Smart Garbage System In Society Using IOT

Miss. Dipali A. Bajare, ME Student, Dept. of E&TC, Pune University, K. K. Wagh College of Engineering , Nasik, Maharashtra, India. bajaredipali94@gmail.com

Dr. S. S. Morade, Assistant Professor , Dept. of E&TC, Pune University, K. K. Wagh College of Engineering , Nasik, Maharashtra, India.

Abstract :- Now a days, many times it is witnessed that Dustbin are placed at public places in the cities are overflowing owing to the increase in the waste generation from various sectors like medical, domestic, industrial etc. the waste is in the form of wet as well as dry form. It leads to the unhygienic environmental condition for the people living in surrounding and creates bad odor in the surroundings. This gives rise to the spreading of harmful deadly diseases to the human which leads to their illness. To overcome such a harmful condition a system called "Smart Waste Management System using IoT" is developed. In this proposed system, dustbins are equipped with low cost embedded device which helps in tracking the level of the garbage bins. These garbage bins are identified by an unique identification code in order to have ease in their identification. The unique ID helps to detect which garbage bin is full. When the level reaches the threshold value, the device transmits the level information along with the unique ID. These details are accessed by the concerned authorities from their respective location via internet so that an immediate action is performed to empty dustbin. By adding wet and dry button in garbage chute control system one can identify the appropriate dustbin.

Keywords — *IOT(Internet Of Things), PIC Microcontroller, NODE MCU, Smart System.*

I. INTRODUCTION

The Automatic Waste Segregation is used to separate the trash into metallic, wet and dry type so as to recycle them separately. The proximity sensor gets activated while dumping the waste inside the and conveys the same to the Arduino. Waste slips over the slope and falls on the sensors. The sensors which are placed in the trash can detect whether the waste is metallic, wet or dry waste. For the nal segregation, DC geared motors are used. The motor changes a circular base with separate container for each waste and rotates according to the suitable wastes. For the garbage monitoring system, Ultrasonic Sensor is installed at of trash can and they measure the availability of space in the trash. If the space is less than this particular value, a message will be sent to the connected phone as 'Basket is full' with trash identity number so that it can be emptied by proper arrangements. NODE MCU ESP8266 is the wi-Fi module which is used to connect the arduino and shows the output in a BLYNK application which can be viewed in our smart phones. This kind of a project, if implemented on a large scale will help to maintain the cleanliness of the city.

II. OBJECTIVES

Worldwide significant Increase in municipal Solid waste generation is observed. This large solid waste is observed because of Population Growth Rate, Industrialization, Urbanization and economics Growth which have ultimately resulted in increased solid waste generation. Most urban Solid Waste in Indian cities and Towns is land filled and dumped. The project deals with the Most blistering topic means waste Segregation. An Efficacious Management needs to be materialized for better plant to live in. Hence, with our cost effective project proposal, we try to bring in the changes. It deals with the minimization of blue-collar method utilization for exclusion of waste into an automated panache. An Automation of this style not only saves the manual segregation of the numerous Health issues but also proves to be economical to the nation. Besides this system Utilizes low cost components for the successful components for the successful segregation of most types of waste. When installed in apartments or small colonies, it proves to be beneficial in sorting the waste at the site of disposal itself.

III. LITERATURE SURVEY

In Literature survey some different papers gives the idea or related information about existing work. In this paper system based on microcontroller bins were interfaced. Information related to garbage in the bins was given by the IR wireless sensor with the central system. The status signal was seen the mobile related the web browsers. Using the weight based sensor this system reduced the cost. This

