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GSM based Garbage Monitoring System

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Abstract: ***This project was designed to develop GSM Based Garbage Monitoring System. In this project, a smart garbage management system is proposed. This system monitors the garbage overflow in garbage bin. In this project, with the help of sensor systems the level of garbage in the dustbin is detected, and communicated same to the authorized person through GSM system. Infrared sensor (IR sensor) is used to detect the level of garbage. Microcontroller is used to interface the sensor system with the GSM system. In case of any fire incidents in the garbage bin then the fire alert message is sent to the control station via GSM.***

Keywords: Microcontroller, GSM Module, LCD Display, MAX 232, IR Sensor, Fire Sensor

I. INTRODUCTION

Though the world is in a stage of upgradation, there is yet another problem that has to be dealt with. Garbage! Pictures of garbage bins being overfull and the garbage being spilled out from the bins can be seen all around. As more number of insects and mosquitoes breed on it then it leads to many diseases spread out from the bins can be seen all around . A big challenge in the urban cities is solid waste management. Hence, smart dustbin is a system which can eradicate this problem or at least reduce it to the low level. Our present Prime Minister of India, Shri Narendra Modiji has introduced the concept of built 100 smart cities in India "Swaccha Bharat Abhiyan" was initiated to ensure a clean environment. Polluted environment is developed by majority of viruses and bacterial infections. Safeguarding the environment using technology sources is needed at present**.**

II. LITERATURE SURVEY

GSM BASED GARBAGE AND WASTE COLLECTION BINOVERFLOWINDICATOR: Vol-3 Issue-2 2017IJARIIE-ISSN S (O)-2395-4396
In this paper, a smart garbage management system is proposed. This system monitors the garbage overflow in garbage bin. In this project, the level of garbage in the dustbin is detected with the help of sensor systems, and communicated to the authorized person through GSM system. Infrared sensor (IR sensor) is used to detect the level of garbage. Microcontroller is used to interface the sensor system with the GSM system. An RFID is used to monitor the desired information related to the garbage for different selected locations. It also monitors the attendance of the authority person .With the use of conveyor belt and PH sensor the degradable and Non-degradable waste can be separated. Thus the collection andseparation of garbage is monitored efficiently. After a dedicated survey keen observation it was found that the developing eastern countries are lagging behind in context of cleanliness hygiene as compared to the development countries. Deadly Swine Flu is an ongoing example. The death rate is much higher due to unhygienic conditions. In order to cope up with the situation, Shree Narendra Modi, Prime Minister of India has presented a unique example of a way to achieve cleanliness by launching a campaign popularly known as SWACHHA BHARAT ABHIYAN (Clean India Mission) in which every individual irrespective post and authority, has to maintain clean surrounding. But it is almost impossible to do so in the contemporary busy world. And here comes the miracle of science and technology

III. BLOCK DIAGRAM

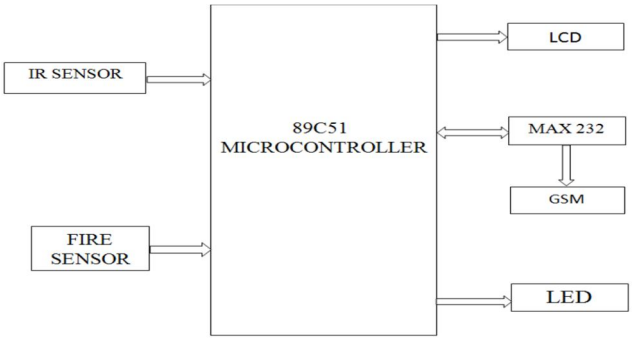


Fig.1. Block Diagram.

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A. Microcontroller

The AT89c51 microcontroller is used as central processing unit of our project. Microcontroller is a single chip that contents the Processor, ROM, EPROM, EEPROM, RAM, clock and I/O ports. ATMEGA16A is a8 bit microcontroller with 16kbytes.

