

Smart Dustbin using IOT Notifications

Amaan Ahmed¹ Nazifa Ahmedi² Mahesh Pal³ Rajnish Pandey⁴ Mr. Kashif Shaikh⁵

^{1,2,3,4,5}Department of Computer Engineering

^{1,2,3,4,5}Thakur Polytechnic, Mumbai, Maharashtra, India

Abstract— The idea is incredibly simple and is driven by the very fact that the dustbin requires very frequent cleaning which isn't always possible. In our city again and again we see that the rubbish bins or dustbins placed at public places are overflowing. It creates unhygienic conditions for people. It successively results in various hazards like bad odour and ugliness thereto place which can be the foundation cause for spread of assorted diseases. To avoid this entire hazardous scenario and maintain public cleanliness and health this work is mounted on a sensible garbage system. The most aim is to accommodate more and obtain the dustbin cleaned frequently using alert service. The technologies which will be utilized in this project are IOT, web page, GPS module, WIFI module, TCP/IP protocol stack, etc. which will enable the authorities to look at and monitor the status of the bins within the particular areas. This can be effective in such the simplest way that the desired levels of garbage will alert them to initiate and bear the method of emptying the rubbish bins so as to possess a correct waste management system and a clean environment.

Keywords: Smart Dustbin, IOT, Integrated Development Environment (IDE)

I. INTRODUCTION

The universal truth is that wastage of anything is harmful for the society. the last word have to be compelled to developing nation is that the key for “smart city” the influential ecological factor this could include hazardous pollution, effects on human health so Internet of things (IOT) Provides new opportunities for creating cities smarter by introducing the smart waste management system, we are taking key step towards becoming a wise city we've few garbage bins placed in cites which is overflowing and it checked by local authorities there are every kind of garbage all disposed in bins and it all dumped together. So we designed the new concept of waste management disposal using automatic garbage level detecting from ultrasonic sensor and it'll provide real time information about dustbin which is situated city. The rubbish bin is filled this information is send to the concerned authority person to scrub the dustbin for real time information, we use GSM. GSM is now back bone of communication system which is low cost and high performance device and straightforward to implementation. GSM module gives message signal when the dustbin is 70% filled and also the compressor will compress the rubbish. The most target of this project is to avoid wasting time, money, and fuel and also reduces exhaust gas emission.

II. LITERATURE REVIEW

The idea of smart garbage bins and systems are in discussion for quite and very long time. The technologies used at disposal to develop this smart system have also evolved, Internet of Things (IOT). Each idea seems to be similar but is slightly different at its core and our proposed work is not any exception from a similar. After the IOT field, finding its hold

in our lives, this is often our original plan for designing a wise trash collection system which has provision for citizen participation and analysis of knowledge for better deciding. At hardware level, the smart system may be a garbage bin with ultrasonic sensor, a micro-controller and Wi-Fi module for transmission of knowledge. The worldwide implementation of Internet of Things is feasible with a Cloud centric vision. This work exploits the long run possibilities, key technologies and application that are likely to drive IoT research. But a robust foundation to our work is provided, where the fundamentals and applications of Arduino board is explained. it's quite interesting because it implements a GAYT (Get As You Throw) system concept as some way to encourage recycling among citizens. As we might discuss further, the citizen participation a part of our system is kind of influenced by their work. There are numerous public dustbin out there that individuals use and are emptied in an exceedingly few days by the general public authorities. Now the matter isn't all dustbins are filled at a similar rate and therefore the dump vehicle waste time checking each and each dustbin. This ends up in more fuel usage, labour and value. The answer may be a smart dustbin. IOT of smart dustbin can solve this issue by tracking the quantity of garbage inside the bins and thus may be easily geo tagged and therefore the dump vehicle can plan its path round the city in an exceedingly more optimized thanks to save time and fuel cost. The dump vehicle can decide which smart dustbins to clear first and whom to clear next time. This could be a wise city project. The project involved an Arduino Nano with ESP8266 to speak to the net and an Ultrasonic sensor to live the depth of the rubbish within the smart dustbin. The system updates the server every 3 seconds and therefore the user can track the amount of garbage within the bins.

