Low cost smart dustbin

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ABSTRACT

In last few years there is a more garbage problem are available in india , the concept of develop smart cities. While the throught comes up for smart cities there is requirement for smart waste management. smart dustbin is for the offices , colleges, hospital ,busstand. In the recent decades, Urbanization has increased tremendously. At the same phase there is an   solve in waste   production in india . garbage has been a health issue to be considered. This project is used to solve the garbage problem and create the smart cities.in this project there are many component are used ardunio,GPS (Global Positioning System), GSM (Global System Mobile Communication),Power Supply ,LED(Light Emitting Diodes) Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. The threshold stature is set as 10cm. low cost smart dustbin is very useful to daily life it will help to improve the garbage problem in cities.

Keyword: Smart Dustbin, GSM Module,Powersupply

1. INTRODUCTION:

In our daily life we see the picture of garbage bins and smell problem .in this project are used GSM module to send data to user and GPS tracker are check the location of the user   and remove garbage in dustbins. Ultrasonic Sensor are used to sense sound waves ultrasonic convert into electric energy into acoustic energy. Message display component are used to display the message in dustbin is empty or not, low are not, medium or not, full or not. Usually, it is a common practice to use separate bins for collecting wet or dry, recyclable waste. In this project, I have designed a simple. GSM module is a wireless network it accept a sim card and operate over mobile operations a GSM module is a external device or PC card. GSM module is a embedded system. The number of the control room present in dustbin areas. A GSM module connected to the sim card and send message to the microcontroller. Graphical User Interface will be displayed on the mobile screen to display the status of the garbage level. Dustbin also place in public place like a Railway Station ,Airport etc. In dustbin reach in 85% then Arduino send message to GSM module .Internet can play very important role providing a smart solutions in garbage problem. This is a mobile application developed in java programming this application are directly connected to the GSM module .The garbage west only works with internet connection a in order to send west data in control station. The system has been tested functionality.

2. SYSTEM DESIGN

The system design tries to be cost-effective and user-friendly. Figure 3 shows an outdoor trash bin after and before applying the metal work. The design relied on a commonly used outdoor trash bin, which is redesigned to append an extension arm to hold the solar cell panel. The metal work also included adding an 18cm $\times$ 22cm tray for holding any electronic device during charging from the USB port, which will be attached to the extension arm. Hence author use GS modem. A GSM modem is a specialized type of logical modem that works with a GSM wireless network. It accepts a SIM card, and operates over a subscription to a cellphone operator, just like a mobile phone. A modem can be an external device or a PC Card. An GSM modem is connected to a computer through a serial cable or a USB cable. When a GSM modem is connected to a sim and send message to mobile, this allows the mobile to communicate over the mobile network. While these GSM modems are most