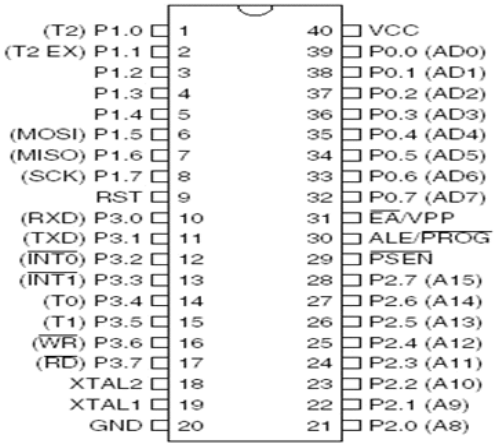


Fig. 2. Pin Diagram.

B. LCD Display

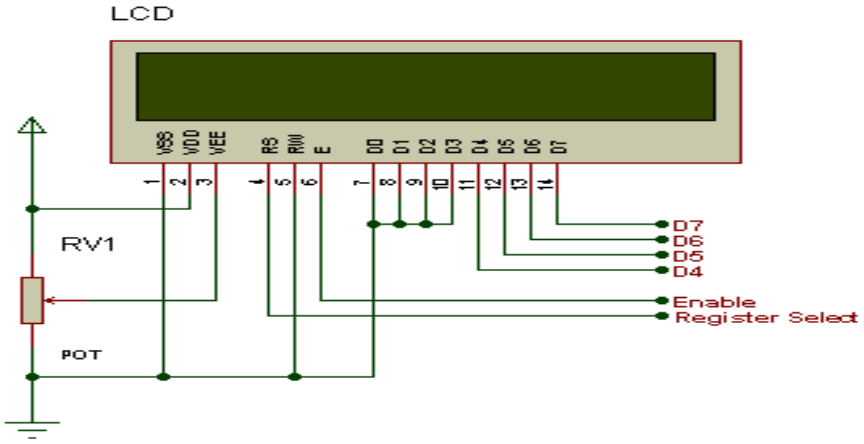


Fig. 3. LCD Display.

1) LCDs mostly connected to the microcontrollers are 16x2 and 20x2 displays.
2) That means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.
3) LCD having 16 pins for interfacing & signalling & VCCS & GNDS.
4) There are three control lines are EN, RS, and RW etc.
5) EN=Enable (It used for tell the LCD to sending data)
6) RS=Register Select (When RS is High (1),then data being sent is text data)
(When RS is Low (0), then data is treated as a command)
7) R/W=Read/Write (When RW is low (0),then the data Read the data)
(When RW is High (1), then the data write the data)

C. GSM Module

When the garbage reaches the full level the led will be on. Once the garbage is full it will automatically send to the authorized person detect that garbage is overloaded via GSM. The authority person holds RFID card and clean the garbage. Once the garbage is cleaned it will send a message to the control station detect that garbage had cleared. In case of any fire accidents in the garbage bin then the fire alert message is sent to the control station through the GSM.

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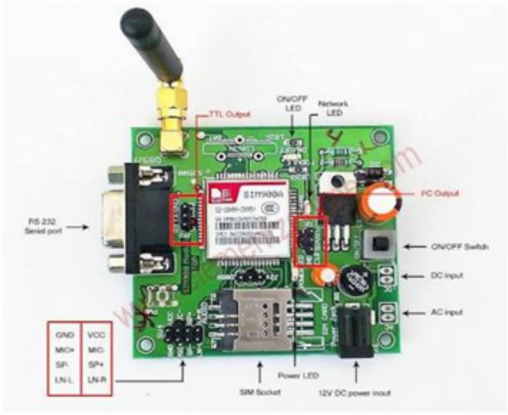


Fig. 4 GSM Module

D. IR Sensor

The IR sensor indicate the level of the garbage to check the overflow condition of the garbage.It emits the light, which is invisible to naked eyes but the electronic components can be detect it. The IR Sensor is a general purpose proximity sensor. IR sensor is used for collision indication. The module consists of the IR emitter and IR receiver pair. The high precision IR receiver always indicate the IR signal].



