GARBAGE MONITERING USING INTERNET OF THING (IOT)

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ABSTARCT

[Nowadays certain actions are taken to improve the level of cleanliness in the country. People are getting more active in doing all the things possible to clean their surroundings. Various movements are also started by the government to increase cleanliness. We will try to build a system which will notify the corporations to empty the bin on time. In this system, we will put a sensor on top of the garbage bin which will detect the total level of garbage inside it according to the total size of the bin. When the garbage will reach the maximum level, a notification will be sent to the corporation's office, then the employees can take further actions to empty the bin. This system will help in cleaning the city in a better way. By using this system people do not have to check all the systems manually but they will get a notification when the bin will get filled.]

KEYWORDS: [IoT, Electronic sensor, Arduino uno, Data transmission, Blynk Application]

INTRODUCTION

IoT or Internet Things refers to the network of connected physical objects that can communicate and exchange data among themselves without the desideratum of any human intervention. It has been formally defined as an "Infrastructure of Information Society" because IoT sanctions us to amass information from all kind of mediums such as humans, animals, conveyances, kitchen appliances. Thus, any object in the physical world which can be provided with an IP address to enable data transmission over a network can be made part of IoT system by embedding them with electronic hardware such as sensors, software and

networking gear. The IoT network consists of embedded electronics, sensors and software that allows these devices to send and receive data among each other. This is why it is beneficial to use such an existing infrastructure for designing the proposed security system. As dustbin is considered as a basic need to maintain the level of cleanliness in the city, so it is very important to clean all the dustbins as soon as they get filled. We will use ultrasonic sensors for this system. The sensor will be placed on top of bin which will help in sending the information to the office that the level of garbage has reached its maximum level. After this the bin should be emptied as soon as possible.

COMPONENTS OF THE PROJECT

1.ARDUINO UNO

Arduino is an open source, PC paraphernalia and programming organization, endeavour, and
client group that plans and produce microcontroller packs for constructing programmed devices and intelligent object that can detect and control questions in the real world. The inception of the Arduino extend began at the Interaction Design Institute in Ivrea, Italy.
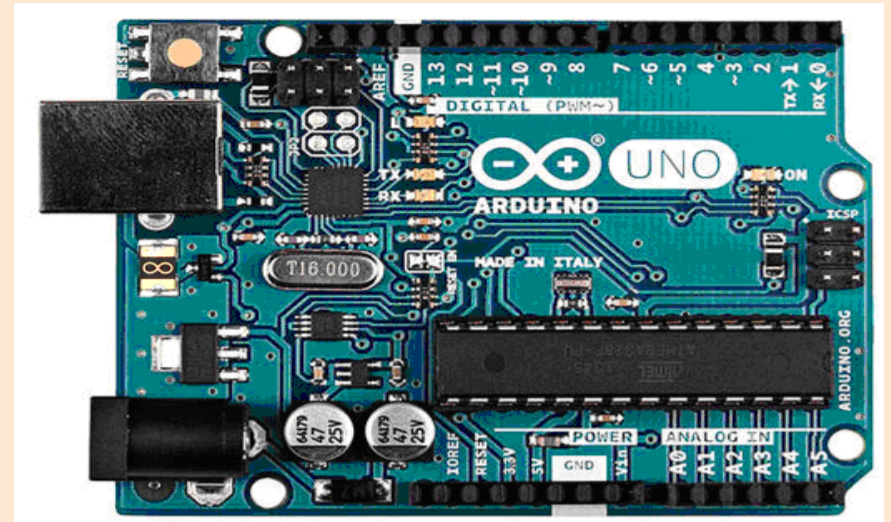
FIGURE 1; ARDUINO UNO

2.ESP8266 (Wi-Fi Module)

