

**Smart Dustbin overflows Indicator using IOT**Vishesh Kumar Kurre<sup>1</sup>, Swati Sharma<sup>2</sup><sup>1</sup>M.TechScholar, Electronic and communication, Kalinga University, Raipur, Chhattisgarh, India<sup>2</sup>Assistant Professor, Electronic and communication, Kalinga University, Raipur, Chhattisgarh, India

**Abstract** —we see that many our city garbage bins or dustbins placed at public places are overflowing. It creates unhygienic conditions for people. Also it creates ugliness to that place. At the same time bad smell is also spread. This is very big problem to our environment and our health. To avoid all such situations we are going to implement at Smart dustbin overflow indicator using IOT (Internet of Things) technology. In this Paper we are going to place a sensor (Infrared sensor / proximity sensor) under the dustbin. This dustbin provides Deferent level of dustbin status, when the sensor signal reaches to the Maximum value, a mail notification will be sent to the respective Municipal / Government authority person. We can also see the density of the Dustbin through internet on a Dashboard, dashboard provide the authenticate person will easy check the present condition of the dustbin. So then that person can send the collection vehicle to collect the full garbage bins or dustbins.

**Keywords-** Smart Dustbin, Internet, Raspberry Pi, Digital Dustbin, Internet of things.

**I. INTRODUCTION**

The Internet of Things (IOT) is a concept in which surrounding objects are connected through wired and wireless networks without user intervention. In the field of IOT, the objects communicate and exchange information to provide advanced intelligent services for users. Owing to the recent advances in mobile devices equipped with various sensors and communication modules, together with communication network technologies such as Wi-Fi and LTE.

The Internet of Things is a new concept. Internet of things has gradually changed our life, by influencing Monitoring system, enterprise production, storage and transportation, express, supermarket shopping, etc. By using Internet of things technology in the supply chain, enterprise can optimize the structure and process of supply chain management system, improve the information transmission speed and things matching accuracy, and improve the operation mode of supply chain. The paper constructs a supply chain simulation system based on Internet of things. Firstly we analyze the process of the simulation system, and then introduce key techniques of simulation platform and main functions of the system.

This system is work with help of internet .In the dustbin we placed the level Detector sensor this detect the level of garbage. When the dustbin is full the notification sends to the IOT system. This portal is Automatic controlled by the internet. Also Show the status of the Smart Dustbins of dashboard. Smart Dustbinsplaced at many locations in the city can be efficiently and effectively monitored. This is proved the information or status to authorized person through the Email and Dashboard.

**II. METHODOLOGY**

The methodology of the system is work with the different level is following:

**1)IR Sensor**

An Infrared (IR) sensor is used to detect object or garbage to the configuration of the sensor. An IR sensor consists of an emitter, detector and associated circuitry. The circuit required to make an IR sensor consists of two parts; the emitter circuit and the receiver circuit.

The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, its resistance and correspondingly, its output voltage, change in proportion to the magnitude of the IR light received. This is the underlying principle of working of the IR sensor. This circuit connected in LM 358 comparator IC .this comparator circuit is compare the output voltage and the reference voltage. It gives the two conditions High and Low Its high when any object is came in front sensor otherwise it low

This principal is used in the dustbin for detection of garbage in various level like empty,quarter, half, 3/4 and full.

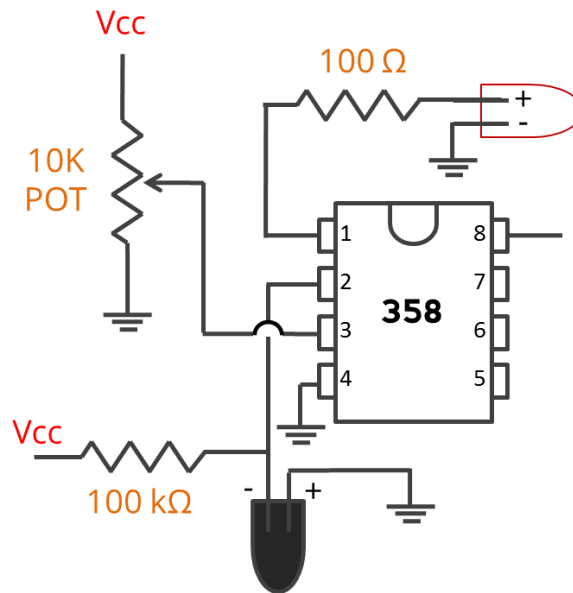


Fig: 2.1 IR Receiver & Transmitter

## 2) Raspberry Pi board

The Raspberry Pi hardware has evolved through several versions that feature variations in memory capacity, and peripheral device support. It helps to connected through the internet. Raspberry Pi is as small as the size of a credit card; it works as if a normal computer at a relatively low price. This is very good module to operate the many factures.