sensor is only detected the weight of the waste available in bin but not the level of the chute[1]. The ultrasonic sensor is used to detect level of the garbage bins. The GUI developed and for the different location check the information related to garbage. Two units i.e. slave and master unit presents in this system. Master unit placed at the control room. The sensor will check the level of the chute and send to slave unit and also send the information to master unit. The proper authorized person will take the proper action[2]. This paper based on IoT. Aurdino uno board is used they interfaced with GSM modem and ultrasonic sensor. The sensor located on the top of the bin. The threshold value is set. This system provides the unhygienic condition for the people and maintains to clean the environment [3]. The microcontroller and interface between the sensor system and GPS system is used in this paper. To developed for desired information related to the various levels of chute in different places this system monitor and integrate an android application, They supported to the swatch Bharat mission [4]. NIR Near Infrared reflectance spectroscopy can identified the plastic. The chute bins placed needy the area. Dissenter materials used can be mix into the uniform material and this process is repeated every hours[5]. The paper suggested that, it first starts with an assumption that the smart city must include the IoT base. This system uses dynamic scheduling And based on the fact that the garbage will be collected only when it is fully filled or the maximum capacities of the dustbins are filled [8]. This paper sketch of the IoT with a stress on technology, application and protocol concern. system explains information about the differences between internet of things and developing technologies like as cloud computing and data analytics.[9]

A. Proposed Solution

In this system through a flab Garbage is press. To start the entire system An IR proximity sensor is detected. Metal detections system is dropped the waste to detect the metallic waste. To differentiate between wet and dry chute this module is used. For dry, wet and metallic waste a circular base containers is rotated. Once the container corresponding to the type of garbage is positioned under it the collapsible flap is lowered. The garbage containers sent for further processing after collected separately.

B. Innovativeness Of the proposed Solution

Where the level of the dust in garbage bin are detected the ultrasonic sensor also send the signal to PIC microcontroller And they are encoded the same signal And send to the application And it is received. Here we can used the buttons for the purpose of wet And dry garbage are selected.

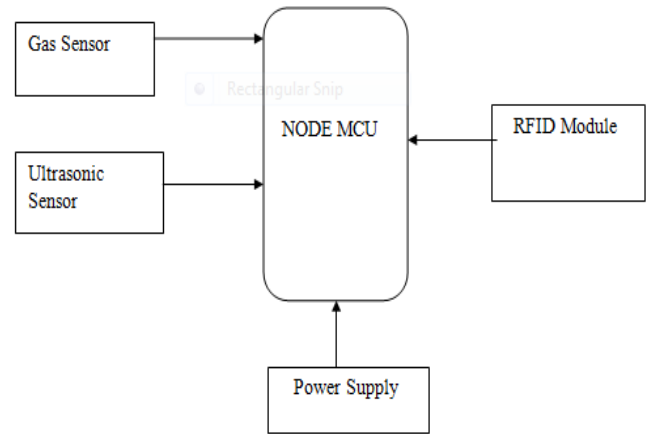## IV. ARCHITECTURE OF CHUTE CONTROL SYSTEM

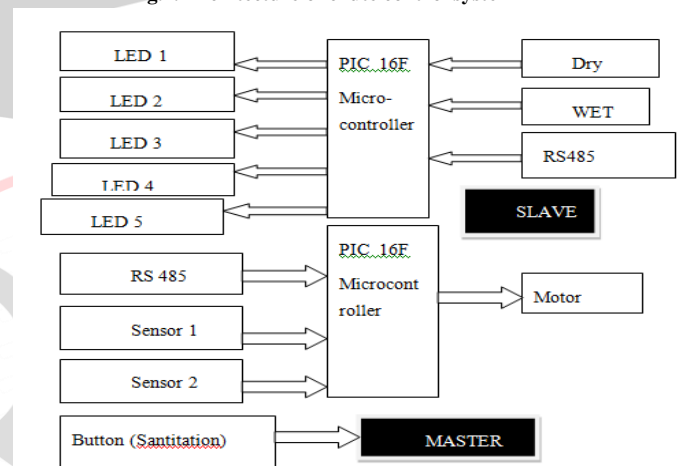**Fig.1. Architecture of chute control system**

Fig2. Architecture of RS485 Communication Between two Controller

Explanations of the Architecture

If user press Dry button , then signal given to master and master and master gives that signal to slave to open the Dry garbage door. That Dry garbage can drop into dry tank which is present below the machine there is a two tank present below the machine. Master decides on which side shaft should be move. Either on dry side or wet side and it gives/ send busy signal to other slave. Suppose user press wet button but actually He want to press Dry button in this condition system get damage. And signal give to user. For this purpose RS485 Communication is used. After that ultrasonic sensor sense Particular value reach and measure after this process signal is send or mail to proper Authorize person after that this signal is send to garbage collect people collect that garbage. After collection of all garbage their Attendance time send on RFID . it also mention that how much time garbage collected.

