TEST Engineering & Management

July – August 2020
ISSN: 0193-4120 Page No. 654 - 657

Intelligently Regulatory IOT Bin

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Article Info
Volume 83
Page Number: 654 - 657
Publication Issue:
July - August 2020

Article History
Article Received*: 06 June 2020*
Revised*: 29 June 2020*
Accepted*: 14 July 2020*
Publication*: 25 July 2020*

Abstract

The world is facing a very tremendous problem of waste nowadays. As the countries are becoming more advanced, improper waste management rate is increasing per day which is a serious concern leading to growth of many insects and diseases. This paper discloses the automated bins which is based on IoT Technology which will help in providing a clean environment more efficiently. This paper works on the solar energy so that no electricity been used and is saved. The bin opens automatically whenever the person needs to put the garbage into it. The transportation vehicle used to move in every corner causing lots of fuel consumption and waste of fuel and money The bin regulated and monitors the status of the bin. The bin is designed through ATMEGA2560 which is the lifeline for the system. The alert message is sent through GSM to the authority in charge for the security of the bin. The status is been visible on ThingSpeak server and the hybrid mobile Application.

Keywords: *ATMEGA2560, GSM, Hybrid Mobile Application, IoT Technology, ThingSpeak.*

I. INTRODUCTION

Improper Waste Management is the major problem for today's life. It can be said that it is the root cause for the diseases spread from waste like problems on breathing, Typhoid, Malaria etc all air borne diseases are spread through the pollution. Waste pollution plays a very big role in this. It is not only harmful for person's life but also very harmful for animal lives too. Animals in search of prey, eats from waste, there are many toxic chemicals or toxic substances thrown into the dustbin like sharp tools, knives, blades etc. These animal consume the food from waste and it may happen that they can swallow plastic too which is a toxic substance for a living being. Several rules have been made to throw the garbage into the particular field but still there is still lack of discipline among us. Under Swachh Bharat Abhiyaan was started in India to make the India clean and green which somehow worked and can be said that the waste has been managed, but up to some extent it is been unable to clear all the waste pollution and remove the problem of improper waste management.

II. EXISTING SYSTEM

There are the existing system still prevailing that is the traditional methods still being used today that people used to throw the garbage into the bins or in open, so that the bin gets overflown resulting of scattering and littering of waste all around the bin. It creates a lot of pollution and a bad impact on living ones' health. The transportation vehicle used to move in every corner in order to get the garbage which cause lots of fuel consumption and waste of fuel and money.

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TEST Engineering & Management

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Also, the cleaning person's hands get damaged due to rag picking from naked hands and it may grants invitation to several diseases to the poor hands. As this is the inappropriate method to follow, so in order to get advanced and get better clean environment such kind of systems could help to ease with the surroundings.

Fig 1: Overflowing of Bin scattering the waste and littering

One of the system which is newly developed by Surat is the underground bins which is situated in Surat which shows real time information and sends alert. Also there are the bins developed by Sails India Pvt Ltd in North Delhi which are also underground.

Fig 2: Underground dustbins by Surat

III. PROPOSED SYSTEM

The proposed system is the intelligently regulatory bin proposed on IoT Technology. The Bin is operating on solar energy in terms of saving the electricity. It opens automatically whenever a person comes in front of bin, the garbage is been thrown into bin and when he leaves the bin closes automatically. Now the status is shown by the bin through LED's embed on it whether it is full, empty or medium. The motion sensors are embed in the system with Arduino Mega based on ATMEGA2560 responsible for opening and closing of bin.

When the bin gets full the alert message will be sent to the incharge through GSM to empty the bin immediately. The bin also regulates the environmental quality around the bin, it shows temperature and humidity and information about pollution gases around it. If any hazardous substance like cigarettes thrown into bin which can even burn other waste then immediately the fire LED will glow and the alert message will be sent to the incharge that fire is detected, please take some action. The location of bin is monitored through GPS and will be sent in the form of SMS to the incharge.

The ThingSpeak server shows the status of the bin and a hybrid application is made such that the data updating can also be seen in application.

