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IOT Based Garbage Management System

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Abstract: ***Nowadays we can see that most of the garbage's across the roadside are overloaded because the wastes are not collected periodically by authorities. It creates Unhealthy Environment for living Human Beings and distributes bad smell around the surrounding atmosphere. This action going to lead environmentally deadly diseases & people's Health Problems. To overcome this problem I am going to introduce a Simplified project called "IOT based Garbage Management System". In our project I am going to use an ARM7 Microcontroller i.e., LPC-2148, ULTRASONIC (HC-SR04) Sensor, GSM (SIM900) and GPS. Using GSM and GPS Wastages and Garbage collection dustbins maximum overflow indicators Short description: ULTRASONIC sensor will be placed UPPER the garbage bin or dustbin. Whenever SENSOR reaches to the threshold value, a SMS will be sent to the respective Municipal or Government authority person immediately. Then that person can send the collection vehicle to collect the full garbage. The vision of our project is to make the surroundings clean in smart way.***
Keywords: ARM7 (LPC2148) Microcontroller, Ultrasonic Sensor (HC-SR04), GSM Modules, 2X16 LCD.

I. INTRODUCTION

This Project going to led the development of a sensational gizmo, Internet Of Things (IoT). The IOT allows object to sense using sensors and control remotely using controllers. The technology can be simply viewed as an interaction between Humans-Machines. All the Components We Have Been uses in our daily life can be easily controlled and monitored using the IoT.

An embedded system is a special- purpose system in which the computer is completely encapsulated by or dedicated to the device or system it controls. Unlike a general-purpose computer, such as a personal computer, an embedded system performs one or a few pre-defined tasks, usually with very specific requirements.

Since the system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product. Embedded systems are often mass- produced, benefiting from economies of scale. A majority of process in the project is done with the help of sensors in IoT. Sensors are deployed at the top of bins and these sensors convert amount of waste present in bin into digital signals and transmits them to Its ARM7 controller LPC2148.

Smart garbage bin works with the same manner with the combination of sensors namely ULTRASONIC sensor that indicates its different levels respectively.

The ULTASONIC sensors will show us the different levels of garbage in the garbage bins and this details are further given of the microcontroller (ARM LPC2148) and the controller gives the details to GSM module and with the help of GSM module's GPRS connection the details are sent to the web server (HTTP) and also in the form of SMS to the mobile.

The SMS contains the details of the Bin with Longitude and latitude co- ordinates of link of position of bin.

II. PROPOSED SYSTEM

Considering based on the need of modern technology the smart garbage dump bin can expensive but considering an amount/no of dustbins needed in India, cost effective garbage bin would not be a primary experiment it is why I have decide to use based on Ultrasonic Sensor and it is area to reduce its effective cost, Make the environment clean. Efficient management of smart bins in smart cities and rural areas. And It Reduce bad odors.

A. System Architecture

1) Microcontroller ARM7 (LPC-2148) The LPC-2148 Microcontrollers are based on 32bit architecture. Embedded ICERT and Trace interfaces offer real-time debugging with on-chip Real time Monitoring software and high speed tracing of instruction execution. It has 8 to 40 KB of on-chip static RAM and 32 to 512 KB of on-chip flash program memory of speed 60MHz.

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Fig. LPC2148 (ARM7)

2) *ULTRASONIC Sensor (HC-SR04)* This Ultrasonic Sensor gives indication of the level of garbage/wastage filled in garbage bin and Ultrasonic Sensor are placed at the Peak of the bin and the ranging distance of the sensor is 2- 500 cm's, covered angle up to <15 degrees. The ranging accuracy can reach to 3mm.

Fig. Ultrasonic Sensor (HC-SR04)

B. GPS Module

Here the GPS module is used for the purpose of to identify the location of the garbage bin with longitude and latitude global co-ordinates within the globally placed.