Fig. 5 IR Sensor

E. Fire Sensor

The LCD display is used to display the overflow of garbage in the bin .If the level of IR sensor reaches the threshold level the garbage full message will be sent to the authorized person via GSM



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Fig. 6 Fire Sensor

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F. Power Supply

When working with electronics, you always need one basic thing: Power. power supply is required for every electronic circuit. The perfect working of each and every component, the exact amount of voltage and current to be supplied to it. If the power exceeds its limit, it can be fatal.Below is the basic block diagram of power supply which gives output of 5V, as only that much is required for microcontroller. In this power supply section is required to convert AC signal to DC signal and also to reduce the amplitude of the signal. The available voltage signal from the mains is 230V/50Hz which is an AC voltage, but the required is DC voltage (no frequency) with the amplitude of +3.3V, +5V for various applications. In this section we have Transformer, Bridge rectifier, are connected serially and voltage regulators for +5V ,+3.3V are 7805 . We need a +3.3V DC supply as the operating voltage for the microcontroller unit

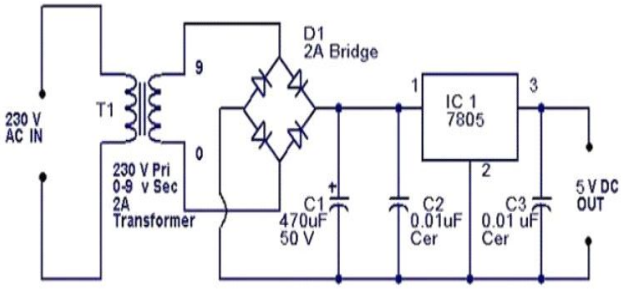


Fig. 7. Power supply

G. Flow Chart

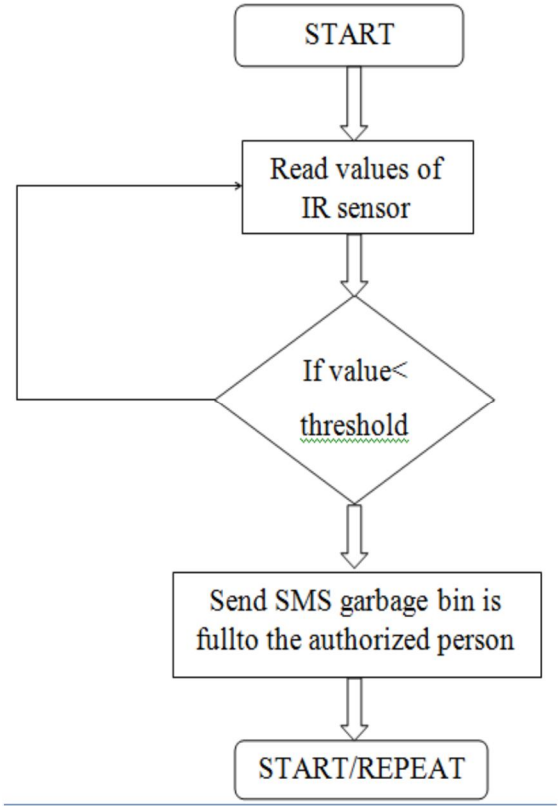


Fig. 7.Flow chart of IR Sensor

Algorithm

Step1.Start
Step2.Collect information from _re sensor
Step3.If _re alert is ON then send SMS to the authorized person else
start or repeat process.

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H. Flow chart

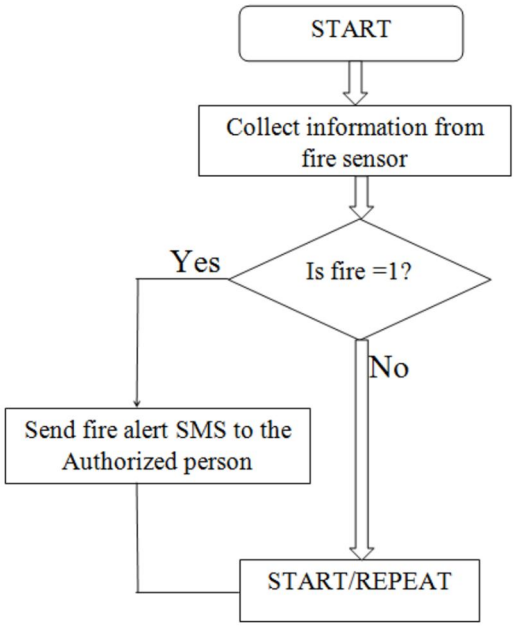


Fig. 8.Flow chart of fire sensor

Algorithm

Step 1.Start
Step2.Collect information from _re sensor
Step3.If _re alert is ON then send SMS to the authorized person else
start or repeat process.

