Smart System for Waste Management Using GPRS

K. M. Kalpana[1], D. Sinivasulu[2]

M. Tech Student[1], Professor[2]

[1&2]Department of Embedded Systems, Sri Venkateshwara College of Engineering, Tirupati, India

ABSTRACT

Internet of Things (IOT) is a smart and makes technology to incorporate in each and every thing and even in small things too. It links smart objects to the internet. Life is made simpler and more productive through IOT.

In the existing system, garbage bins are manually cleaned that means an authorized person need to check whether the bins are filled or not daily so it needs human effort to check every time. Monitoring and cleaning of wastes in time is one of the primary issues in the cities. In the proposed system we made a smart system to automated this process. Here we are using ultrasonic sensors which are fixed over the dustbins. These sensors continuously calculates the level of the dustbin that is filled. This live data is sent to ARM7 processor. ARM7 will process the data and send to the cloud server through GPRS. The user can access the data through an URL provided to them and plan according to that which bin needs to be cleaned and automatically certain action will be taken to clean the bins.

Index Terms – GPRS, Ultrasonic sensor, LCD, IOT.

I. INTRODUCTION

Now a days the concept of cleanliness becomes very crucial in these times. Dispose of waste at public places and incorrect way of disposing wastes may cause serious effects like health issues and also can cause different types of pollution that may severely affect the environment thus by creating health issues which can't be treated. In countries like India where population increases rapidly we need very efficient waste management system. Disposal of waste increases as population increases and thus it can severely affect the health of lot of people

Waste means any material either solid, liquid, semisolid, containing gas or other forms resulting from industrial, commercial, mining or agricultural operations or from community and household activities that is devoid of usage and discarded.So to solve this issue our PM Narendra modi proposed swatch bharath. So we are contributing our technological knowledge to reduce the effects that is caused by incorrect way of disposal of waste.

Here IOT technology plays an important role in this project where we are uploading the filled status of the bin continuously to server through GPRS. Here we

are using ultrasonic sensors to detect the status of the bins.

II. EXISTING SYSTEM

In traditional systems we monitor the status of bins manually and later in previous system we check whether garbage filled or not using pressure sensor, microcontroller and GSM module. By using pressure sensor we check only the bin is filled and it sends a message to associated person only if that bin is filled. Here we are not checking the level of the bins which may results in overflow of the garbage before associated person cleans.

III. PROPOSED SYSTEM

In proposed system we are using GSM module for continuously uploading the filled status of the dustbins in server. We are using ultrasonic sensors for checking the filled status of the dustbin. Ultrasonic sensors used here are continuously monitoring the filled level of the dustbin and send status of dustbins to ARM7 processor and this processes the information according to our requirement and it uploads the status of the bins in server continuously so that any user can check the status of the bins just by using URL link
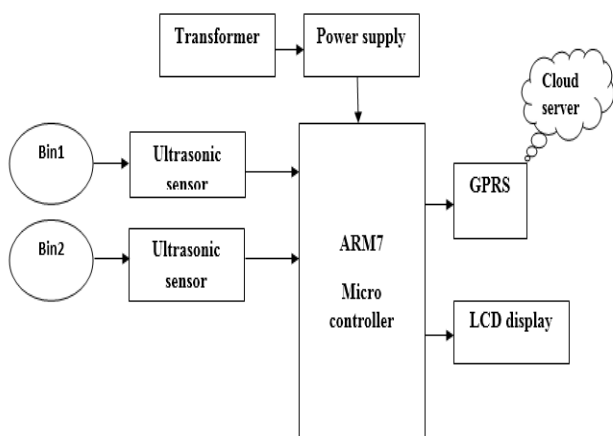
Block diagram of the project

3.1. Power supply

The power supply is an electronic device which supplies power to all electronic devices based on our requirement.

3.1.1 Transformers: Transformer is an electrical device which transforms electrical energy from one level to other level and also transfers energy from one circuit to another circuit. It works on the principle of electromagnetic induction. Transformers are divided into two types based on energy levels it transformed.
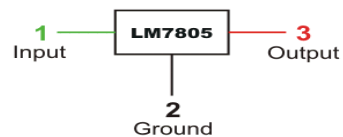

Figure 2: Transformer

3.1.2Rectifier: It is an electronic device which is used to converts the AC power into the pulsating DC power.

3.1.3. Capacitors: Capacitors are used as filters in power supply section. It is used to remove the remaining AC component if any in the output of the rectifier.

3.1.4 Voltage regulators: Voltage regulators give the stabilized output and there are two types of the regulators are available in the market. Those are 78XX and 79XX series in that 78 for positive voltage and 79 for negative voltage.