C. GSM Module

GSM module is connected to a Network; this allows using the GPRS and SMS to communicate over the mobile network for this project. Control signals came from controller sent to cloud using GSM Module.


Fig. GSM Module

D. Liquid Crystal Display

LCD's have been become most popular over recent decades for Data/information visible in many smart devices. The Display devices are mostly controlled by controllers. They makes complex/convolve devices easier to operate.

Fig. 2X16 LCD Display

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III. BLOCK DIAGRAM

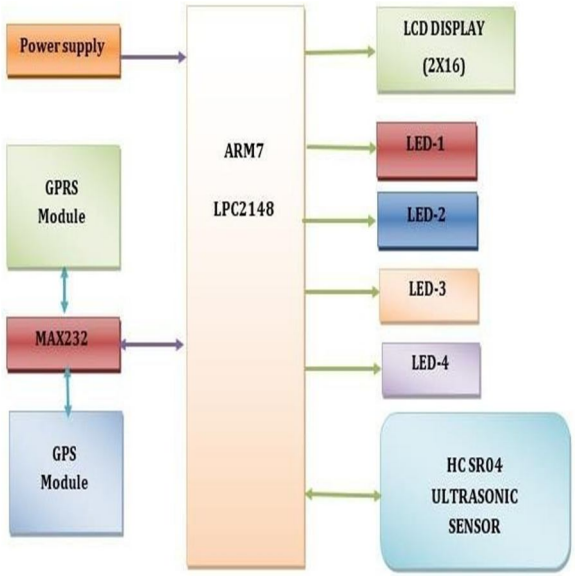
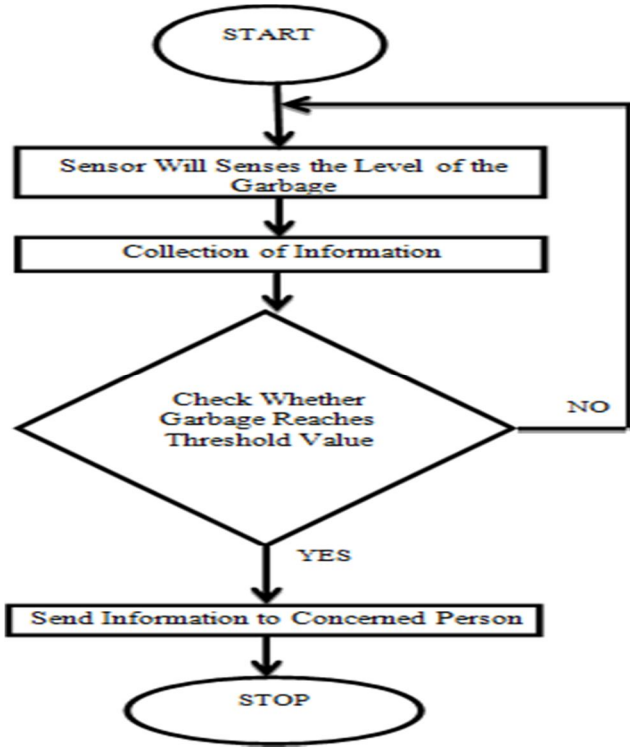


Fig. Block diagram

IV. FLOW CHART



V. CONCLUSION

By implementing our project in real time scenario we can reduce the unhygienic condition among the smart cities and many rural areas. The Project will give information to the concerned person through the SMS with location. The webpage can be seen by all the officials. If the garages are not properly cleaned and remove, there might be a probability for diseases to people. This may cause severe health hazards to humans. For developing this proposed management system, it will reduce cost, Human power and indirectly reducing Pollution and traffic in that place.

VI. ACKNOWLEDGEMENTS

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V. REVIEW

This isn't an original idea, for the Development of IOT based garbage Management system; this idea has been existed from many decades, after an IOT Technology found its grip in our lives. This is, however an original plan for implementing IOT Based garbage Management system with Ultrasonic Sensor and GSM modules are used for transferring of data.