This system has many advantages such as there is deployment of the dustbin based on the actual needs. Another advantage of this system is reduction in cost and

resources optimization. This system eliminates unhygienic condition and bad odor. It improves the Improves the quality of environment human beings live in and some drawbacks due to the over flow of the waste in the dustbin such as Leads to unhygienic and odor environment which cause livelihood of the environment. It leads to because of this system there is More Traffic and Noise.

V. SOFTWARE DETAILS

The PIC 16F supported to the MPLAB software. MPLAB is the proprietary freeware. It is developed by the microchip technology. It is the integrated development environment for the development of embedded applications on PIC microcontrollers. Project management, code editing, debugging and programming of microchip 8 bit, 16bit and 32 bit PIC microcontroller are supporting to the MPLAB. Embedded c language is used for the MPLab and NODE MCU. The SMTP protocol is used to send the email.

VI. FLOW CHARTS OF SMART DUSTBIN IMPLEMENTATION

In this system the master is placed at the ground floor of the building near the dustbin. And each floor separately provided Slave. The master and slave communicated with each other by using the RS485. If the system is busy or ready then these signal is given to other slave and also gives indication i.e. LED is glow.
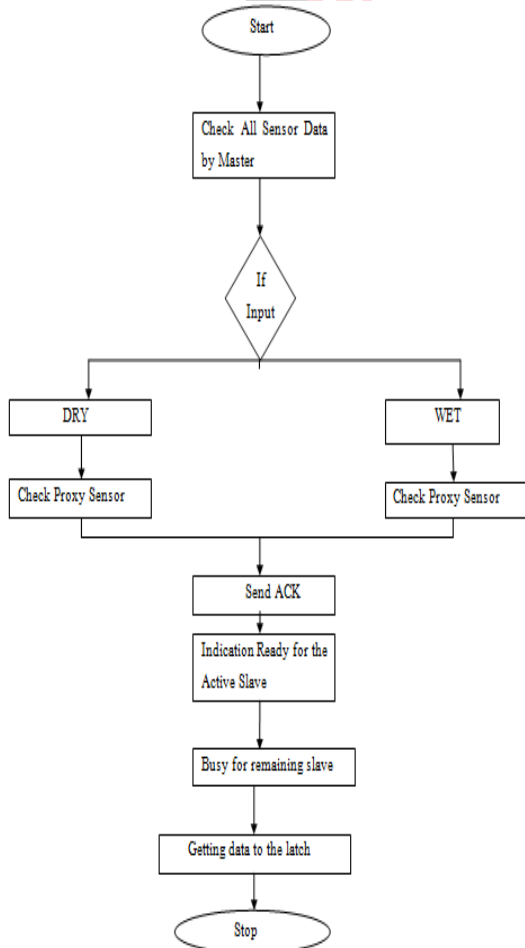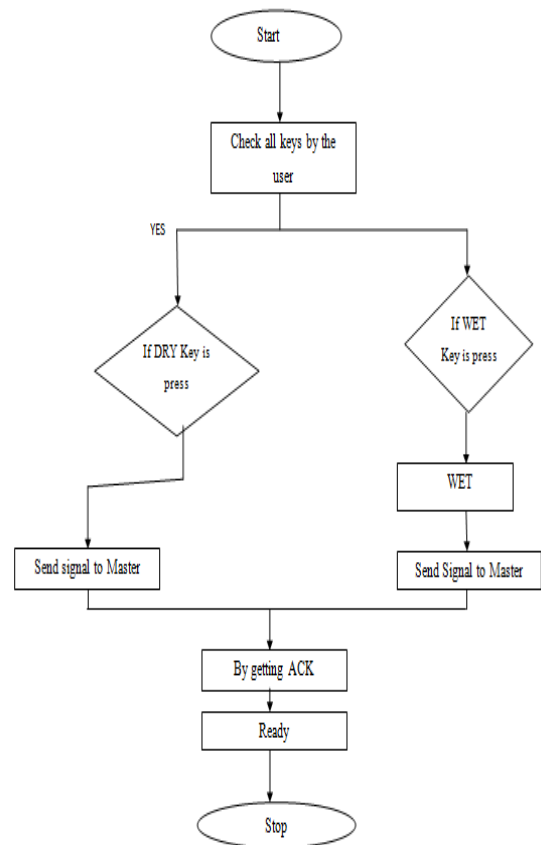

