

A Review: Multipurpose Garbage Monitoring System Using IoT

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Abstract - In this paper a cost effective dust bin monitoring system with street light is proposed. “SWACHH BHARAT ABHIYAN” - PM Narendra Modi’s ambitious project to make INDIA a clean country. An efficient method to monitor the waste has been designed with some sensors and the output will display on the monitoring screen of municipality office. Level sensor detects the level of the garbage inside the bin and thus we get information about the level of garbage in the bins. The weight sensor is mounted at the bottom of dust bin and continuously monitors weight of garbage in to dustbin. On the receiver side continuously monitor garbage in to dustbin. Municipality takes many measures to maintain the cleanliness of the city. One of which is establishing dustbins in regular distance for the convenience of public to discard items. Cleaning this garbage is an important function of municipality which is directly related to health issues. We have designed a model for a ‘Smart Dustbin’ which indicates directly that the dustbin is filled to a certain level by the garbage and cleaning or emptying them is a matter of immediate concern. This prevents lumping of garbage in the roadside dustbin which ends up giving foul smell and illness to people. The developing system will have a complete monitoring system which is IOT based. Also the information will be directly sent to the internet from system; no need of computer for transmission purpose which reduces the cost.

Keywords - Internet Of Things(IOT), Arduino, dustbin, Temperature sensor, Ultrasonic Sensor etc.

I. INTRODUCTION

Dustbin is a common and a basic need everywhere. It is observed that often the garbage get accumulated due to irregular removal of garbage present in the dustbin. Here we have figured out a new model for the municipal dustbins which intimates the centre of municipality for immediate cleaning of dustbin. This dustbin is also designed to compress the garbage periodically thus preventing the unnecessary occupying of dustbin’s space by light weighted but space occupying garbage particles like sponges, etc. A leaf switch is pressed by the garbage when it reaches a particular level and an Arduino Uno is programmed in such a way that when the garbage reaches this particular level, intimation is given to the central hub through IoT.

An efficient method to monitor the waste has been designed with some sensors and the output will display on the

monitoring screen of municipality office. Level sensor detects the level of the garbage inside the bin and thus we get an information about the level of garbage in the bins. The LDR use minimizes the wastage of electricity. A temperature sensor placed at the garbage bin is used to detect the air pollution as well as temperature around the bin.

II. OVERVIEW OF IoT

The Internet of things (IoT) is the internetworking of physical devices, vehicles, buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure,^[4] creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic

benefit in addition to reduced human intervention. IoT is a real time technology.

In this project we are using the IoT to monitor the output of the project on the screen of computers not only in the city where the dustbin is placed but also it can be monitored from anywhere.

III. LITERATURE REVIEW

In this paper consideration of waste management issues have been solved by smart bin, interface of GSM and ultrasonic sensor with the help of microcontroller based Arduino people get best solution to management of waste this is replacement of traditional dust bin into smart bin one[1]. ARM 7 have been used for controlling Zigbee and global communication, it gives the indication and sending the message using GSM. Sensors are placed in the bin [2]. This bin made and wireless sensor node is attached to dust bin send the signal to road side unit real time show status of the bin other same signal from RSU reaches the Garbage Collecting Vehicle (GCV) arrive that place and collecting garbage[3]. Many technology uses to recycling the garbage. For unhygienic condition people face more problems regarding to health Such situation is control by providing unique ID to garbage bin and identify ID number is given to each can if bin is fill then send SMS to the server[4]. In this paper uses microcontroller ATMEGA 16 and certain sensors like PIR sensor, Hall Effect sensor, solar sensor, and LDR sensor. These sensors are connected to microcontroller through an interfacing circuit and an amplifier. The output could view in LCD display, sensor is sense the light and presence sensor sense car or human so light turn on [5]. This paper is based on efficient of automatic street lighting system based on low cost microcontroller controlling LED based on street automatically lighting levels control and light sensor, rain sensor, laser sensor and a set of the light emitting diode (LED) have been used brightness in of light will be directly proportional to number of traffic light Operate like ON or OFF accordingly during night and heavy raining or bad weather[6].