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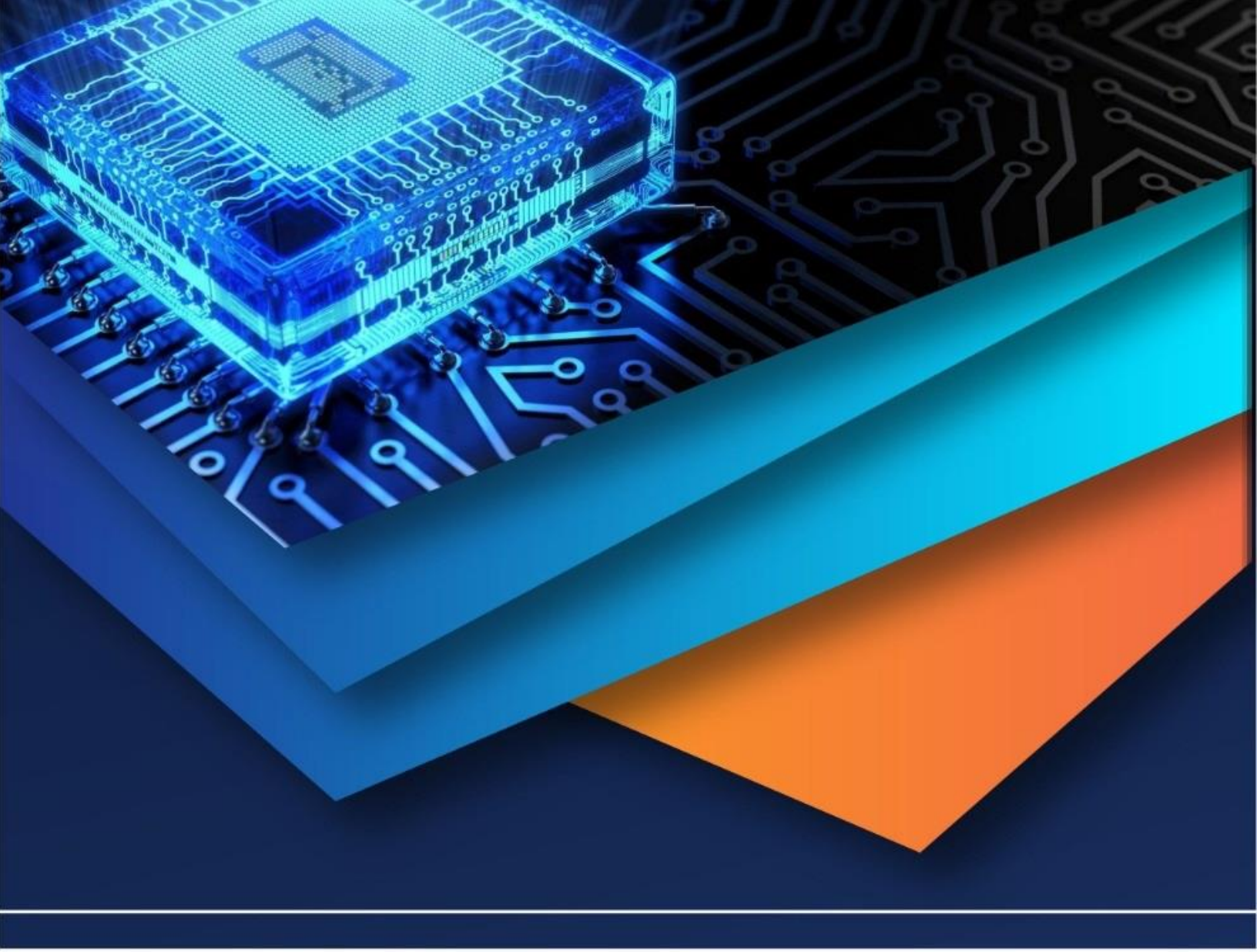

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