ESP8266 is a Wi-Fi module which will give your projects access to Wi-Fi or internet. It is a very cheap device but it will make your projects very powerful. It can communicate with any
microcontroller and make the projects wireless. It is in the list of most leading devices in the IOT platform. It runs on 3.3V and if you will give it 5V then it will get damage. The ESP8266 has 8 pins; the VCC and CH-PD will be connected to the 3.3V to enable the wifi. The TX andRX pins will be responsible for the communication of ESP8266 with the Arduino
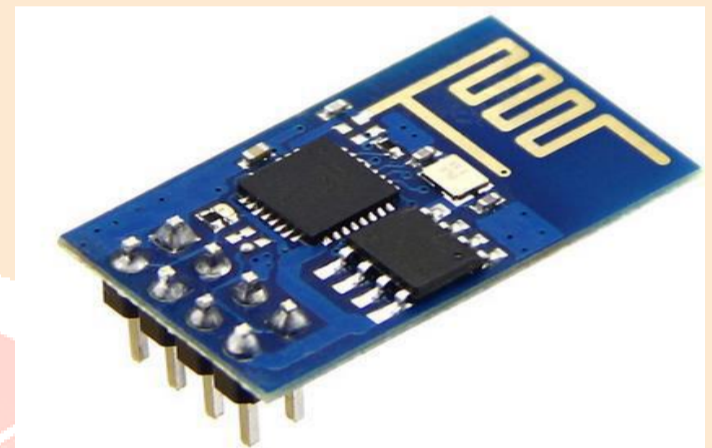
FIGURE 2; ESP8266

3.ULTRASONIC SENSOR

The Ultrasonic Sensor is used to measure the distance with high accuracy and stable readings.
It can measure distance from 2cm to 400cm or from 1 inch to 13 feet. It emits an ultrasoundwave at the frequency of 40KHz in the air and if the object will come in its way then it willbounce back to the sensor. By using that time which it takes to strike the object and comesback, you can calculate the distance. It has fourpins. Two are VCC and GND which will be connected to the 5V and the GND of the Arduinowhile the other two pins are Trig and Echo pins which will be connected to any digital pins of the Arduino. The trig pin will send the signal and the Echo pin will be used to receive thesignal. To generate an ultrasound signal, you will have to make the Trig pin high for about 10us which will send a 8 cycle sonic burst at the speed of sound and after striking the object,
it will be received by the Echo pin.

FIGURE 3; ULTRASONIC SENSOR

4.BREAD BOARD AND JUMP WIRES

A modern solderless breadboard consists of a perforated block of plastic with numerous tin plated phosphor bronze or nickel silver alloy spring clips under the perforations. The clips are often called tie points or contact points. The number of tie points is often given in the specification of the breadboard. The spacing between the clips (lead pitch) is typically 0.1 in (2.54 mm). Integrated circuits (ICs) in dual in-line packages (DIPs) can be inserted to straddle the centerline of the block. Interconnecting wires and the leads of discrete components (such

as capacitors, resistors, and inductors) can be inserted into the remaining free holes to complete the circuit. Where ICs are not used, discrete components and connecting wires may use any of the holes.A breadboard is utilized to build and test circuits expeditiously afore finalizing any circuit design. The breadboard has many apertures into which route components like ICs and resistors can be connected
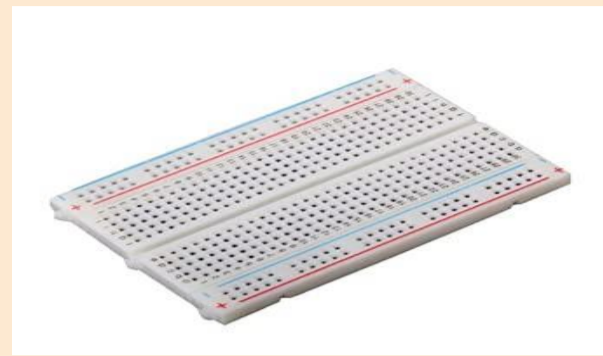