IV. BLOCK DIAGRAM

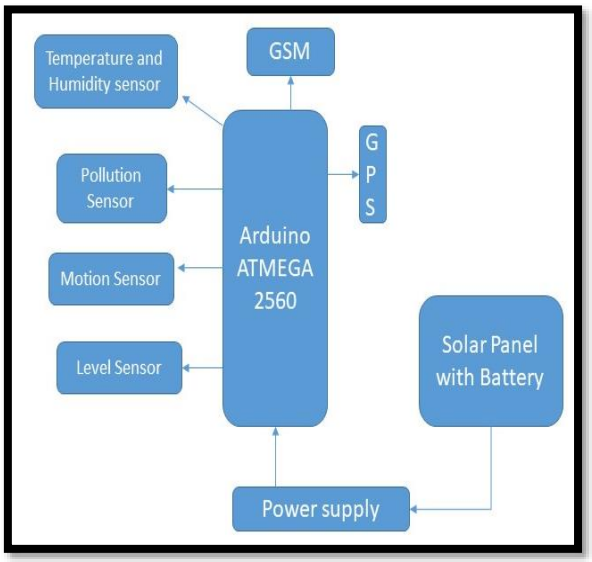

Fig 3: Block diagram for bin

V. HARDWARE DETAILS

Arduino Mega – Arduino Mega 2560 is based on the ATMEGA2560 chip. It has total 54 pins. In our system, some of the sensors are being connected with it and working through its command. It acts as the heart and brain of the system, where it gives the commands to sensors when to function.

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Fig 4: Arduino compatible ATMEGA2560

Temperature and Humidity sensor - A humidity sensor and temperature sensor is used for monitoring the temperature and humidity (moisture) across its range. The range for this sensor is 0-50℃.

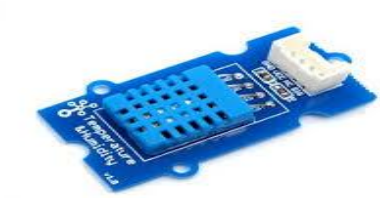

Fig 5: Temperature and Humidity Sensor

Motion Sensor - The motion sensor here used is to check the range of the person so that the bin could open and closes automatically.

VI. HARDWARE RESULT

Fig 6: Dustbin level on server

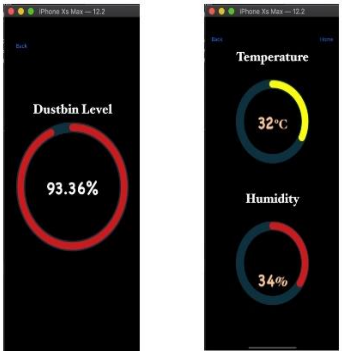

Fig 7: Status of bin on application

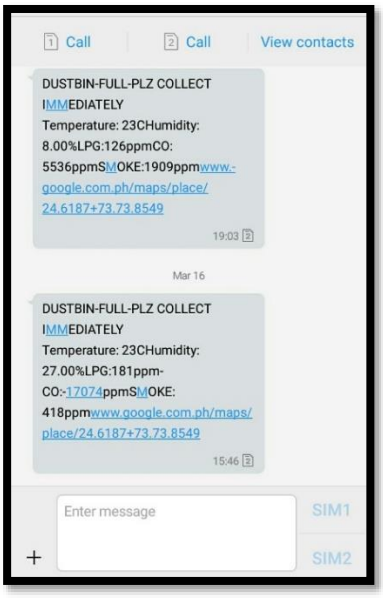

Fig 8: Figure showing alert message received when full

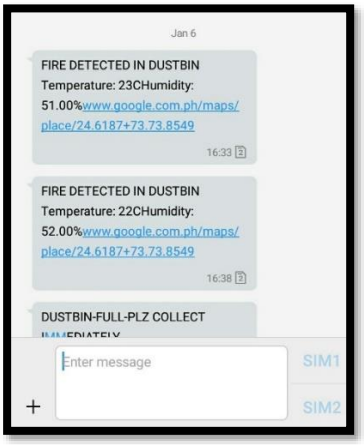

Fig 9: Message received when fire like substance found

VII. CONCLUSION

So, to eliminate and reduce the problems of improper waste management, the automated bin is required to eliminate the problem of opening the dustbin with hand, the bin is doing its functioning by opening and closing automatically, sending alerts, showing status.

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