IOT BASED GARBAGE MANAGEMENT SYSTEM

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Abstract- *In the present day scenario, many times we see that the garbage bins or dustbin areat public places in the cities are over flowing due to increase in the waste every day. It creates unhygienic condition for the people and creates bad smell around thesurrounding which causes deadly diseases and human illness, to avoidsuch a situation we are planning to design IoT Based garbage Management for SmartCities. In this proposed System there are multiple dustbins located throughout thecity or the Campus, these dustbins are provided with low cost embedded device whichhelps in tracking the level of the garbage bins and an unique ID will be provided forevery dust bin in the city so that it is easy to identify which garbage bin is full. Whenthe level reaches the threshold limit, the device will transmit the level along with theunique ID provided. These details can be accessed by the concern authorities fromtheir place with the help of Internet and an immediate action can be made to cleanthe dustbin.System is proposed in this paper.This isan advanced method in which waste management is automated.*

Keywords- Ultrasonic Sensor, Wi-Fi Module, Voltage Regulator, LCD Display, AT Mega 328 Microcontroller, Power Supply ,IOT .

I. INTRODUCTION

Garbage Monitoring System: - Garbage may consist of the unwanted materialleft over from City, Public area, Society, College, home etc. This project is relatedto the Smart City and based on Internet of Things(IOT). So for smart lifestyle,cleanliness is needed, and cleanliness is begins with Garbage Bin. This project willhelp to eradicate or minimize the garbage disposal problem. The Internet of Things(IoT) is a recent communication paradigm that envisions near future, in which theobjects of everyday life will be equipped with microcontrollers, transceivers for digitalcommunication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the InternetThis project IOT Garbage Monitoring system is a very innovative system whichwill help to keep the cities clean. This system monitors the garbage bins and informsthe level of garbage collected in the garbage bins via a web page. For this thesystem uses ultrasonic sensors placed over the bins to detect the garbage level andcompare it

with the garbage bins depth. This system makes use of microcontroller,LCD screen, Wi-Fi modem for sending data and a buzzer. The system is powered bya 12V supply. The LCD screen is used to display the status of the level of garbagecollected in the bins.Whereas a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the garbage bins and highlights the garbage collectedin   color in order to show the level of garbage collected. The LCD screen showsthe status of the garbage level. The system puts on the buzzer when the level ofgarbage collected crosses the set limit. Thus this system helps to keep the city clean.

II. LITERATURE SURVEY

This is not an original idea, for the implementation of smart garbage bin; the idea has existed for many years, After the IoT field finding its grip in our lives. This is, however an original plan for designing smart garbage bin with weight sensor, IR sensor and Wi-Fi module for transmission of data.

[1]. A State of the Art review on Internet of Things by P. Suresh, Vijay. Daniel, R.H. Aswathy, Dr. V. Parthasarathy. It gave the idea of IoT subject and addition details about IoT. The proper smart environment and various applications. ISSN: 2278 – 909X International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 5, Issue 5, May 2016

[2]Internet of Things: Challenges and state-of-theart solutions in Internet-scale Sensor Information Management and Mobile analytics by Arkady Zaslavsky, Dimitrios Georgakopoulos. This paper gave us the details about mobile analysis and sensor information management that will help in data segregation of various dustbins.

[3]City Garbage collection indicator using RF(Zigbee) and GSM technology. This paper gave the details for the module required for the transmission of the data to the receiver side and also the main channel follow of the project. Initially we used GSM technology for our project but later on decided to us Wi-Fi module for the ease of data transmission.

[4]Smart Garbage Management System by Vikrant Bhor, Pankaj Morajkar, Maheshwar Gurav, Dishant Pandya. It provided us with additional details and designs needed for flow and management of garbage while collection

[5]IoT-Based Smart Garbage System for efficient food waste management by Insung Hong, Sunghoi Park, Beomseok Lee, Jaekeun Lee, Daebeom Jeong, Sehyun Park. This paper gave the overview working of the IoT based smart garbage bin and the food management.

III. PROPOSED SYSTEM

Considering the need of modern technology the smart garbage bin can expensive but considering the amount of dustbin needed in India, expensive garbage bin would not be a prior experiment that is why we have decide to use based sensors to reduce its cost and also make it efficient in applications.

SYSTEM ARCHITECTURE:

COMPONENT USED:

1.POWER SUPPLY:

We use 12v power supply in our project. It is mainly used to provide DC voltageto the components on board. 3.3V for lpc2138 and 4.2v for Wi-Fi module isapply from power supply. 5V is required for relay applied from power supply.

2. ATMEGA 328 Microcontroller (AVR Family):

The high-performance Microchip 8-bit AVR RISC-based micro controller combines 32KB ISP ash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose workingregisters, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serialinterface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFPand QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operatesbetween 1.8-5.5 volts.

3 .Wi-Fi Module ESP 8266:

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and micro controller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems. The chip first came to the attention of western makers inThe

ESP8285 is anESP8266 with 1 MiB of built-in ash, allowing for single-chip devices capableof connecting to Wi-Fi.

4. Ultrasonic Sensor:

The Ultrasonic Sensor sends out a high-frequency sound pulse and then timeshow long it takes for the echo of the sound to reflect back. The sensor has2 openings on its front. One opening transmits ultrasonic waves, (like a tinyspeaker), the other receives them, (like a tiny microphone).