3.2 Ultrasonic sensor: ultrasonic sensor uses ultrasonic wave emission principle for detecting objects and also it can measure the distance of the objects from where it is located. So it is used in our project to detect the filled status of the dustbin. It works on the principle of

ultrasonic   waves
emission

3.3 ARM7

PROCESSOR:

The ARM (Advanced RISC Machine have different features as well as the different core for very large range of applications. The first ARM architecture design has 26-bit processors, but now it reached to 64-bit processors. The ASK 16/32-bit ARM7TDMI-S microcontroller training board is very specifically designed to help students to meet their required skills in the area of embedded systems. It is possible to design the kit in such way that all the Important Features of the microcontroller will be completely used by the students.

3.4 LCD Display: it is used to display data. It is an electronic device which displays our required data. Generally there are two types of LCDS: 16 * 2 and 20 *4. We can use anyone of them based on our application.

It operates in modes in displaying characters: 4 bit mode and 8 bit mode. But most preferable is 4 bit mode as it saves the pins interfaced with LCD thereby giving chance to interface more modules

3.5 software requirements:
3.5.1 keil IDE: it is an open source platform to write codes for ARM7 using embedded c

4. RESULTS AND DISCUSSION
4.1 Working of project:

This project is very efficient to use in urban cities, Smart cities as it can reduce the human efforts for waste management and also it can provides perfect information about status of the bins so that people can clean that waste within time without causing them to overflow to keep the city clean. So by doing this we are using ultrasonic sensors to check the filled status of the dustbin and we are using ARM processor to process this information and also to upload the information from sensors in server through GSM.

4.2 Applications

➢ It can be used in smart cities
➢ Can be used in urban areas
➢ Can be used in any areas where waste management is very difficult

4.3 Advantages:
The proposed system has been thought of because it has following advantages.
➢ More compatible
➢ Provides hygienic surroundings
➢ Reduces pollution
➢ Prevents many health issues

IV. CONCLUSION & FUTURE SCOPE

CONCLUSION

This project works on the basis of Ultrasonic sensor, controller and GPRS. Ultrasonic sensor will continuously monitors the level of the dustbins. It is introduced for economic and efficient garbage collection. By implementing this project we can avoid the overflowing of trash bins in residential areas which will prevent many diseases and hence we can maintain a clean environment. And also no of need of human to check the status of dustbin by going near to dustbin. Instead of this we can easily check the status of the dustbin in server by just using an URL provided.

FUTURE SCOPE

This project can be enhanced in future by applying or using WLAN connections. So that we can minimize the effects that are caused by GSM like network problem. So by using WLAN technologies we can manage through a long range wide area.

V. REFERENCES

[1]. Navghane S.S., Killedar M.S., RohokaleDr.V.M, IoT Based Smart Garbage and Waste Collection Bin, International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) 5(5) (2016).

[2]. Sahu R.M., AkshayGodase, PramodShinde, ReshmaShinde Garbage and Street Light Monitoring System Using Internet of Things, International Journal Of Innovative Research In Electrical, Electronics, Instrumentation And Control Engineering 4(4) (2016).

[3]. GaikwadPrajakta, JadhavKalyani, MachaleSnehal, Smart Garbage Collection System In Resedential Area, International Journal of Research in Engineering and Technology 04(03) (2015).

[4]. Tapase R.B., AshwiniMohite, TruptiKadam, Puja Deshmukh, Intelligent Monirtoring System For Garbage Waste Bins Using Arduino, International Journal of Research in Engineering and Technology 05(12) (2016).

[5]. Tarandeep Singh, Rita Mahajan, Deepak Bagai, Smart Waste Management using Wireless Sensor Network, International Journal of Innovative Research in Computer and Communication Engineering 4(6) (2016).

[6]. Mahar, A., Malik, R.N., Qadir, A., Ahmed,T., Khan, Z., and Khan, M.A., (2007),"Review and analysis of current solid waste management situation in urban areasof Pakistan", In # &'$&# (pp. 34-41).

[7]. Rajput "Scenario of Solid WasteManagement," IEEE Journal on Emergingand Selected Topics in Circuits and Systems, vol. 3, no. 1, pp. 45–54, 2009.

[8]. Yadav I.C and Devi N.L (2009). Studies onMunicipal Solid Waste Management inMysore City- A case study. Report and Opinion, 1 (3), 15-21.

[9]. Shivayoginath, "M2M-based metropolitanplatform for IMS-enabled road trafficmanagement in IoT," IEEECommunications Magazine, vol. 49,no.11, pp. 50-57, 2007.