International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

SEGREGATION OF WASTE-A SURVEY

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Abstract - *Waste segregation and recycling are effective ways of reducing trash. In our country, recycling centers do manual process of sorting wastes so it increases human interface. For this we implement a system which minimizes human interference in the waste collecting and segregation process. The main objective of this project is to design a system using Arduino UNO for automatic segregating of waste at source and capable of cleaning. It is based on the principle of EM induction. Ultrasonic sensor estimates the distance and the status of the bin will be send through GSM. This bin can be used at places like offices, apartments, shopping malls etc. This system will be useful in making Waste Management in smart cities automated without the human intervention.*

***Key Words*: Arduino UNO, GSM, Ultrasonic sensor, IR sensor, L293D H-Bridge, Moisture sensor.**

1. INTRODUCTION

As the world is in a stage of up gradation, there is one stinking problem. We have to deal with Garbage! In our day to day life, we see the pictures of garbage bins being overfull and all the garbage spills out. This leads to many diseases as large number of insects and mosquitoes breed on it. A big challenge in the urban cities is solid waste management not only in India and also in many parts of the world. Hence, such a system has to be built which can eradicate this problem or at least reduce it to the minimum level. Based on estimates, the world cities generated 1.3 billion tons of waste annually with Asia accountable for 1 million tons per day.

More than half the world's population does not have access to regular trash collections which have caused troubles, are at a crisis level. With the upcoming smart cities, large numbers of responsibilities need to be fulfilled. A smart lifestyle begins with cleanliness, and cleanliness begins with waste management in proper way. A society will get its waste dispatched properly only if the dustbins are placed well and disposed well. The main problem in the current waste management system is the unhealthy status of dustbins.

2. LITERATURE SURVEY AND SUMMARY

In [1] Rapid increase in volume and types of solid and hazardous waste due to continuous economic growth. It is estimated that in 2005-06 the total amount of municipal solid waste generated globally reached 2.02 billion tones, representing a 7% annual increase since 2003. The segregation, transport, handling, and disposal of waste needs to be properly managed to minimize the risk to the health and safety of patients, the public, and the environment. This paper proposes an Automated Waste Segregator (AWS) which is a cheap as well as easy to use solution for a segregation system for household use, so that it can be sent directly for processing. It is designed to sort the refuse into dry and wet waste. The AWS employs capacitive sensors to distinguish between wet and dry waste. Experimental results show that the segregation of waste into wet and dry waste has been successfully implemented using the AWS.

In [2] Waste management, both indoor and outdoor, is almost done manually. This is unhygienic, and requires significant amount of valuable human resource to get it done. Outdoor waste management is automated to an extent. Therefore, a proposal to fully automate indoor waste management, by making the existing disposal outlets more intelligent and using a movable waste collecting robot, is discussed in this paper. The filling of the dustbin is monitored by ultrasonic sensors and if it is filled to the brim, the Arduino Nano controller transmits the data to the robot with the aid of wireless Zig bee 802.15.4 protocol. The robot is designed in such a way that it effectively tracks the location of the filled dustbin and collects the waste in its storage part. The RSSI (Received Signal Strength Indicator) value from the message received is used to identify which dustbin is full and its location based on Wave Front Algorithm. In comparison with the existing systems, the proposed system exhibits appreciable efficiency in power consumption and making it an ideal candidate for waste management.

In [3] In last few decades garbage management has become a perilous matter in the developing country along with the rapid growth in the population and pollution. In most of the areas it is revealed that overflowed garbage bins are not emptied on time thus creating disease ridden environment and infirm countries. Collection of garbage in bins faces daily variation in quantity according to time as well. Waste picking vehicles of Municipal Corporation which are at fixed intervals has dwindling reliability and unmonitored collection system. The proposed model makes an IOT based smart garbage monitoring system which can detect the garbage level of the dustbin and via Wi-Fi and GSM the status and location of bins can be displayed on web server. This system will improve the coordination between the transportation process and garbage collection.

In [4] This research aimed to design and develop an autonomous robot to feasibly address waste disposal issues in common indoor places. The researchers found a path to

improve plan by using Fuzzy Logic Control (FLC). And also, they utilized the Microcontroller unit to control sound, input proximity and IR sensors, and output geared DC motors through machine learning and electromechanical interface. They simulated an adaptive algorithm using Mamdani-type FLC model, implemented this algorithm using C programming language, then downloaded as machine code to a real prototype. Based on test results, the waste robot accurately detects human involvement, a feature that would be pivotal in overcoming individual indifferences on waste management. This research chronicled how a waste management robot prototype was designed and developed as feasible solution to address waste disposal issues in strategic locations such as households, offices.

In [5] An Automated Waste Control Management System (AWCMS) has been designed which includes an electronic waste detection device and a central control unit. An infrared sensor is used for sensing waste levels, GPS is used for location identification, Arduino Board having a microcontroller and GSM Module is used for sending the message which contains the information regarding the status of the bin. The central control unit consists of a receiving device which receives a message through GSM Module and sends it to the computer software using Arduino Board's microcontroller. The software has a proficiently designed GUI which helps the user to perform and monitor all the required actions for waste monitoring and detection of waste bins placed in an area or a city. All the information is displayed in the GUI of the software in the event of a waste-bin getting full and then being emptied by municipal waste trucks or field workers. So that all the components in this entire system work in an efficient manner to make waste management automation possible so the waste is collected and disposed to the landfill at proper time.

