International journal of basic and applied research
www.pragatipublication.com
ISSN 2249-3352 (P) 2278-0505 (E)

AUTOMOTIC DRY & WET WASTE SEGREGATION SYSTEM BY USING SOIL SENSOR & IR SENSOR

K. MOUNIKA[1], CH. PRASANNA[2], M. KEERTHANA[3], T.SAGARIKA[4], M.ALEKHYA[5]

[1, 2, 3, 4,5] UG Scholars, Department of ECE, ***PRINCETON INSTITUTE OF ENGINEERING & TECHNOLOGY FOR WOMEN***, Hyderabad, Telangana, India.

[6] Associate Professor, Department of ECE, ***PRINCETON INSTITUTE OF ENGINEERING & TECHNOLOGY FOR WOMEN***, Hyderabad, Telangana, India.

ABSTRACT:

The uncollected waste material when the waste bin is full is a common problem nowadays. Thus, an efficient waste management for the waste material is essential in ensuring a clean and green surrounding environment. This paper presents an Internet of Things (IoT) based Smart Waste Collection Monitoring and Alert System to monitor the waste material at the selected site of garbage collection area. The system is implemented using an ultrasonic sensor which is connected to Arduino UNO as to monitor waste bin garbage level. In this system, waste bin depth level will be sent via Arduino Ethernet Shield with an Internet connection to the Ubidots IoT Cloud. The Ubidots store the collected waste bin level data into IoT database and display the waste bin depth level on online dashboard for real-time visualization. The Ubidots Event manager invokes a notification alert to garbage collector mobile phone via a SMS when the waste bin is nearly filled for immediate waste collection. Therefore, the waste collection became more effective and systematic.

Keywords: IOT , GSM, GPS, LCD.

1. INTRODUCTION:

At present, most of the cities around the world require challenging solutions for solid waste management, as there is rapid growth in residential areas and the economy. Municipal authorities have inadequate resources for waste management institutions to effectively collect the waste generated. It becomes an excessive wastage of resources when bins are collected that are filled up partially. The IoT based garbage monitoring system is a very innovative system which will help to keep the environment and cities clean. This system monitors the garbage bins throughout the city and informs about the level of garbage collected in the garbage bins to a person in the administrative department. For number of times we have seen that the dustbins are being overflown with the waste materials and the concern person don't have any information about it within the time, due to which unsanitary conditions are formed in the surroundings environment and living area. Bad smell is out due to waste in dustbin at the same time. Also, the bad look of the city which leads to air and environmental pollution and to some harmful infections and diseases around the locality which is spreadable easily. There are number of