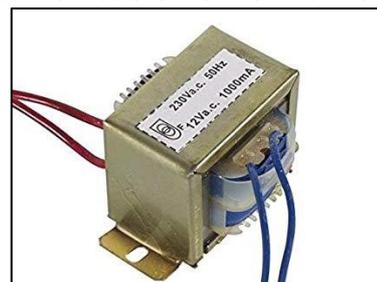
III. REQUIREMENT ANALYSIS

Before we proceed to the working and execution of the project it is necessary for us to know about the resources that are to be used to build the project:

A. Hardware Requirement

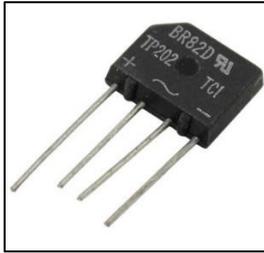
1) Transformer:

A transformer may be a passive device that transfers power from one circuit to at least one or more circuits.



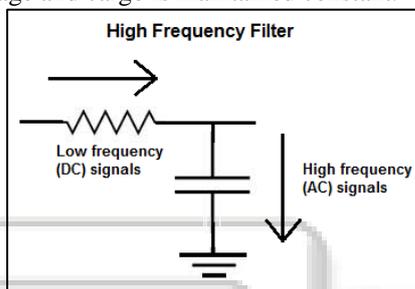
2) *Bridge Rectifier:*

A rectifier is an device that converts AC (AC), which periodically reverses direction, to direct current(DC), current that flows in there one direction, a process called rectification. It converts A.C. into pulsating D.C.



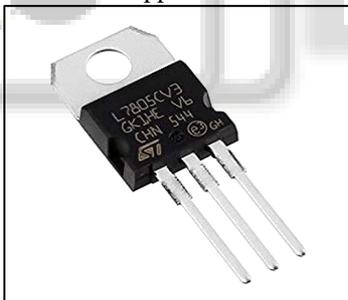
3) *Filter:*

Capacitive filter is employed during this project. It removes the ripples from the output of rectifier and smoothenes the D.C. Output received from this filter is constant until the mains voltage and cargo is maintained constant.



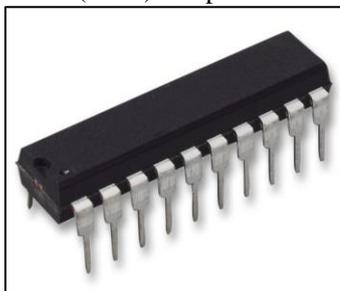
4) *Voltage Regulator (7805):*

The LM78XX/LM78XXA series of three-terminal positive regulators are available within the TO-220/D-PAK package and with several fixed output voltages, making them useful during a wide selection of applications.



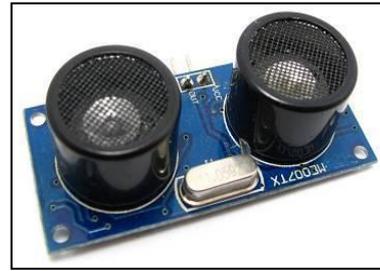
5) *Microcontroller:*

A microcontroller may be a small computer on one metal-oxide-semiconductor (MOS) computer circuit chip.



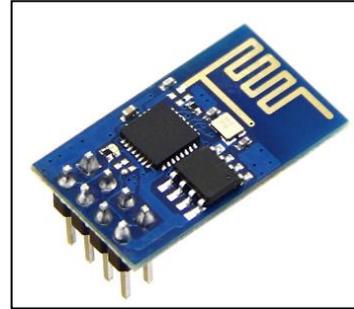
6) *Ultrasonic Sensors:*

Ultrasonic sensors are accustomed detect the presence of targets and to live the gap to targets in many automated factories and process plants.



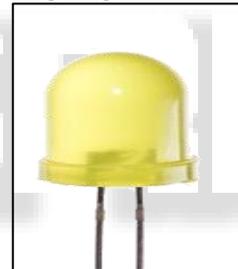
7) *WiFi Module:*

The ESP8266 Wi-Fi Module may be a self-contained SOC with integrated TCP/IP protocol stack that may give any microcontroller access to your Wi-Fi network.