repeated used to provide mobile internet connectivity, many of them can also be used for sending and receiving message. GSM Modem sends and receives data through waves. In this project the software GSM 900 modem is used to send the messages which is shown in figure. It consists of a GSM modem with standard communication interfaces like (Serial Port), USB, so that it can be easily connected to the any devices. The power supply circuit is also built in the GSM module that can be turn ON by using that particular suitable adaptor.
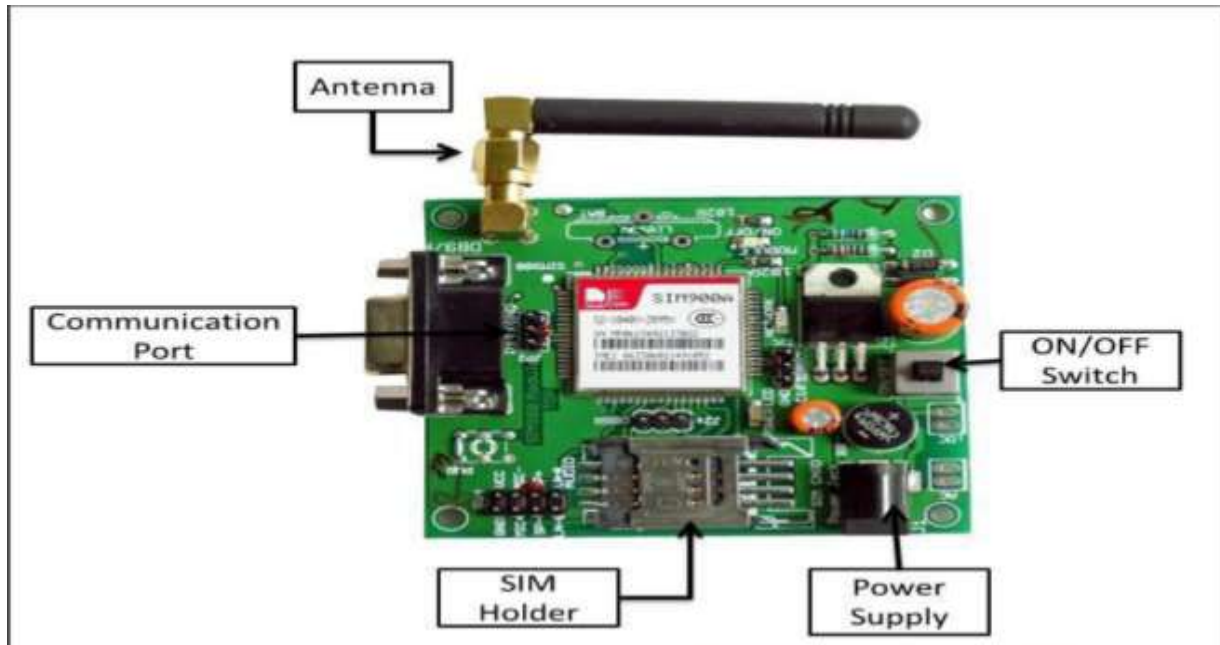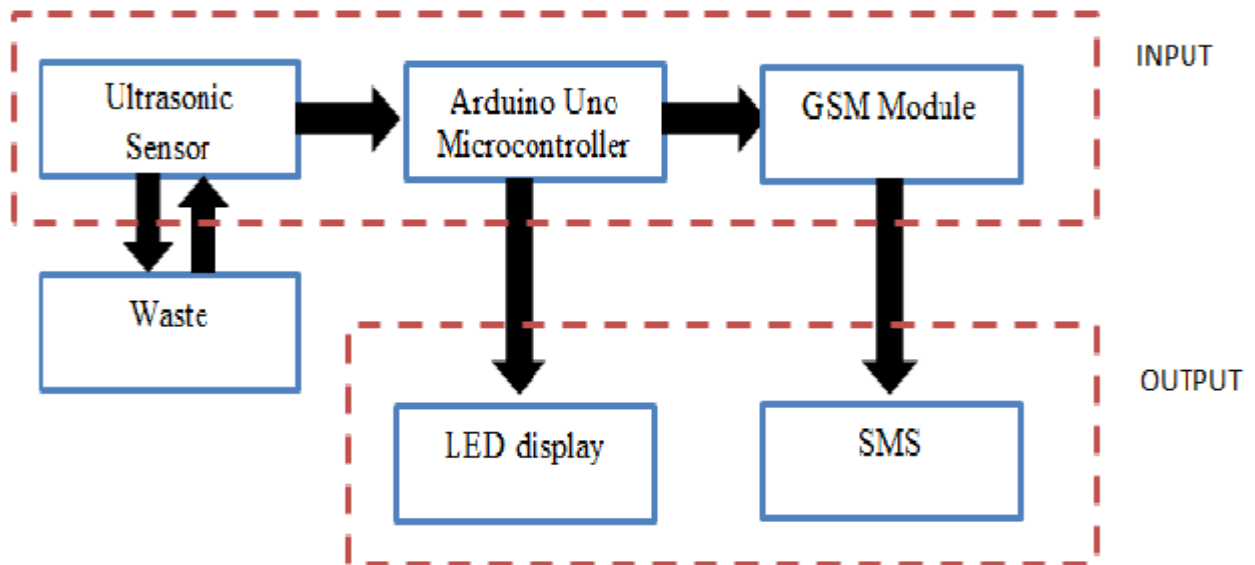
Figure 1-System Design