Fig.3. Flow chart of Master

Fig.4. Flow chart of Slave

If the user press the dry button then this signal pass to the master and master identified which type of input is given. The input is dry then the motor shaft is move and put the garbage into proper dustbin. If one user used this system then the another user send the busy signal or suppose the garbage bins are full then the dry and wet buttons are deactivate.

VI.1. Comparison between the Existing system and Proposed system

Proposed System	Existing system
RS485 is used for the communication purpose.	In this system do not use the RS485. Wi-Fi module is used.
This system avoids the manual segregation and garbage collected people can safely collected the garbage.	Some of the system the garbage collected people separate out the dry or wet garbage. Sometimes deadly diseases are spread.
Reduce the environmental pollutions.	Reduced the environmental pollutions.
This system useful for the more floors of the buildings.	Not useful for the more floors of the buildings.

This system is affordable for the users or saves the time, money, fuel and reduced the human efforts.	Costly. This system also saves the time, fuel.

Table 1. Analysis of the existing and proposed system

VII. APPLICATIONS

- Empowered Swatch Bharat mission

- E-governance based on digital India

- Reduce environmental pollution.

- Real Time Based cleaning ur cities.

VIII. RESULTS

Fig.5. shows the experimental set up of the smart dustbin implementation. In this implementation present the RFID module, ultrasonic sensor , NODE MCU. Master and Slave interfaced to the pic microcontroller.
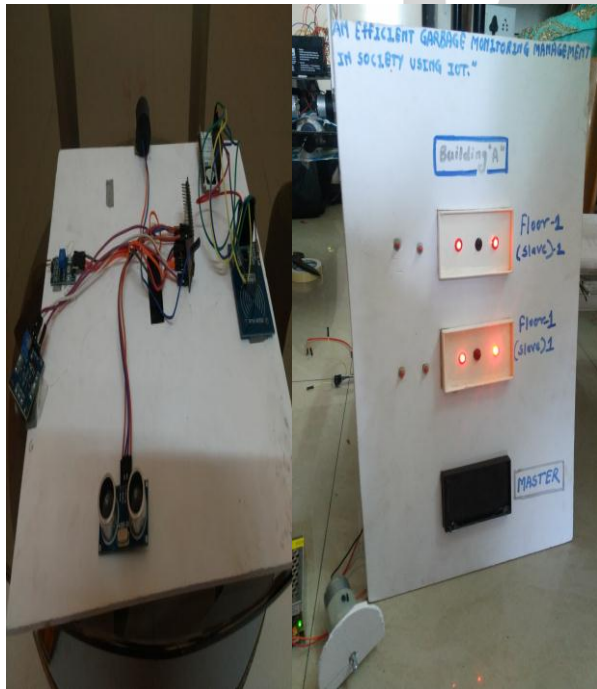

