotate which will separate the wet garbage from the dry garbage after it is sensed by the humidity sensor.L293D is a dual H-Bridge motor driver, which will help in rotating in either way.

G. **Arduino IDE**: Arduino IDE is an open source Arduino software used to code Node MCU and upload it on board. It works in all Windows, Mac OS and LINUX.

H. **BLYNK App**: It is an android app that allows communication which allows its communication with Wi-Fi compatible micro-controllers.

I. **Jumper wires**: These are tiny wires which connect different micro-controllers and sensors together.

VI. FLOW DIAGRAM
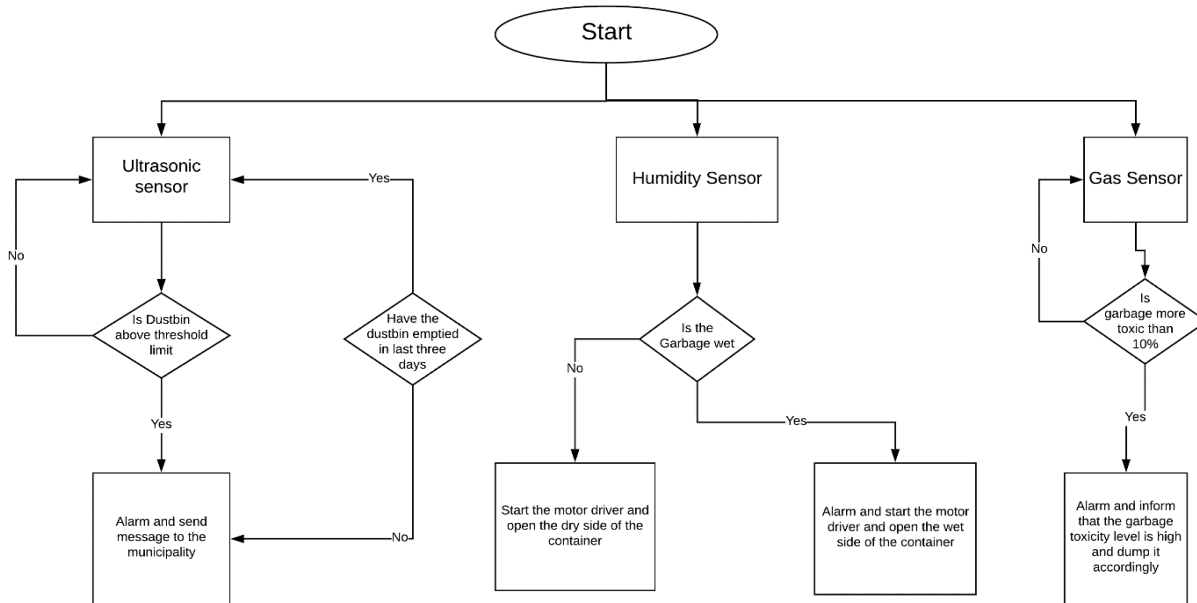
VII. WORKING

In our proposed model of Garbage Management various sensors play the major role in the implementation of the whole model. In this model we will be using Node MCU as our microcontroller because as compared to Arduino, Node MCU can store large out of data, along with the microcontroller other wireless sensors are also major factors for the whole implementation of the model to take place.

We will be making use of a very cheap but effective object distance measuring sensor named as Ultrasonic sensor which will help to find the level of garbage in the garbage bin. The ultrasonic sensor will be connected to the microcontroller which will send the data directly to the control unit from which the level of garbage can be monitored directly. The other important sensor is Humidity sensor which will identify whether the garbage is wet or dry waste, and start the gear motor and open the container and put that in the one. Other than this our system also identifies the toxicity of the waste which is very beneficial in reducing the spread of diseases caused by the toxic and waste as the microcontroller will intimate the municipality to treat the waste as its earliest and in the best suitable way which will reduce the generation of foul smell and also reduce the growth of unwanted disease causing insects and smell. This will be done by using Gas sensor. The point of using this model is that it will help in the real time monitoring of waste cans and also help in maintaining hygiene of the surrounding place. The microcontroller will be coded in such a manner that it will send the message for the collection of garbage on every third day if the garbage does not cross the threshold mark. If the garbage crosses threshold mark before third day then the garbage should also be collected immediately. If any of the provided conditions are satisfied a text will automatically sent to the municipality. This system is economic and very much nature friendly and the most important factor is that it offers real time monitoring.

A. Sensing module:

In this system, there are a number sensors which are used to provide different vital information about the garbage. Firstly we have the ultrasonic sensor, which is used to monitor the level of garbage actively. And next up we have the gas sensor, which is used identify the level of toxicity of the gases produced by the stored garbage. There is an third sensor called DHT11 sensor, which is capable of identifying the moisture content of the garbage.

B. Data traffic and transfer module:

This module mainly consists of single micro controller unit called the node MCU. It is an device based on the 12E version of ESP-8266 micro controller which is used to oversee the incoming data traffic from the suite of sensors present and pass it on the wifi chip. The communication is carried between the garbage bin and user's BLYNK app using the above mentioned wifi chip.