Block Diagram

Figure 2- Block diagram

2.2 Description of Blocks

2.2.1 Ultrasonic sensor

Ultrasonic is reliable in any can be used inside or outside. Ultrasonic sensors can handle   avoidance for a mobile system, and being moved often, as long as it fast. Ultrasonic are so also used, they can be reliably implemented in bin senses applications, water level sensing, drone applications   or bank. Ultrasonic rangefinders are commonly used as devices to detect a collision sensors are a reliable, cost-effective solution for distance sensing, Once you ultrasonic technology is perfect for and not so good for, you can make a more decision on the right sensor system for your device.

2.2.2 Arduino

Arduino is a single-board controller meant to make the device more accessible which are different objects. The hardware and software features with an open-source designed around an 8-bit AVR microcontroller or a 32-bit ARM. Current consists a USB interface, 6 analog input pins and 14 digital input or output pins that allows the user to Arduino boards. The Arduino Uno on the ATmega328. It is featured by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Android uses a Java based language. To develop an Android app, a tool named Eclipse is required as well as Android's SDK , which is an add-on for the Eclipse program. When creating a new application for the Android, the platform version must be selected, e.g. 1.5, 1.6, 2.1, The three main components required in the creation of the Android app are: the java file, xml file, and graphics files needed for the application. For Arduino firmware, the IDE is provided as the open source by the company. The tool can run on multiple platforms, e.g. Windows, OS X, and Unix. They needed to be able to communicate with each other in a secure manner over short range.
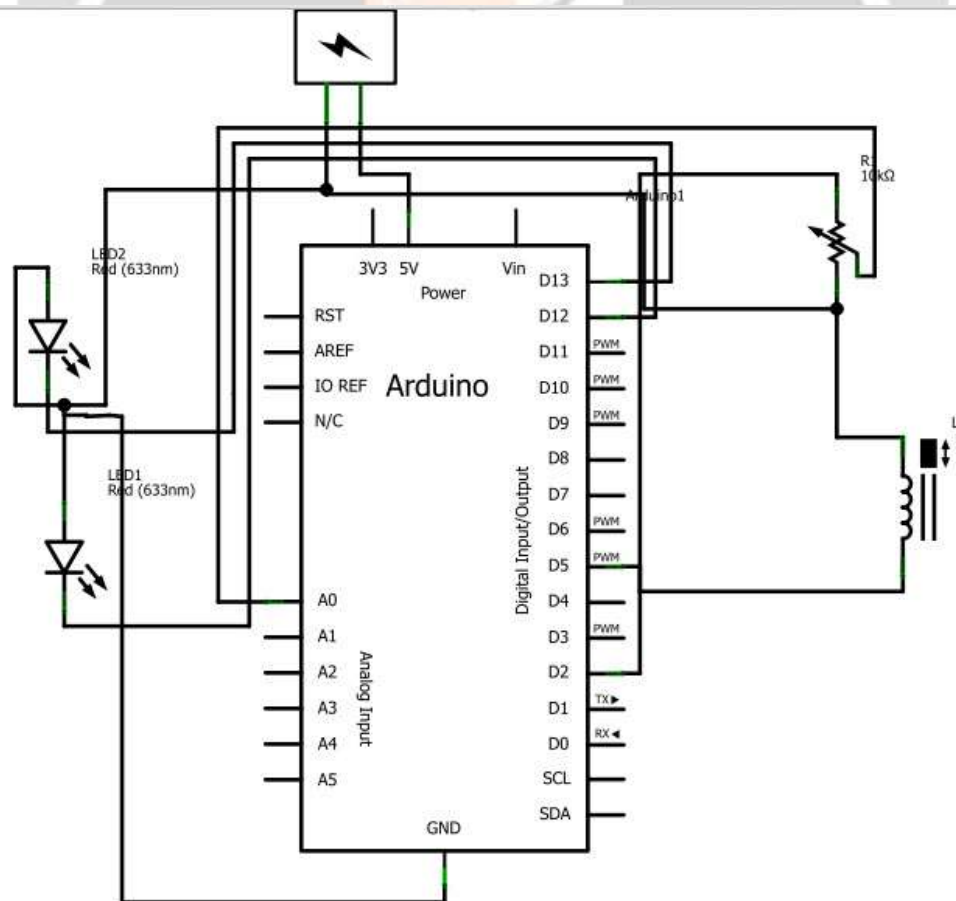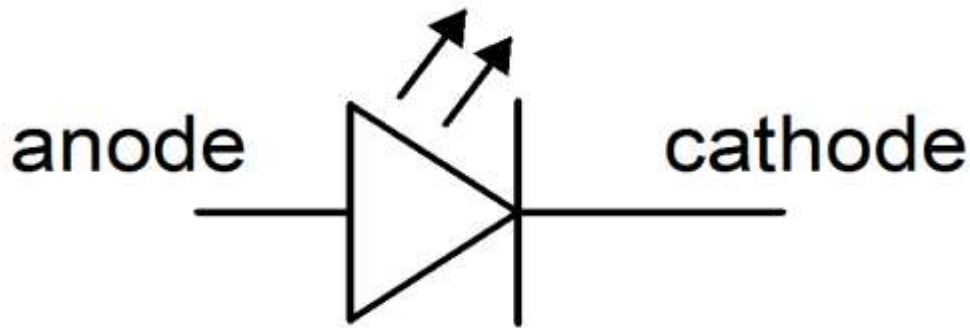