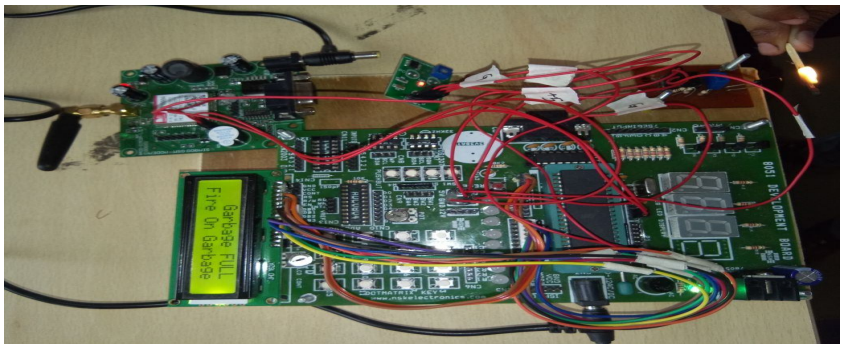
I. Advantages

1) Monitors the garbage bins and informs about the level of garbage collected in the garbage bins.
2) To keep our Environment clean green.
3) The cost effort are less in this system.

J. Applications

1) This project can also be used in the SMART CITY. This project is also helpful in the government project of SWACHH BHARAT ABHIYAN.
2) E-Governance based on Digital India.
3) Reduce environmental pollution.
4) Real time based cleaning our cities.