8) *LED:*

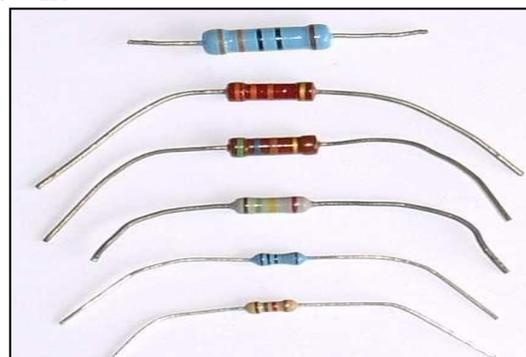
A semiconductor diode (LED) may be a semiconductor light. LEDs are used as indicator lamps in many devices, and are increasingly used for lighting.



9) *Resistor:*

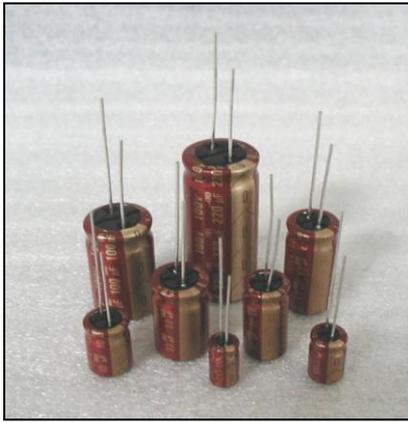
A resistor may be a two-terminal electronic component designed to oppose an electrical current by producing a dip between its terminals in proportion to the present, that is, in accordance with Ohm's law:

$$\text{law: } V = IR$$



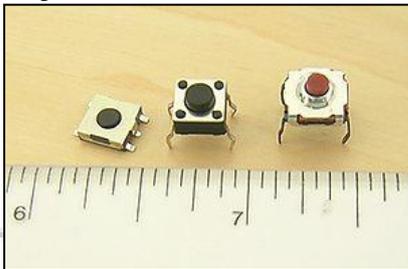
10) *Capacitor:*

A capacitor or condenser may be a passive electronic component consisting of a pair of conductors separated by a dielectric.



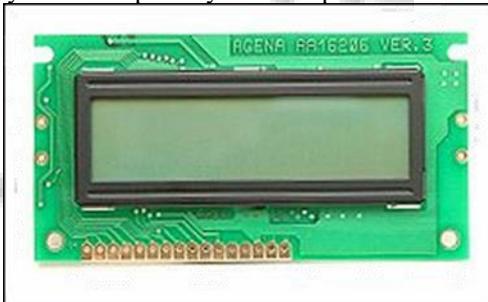
11) *Push Button:*

A push-button (also spelled pushbutton) or just button may be a simple switch mechanism for controlling some aspect of a machine or a process.



12) *LCD:*

liquid Display may be a form of flat panel display which uses liquid crystals in its primary kind of operation.



13) *GPS Module:*

Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth.

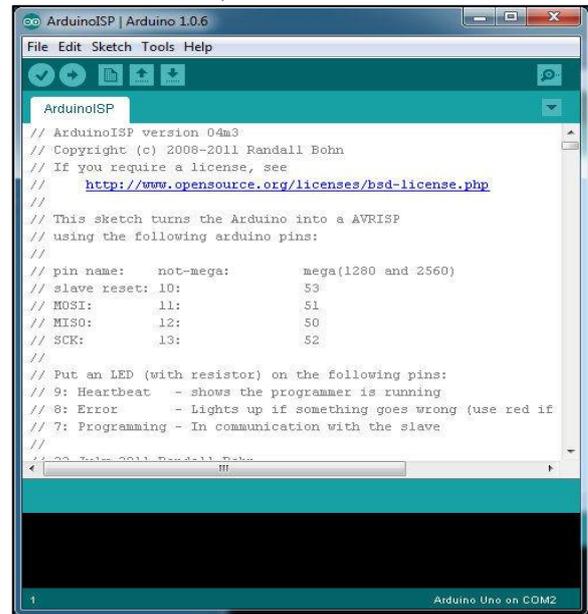


B. *Software Requirement*

1) *Arduino Compiler:*

The Arduino Integrated Development Environment (IDE) could be a cross platform application (for Windows, macOS,

Linux) that's written in functions from C and C++. The ASCII text file for the IDE is released under the GNU General Public License, version 2.