FIGURE 4; WIRES

FIGURE 5; BREAD BOARD
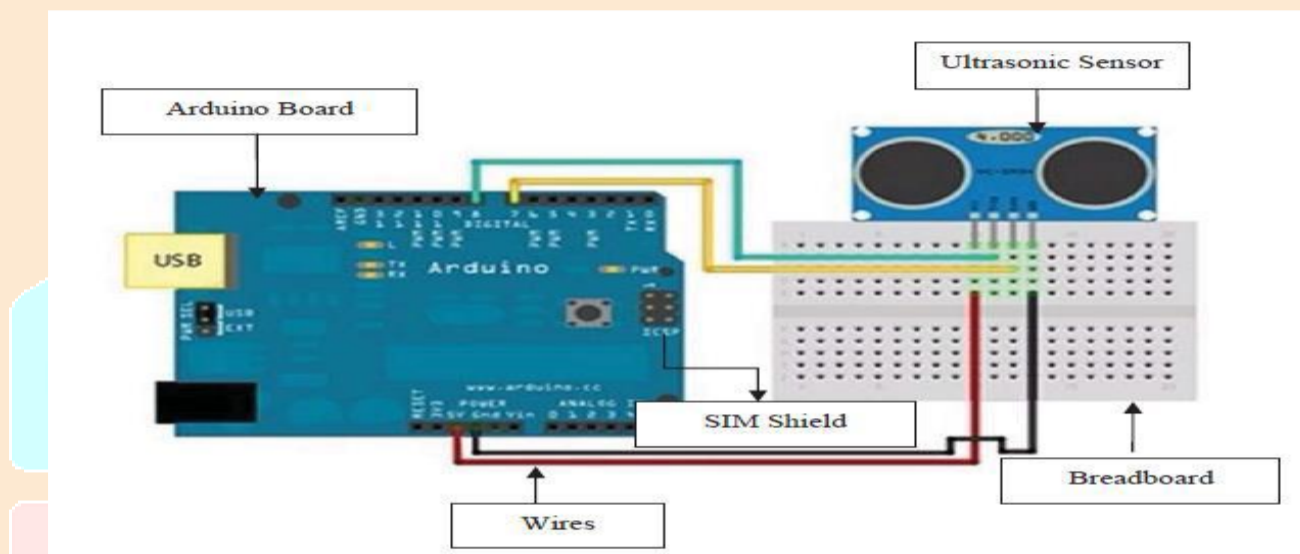
THE ARCHITECTURE DIAGRAM

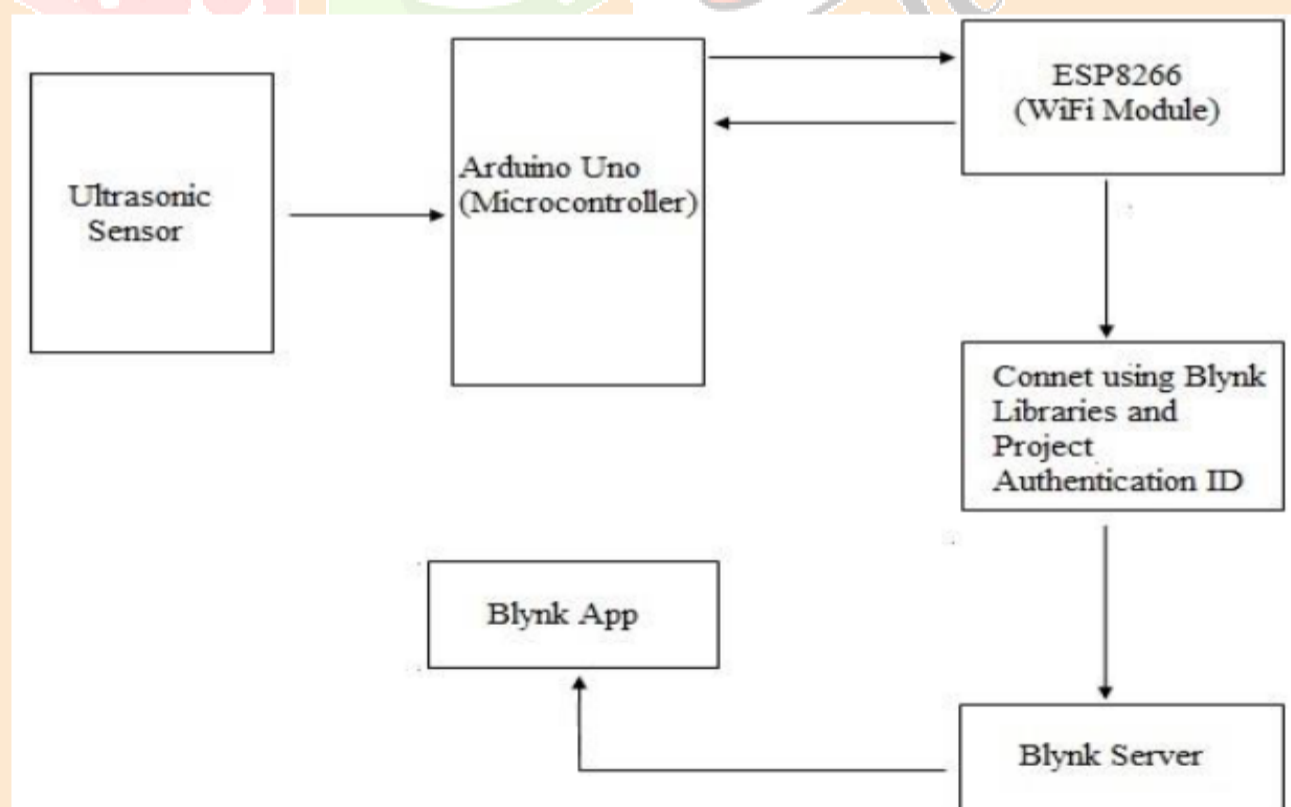FIGURE 6; THE SKETCH DIAGRAM USING THE COMPONENTS

FIGURE 7; ARCHITECTURAL DIAGRAM

The system worked in two parts, the first part was to find the companies that were involved in collecting the waste and owned trucks and who could also organize some drivers for collecting the garbage from various parts of the city in the truck and pass on the city dumps or the recycling organizations. The second part was to make a system which could handle all the communications of all the people involved and could also

maintain the data which will be collected while working around in the city.Various bins were placed around the city which were provided with an embedded device which was low in price and helped in tracking the garbage level in the bins [5]. A different ID was provided to each bin so that it could be easier to detect that which is