K. Experimental Setup



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L. Result

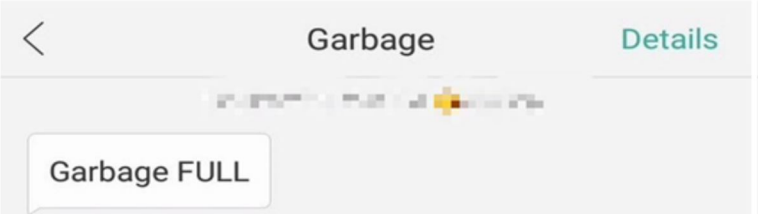


Fig..9. Garbage FULL message

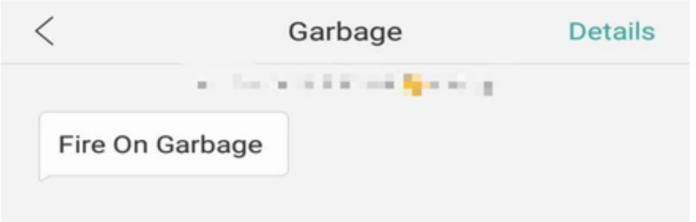


Fig.10. Fire On Garbage message

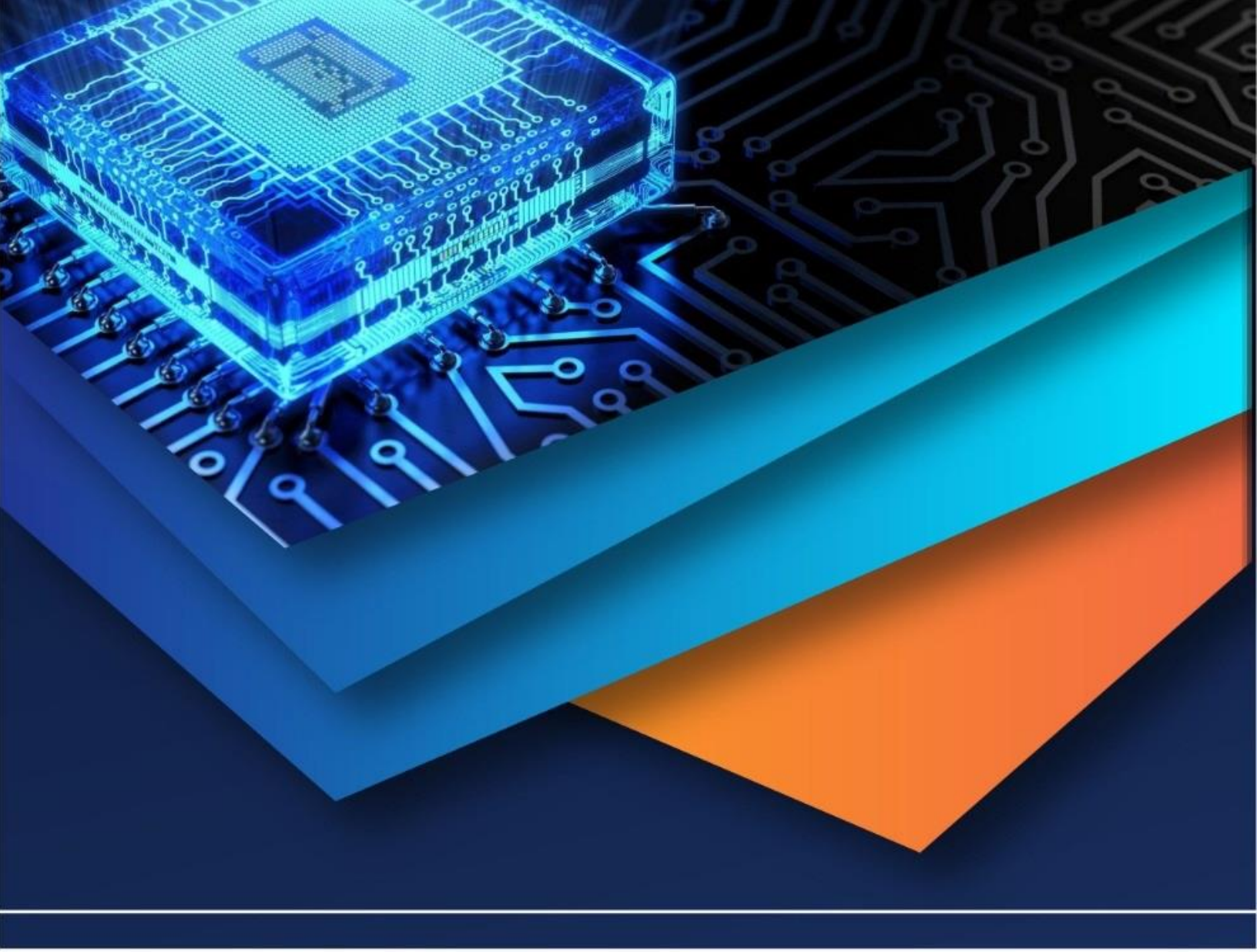
IV. CONCLUSION

In this, system the garbage can be cleared and the overflow of garbage can be managed efficiently.. This system can also avoid _re accidents in the garbage cans with the help of fire sensor. This will intimate or send SMS to the authorized person through GSM. The garbage managing system and the facility of collecting the garbage presently doesn't it to the current requirement. Hence better facility of collection of garbage and transportation should be provided. Since, this system provides the information when the bin gets completely filled with garbage, it reduces the number of times the arrival of vehicle which collects the garbage. This method finally helps in keeping the environment clean. Thus, the garbage collection We can add GPS modem to this project this will help to track the position in case there are more dustbins. There is a great scopefor the modification of the Garbage monitoring system in future. The system can be improved by adding new functionalities like line follower robot to it, when the bin is full directly it is dumping on tipper. In this, system the garbage can be cleared and the overflow of garbage can be managed efficiently.. This system can also avoid _re accidents in the garbage cans with the help of fire sensor. This will intimate or send SMS to the authorized person through GSM. The garbage managing system and the facility of collecting the garbage presently doesn't to the current requirement. Hence better facility of collection of garbage and transportation should be provided. Since, this system provides the information when the bin gets completely filled with garbage, it reduces the number of times the arrival of vehicle which collects the garbage. This method finally helps in keeping the environment clean. Thus, the garbage collection We can add GPS modem to this project this will help to track the position in case there are more dustbins. There is a great scope for the modification of the Garbage monitoring system in future. The system can be improved by adding new functionalities like line follower robot to it, when the bin is full directly it is dumping on tipper.

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