In [6] This paper detects the wastes in the dustbins with the help of sensor devices and as soon as the waste is detected, it will be segregated and right away information is transferred to cloud via IOT. Microcontroller is used between the sensors and IOT module. Ultra-sonic sensor is used to detect the nearness of the waste material. The moisture sensor is used to analyze and report the moisture content in the waste, and if there is moisture content available then the waste cannot be put in the dustbin. Image processing algorithm is used to identify the plastics and degradable items and is separated to another separate sections. The dustbin data are uploaded to the cloud in real time.

3. GAPS IN LITERATURE SURVEY

In [1] The AWS employs capacitive sensors to distinguish between wet and dry waste. Capacitive sensors very much sensitive to changes in environment conditions such as temperature, humidity. And this sensor is not so accurate. This will affect the performances.

In [2] The Arduino Nano controller transmits the data to the robot with the aid of wireless Zig bee protocol, which is includes short range and low data speed. Replacement of Zig bee complaint appliances is costly. To identify which dustbin is full and its location Wave Front Algorithm is used which is time consuming and expensive and it is possible that two or more nodes have same value.

In [3] The status and location of bins can be displayed on web server that can site down because the server can be overwhelmed at times. By using IOT there is a huge risk of leakage data when sent over a network which can mix up two data. Due to the complex network, a single loophole can put the entire system down.

In [4] Fuzzy Logic Control (FLC) is used which requires lot of data to be applied. The accuracy depends on human knowledge and expertise and needs regular updates with time. They have utilized MCU that can't interface high power devices and it performs limited number of executions simultaneously.

In [5] In this paper human intervention still exists i.e., for segregating the collected garbage whether it is a wet or dry waste.

In [6] In this paper they have used Microcontroller which cannot perform many functions at the same time. The data is uploaded to the cloud which requires network to send files and to retrieve them. Image processing is used to detect wet or dry waste which is very costly and time consuming.

4. DESIGN METHODOLOGY

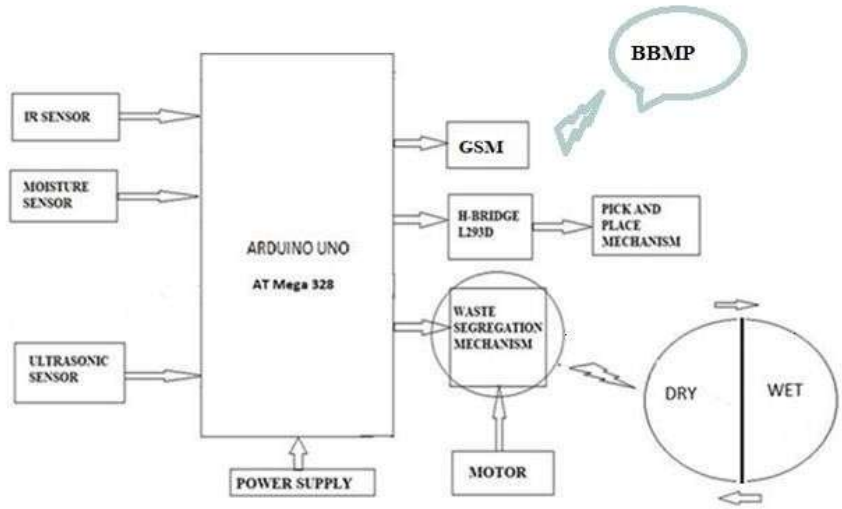

Fig -1: Block diagram of AWS

5. CONCLUSION

The above reviews give out different methods and strategies used for serving the purpose of waste management. Our project provides one of the most efficient ways to keep our environment clean and green. In this project we have tried to upgrade the trivial but vital component of the urban waste management system, i.e. dustbin.

REFERENCES

1. Amrutha Chandramohan, Joyal Mendonca, Nikhil Ravi Shankar, et al "Automated Waste Segregator" 2014 Texas Instruments India Educators' Conference (TIIEC).

2. Poorani Ravindhiran, Pradeep Gopal, Joseph Gladwin S, Rajavel R ". Automated Indoor Waste Management System Employing Wave Front Algorithm and Received Signal

3. Strength Indicator Values-based Mobile Robot" 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC).

4. Smita S Pawar, Shivani Pise, Kranti Walke, Renuka Mohite "Smart Garbage Monitoring System Using AVR Microcontroller" 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA)

5. Ralph Sherwin A. Corpuz, John Clifford R. Orquiza "Utilization of Fuzzy Logic Control in a Waste Robot" 2018 Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment and Management (HNICEM).

6. Agha Muhammad Furqan Durrani, Ateeq Ur Rehman2, Arslan Farooq, Jehangir Arshad

7. Meo et al "An Automated Waste Control Management System (AWCMS) by using Arduino" 2019 International Conference on Engineering and Emerging Technologies (ICEET).

8. Shamin N, P Mohamed Fathimal, Raghavendran R, et al "Smart Garbage Segregation & Management System Using Internet of Things (IOT) & Machine Learning (ML)" 2019 1st International Conference on Innovations in Information and Communication Technology (ICIICT).

9. Balagugan, Raja S Maheswaran T, Savitha S "Implementation of Automated Waste Segregator at Household Level" -IJIRSET 2017.

10. "Smart Garbage Monitoring and Clearance System using Internet of Things" S. Vinoth Kumar, A. Krishna Kumar and Mahantesh Mathapati, et al-2017 IEEE International Conference.

11. Shashika lokuliyana, Anuradha Jayakody, G.B.S Dabarera, et al "Location Based Garbage Management System with IOT for Smart city"- 2018 IEEE International Conference.

12. Jayashree Ghorpade-Aher, Anagha Wadkar, et al "Smart Dustbin: An efficient Garbage Management Approach for a Healthy Soceity"-2018 IEEE International Conference.