unwanted manual checks of garbage bin's level by municipal corporations which is less effective and time consuming. Trucks are sent to empty the dustbins whether they are full or not. And the trucks need fuel which is costly. Several sensing methods have been integrated and have combined their verdicts that offer the detection of bin condition and its parameter measurement. Though results and developed algorithms are efficient for automatic bin status monitoring work lacks remote monitoring of bin. So, in this paper we have proposed system which can be deployed in general purpose dust bins placed at public places and which allows us to monitor its status remotely over web browser for efficient waste management. Due to drastic increase in economic and population growth in the nation there is huge development in the generation of the solid waste. Solid waste management is a main problem of surroundings in the whole globe. SWM is a huge problem not only in urban cities of India but in most of the nations in the globe. There is a requirement to evolve an effective system which will resolve this issue or decrease it to some level. It will support them to maintain their surroundings green and clean in an effective way. Today each government across the world is scheduling to construct smart cities or attempt to change the cities into smart cities. A smart city is a city which is constructed on smart integration of activities and endowments of independent, aware and self-decisive citizens. The solid waste collection in a smart city is an essential part for surroundings and its effect on society must be regarded seriously. By offering a whole internet of things based system the process of collecting, tracking and handling the solid waste can be monitored and automated easily and effectively(Chaudhari and Bhole, 2018; Ramesh et al, 2018; Sharma and Singh, 2018). Pokalekar et al (2018) has stated that internet of things can be described as a physical object networking with the use of embedded software and electronic sensors that permits the devices to receive and send information from each other. The internet of things carries out collection of data, sensing, storing data and processing by linking physical devices to internet. Surapaneni et al (2018) has stated that the municipal corporations are wholly liable for proper management of waste in their respective cities in the context of India. But most of the authorities are not satisfying their duty to offer effective ways of handling the waste generation at source, transporting, collecting and waste disposal. Because of this ineffective waste collection, the collected waste is always integrated with excreta of animals and humans in the drains and liable for roads flooding during rains, breeding of insects and lastly resulting in spreading various diseases. Dilip et al (2018) internet of things SWM system is a creative way which will support to maintain the cities clean. This system supervises the bins of garbage and informs about the garbage collected in dustbin through a web page. For this the system utilizes ultrasonic sensors placed on the top of dustbin to sense the level of garbage and comparing it with depth of garbage bins continuously (Nithish et al, 2019). This system makes use of LCD screen, ARM microcontroller, RF transmitter and GSM module for sending the information. The LCD display is utilized to show the garbage collected level in dustbins in percentage form. Sherly et al (2018) has stated that the solid waste management system is produced every day and by 2025 it would increase rapidly and hence effective method and decisions must be taken in order to handle the waste. Kumar et al (2016) have led a method of handling waste in a wellmannered way. The internet of things based alert system is used to produce the alarm signal to municipal officers. Arduino UNO is interlinked with ultrasonic sensor to evaluate the garbage level of dustbin (Anwar et al, 2018). RFID is used to identity and verify dustbin. Android application is connected with web server for interaction from municipal officer to nearby truck vehicle to collect the garbage (Pawar et al, 2018). Several solutions have been used for waste management to make it

efficient and smarter. Every waste bin is attached with ultrasonic sensor which predicts the level of waste of dustbin (Sharma et al, 2018). According to Ali et al (2018) the ultrasonic measures estimate the waste level by sending a sound wave at a particular frequency and listens the sound wave that is bounced (Rao et al, 2018). Moisture sensor predicts the waste content that is disposed into dustbin and segregates the waste stored relying on waste moisture content (Jadhao et al, 2018).

2. LITERATURE SURVEY

According to Patel and Patel (2016) Internet of things is defined as a network type to link anything with internet based on stipulated protocols through equipment's of information sensing to organize communication and information exchange to accomplish smart positioning, recognition, administration, tracing and monitoring.Levallois(2017) defined internet of things as an interlink of physical devices also known as smart devices and connected devices, construction and other items involved with software, electronics, actuators, network connectivity and sensors which develop these objects to exchange and collect data.

Arkko et al (2015) denotes internet of things as a trend where huge set of embedded tools use services of communication provided by the protocols of internet. Most of these devices always referred smart objects which are not operated by humans directly but occur as components in vehicles or buildings or are distributed in the surroundings.

Thaler et al (2015) defined internet of things as a worldwide infrastructure for information society developing advanced services by interlinking virtual and physical things based on evolving and existing interoperable ICT. Through the use of recognition, data processing, communication and capture capabilities the internet of things makes complete use of things to provide services to entire types of applications whilst assuring the privacy and security needs are satisfied. The internet of things can be understood as a vision with societal and technological suggestions.

According to GSM Association (2014) internet of things defines the use of intelligently linked systems and devices to leverage data collected by actuators and embedded sensors in machines and other physical devices. Internet of things is anticipated to spread rapidly in the upcoming years and this convergence will release new service dimension that develops customer's life quality and enterprises productivity. IEEE (2014) defines internet of things as an items network each involved with sensors which are linked to internet. Chebudie et al (2014) has mentioned that internet of things envisions a complex and self-designing network that interlinks things to internet through the use of standard protocols of communication. The interlinked things have virtual or physical representation in digital world, capability of actuation/sensing, and a feature of programmability and are identifiable distinctly. The representation comprises information involving the things status, identity, place or any other social, business and privately related data. The things provide services without or with intervention of humans through the use of distinct recognition, data communication capture and capability of actuation. The service is used through the use of intelligent interfaces and is made feasible anytime, anywhere and for anything considering security.

