

Smart Garbage Segregation and Monitoring Systems

Ansari Hera Gulam Waris¹ Patil Pranali Ramesh² Yadav Neha Ramashary Binda³
Vishe Arati Ashok Anita⁴ Prof. Sonali L. Vidhate⁵

^{1,2,3,4,5}Department of Computer Engineering

^{1,2,3,4,5}Alamuri Ratnamala Institute of Engineering and Technology (Mumbai University)
Shahapur, Thane, India

Abstract— Garbage monitoring system and segregation is very innovation system which will help to keep the cities Green and clean this is the main motive of our project. This will contribute to make the mission of Swatch Bharat Abhiyan. In this project we segregate the waste at disposal level at our home as well as roadways, due to which the problem of waste management at dumping round can be reduced. This system monitors the garbage bins and inform about the level of garbage collect in the garbage bins via. cloud, IOT. We used the sensors to segregate and manage the garbage dustbins. And after that the clothes from dry garbage will be donating the nearest NGO. And as all we know wet garbage is mainly used for fertilizers. So, the garbage is not only separated the disposal is also done in proper way.

Key words: Power Supply Kit, Arduino Board, PIC Microcontroller IR Sensor, Ultrasonic Sensor, Motor Drive, DC Motor, LCD Display

I. INTRODUCTION

In India population is increasing rapidly. The increase in population as the adverse effect on the Environment. The main cause of this problem is huge amount of waste generated very day in our country. The waste which is generated are not disposed properly due to which it causes bad effect on the environment as well as on living creature. According to one survey 0.1 million tons waste is generated, but out of that only 5% of waste is recycled or disposed. Many researches and project are done on the waste management but very few of it get implemented. This project describes how to segregate the dry and wet waste into its respective bin at household as well as roadways bins it use sensor for segregating dry and wet waste or garbage. Also, this system shows the level of garbage in garbage bin and proper settlement of the garbage.[1]

II. LITERATURE SURVEY

- 1) Designed and development of smart waste subsystem Ravenna Singh suggested that solid waste management is the pervasive problem now a days and rising continuously with the rise in urbanization. Solid waste is always the mixture of different type of material. Solid waste can be categorized into two type
a) Biodegradable waste: -It consists of vegetable waste, fruit waste, leaves, paper, etc. This waste can be decomposed and can be use like fertilization which would be help in growing more and more plants. b) Non-Biodegradable waste: -It consists of metal, plastic, foil paper, glasses, etc. This type of waste cannot be decomposed and it cause adverse effect on the environment.

- 2) In this author Narayan Sharma and Nirman Singha describes that the application of smart bin in managing of the waste collection system of an entire city.
- 3) Automatic waste segregating. In this paper the author Amrutha Chandramohananet describes an INDIA about an automatic waste segregating which is chip essay to used solution for segregating system at household so that the waste can be sent directly for processing.
- 4) Smart dustbin in this paper author Twinkle Sinha, K. Mugesh Kumar, suggested that the smart bin is built on micro controller-based platform Arduino board which interfaced with GSM modem and ultrasonic sensor waste management has been a crucial issue to be consider this paper is way to achieve this good cost.
- 5) Microcontroller based automatic waste segregate. In this paper the author M.K. pushpa, Aayushi Gupta describe the Idea About the waste segregate which segregates the waste into 2 major Dry, Wet part by using conveyor belt. Also, the Clothes which are collected from that dustbins can be given to the NGOs.[2][7][8]

III. HARDWARE IMPLEMENTATION BLOCK DIAGRAM

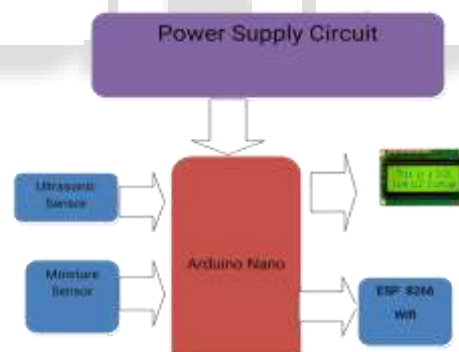


Fig. 1: Block diagram of System

A. Power Supply Circuit

In this project we require a power supply with positive and negative outputs as well as zero volts. This is called a Dual supply it can be used for two ordinary supplies. Dual supply has three output for example PIC microcontroller works on the 5v volts, Arduino board take 12V power supply and DC motors take 12v power supply. LCD is used to display the output by operating power 5V by using power supply circuit.[5]

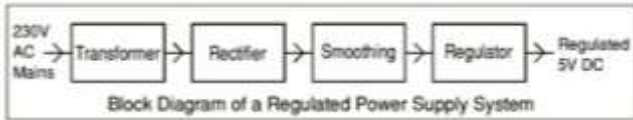


Fig. 2: Regulated Power System

B. Ultrasonic Sensor

Ultrasonic sensor is based on principal to measure the distance at the output by reflected sound waves. In the 1st model the ultrasonic sensor will check the garbage level present in the dustbin and also indicated the result into LCD display input level of garbage can be monitor or measured by this sensor.[4]