- Software –OS is installed like Linux
- USB – Usb port used to connect keyboard, mouse etc.
- General Purpose I/O – GPIO are used to connect the sensor or any other circuit.
- Video – HDMI or (digital) DVI via cheap adaptor/cable
- Networking –it is used through LAN or Wireless system
- Processor and Memory – it support ARM microcontroller

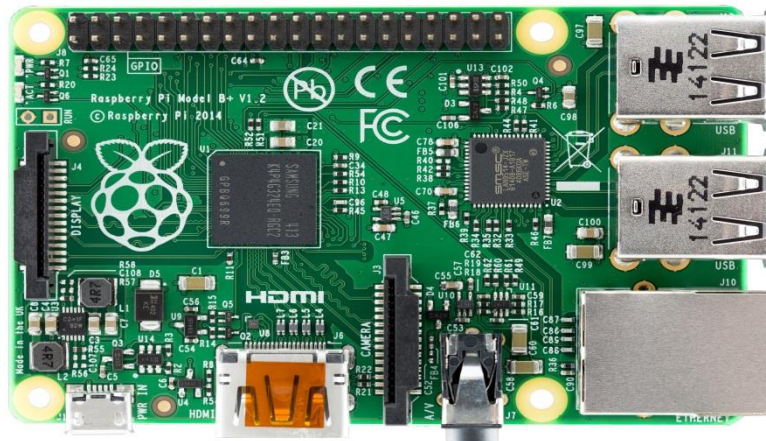


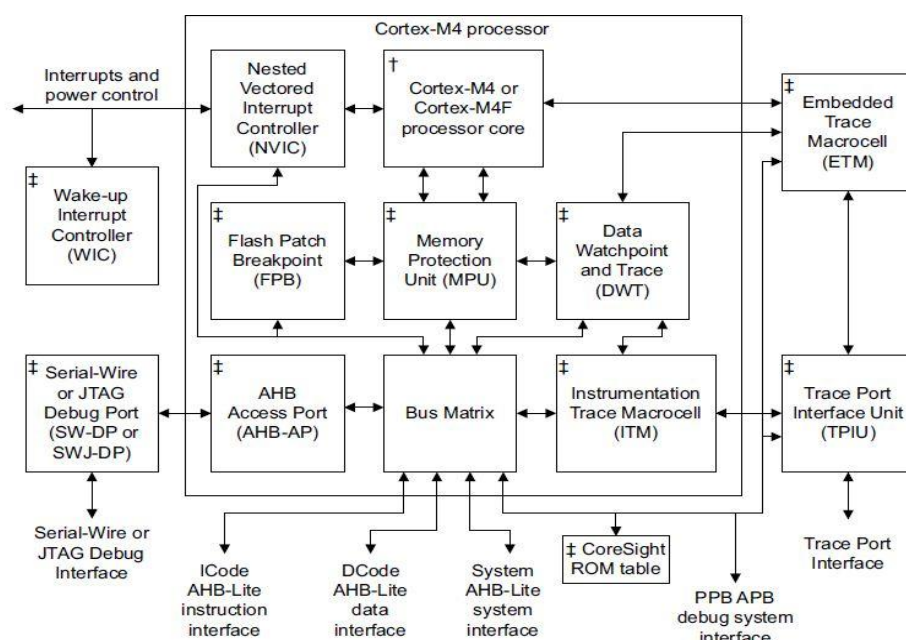
Fig -2.2: Raspberry Pi

### 3) ARM CORTEX M4

ARM microcontroller used to reads the data from the dustbin sensor and process the data received from dustbin sensor, and the same data send to the Central system.

The Cortex-M4 processor is a low-power processor that features low gate count, low interrupt latency, and low-cost debug. The Cortex-M4F is a processor with the same capability as the Cortex-M4 processor, and includes floating point arithmetic functionality (Floating Point Unit). Both processors are intended for deeply embedded applications that require fast interrupt response features.

