

A Review Iot Based Garbage Monitoring System To Support Swachh Bharat Abhiyan

Mr. Krushna A. Choudhari¹, Mr. Nikhil M. Kolte², Ms. Tanuja D. Naphade³, Ms. Ashwini J. Waghode⁴, Prof. B. B. Thakare⁵

^{1,2,3,4}Student, Computer Science And Engineering, Padm. Dr.V.B.Kolte College Of Engineering, Malkapur, Maharashtra, India

⁵Asst.Prof, Computer Science And Engineering, Padm. Dr.V.B.Kolte College Of Engineering, Malkapur, Maharashtra, India

ABSTRACT

Rapid increase in population, has led to improper waste management in metropolitan cities resulting in increased pests and spreading of diseases. A Waste is defined as any material that is not useful and represents no economic value to its owner, the waste generator. Depending on the physical state of waste, they are categorized as solid, liquid and gaseous. Improper waste management and disposal causes serious impact on health, leading to the spread of infectious diseases and problems to the surrounding environment. Organic domestic wastes pose a serious threat, since they ferment, creating favorable conditions for the survival and growth of microbial pathogens. Exposure to hazardous waste affects human health, children being more vulnerable to these pollutants. Uncollected solid waste obstructs storm water runoff, resulting in the formation of stagnant water bodies that becomes breeding grounds of diseases. Waste dumped near a water source causes contamination of the water body and the ground water source. Direct dumping of untreated waste in rivers, seas and lakes results in the accumulation of toxic substances in the food chain through the plants and animals. Waste treatment and disposal sites create health hazards for the neighborhood causing air pollution and attracting all types of insects and rodents that spread disease.

This project IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. Then that person can send the collection vehicle to collect the full garbage bins or dustbins. If garbage does not collect within the two hours then again message to be send to the municipal/government authority via web page. Gas sensor is also used to sense the gas and again message will be display to the municipal authority. E.g. suppose people through lead acid battery in the dustbin and if battery will destroy then some gas will be leak. So gas sensor will sense these gases and display message to the municipal authority via web page. Fire sensor will also used in this system. If there is fire in the garbage, then fire will sense by the fire sensor, and again message will send to municipal. Thus this system helps to keep the city clean.

Keywords:-Android Application, Dustbin, Microcontroller Board, IOT, Garbage sensors, Gas Sensor, Temperature Sensor.

1. INTRODUCTION

This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a mobile application. For this the system uses garbage sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of Arduino family microcontroller, Wi-Fi modem for sending data and a buzzer. The system is powered by a 12V transformer. The mobile application is used to display the status of the level of garbage collected in the bins. Where as a web page is built to show the status to the user monitoring it. The application gives a graphical view of the garbage bins and highlights the garbage collected in colour in order to show the level of garbage collected. The application shows the status of the

garbage level. The system puts on the buzzer when the level of dustbin garbage collected crosses the set limit. Thus this system helps to keep the city clean by informing about the garbage levels of the bins by providing graphical image of the bins via a mobile application.

Garbage may consists of the unwanted material left over from City, Public area, Society, College, home etc. This project is related to the “Smart City” and based on “Internet of Things” (IOT). So for smart lifestyle, cleanliness is needed, and cleanliness is begins with Garbage Bin. This project will helps to eradicate or minimize the garbage disposal problem. The Internet of Things (IoT) is a recent communication paradigm that envisions near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet . This project IOT Garbage Monitoring system is a very innovative system which will help to keep the cities clean.

2. LITERATURE SURVEY

A State of the Art review on Internet of Things by P. Suresh, Vijay. Daniel, R.H. Aswathy, Dr. V. Parthasarathy. It gave the idea of IoT subject and addition details about IoT. The proper smart environment and various applications [1].

Internet of Things: Challenges and state-of-the-art solutions in Internet-scale Sensor Information Management and Mobile analytics by Arkady Zaslavsky, Dimitrios Georgakopoulos. This paper gave us the details about mobile analysis and sensor information management that will help in data segregation of various dustbins[2].

The waste management is built around several element. Waste item, domestic bin, trash bags, collective containers and collecting vehicles. The waste flow start from the waste item and the domestic bin to end in the collecting vehicles. Use the waste identification for sorting process. Base on RFID technology new trash bag is added in a collective container. The technology use Radio Frequency Identification (RFID), Smart vehicular and Trash Bag. They only identify RFID tags garbage bins, Low data speed, high cost. The zig bee and GSM system would be able to monitor the solid waste collection process. This technique overcome some disadvantages which are use of minimum route, low cost, fuel use, clean environment [3].

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 [4].

3. PROPOSED SYSTEM

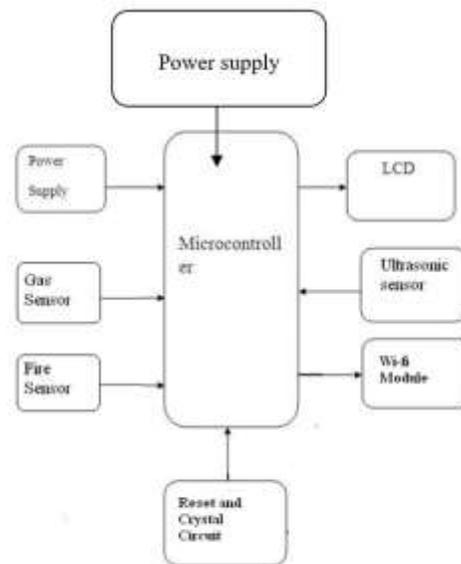


Figure 1. Block Diagram

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.

3.1 Microcontroller :

Atmega 328

The ATmega48P/88P/168P/328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega48P/88P/168P/328P achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

3.2 Ultrasonic Sensor:

This sensor is a distance measuring sensor and provides information of absolute level of garbage inside the bin. It is transmit ultrasonic waves from transmitter and detects reflected waves from an object by receiver.

3.3 Wi-Fi Module:

802.11b/g/n protocol, Wi-Fi Direct (P2P), soft-AP, Integrated TCP/IP protocol stack. Wi-Fi Module helps us to send the details of the dustbin at the receiver side.

3.4 Gas Sensor:

A gas sensor to detect harmful gases, a temperature and humidity sensor, and a sound sensor for noise pollution monitoring. All the sensors are managed by a microcontroller with a LoRa coupled communications module that is used to transmit the information obtained from the smart bin.

4. CONCLUSION

IOT based garbage monitoring system is a very innovative system which will help to keep the cities clean. It can automatically monitor the garbage level & send the information to User. 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.

5. REFERENCES

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