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The background of the central section is a dark blue image of a person's hands holding a glowing Earth globe. The globe is surrounded by various digital data visualizations, including bar charts, line graphs, and network diagrams. Text overlays like 'BUSINESS', 'NETWORK SEARCH', and 'LADING 100%' are visible. The overall aesthetic is futuristic and technological.

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Design and Implementation of IOT Based Garbage Management and Gas Alert System

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ABSTRACT: One of the principal concerns with our environment has been waste management which affects the health and environment of our society. The management and detection of waste are one of the primary problems of the current era. The traditional way of manually monitoring the wastes in waste bins is a cumbersome process. It utilizes more human effort, cost, and time which can easily be prevented with our existing technologies. A random and illegal discharge of waste, an absence of waste disposal and management systems, and inefficient waste management policies have caused serious environmental problems and have incurred considerable costs for waste disposal. The detection, monitoring and management of wastes is one of the primary problems of the present era. This is our solution, a method in which waste management is automated. This is our IoT Garbage Monitoring system, an innovative way that will help to keep the cities clean and healthy. In this project, we designed the real-time waste management system which is the biggest problem of our city or country. The ultrasonic sensor is used for measuring the level of waste in the garbage. The gas sensor is used to detect the harmful gas present in the garbage. Regularly, measured data and sensor information are transmitted to the Blynk app via the network. By introducing smart waste management solutions, cities have taken a key step towards becoming smart cities. The targeted waste collection saves time, money, and fuel while decreasing gas emissions and noise levels for citizens.

KEYWORDS: Esp32 MCU, IOT, LED, Gas Sensors, Ultrasonic Sensor

I. INTRODUCTION

Today big cities around the world are facing a common problem, managing the city waste effectively without making city unclean. Today's waste management systems involve a large number of employees being appointed to attend a certain number of dumpsters this is done every day periodically. This leads to a very inefficient and unclean system in which some dumpsters will be overflowing some dumpsters might not be even half full. This is caused by variation in population density in the city or some other random factor this makes it impossible to determine which part needs immediate attention. Here a waste management system is introduced in which each dumpster is embedded in a monitoring system which will notify the corresponding personal if the dumpster is full. In this system, it is also possible to separate wet and dry waste into two separate containers. This system provides an effective solution to waste management problem.

II. METHODOLOGY

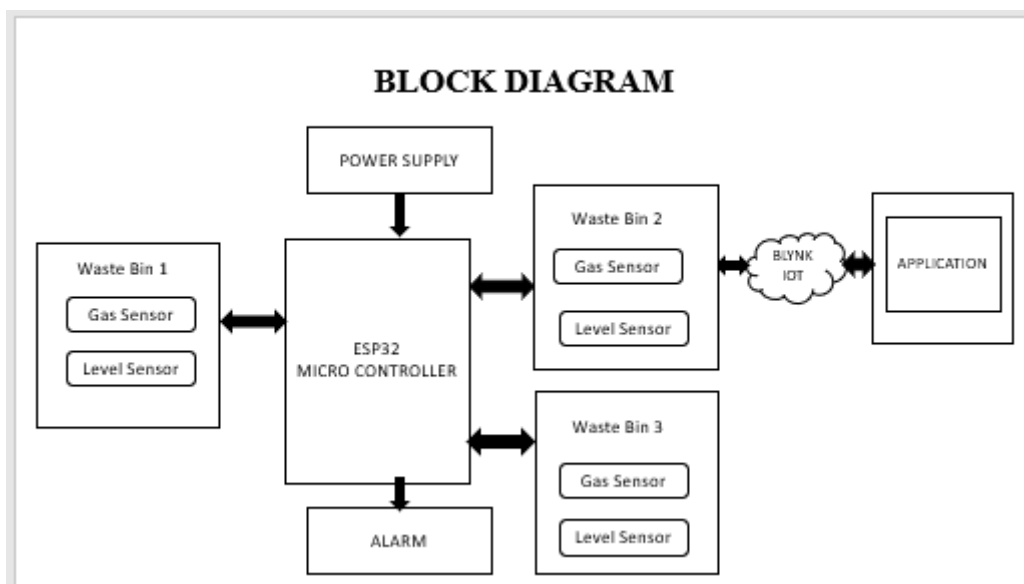
The laborers of municipality are not taking that much responsibility to check each time whether the dustbin is full or going to be full. It is also a hectic work to check each moment, as it may be required on an hourly basis. So proper monitoring can possible through the LED indication system, so that municipal people can collect massive amount and make the surrounding good. Basically waste disposal are placed in the dustbin, but one can not estimate the level of garbage, so ultrasonic and with the help of Arduino controller one can get the information easily about the garbage level is full in the dustbin and from this LED indication help municipal people so that they can take the waste from the dustbin. Ultrasonic sensor is placed at the top of the dustbin which will measure the distance.