IV. WORKING PRINCIPLE:

Block diagram

A. Transmitter

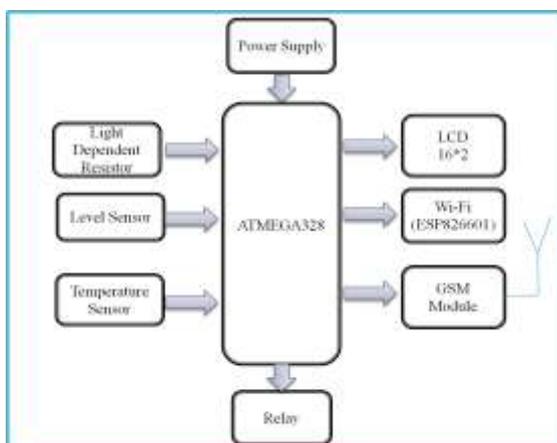


Fig.1 : block diagram of Transmitter

LDR:

LDR or a light dependent resistor is also called as a photoconductor, photo cell, and the photo resistor.

It is a one of a type of resistor whose resistance varies depends on amount of light falling on the resistor, then the resistance changes.

Level sensor:

Level sensor detects the level of fluid and solid. Level sensor measures a level and gives a specific range of values. Level sensor senses that the substance (solid or liquid) is above or below the desire point.

Ultrasonic level:

This sensor is a distance measuring sensor and provides information of absolute level of garbage inside the bin.

It is transmit ultrasonic waves from transmitter and detects reflected waves from an object by receiver.

LM35 (temperature sensor):

LM35 is a precision IC temperature sensor with its output proportional to the temperature (in °C).

The sensor circuitry is sealed and therefore it is not subjected to oxidation and processes.

Atmega328p:

The Atmega328p is a 8-BIT AVR RISC-based microcontroller. It has 32 kb flash memory with read-while-write capabilities, 1 kb EEPROM, 2 kb SRAM.

It also has 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters also internal and external interrupts, serial programmable USART, 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D convertor.

B. Receiver

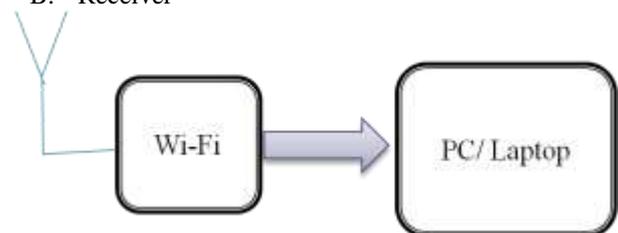


Fig.2 : block diagram of Receiver

Wi-Fi:

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

GSM:

GSM (Global System for Mobile communication) is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses

data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band.

CIRCUIT DIAGRAM:

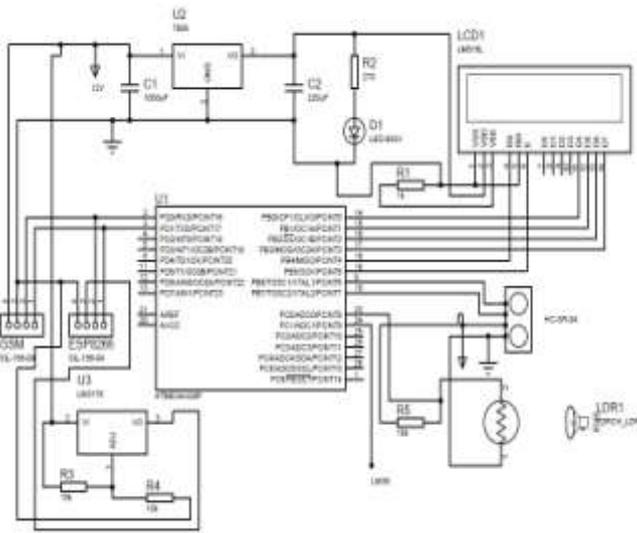


Fig.3.: Circuit diagram

This is the circuit diagram of the system, here all the components are connected to the microprocessor and after all the result will be shown on the LCD screen .

Power Supply:

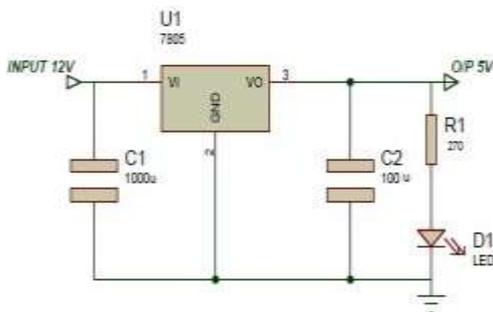


Fig.4: power supply

Power Supply: Above fig.5 shows the circuit diagram of power supply. We apply 12v input supply to it and it gives us the 5v supply which is applicable for Atmega 328 IC. In this power supply circuit we use the 7805 voltage regulator IC which can convert the 12v supply to the 5v. We can also use the capacitor for the filtering purpose and there is one LED for the indication purpose.