International journal of basic and applied research
www.pragatipublication.com
ISSN 2249-3352 (P) 2278-0505 (E)

Hung (2017) has defined the IoT as dedicated physical objects network that comprises embedded technique to sense and interact or communicate with their external environment and internal states. The link of processes, personnel and assets enhance the seizure of events and information from which a firm can learn usage and behaviour react with preventive measures or transform or augment processes of business. The internet of things is a basic capability for the making of digital business. In the report of EY (2016) the internet of things explains the link of devices to internet using embedded sensors and software to interact, exchange and gather information with one another. The globe is wide open with internet of things providing an endless number of opportunities widely and links at work, at play and at home. Madakam et al (2015) defined IoT as a comprehensive and open network of intelligent events that have the capability to organize automatically, share data, resources and information, acting and reacting in face of circumstances and alterations in the surroundings.

3. METHODOLOGY

In this project methodology model takes the fundamental process activities of Project Plan, specification, Analysis, hardware and software Design, development, validation and represents them as separate process phases. Now, let us see the particulars of the various blocks of the hardware of an garbage monitoring system. As shown in Fig. the blocks are:

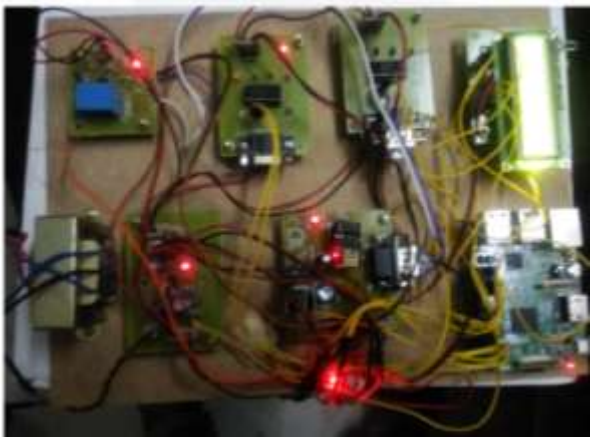

Fig.1. power supply connected.

International journal of basic and applied research
www.pragatipublication.com
ISSN 2249-3352 (P) 2278-0505 (E)

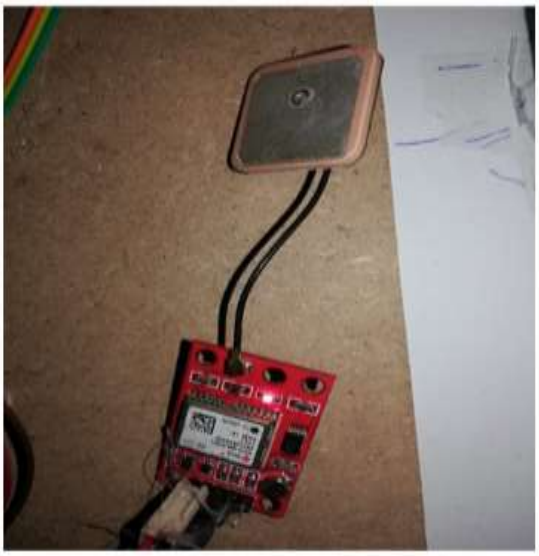

Fig.2. GPS module.

Here we are using WIFI module we get latitude and longitude values from predefined values in program.

Fig.3. Dust bins status.

