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Smart Garbage Monitoring System

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Abstract: Nowadays certain actions are taken to enhance the extent of cleanliness within the country. People are becoming more active in doing all the items possible to wash their surroundings. Various movements also are started by the govt to extend cleanliness. We will attempt to build a system which can notify the firms to empty the bin on time. In this system, we'll put a sensor on top of the rubbish bin which can detect the entire level of garbage inside it consistent with the entire size of the bin. When the rubbish will reach the utmost level, a notification is going to be sent to the corporation's office, then the workers can take further actions to empty the bin. This system will help in cleaning the town during a better way. By using this technique people don't need to check all the systems manually but they're going to get a notification when the bin will get filled.

Keywords: Arduino Uno, Ultrasonic sensor and ESP8266 Wi-Fi module.

I. INTRODUCTION

Society, College, home etc. This project is related to the “Smart City” and supported to “Internet of Things (IOT). So, smart lifestyle, cleanliness is required, and cleanliness is beginning with Garbage Bin.
This project will help to remove the garbage disposal problem. The Internet of Things (IoT) is a recent communication paradigm that envisions near future, during which the objects of lifestyle are going to be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them ready to communicate with each other and with the users, becoming an integral a part of the web.

II. LITERATURE REVIEW

[1], A Dustbin is placed and during this system, which the smart bin was built on a platform which was supported Arduino Uno board which was interfaced with a GSM modem and an ultrasonic sensor. The sensor was placed on the highest of the bin. A threshold level was set as 10cm. Once the garbage reaches the extent of threshold, the sensor triggers the GSM modem which alerts the associated authority till the rubbish within the bin is emptied. And then, a conclusion was made that to state that various issues like affordability, maintenance and durability were addressed when these smart bins were designed. It also contributed towards a hygienic and clean environment within the process of building a sensible city.

[2], The researchers suggest the method for garbage management which is as follows. The bin has to be interfaced with a system supported microcontroller and is made which had IR wireless systems with a central system that showed the present status of the rubbish within the bin. The status of the procedure was seen on a mobile based web browser with a html page by using Wi-Fi. In the end the sensor could only detect the load of waste present within the bin but not the extent of waste. The author proposed a way for organizing the gathering of the rubbish within the commercial and residential areas of the cities.

[3], The extent of garbage within the bin was detected by the ultrasonic sensor which sends the information to the room using the GSM module. A GUI was also developed to see the knowledge that was associated with the rubbish for various locations, GUI was supported MATLAB so it had been different. Two units were present within the system, slave unit was within the bin whereas the master unit was there within the room. The sensor checks the level of garbage and prepares it to send it to the slave unit which can further send the info to master unit which eventually will inform the authorities to clean the bin. This paper proposed Decision network which might be used for garbage pickup within the cities.

[4], this technique handled the ineffective waste collection within the inaccessible areas of the town. The cameras were fixed and placed in those parts of the cities which were facing the foremost problems. The system was worked in two parts basically, 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 rubbish from various parts of the town within the truck and expire the town dumps or the recycling organizations. Then the second part was made to form a system which could handle all

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the communications of all the people involved and will also maintain the info which can be collected while working around in the city. So many bins were placed to be present in and around the city which were given an embedded device which was low in price and helped in tracking the rubbish level within the bins.

[5], a special ID was provided to every bin in order that it might be easier to detect that which is bin is full and prepared to be emptied. The project is split 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 extent of the rubbish and therefore the data is passed onto the system with the assistance with RF Transmitter.

[6], Also proposed a model for cyber security systems using artificial system to possess secured transactions.

III. MATERIALS AND METHODOLOGY

Figure 1. Arduino Uno

Figure 2. ESP8266

Figure 3. Ultrasonic sensor.

3.1. Arduino Uno

Arduino is an open-source board having stated as microcontroller, PC paraphernalia and programming organization, endeavour, and client group that plans and produce microcontroller packs for constructing programmed devices and intelligent object which can detect and control questions in the real world. The equipment reference plans are appropriated under an ingenious Commons Attribution Share. Arduino Uno is shown in figure1.

3.2. ESP8266 (Wi-Fi Module)

ESP8266 may be a Wi-Fi module which can give your projects access to Wi-Fi or internet. It is a really cheap device but it'll make your projects very powerful. The wi-fi module can communicate with any microcontroller and make the projects wireless. It is in the front list of most leading devices in the IOT platform. It runs on 3.3V and if you'll provides it 5V then it'll get damage. The ESP8266 has 8 pins; the VCC and CH-PD are going to be connected to the three .3V to enable the wi-fi. The TX and RX pins are going to be liable for the communication of ESP8266 with the Arduino. The RX pin works on 3.3V so you'll need to make a potential divider for it because it used for implementation. ESP8266 is shown in figure 2.