2) *IOT Gecko:*

IOT Gecko offers the biggest platform to control and develop internet of things-based systems with ease. Monitor and control the physical world using the net interface on IOT Gecko.



3) *MC programming language embedded C:*

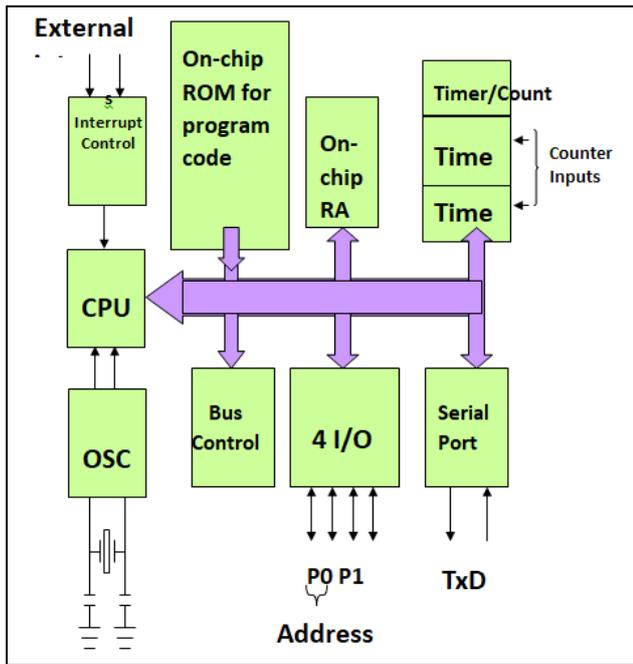
C could be a general-purpose, procedural programming language supporting structured programming, lexical variable scope, and recursion, while a static type system prevents unintended operations.

IV. PROPOSED WORK

This part comprises of the look, architecture and dealing of the proposed model.

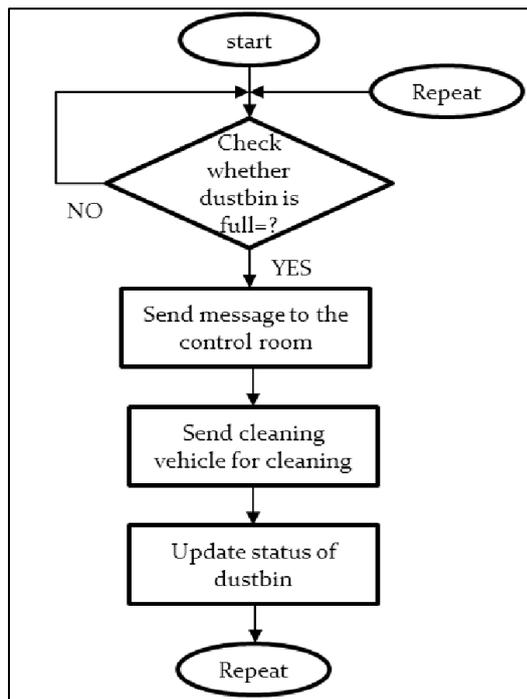
A. *Design:*

The following design represents the concept of integration and collaboration of components and their connections



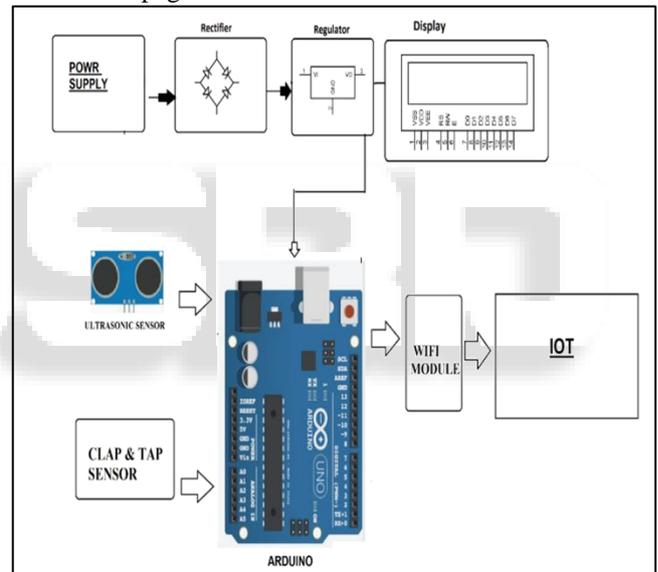
B. Work Flow:

The project uses an ultrasonic sensor module comprising of 1 transmitter and 1 receiver. The transmitter can deliver 40 KHz ultrasonic sound while the utmost receiver is meant to just accept only 40 KHz sound waves. The receiver ultrasonic sensor that's kept next to the transmitter shall thus be ready to receive reflected 40 KHz, once the module faces any obstacle ahead. Thus whenever any obstacles come sooner than the ultrasonic module it calculates the time taken from sending the signals to receiving them since time and distance are related for sound waves passing through air medium at 343.2m/sec. Upon receiving the signal MC program while executed displays the info i.e. the gap measured on a 16X2 LCD interfaced to the microcontroller in cms.



C. Implementation:

This project IOT Garbage Monitoring system could be a very innovative system which can help to stay the cities clean. This technique monitors the rubbish bins and informs about the amount of garbage collected within the garbage bins via an internet page. For this the system uses ultrasonic sensors placed over the bins to detect the rubbish level and compare it with the rubbish bins depth. The system makes use of AVR family microcontroller, LCD screen, Wi-Fi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is employed to display the status of the amount of garbage collected within the bins. Whereas an internet page is made to point out the status to the user monitoring it. The net page gives a graphical view of the rubbish bins and highlights the rubbish collected in colourise order to point out the amount of garbage collected. The LCD screen shows the status of the rubbish level. The system puts on the buzzer when the amount of garbage collected crosses the set limit. Thus this technique helps to stay the town clean by informing about the rubbish levels of the bins by providing graphical image of the bins via an internet web page.



V. RESULTS AND CONCLUSION

We have implemented real time waste management system called Smart Dustbin using Arduino to ascertain the fill level of smart container whether the dustbin are full or not. During this system the knowledge of all smart dustbins are often accessed from anywhere and anytime by the priority person and he/she can take a choice accordingly. By implementing this proposed system the value reduction, resource optimization, effective usage of smart dustbins are often done.

VI. FUTURE SCOPE

The Smart Dustbin Notification Project aims at developing a wise alert system for garbage clearance by giving an alert signal to the municipal web server for fast cleaning of dust bin with proper verification supported level of garbage filling. An Android application is developed and linked to an internet server to intimate the alert form the micro-controller

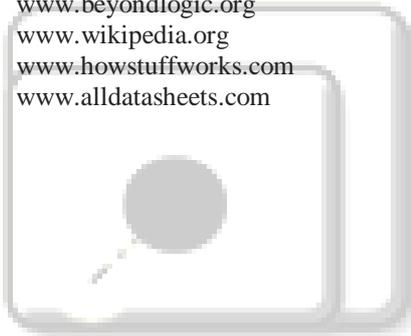
to the urban office and to perform the remote monitoring of the cleaning process, done by the workers, thereby reducing the manual process of monitoring and verification. The notifications are sent to the Android application using Wi-Fi module.

ACKNOWLEDGEMENT

We the members of Group who have worked hard within the Capstone Project Planning project would love to thank our mentor Mr. Kashif Shaikh and Ms. Vaishali Rane (Head of Department) for giving us the opportunities to present this project before you. We made the project named “Smart Dustbin” successfully by using various programming tools and languages like C, Arduino Compiler and also by the assistance of varied sources of data we successfully completed the project within the given schedule time and also our subject guide helped us to create this project an awfully successful project.

REFERENCES

- [1] www.programmer2programmer.net
- [2] www.readymadeproject.com
- [3] <http://ajprofessionals.googlepages.com/>
- [4] www.atmel.com
- [5] www.beyondlogic.org
- [6] www.wikipedia.org
- [7] www.howstuffworks.com
- [8] www.alldatasheets.com



IJSRD