OUTPUT RSULTS WITH LOCATION:

International journal of basic and applied research
www.pragatipublication.com
ISSN 2249-3352 (P) 2278-0505 (E)

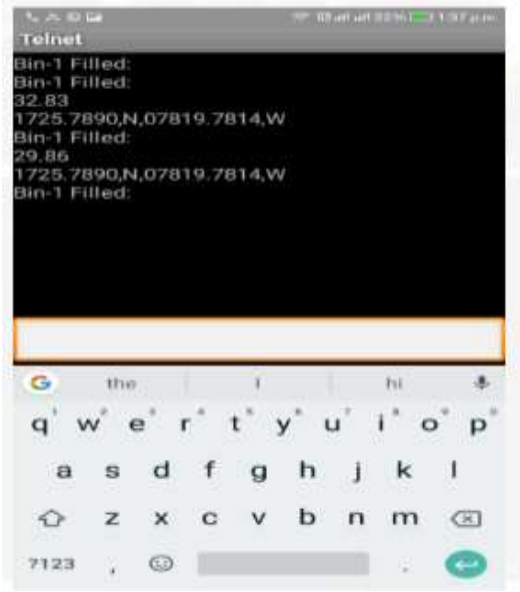

Fig.4. Out put results by using TELNET app.

CONCLUSION

In this project, we propose a new solution to enhance waste collection efficiently using the Arduino Uno with Arduino Ethernet Shield technology and ultrasonic sensor systems. In this proposed system, the garbage overflow of garbage can be avoided and managed efficiently. This will intimate or send SMS or email to the authorized person through Ubidots platform. The garbage managing system and the facility of collecting the garbage presently doesn't fit to the current requirement. Hence better facility of collecting garbage and transportation should be provided. Since, this system provides the information when the bin gets completely filled with garbage, it reduces the number of times the arrival of vehicle which collects the garbage. This method finally helps in keeping the environment clean. Thus, the waste collection is made more efficient.

FUTURE SCOPE:

In future may be use the Autodialed module used in GSM module to get the call in emergency cases. And to easily operated with help of web page. With GPS location and intimate to authority peoples.

REFERANCES

[1] X. Li, H. Wang, Y. Yu, and C. Qian, "An IoT data communication framework for authenticity and integrity," in *Proc. IEEE/ACM 2nd Int. Conf. Internet Things Design Implement. (IoTDI)*, Apr. 2017, pp. 159–170.

[2] *eHealth*. Accessed: Jan. 2019. [Online]. Available: http://www.who .int/topics/ehealth/en/

[3] World Health Organization. *MHealth: New Horizons for Health Through Mobile Technologies*. Accessed: Jan. 2019. [Online]. Available: http://www.who.int/goe/publications/goe_mhealth_web.pdf

[4] M. Gerla, E.-K. Lee, G. Pau, and U. Lee, "Internet of vehicles: From intelligent grid to autonomous cars and vehicular clouds," in *Proc. IEEE World Internet Things (WF-IoT)*, Mar. 2014, pp. 241–246.

[5] G. Wang *et al.*, "Verifiable smart packaging with passive RFID," *IEEE Trans. Mobile Comput.* to be published, doi: 10.1109/TMC.2018.2852637.

[6] *Nest*. Accessed: Jan. 2019. [Online]. Available: https://nest.com

[7] *HVAC Monitoring System*. Accessed: Jan. 2019. [Online]. Available: https://www.sensaphone.com/industries/hvac.php

[8] T. Gupta, R. P. Singh, A. Phanishayee, J. Jung, and R. Mahajan, "Bolt: Data management for connected homes," in *Proc. USENIX NSDI*, Apr. 2014, pp. 243–256.

[9] Y. Kim *et al.*, "Design of a fence surveillance system based on wireless sensor networks," in *Proc. 2nd Int. Conf. Autonomic Comput. Commun. Syst.*, Sep. 2008, pp. 23–25.

[10] A. J. Brush, J. Jung, R. Mahajan, and F. Martinez, "Digital neighborhood watch: Investigating the sharing of camera data amongst neighbors," in *Proc. Conf. Comput. Supported Cooperat. Work*, Feb. 2013, pp. 639–700.

[11] J. Scott *et al.*, "PreHeat: Controlling home heating using occupancy prediction," in *Proc. 13th Int. Conf. Ubiquitous Comput.*, Sep. 2011, pp. 281–291.