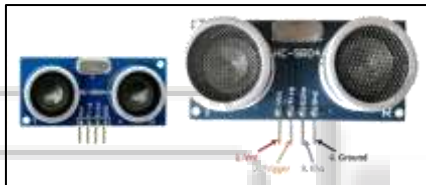


Fig. 3: Ultrasonic Sensor

C. IR Sensor

It is infrared sensor is electronic device which used to sense the certain object surround the area by emitting and detecting infrared radiation the object can detect. The use of IR sensor in this project is to sense whether the garbage was present in the plate or not.[8]



Fig. 4: IR Sensor

D. Soil Moisture Sensor

The soil moisture sensor detects the moisture present in the soil. In this project the sensor senses the moisture present in the garbage and it gives the result to PIC micro controller according to programming the wet waste can throw into wet section and dry waste will throw into dry sections. [3]



Fig. 5: soil moisture sensor

E. Arduino Board

In this project Arduino board is used as advanced technology which helps to detecting the sensors output and converted into required appropriate form and also display the required output on LCD screen. Arduino board is hardware and software based open source and easy to operate. It has 14 digital input/output pins, 6 analog inputs, a 16 MHz quartz crystal a USB connection a power jack and a reset button. It contains everything needed to support the microcontroller simply connect it to a computer with a USB cable or power it with AC to DC adapter or battery to get started.

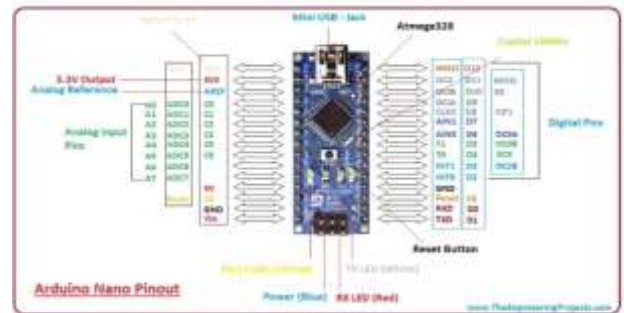


Fig. 6: Arduino board

F. LCD

We have used 16 by 2 LCD in two rows and 16 columns are present the digital output from microcontroller and Arduino board are display by liquid crystal display. LCD can be enabling only when pins are active by the programming.[6]



Fig. 7: LCD

IV. SOFTWARE IMPLEMENTATION

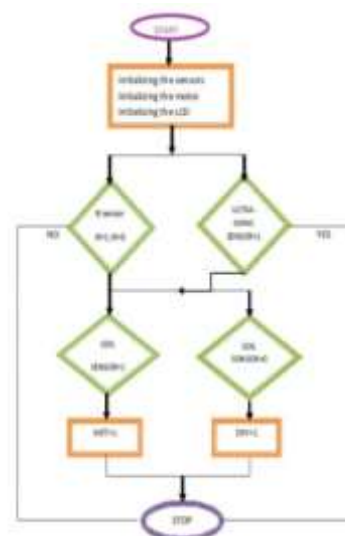


Fig. 8: Flow of System

Step 1 : Put the garbage into the bin.

Step 2 : Initialization all sensors, motor and LCD display.

Step 3 : Connect to ultrasonic sensors.

- Step 4 : Check whether the garbage level. Is the dustbin being empty? If yes then go to step 10.
- Step 5 : Connect to IR sensors check whether the object was present or not. If the object is present? Go to step 8.
- Step 6 : The soil moisture sensor checks their moisture present or not if moisture is present then go to step 7
- Step 7 : Disconnect the soil moisture sensor.
- Step 8 : Disconnect the IR sensor.
- Step 9 : Show the garbage level of the waste present in the dustbin and also indicate on LCD display.
- Step 10 : Disconnect from the ultrasonic sensor stop.

V. CONCLUSION AND OUTPUT

Our waste management provides an excellent way to prevent human waste, to prevent human intervention and to provide smart technology to remove waste.



Proposed idea can be applied to smart cities where residents are busy with their busy schedules and there is not enough time to separate the waste. And dispose the garbage in proper way.



And dispose the garbage in proper way. We try to distinguish waste at the domestic level. So, the corporation's work is decreasing and it is possible to reuse the waste.[9]

ACKNOWLEDGEMENT

We would like to express our sincere thanks to our guide Prof. Sonali L. Vidhate for supporting and encouraging us to complete this work.

REFERENCES

- [1] Ruveena Singh, Dr. Balwinder Singh Design and Development of Smart Waste Sorting System.
- [2] Narayan Sharma, Nirman Singha, Tanmoy Dutta Smart Bin Implementation for Smart Cities. Amrutha Chandramohan et. al. Automatic waste segregator.
- [3] Kumar, L. M. et. al. Embedded wireless enabled low-cost plastic sorting system for efficient waste management.
- [4] Twinkle Sinha, K. Mugesh Kumar, P. Saisharan Smart Dustbin.
- [5] M. K. Pushpa, Aayushi Gupta et. al. Microcontroller Based Automatic Waste segregator.
- [6] Satu-Satunya di Indonesia, mesin sampah keluarkan voucher ada di denpasar July 31, 2015.
- [7] United Nations statistics division environment statistics unstats. Un. Org Retrieved 3 march 2017.
- [8] Segregation of waste. The nation 2 February 2019.
- [9] Waste management – Biological Reprocessing retrieved 28 September 2020.
- [10] What is the polluter pays principle? LSE 11 may 2018 Retrieved 7 February 2020.
- [11] Ministry of environment and forests 2006. National environment policy Available at Government of India (Accessed 30 January 2017).