bin is full and ready to be emptied. The project is divided into two sections one being the transmitter section and other the receiver section. The transmitter section consists of a microcontroller and sensors which check the level of the garbage and the data is passed onto the system with the help of the RF Transmitter, then RF Receiver receives the data and sends it to the client associated so that the bin can be emptied quickly.

- **CONFIGURING BLYNK APP**

To connect to the internet we make use of a prebuilt platform called Blynk app. After the user installs the Blynk app on the smartphone, an account to be created in the app to access its services. The services are enabled for the signed users. Let us create an account and add a new project to get started. An unique authentication code is used by the code to communicate with the project. The Blynk needs to be running in the background for the user to get real time notifications
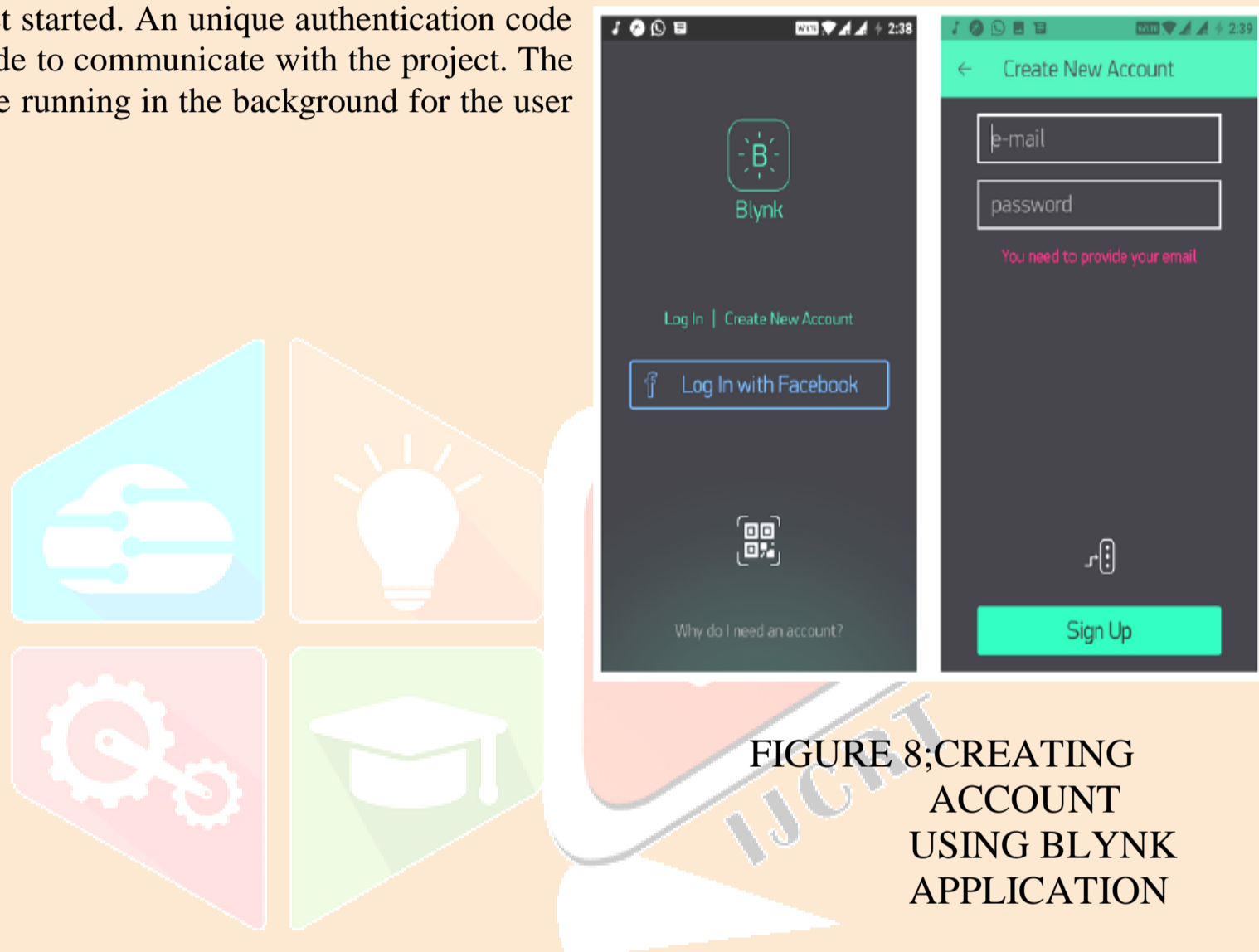

