Smart Dustbin with Reward System

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ABSTRACT

Sri Lanka is facing urbanization with the impact of globalization, which has results in an increase of needs and wants of people and increasing living standards of people tremendously. Urbanization directly contributes to waste generation, and unscientific waste handling causes health hazards and urban environment degradation. The failure to address this escalating problem in a timely manner resulted in unsanitary eye sores and the degradation of wetlands, coastline, rivers and other streams which become dumping sites for plastic polythene and other mixed waste.

Index Terms—Eco-points, RFID, smart dustbin, waste categorizing.

Keywords: IR sensor, Ultrasonic Sensor, Aurdino nano, servo motor, DC motor

ARTICLE INFO

I.   INTRODUCTION

Government has provided us with dustbins at every public places but these places have still have lot of trash laying around the surroundings. Hence we came up with solutions to make sure people dump their trash into bin on daily basis and also get some interesting rewards. As such there are no such concepts to help keep environment clean.

Till date we still litter at public places is one of the biggest problems we are facing today. Although we all know the use of dustbin, people often drop their garbage anywhere rather than dropping it in dustbin.

Here we are with a solution.

We are trying to design a "Smart Dustbin with Reward System"

In this project, we are going to give some reward for the trash that people put into dustbins. This reward will somehow lead to collection of trash (litter) into dustbin instead of being littered at public places.

In this project, we are going to use working principle of,

1. Smart dustbin
2. Weight measurement using ultrasonic sensors
3. Spring vending machine based on arduino

II.   LITERATURE SURVEY

[1] RFID technology is used for collection of data regarding garbage container. RFID tag detected within the frequency range and when any tag comes to the range of RFID reader, it automatically reads data from RFID reader, then filters collected data and arranges it into specific formatted SMS. After that, the data is sent to central server sends the information to the web server as well as authorized person's mobile phone.

[2] This Paper proposed a method as follows. The level of garbage in the bin is detected by using the ultrasonic sensor and communicates to control room using GSM system. Ultrasonic sensors are used to detect the level of the garbage bin. When the bin is fill the output of the ultrasonic sensor detects this output is given to microcontroller to send a message to control room through GSM In this paper ultrasonic, GSM and atmega328 controller is used to monitor the garbage bin level.

III. OBJECTIVES

To build a prototype for smart dustbin controlled by using arduino, along with ultrasonic sensor and GSM.   The objective is to free from secondary jobs.
Application that would be pivotal for the   entire functioning of dustbin.
Dust level process through ultrasonic distance measurement.
Easy access to the GSM (messaging system).
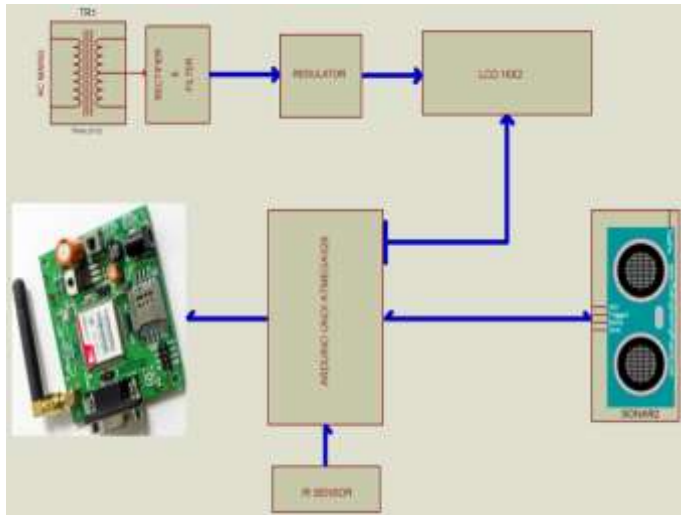
IV. METHODOLOGY

Fig 1. Block diagram

Here arduino board, GSM modem operates with 12V DC, LCD display, sensor circuit operates with DC 5V supply and this supply is provided by regulator of LM7805. 12V step down transformer with rectifier and filter is used to give power supply (or adapter can be use depends upon our requirement).

ULTRASONIC MODULE

Ultrasonic module has 4 pins i.e. Vcc, Gnd, Trigger, Echo. Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principle of work:
(1) Using IO trigger for at least 10us high level signal,
(2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.
(3) IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning. Test distance = (high level time×velocity of sound (340M/S) / 2,

LCD DISPLAY

LCD stands for liquid crystal display. They come in many sizes 8x1 , 8x2 , 10x2 , 16x1 , 16x2 , 16x4 , 20x2 , 20x4 ,24x2 , 30x2 , 32x2 , 40x2 etc. Many multinational companies like Philips Hitachi Panasonic make their own special kind of lcd's to be used in their own product.

V. ADVANTAGES

- The circuit required power supply for its operation is very less. (12V, 750mAh)
- The component required for this hard ware is easily available in market, and well in rate.
- The circuit is compact in size, so small space is required can be fit in dust bean with SMD components.
- Circuit can send sms to the store number.

VI. FINAL ASSEMBLY

Fig (a) Assembly of circuit.

Fig (b) Assembly of project

VII. CONCLUSION

The Smart Dustbin and point rewarding system concept which designed are an optimal solution for Municipal council to manage their waste collection in an efficient way. As the ineffective waste management is due to lack of methodology to categorize waste and collect them in an effective time schedule, the system designed will influence the people to categorize their waste by their own and the municipal council can collect the waste on a proper plan with the notifications they get from the smart dustbins when they are about to full and overflow. The Municipal council does not have to worry about the waste they are collected anymore. As the collected waste amounts in municipal council waste collection centers can be viewed by the recycling centers, the municipal council can sell most of the waste categories to those recycle centers as the wastes are properly categorized. The researchers hope this system will help to encourage people to categorize the waste. And also, the government can establish this system to overcome several problems such as waste categorizing, waste collecting, waste disposal, and waste recycling, etc.

ACKNOWLEDGEMENT

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