Figure 3- Arduino

2.2.3 LCD

Figure 4 -LCD Symbol

The LCD used here is 16x2 alphanumeric Liquid Crystal Display (LCD) which means it can display alphabets along with numbers on 2 lines each containing 16 characters. It is used to display the password entered and the status of the password.

Figure 5- LED

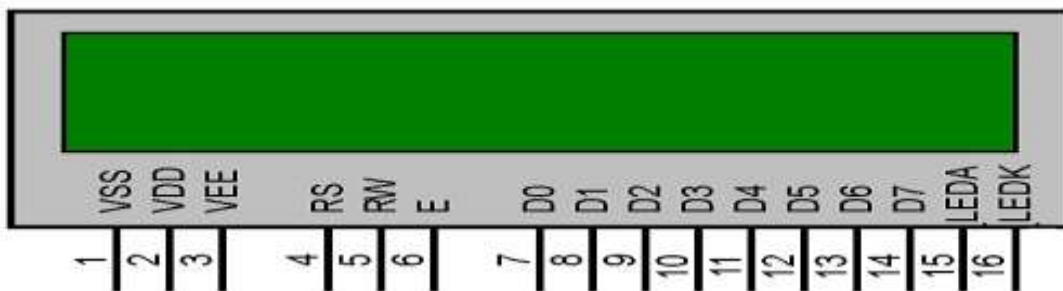It can be used to display the various options and all the readings that have been stored in the EEPROM.

Figure 6- Display Message

2.2.4 Power Supply

The power supply gives +5v and +12v supply to the circuit. The power supply consists of different stages namely transformer, rectifier, filter, and regulator. Transformer is a step-down transformer taking input of 230v AC and giving output of 15v at the secondary. A **power supply** is an electrical device that provide power to an electrical node . a power supply is to convert current from a source to the voltage, current, and frequency . Other functions that power supplies may perform limiting the current the load to safe levels. shutting off the current in the event of an electrical fault the load, power-factor correction,
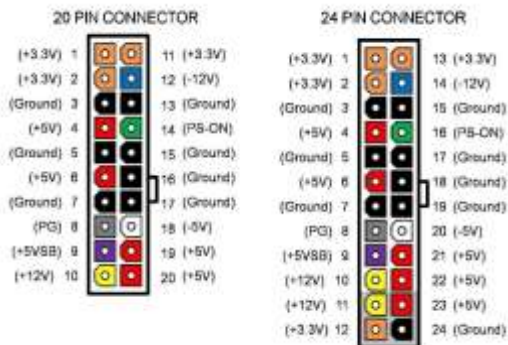

Figure 7 – Pin Diagram

2.2.5 Jumper wires :

It is simple wires that used as connector of each end . Can be allow to use connect two points each other without using soldering . It used with breadboard and other tools in order to make it easy change a circuit is needed . It   also have verity   of colors it have many colors .