5. IC LM7805 Voltage Regulator:

7805 is a voltage regulator integrated circuit. It is a member of 78xx series offixed linear voltage regulator ICs. The voltage source in a circuit may havefluctuations and would not give the fixed voltage output. The voltage regulatorIC maintains the output voltage at a constant value.

6. Online Sms Module:

Online SMS messaging is a legacy description for application-to-person SMSmessaging services. It refers specifically to the sending of large number of SMSmessages to the mobile phones of a predetermined group of recipients.A defining characteristic of bulk SMS messaging is that businesses and organization can make use of one or more solutions to send and receive SMS messages.

7 .16X2 LCD:

LCD (Liquid Crystal Display) screen is an electronic display module and find awide range of applications. A 16x2 LCD display is very basic module and is verycommonly used in various devices and circuits. These modules are preferred overseven segments and other multi segment LEDs. A 16x2LCD means it can display 16 characters per line and there are 2 such lines.
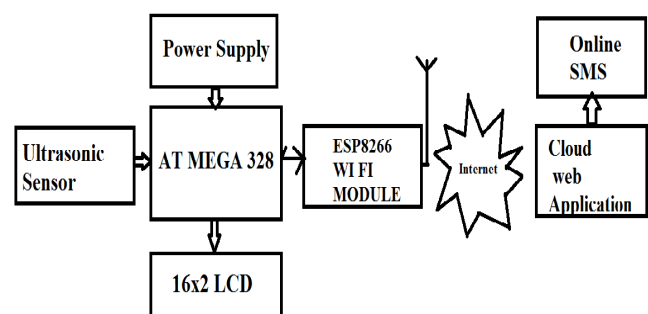
IV. BLOCK DIAGRAM

Figure: Block Diagram of Garbage Management System

V. METHODOLOGY

Whenever the waste is dumped into the dustbin theultrasonic sensor will sense the level of the dustbin and send that data to theserver, server will collect all the data and store it in database. If the dustbingets full the sensor will gives an alert signal, then that signal is forwarded to thewaste collectors. This alert includes the dustbin location, level of the dustbinand the shortest path from the location of bin to the dumping area. The wastecollectors will collect the waste from that bin and follow the optimal path to thedumping area. This system will helpful for the person who collects the waste,by collecting the waste in sequential path other than collecting in rounds androunds. In the first step for the user provided the username and password for the registration on android application. After the registration user have to Login on that application. When the user login on that application display screen show the level of the dustbin to the user also if the dustbin is the full it will show the nearest dustbin location as per GPS module for android mobile . 1. User Registration. 2. User Login. 3. Success. 4. Information show user and send to the user garbage collector, Municipal office. 5. Update the information on the server. 6. After the updating the information will be show to user on that application.

VI. APPLICATIONS

a) Waste level detection inside the garbage bins .Transmission of informationis wirelessely to concern officials.
b) System can be accessed anytime and from anywhere.
c) Real time data transmission and access.
d) Avoid the overflow of garbage bins.
e) Using this system reduction in transportation cost can minimized.
f) It can also help in government project of SWACHH BHARAT ABHIYAN.

VII. ADVANTAGES

a) By implementing this system the cost reduction, resource optimizationeffective usage of smart dustbins can be done.
b) Traditional garbage collection system is changed into a smart and intelligent system.
c) Saves huge time, reduce human eorts .also it is user friendly system.
d) Monitor trucks to dynamic routes.

VIII. LIMITATIONS

a) Ensuring the ultrasonic distance sensor is correctly place. If the pile ofdump increased in the middle the sensor could be giving misleading data.
b) There could be liquid or water thrown into the bin. The design needs tohave water proof electronics and embedded software.
c) The issue availability of 3G or 4G cellular networks .The fact that we madea model at home bypassed this issue as we used Wi-Fi.
d) This project can only use by municipal authorities or other private firmsto tackle the current problem of urban waste collection.

IX. FUTURESCOPE

a) While dealing with more number of dustbins in city level we can use videoprocessing which will improve the reliability of circuit. Also we can addGPS modem which helps to track the position of dust bin.
b) We can create new application also for garbage monitoring which willshow overview of dustbins. Combination of IOT platform with other autonomous andintelligent system for providing smart and widespread application is one of the most interesting future trends.
c) Android application to alert nearest employee Use air quality sensors foridentification of foul smells based on anomalies to predict cleanup schedule.
d) Moisture sensor to detect moist or water also Gas sensors to detect toxic gases

X. CONCLUSION

This implementation of Smart Garbage Collection System using IoT, assuresthe cleaning of dustbins soon when the garbage level reaches its maximum.This system also helps to monitor the fake reports and hence can reduce thecorruption in the overall management system. This reduces the total numberof trips of garbage collection vehicle and hence reduces the overall expenditureassociated with the garbage collection. It is ultimately helps to keep cleanlinessin the society. This is quite a significant project in its originality and concept.We are using Internet of Things theory which gives this project its uniquenessabout the concept. The project aims at cleanliness of the areas where trashbins are located and the very basic management that it contains with itanothervery important aspect of our project is the web portal that is designed in sucha way that operators and citizens both will need it user friendly to monitor thegarbage information. Hence, all in all, an IOT Concept based software projectwith electronic devices used, is the one that will be a great service

to the worldand make it a better place to live in, to some extent.

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