3.3. Ultrasonic Sensor

The Ultrasonic Sensor works in such a way that at field of requirement, it is made used to measure the distance with high accuracy and stable readings. It can have the highest level of its capacity that it measures the distance from 2cm to 400cm or from 1 inch to 13 feet. It emits ultrasound wave at the frequency of about 40KHz in the air and if any object will come in its way, then it will bounce back to the sensor. By using that point which it takes to strike the thing and comes back, you'll calculate the space. Distance can be measured by equation given below.

Distance = Time * sound speed /2.

Where, here, Time = time between an ultrasonic wave is received and transmitted. It has four pins. Two are VCC and GND which can be connected to the 5V and therefore the GND of the Arduino while the opposite two pins are Trig and Echo pins is the one that will be connected to any digital pins of the Arduino. The trig pin will send the signal and therefore the Echo pin are going to be wont to receive the signal.

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To generate an ultrasound signal, you will have to make the Trig pin high for about 10us which will send an 8 cycles sonic burst at the speed of sound and after striking the thing, it'll be received by the Echo pin. Ultrasonic sensor as shown in figure 4.

IV. PROPOSED SYSTEM

The existing system has the restrictions as time consuming, trucks go and empty the containers, even they're empty. The cost is high with unhygienic environment. Sometimes, it is also the bad odour, that causes the unhealthy environment. So, proposed model talks about the way to make use of the recent advancements in technology to form our place clean and tidy.

The implementation starts by setup ESP8266 by flashing the newest version of the firmware. download the ESP8266 flasher tool and therefore the latest firmware from the web which might be within the bin format and flash the ESP8266 with it. Once the ESP8266 flashing done, other components are often added to the configuration. We want a breadboard for the connection with the microcontroller, ultrasonic sensor, buzzer and the ESP8266 using the jumper wires. The breadboard is employed to interface between the varied components available. It also makes it easy to attach multiple inputs to one pin on the Arduino-board.

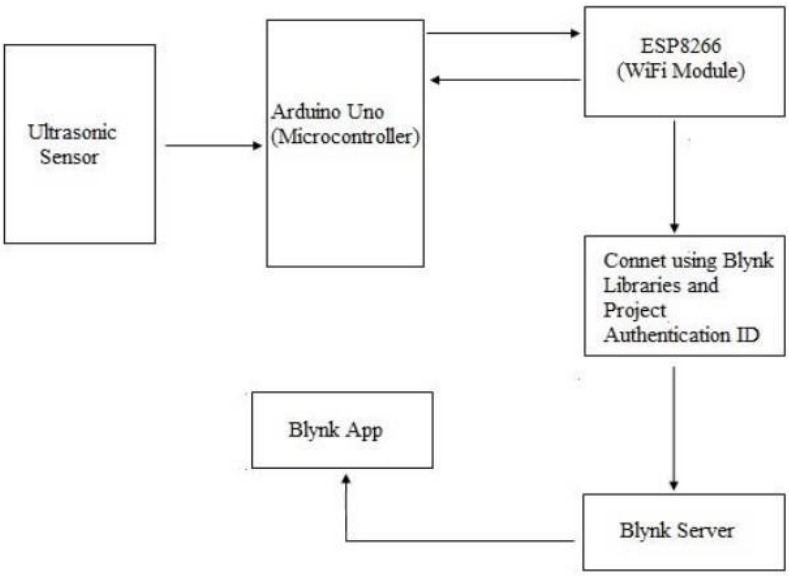

Figure 4. Proposed model - Architecture Diagram

V. CONFIGURATION WITH BLYNK APP

To connect to the web, 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 within the app to access its services. First, will have to create an account and add a replacement project to urge started. A unique authentication code is employed by the code to speak with the project. The Blynk must be running within the background for the user to urge real time notifications. The configuration of Blynk app and account creation is shown in figure 5.

After the account creation, Arduino will first read the ultrasonic sensor, It, sends the signal with the speed of sound. It reflects back after striking the object and the travel time is store based on equation1. Thus, by making all these things, the distance of an object is calculated. Based on the space we will identify the rubbish level to be low or high. We used the term “overflow” to point the required for cleaning process. Thus, the mobile is enabled with the term as “Overflow”.