Fig.5. Experimental Setup

The fig 6. Shows the Information about the garbage send via email . When the sensor sense the particular level reached by the garbage in dustbin an email will be send to the proper Authorized person. Also, the RFID will detect the data about name, date, time of the respective person who collects the garbage and accordingly the mail will be send to Authorized person.
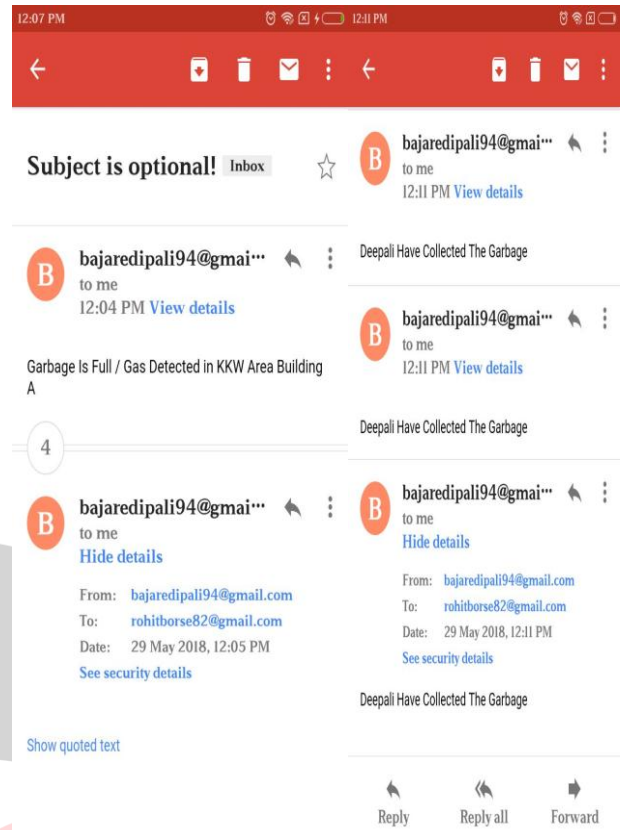

Fig.6. Information related to garbage send via E-mail

CONCLUSION

Various features such as durability, affordability, prevention against damage and maintenance issues are addressed when these smart dustbins are designed. This Smart Dustbin cans con-tribute a lot towards clean and hygienic environment in building a smart city. The targeted waste collection save times, money, and fuel and also reduce the human efforts. This system which will help to keep the cities clean and its makes our system transparent between public's workers and Municipal Corporation. This project is the cost effective. This system is helpful for the Buildings, Schools, and Industry etc. This system avoids the Manual segregation.

In future if wet waste gets mixed with dry waste by mistake by someone, then the sensor technology will detect accordingly and the signal will be provided to the authorized person for the same so that corrective action could be taken. As also, If dustbin is full then wet and dry button deactivate and send the voice message to the user. For future, purpose an automated system can be developed which can pick up waste in and around of the bin, segregate them and put them in respective bins.

REFERENCES

[1] Navghane s s, killedar M S and Rohokale D V, "IoT based Smart Garbage Waste Collection Bin" *International Journal of advanced research in electronics and communication Engineering* ,51576-78, 2016

[2] Kasliwal Manasi H and Suryawanshi smithkumar B A Novel approach to "Garbage Management using Internet of things for Smart Cities" *International Journal of current trends in Engineering and Research,*2 348-53, June 2016

[3] Monika k A, Rao N,prapulla S B and Shobha G "Smart Dustbin an Efficient Garbage Monitoring System" *International Journal of Engineering science and computing 71133-16, 2016*

[4] S. vinoth kumar 1, T. senthi kumaran" Smart garbage monitoring and clearance system using internet of things" *IEEE ,International Conference on Smart technology and management ,August 2017.*

 [5] Palaghat Sai," IOT Smart Garbage Monitoring System", *Computer Engineering Dept, TSSM'S BSCOER, Narhe, Pune, India, Vol. 5, Issue 1, January 2017.*

[6] Islam, M.S. Arebey, M. ; Hannan, M.A. ; Basri, H," Overview for solid waste bin monitoring and collection system" *Innovation Management and Technology Research (ICIMTR),International,Conference,Malacca,*
258{262},2012.

[7] M. Al-Maaded, N. K. Madi, Ramazan Kahraman,A. Hodzic, N. G. Ozerkan , "An Overview of Solid Waste Management and Plastic Recycling in Qatar", *Springer Journal of Polymers and the Environment, March 2012,Volume 20, Issue 1, pp 186-194.*

[8] TheodorosAnagnostopoulos, Arkady Zaslavsky, Alexey Medvedev, "IRobust Waste collection exploiting Cost Efficiency of IoT potentiality in smart Cities ", *IEEE April-2015.*

 [9] KristynaRybova, Jan Slavik," Smart cities and ageing population – Implications for waste management in the ceech Republic"- *IEEE 2016.*