FLOWCHART:

1. LDR:

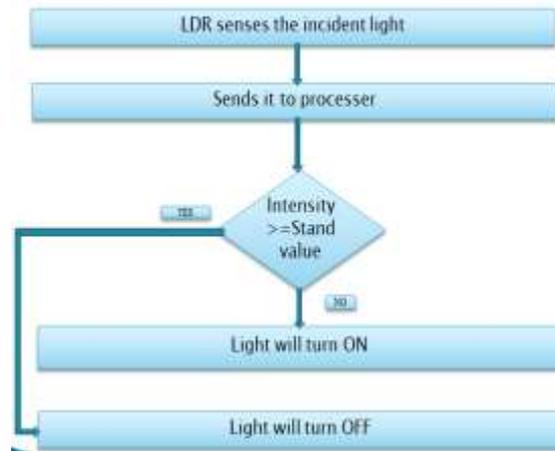


Fig.5.: Flowchart for LDR

The flow control from sensor to microcontroller is as shown in the above flowchart.

2. Temperature Sensor:

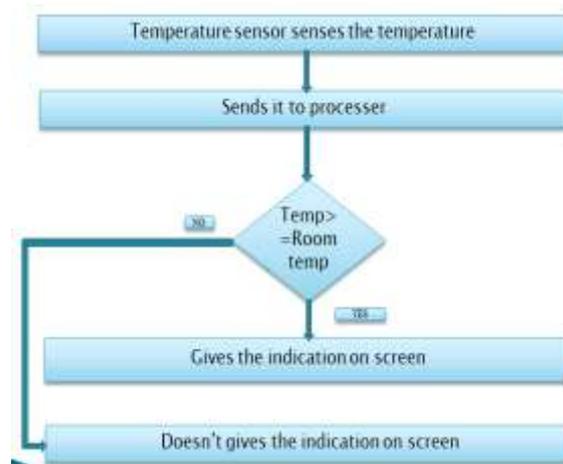


Fig.6.: Flowchart for LDR

The flow control from sensor to microcontroller is as shown in the above flowchart.

V. FUTURE SCENARIO

1. When considering a region with excessive waste disposals, one can make use of a load cell by providing a threshold value to detect the full condition of the garbage bin and also provides more accurate results.
2. The scope for the future work in this system can be implemented with time stamp in which real time clock shown to the concern person at what time dust bin full and at what time the waste is collected from the smart dustbin.
3. We can generate electricity with the help of solar panel in this garbage monitoring system.

VI. CONCLUSION

The system monitors the lends of the waste inside the bin so the human effort is get reduce because as automatically the

level is displayed so it is not necessary to check it manually. Also the wastage of the electricity during the day time is stop and the air pollution taking place due to burning of waste also be reduce to some extent because of the temperature sensor. The reason is this system is very cheap and easy to maintain that's why it is affordable.

REFEREENCES

- [1] Twinkle sinha, k.mugesh kumar, p.saisharan, "SMART DUSTBIN", International Journal of Industrial Electronics and Electrical Engineering, ISSN: 2347-6982 Volume-3, Issue-5, May- 2015.
- [2] Kanchan Mahajan, Prof.J.S.Chitode, "Waste Bin Monitoring System Using Integrated Technologies", International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 7, July 2014.
- [3] Narendra Kumar G., Chandrika Swamy, and K. N. Nagadarshini, "Efficient Garbage Disposal Management in Metropolitan", Cities Using VANETs Journal of Clean Energy Technologies, Vol. 2, No. 3, July 2014.
- [4] Gaikwad Prajakta, Jadhav Kalyani, Machale Snehal , " SMART GARBAGE COLLECTION SYSTEM IN RESIDENTIAL AREA", IJRET: International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN: 2321-7308.
- [5] Richu Sam Alex, R Narciss Starbell, "Energy Efficient Intelligent Street Lighting System Using ZIGBEE and Sensors", International Journal of Engineering and Advanced Technology (IJEAT)ISSN: 2249 – 8958, Volume-3, Issue-4, April 2014.
- [6] Rohaida Husin, Syed Abdul Mutalib Al Junid, Zulkifli Abd Majid, Zulkifli Othman, Khairul Khaizi Md Shariff, Hadzli Hashim, Mohd Faisal Saari, " Automatic Street Lighting System for Energy Efficiency based on Low Cost Microcontroller", DOI 10.5013/IJSSST.a.13.01.05.