Once the code has been compiled, upload it to the Arduino Uno board by connecting the board to the computer using a 2.0 USB cable.

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After uploading the program click on "Serial monitor" to start out running the code. Once the code starts to run, first thing it will do is to try and connect to ESP8266 to the access point pre-defined in the code. if the ESP8266 is connected, the model starts communicating with the Blynk, which servers by sending a ping message.

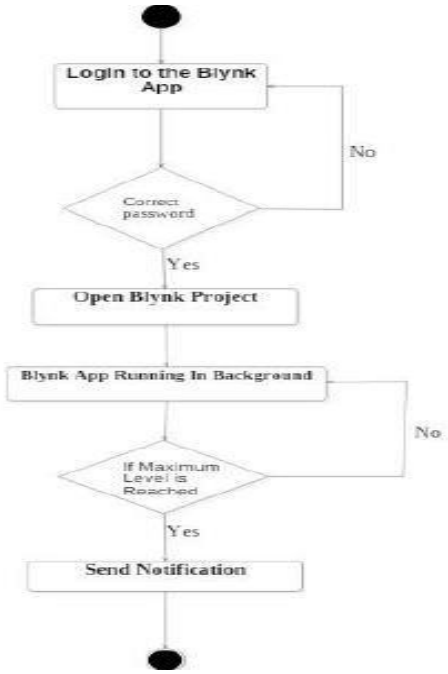

Figure 5. Working process of the proposed model

VI. RESULTS

The system was checked repeatedly by increasing and decreasing the level of garbage in the bin. Notification was sent each time the level got changed. The user checked the notification was checked by the user on the Blynk app, so it can be said that the system has worked in the way we planned. Proper security was also given to the hardware components so that the output which comes is accurate because further actions have to be taken based on the output. The result of the notification is provided in figure 6.

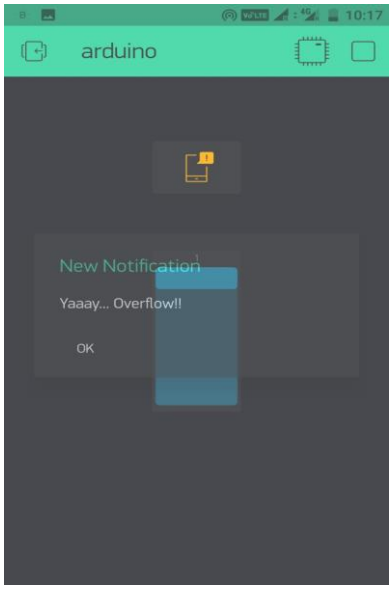

Figure 6. Experimental result.

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VII. CONCLUSION AND FUTURE ENHANCEMENT

The main objective is to take care of the extent of cleanliness within the city and form an environment which is best for living. By using this technique, we will constantly check the extent of the rubbish within the dustbins which are placed in various parts of the town. If a specific dustbin has reached the utmost level, then the workers are often informed and that they can immediately take certain actions to empty it as soon as possible. The employees can check the status of those bins anytime on their mobile phones. This can convince be a really useful system if used properly. The system is often used as a benchmark by the people that are willing to require one step further for increasing the cleanliness in their respected areas. Ultrasonic sensor is getting used during this system to see the extent of garbage within the dustbins but in future various other sorts of sensors are often used with the ultrasonic sensor to urge more precise output and to require this technique to a different level. Now this technique is often utilized in certain areas but as soon because it proves its credibility it is often utilized in all the large areas. As this technique also reduces manual work certain changes are often wiped out the system to require it to a different level and make it more useful for the workers 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.

VIII. REFERENCE

1. Navghane S S, Killedar M S and Rohokale D V 2016 IoT Based Smart Garbage and Waste Collection Bin *International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE)* **5** 1576-78
2. Kasliwal Manasi H and Suryawanshi Smithkumar B 2016 A Novel approach to Garbage Management Using Internet of Things for smart cities *International Journal of Current Trends in Engineering & Research* **2** 348-53.
3. Medvedev A, Fedchenkov P, Zaslavsky A, Anagnostopoulos T and Khoruzhnikov S 2015 Waste management as an IoT-enabled service in smart cities *In Conference on Smart Spaces.* Springer International Publishing 104-15
4. Schafer G 1994 *U.S. Patent No. 5,326,939.* Washington DC: U.S. Patent and Trademark Office.
5. Anitha A, Paul G and Kumari S 2016 A Cyber defence using Artificial Intelligence *International Journal of Pharmacy and Technology*