Smart Dustbin Using an Embedded Arduino

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Abstract: In present day, Urbanization had been increased enormously.On the same side there is an increment of waste production. So, the waste management became a crucial issue to be considered, this paper aids to solve the particular issue. This paper is all about a smart device equipped with LCD, RFID, Microcontroller, Servo motor and Ultrasonic sensor. It detects the presence of the person and it can receives RFID input by the said person. It is capable of displaying the person name by employing LCD mounted on the front part of said dustbin. When the person is identified, the door of dustbin is opened by servo motor and it will be open till the person's presence that is detected by ultrasonic sensor. As the entire process got completed the GSM embedded into the dustbin sends the payback points to the person's id. This point can be redeemed by utilizing application. When the dustbin got filled completely the red LED turn ON and the alert message will be sent to the control room.

Keywords: SIM 900, RFID, LCD, Servo Motor, Arduino UNO, SMPS

1. INTRODUCTION

In today's world, the population density is increasing day by day and with the increment in population there is increment in garbage and waste products[1]. So to overcome this problem this system is designed. This system rewards for the usage of dustbin so that the peoples should use the dustbin instead of throwing things here and there[2].

This system is based on Arduino UNO, Sensors, Motors and Wireless communications. The dustbin consisting of SIM 900, Arduino UNO, Ultrasonic sensor, Servo motor, LCD and RFID[3].

According to Figure 1. The block diagram illustrates that, Arduino UNO acquires signal from RFID in SPIC ("Serial Peripheral Interface Communication") form[4]. It takes the digital signal from Ultrasonic Sensor[5]. It shows the running process on serial LCD. It offers PWM pulses to the servo motor for the opening and closing of door. The GSM unit is employed into the system for sending an alert message to the control room about the filled information of dustbin[6].
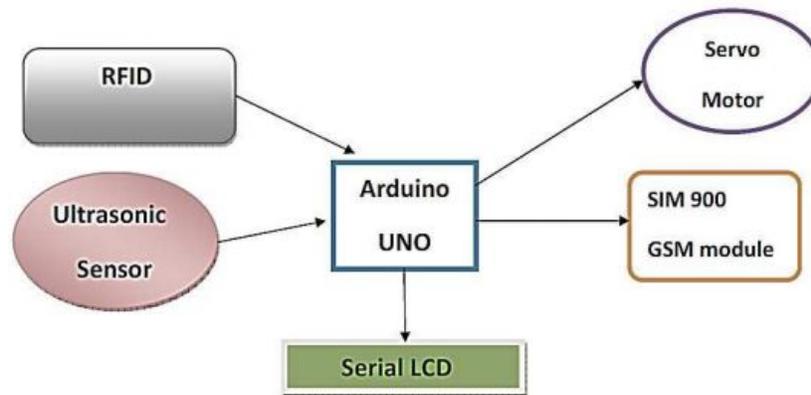
Figure 1. Block diagram of the proposed system

2. OBJECTIVES

- LCD interfacing with Arduino UNO
- Sending alert message by employing GSM unit
- Decision making by means of Ultrasonic sensor
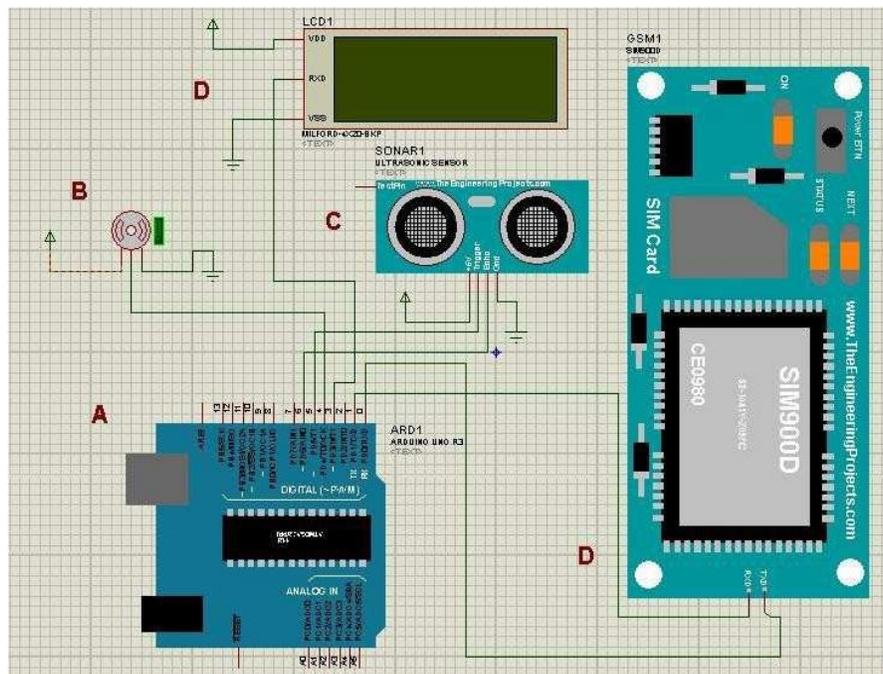- Circuit size reduction[7]

3. CIRCUIT DIAGRAM

Figure 2. Circuit diagram

The circuit diagram of the system is illustrated by the Figure. 2. This figure states the proper connection of the component and modules as required in the system[8].

Figure 3. Dustin with mounted LCD and alert message on the cell-phone

4. CONCLUSIONS

In this paper, the designed system helps to manage the garbage and waste materials. The peoples don't bother about the garbage and waste and they throw it anywhere instead of using dustbin, but this system enforce the person to use dustbin as it gives the reward instead of waste materials to the user. This system is cheaper, user friendly, based on open source technology and it also consumes less power.

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