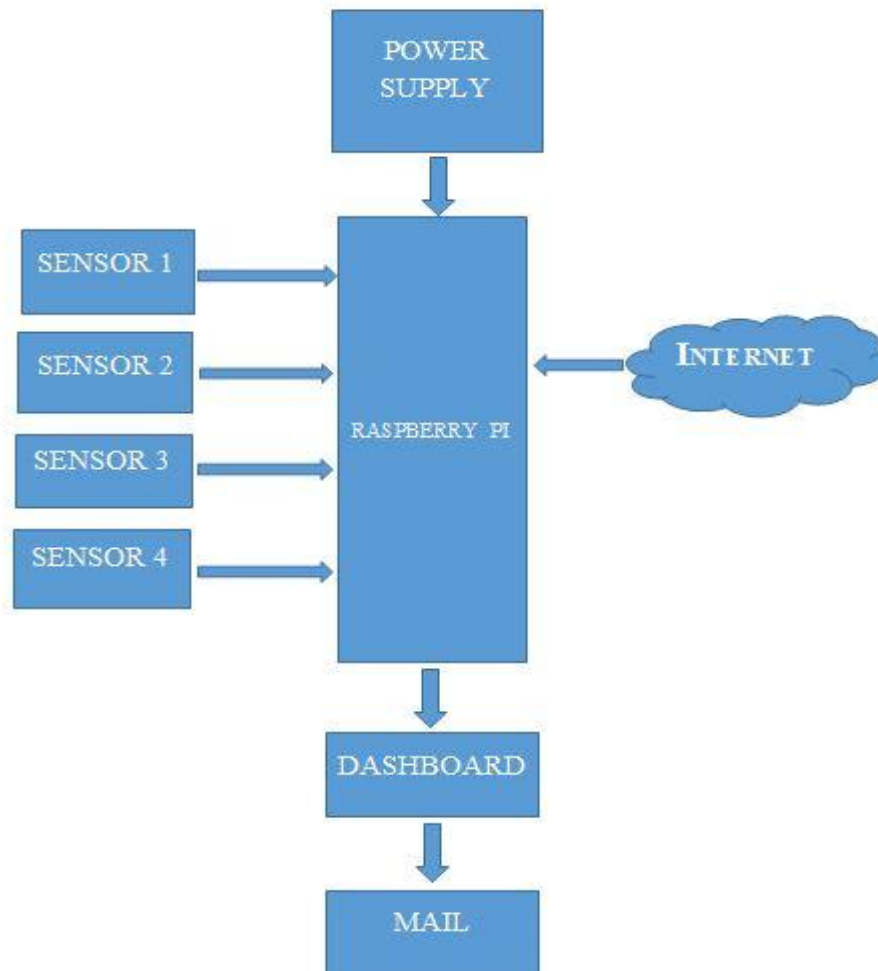
- Gain the advantages of a microcontroller with integrated DSP, SIMD, and MAC instructions that simplify overall system design, software development and debug.
- Accelerate single precision floating point math operations up to 10x over the equivalent integer software library with the optional floating point unit (FPU) .
- Develop solutions for a large variety of markets with a full-featured ARMv7-M instruction set that has been proven across a broad set of embedded applications
- Achieve exceptional 32-bit performance with low dynamic power, delivering leading system energy efficiency due to integrated software controlled sleep modes, extensive clock gating and optional state retention.



#### 4) DASHBOARD

In this project Dashboard is used to show the status of dustbin it proved the different level of garbage in the dustbin. the dashboard is using sever throw the internet. dashboard is like a GUI system to location of dustbin. It is also send the email or mail to the respective person.

### III. BLOCK DIAGRAM



### IV. CONCLUSION

This implementation of smart garbage Bin indicator receptacle, gives a solution for unsanitary environmental condition in a city. This implementation of Smart Garbage collection bin using internet, IR sensor, and raspberry pi. This system assures to send mail notification and status on dashboard of dustbins when the garbage level reaches its maximum. If the dustbin is not cleaned in specific time, then the record is sent to the higher authority who can take appropriate action against the concerned contractor.

This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. It ultimate helps to keep cleanness in the society. Therefore, the smart garbage management system makes the garbage collection more efficient the use of solar panels in such systems may reduce the energy consumption. Such systems are vulnerable to plundering of components in the system in different ways which needs to be worked on.

These dust bin model can be applied to any of the smart cities around the world. A waste collecting and monitoring team which is deployed for collection of garbage from the city can be guided in a well manner for collection.

## REFERENCES

- [1] Vikrant Bhor, Pankaj Morajkar, Maheshwar Gurav, Dishant Pandya “Smart Garbage Management System” International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Vol. 4 Issue 03, March-2015
- [2] Adil Bashir, Shoaib Amin Banday “ Concept, Design and Implementation of Automatic Waste Management System” International Journal on Recent and Innovation Trends in Computing and Communication ISSN 2321 – 8169 Volume: 1 Issue: 7, JULY 2013
- [3] Narayan Sharma, Nirman Singha, Tanmoy Dutta “Smart Bin Implementation for Smart Cities” International Journal of Scientific & Engineering Research, Volume 6, Issue 9, September-2015 ISSN 2229-5518
- [4] Viswanath Naik., S.Pushpa Bai, Rajesh., Mallikarjuna Naik. “IOT BASED GREEN HOUSE MONITORING SYSTEM” Viswanath Naik.S Volume 6, Issue 6, June (2015), pp. 45-47Article Id: 40120150606006 International Journal of Electronics and Communication Engineering & Technology (IJECET)
- [5] Abhinandan Jain, Dilip Kumar, Jyoti Kedia “Smart and Intelligent GSM based Automatic Meter Reading System”International Journal of Engineering Research & Technology (IJERT) Vol. 1 Issue 3, May – 2012 ISSN: 2278-0181
- [6] A. Ohri and P.K. Singh. “Development of decision support system for municipal solid waste management in India: A review.” International Journal of Environmental Sciences. 1(4), pp. 440-453, 2010.