C. BLYNK module:

This module works in the background of this active garbage management system to constantly update the user about garbage collected. BLYNK app actively provides with latest information about the garbage bins to the user. This runs using the predefined principles set by the developer. It contains presets according to which the LED's glow to alert the user in time.

VIII. ARCHITECTURE DIAGRAM
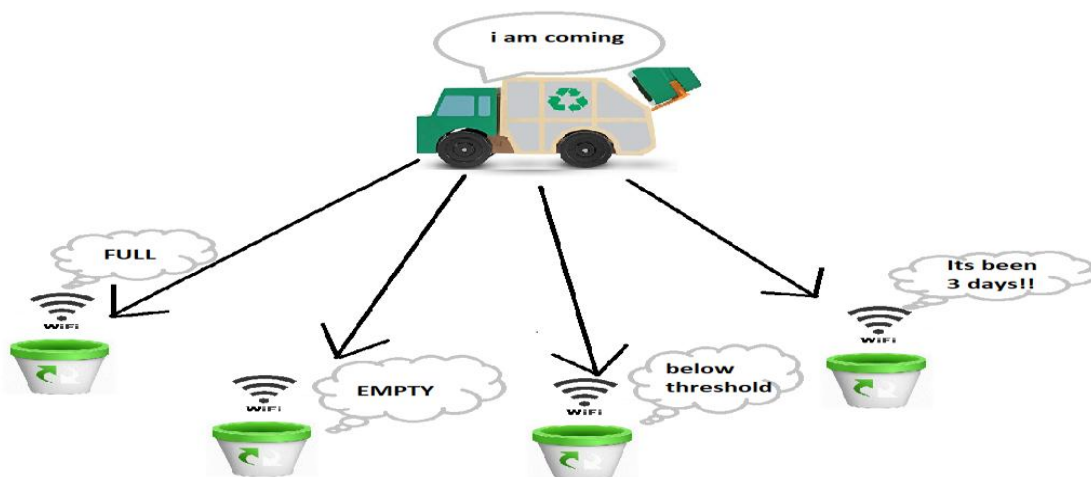
IX. RESULT AND DISCUSSION

Garbage managing smart system using IOT is successfully explained and implemented. This model creates awareness about how hygiene of our surrounding garbage cans is important. It also helps in segregating dry and wet waste & also helps in checking the toxicity level of the waste further simplifying the municipality work of collecting garbage from the particular cans. Since we know that every work that is done today can have a modifying future tomorrow. Our proposed system can be improved by segregating flammable and non-flammable waste. It can also be improvised by decreasing the toxicity of the garbage within the system.

REFERENCES

1. Prof. S.A. Mahajan, Akshay Kokane, Apoorva Shewale, Mrunaya Shinde, Shivani
2. Ingale, Department of Information Technology, PVG's COET, Pune, India. "Smart Waste Management System using IoT". International Journal of Advanced Engineering Research and Science (IJAERS) [Vol-4, Issue-4, Apr- 2017]

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3. Zainal Hisham Che Soh, Mohamad Azeer Al-Hami Husa, Syahrul Afzal Che Abdullah. 1Faculty of Electrical Engineering,

4. Universiti Teknologi MARA Cawangan Pulau Pinang" Smart Waste Collection Monitoring and Alert" System via IoT

5. Saranya.L, Rajeshwari.P, Priyadharshini.M, Praveen Kumar.S.S, Pradeep.G. Department of Electronics and Communication," International Journal of Pure and Applied Mathematics", (Volume 118 No. 20 2018, 597-601).

6. Dr Naveen B*, Kavya G K, Kruthika S N, Ranjitha K N, Sahana C N. Dept of ECE, BGSIT, Mandya "AUTOMATED WASTE SEGREGATOR USING ARDUINO". International Journal of Advance Engineering and Research Development, (Volume 5, Issue 05, May -2018)

7. T. Siddharthan, S. M. Kasiraj. Department of Control &Instrumentation, Valliammai Engineering College "Detection of Toxic Gases using Arduino and GSM Network". International Journal of Engineering Research & Technology (IJERT). Special Issue – 2016.

8. Ms. Rupa1, Ms. Rajni Kumari, Ms. Nisha Bhagchandani, Mr. Ashish Mathur. Dept. of ECE, JIET COE -Jodhpur, Rajasthan, INDIA. "Smart Garbage Management System Using Internet of Things (IOT) For Urban Areas" IOSR Journal of Engineering (IOSRJEN)", (Vol. 08, Issue 5 (May. 2018).

9. Siddharth Wadhwani, Uday Singh, Prakarsh, Shraddha Dwivedi. IMS Engineering College, Ghaziabad, UP, INDIA." Smart Home Automation and Security System using Arduino and IOT". International Research Journal of Engineering and Technology (IRJET), (Volume: 05 Issue: 02 | Feb-2018).

10. Sudharani Ashok Ghadage, Dr. Mrs. Neeta Anilkumar Doshi, "IoT Based Garbage Management (Monitor and Acknowledgment)" Proceedings of the International Conference on Intelligent Sustainable Systems (ICISS 2017).

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