Figure 8 – Jumper Wire

2.2.6 Register

Android uses a Java based language. Eclips are used for develop the android app. Platform version must be selected for creatimng a new application for the android .
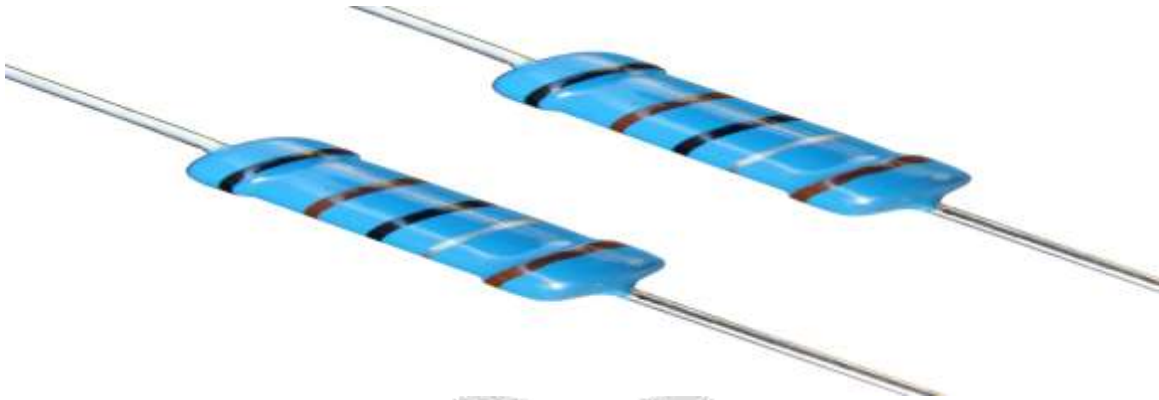
Figure 9 - Register

Java file , xml file , graphics file there are three main components required in the creation of Android app .Java file , which is a file that contains all code required for completion of desired taskas . They needed to be able to communicate with each other in a secure manner over short range. The first step had the MAC address of the microcontroller directly coded into the app for initial testing, and the second was an improvement of the first in that it allowed a user to search for the device, which becomes the final design. The basic steps for connecting to Bluetooth were the same for both versions of the application.

2.2.7 GSM module :

GSM module is a wireless network it accept a sim card and operate over mobile operations a GSM module is a external device or PC card. GSM module is a embedded system. The number of the control room present in dustbin areas. A GSM module connected to the sim card and send message to the microcontroller. Graphical User Interface will be displayed on the mobile screen to display the status of the garbage level. Dustbin also place in public place like a Railway Station ,Airport etc. In dustbin reach in 85% then Arduino send message to GSM

Figure 10 - GSM

Application

1. This simple circuit can be used at residential places to ensure better garbage problem solution .

2. It can be used at organization to ensure authorized access to highly secured places.

3. With a slight modification this project can be used to control the switching of a loads t.

Conclusion:

The project aims to smart dustbin by using android technology by entering an message format through android device .It   creates an advanced system which gets garbage of the problems in the existing system while keeping the costs low. This system involves wireless technology. The wireless transceiver operates. This paper tries to look at the emerging technologies and determine the best approaches in trying to prevent the number one cause of fatal vehicle crashes. This device is capable of reading and collecting the required data and sends them securely to the database stored in server. This system can do tracking of a vehicle which have this device. Besides, if an accident occur this system can communicate nearest hospital and police station. Police station and hospitals authority can see the shortest route to reach the accident spot using this system which have a web application and mobile application. Web based real time data visualization makes this system more convenient to see all the data in a clean, formatted and user friendly way.

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