FIGURE 8;CREATING ACCOUNT USING BLYNK APPLICATION

WORKING PROCESS

After the account creation, the arduino will first read the ultrasonic sensor, It will send thesignal with the speed of sound. It revert back after striking the object and the travel time is

store based on equation1. Thus the distance of the object is calculated. Based on the distance we can identify the garbage level to be low or high. We used the term "overflow" to indicate the necessary for cleaning process. Thus the mobile is enable with the term as "Overflow".
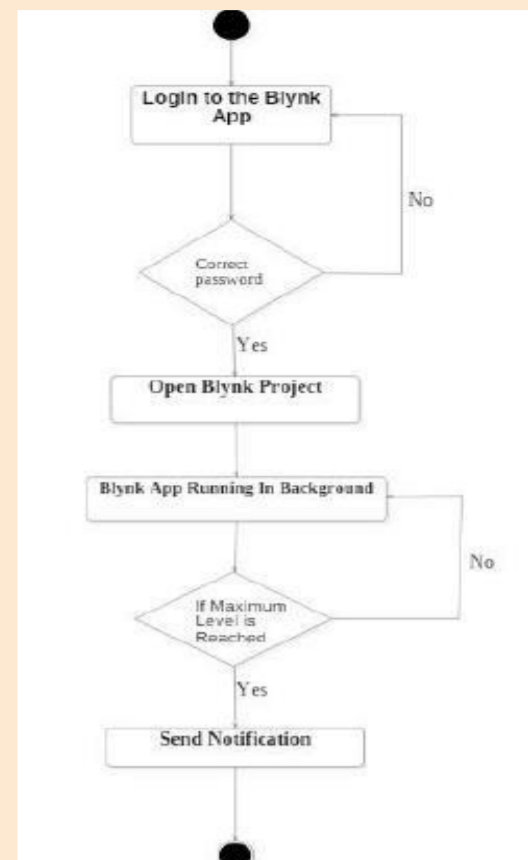

FIGURE 9; WORKING FLOWCHART

CONCLUSION

The main objective is to maintain the level of cleanliness in the city and form an environment which is better for living. By using this system we can constantly check the level of the garbage in the dustbins which are placed in various parts of the city. If a particular dustbin has reached the maximum level then the employees can be informed and they can immediately take certain actions to empty it as soon as possible. The employees can check the status of these bins anytime on their mobile phones. This can prove to be a very useful system if used properly. The system can be used as a benchmark by the people who are willing to take one step further for increasing the cleanliness in their respected areas. Ultrasonic sensor is being used in this system to check the level of garbage in the dustbins but in future various other types of sensors can be used with the ultrasonic sensor to get more precise output and to take this system to another level. Now this system can be used in certain areas but as soon as it proves its credibility it can be used in all the big areas. As this system also reduces manual work certain changes can be done in the system to take it to another level and make it more useful for the employees and people who are using it. In future, a team can be made which will be in charge for handling and maintaining this system and also to take care of its maintenances.