As per the need one should use a motor into the dustbin, so that it will work as per the controller action. This will help the cleaning people/ cleaning authorities easily. Smart dustbin with alarm system will help from foul smell from the waste and due to this alarm dustbin will be squashed on regular intervals. This will be a long-term solution to make the environment healthy and good . The sensor which will be placed at the top level of the dustbin and the garbage level indication is through the ultrasonic sensor. From the sensor there is connection to the LED which gives the dustbin level full that information to the municipal cleaning people.

Solar panels have the potentials to generate sustainable green energy. Most of the time road side municipal dustbins are not maintained properly as well as it is not regularly cleaned. Ultrasonic based alarm and LED indication systems helps a lot to the workers of municipal and the outdoor environment is well maintained by the city corporation.

III. MODELING AND ANALYSIS

In my model the presence of any waste wet or dry can be identified just moisture sensor. In this cycle, in the event that servo motor will turn toward the dry or wet area.



IV. RESULTS AND DISCUSSION

The result and discussion may be is to monitor the garbage level , to sense whether the waste is wet or dry and to monitor if any garbage is spread outside the dustbin. All the 2 sensors collect the respective information and fed to the microcontroller(here Esp 32 MCU).Smart dustbin constantly check the waste material level ,when it is reached to its maximum level, it notify the controller and then there will be a RED LED blinking and it will be there then the bin will be full. This kind of smart dustbin can help the society in terms of reduction of germs produced by the waste materials .It also makes the surroundings clean so it can make green environment. It can continuously monitor every location updates the details about waste collection.

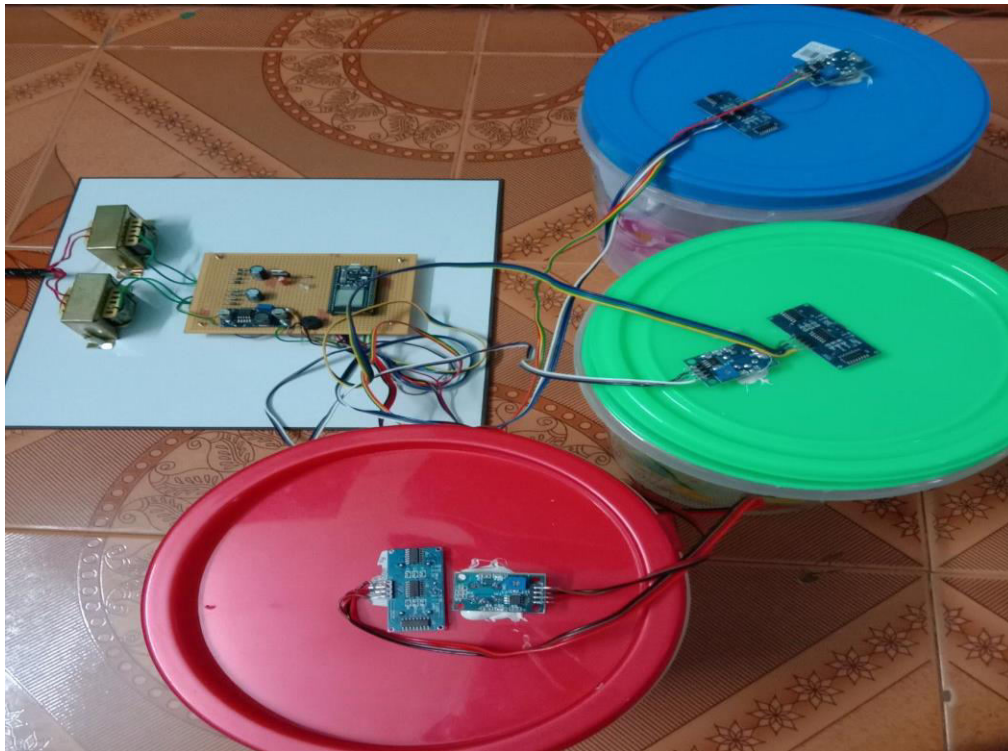


FIGURE 1:Hardware image

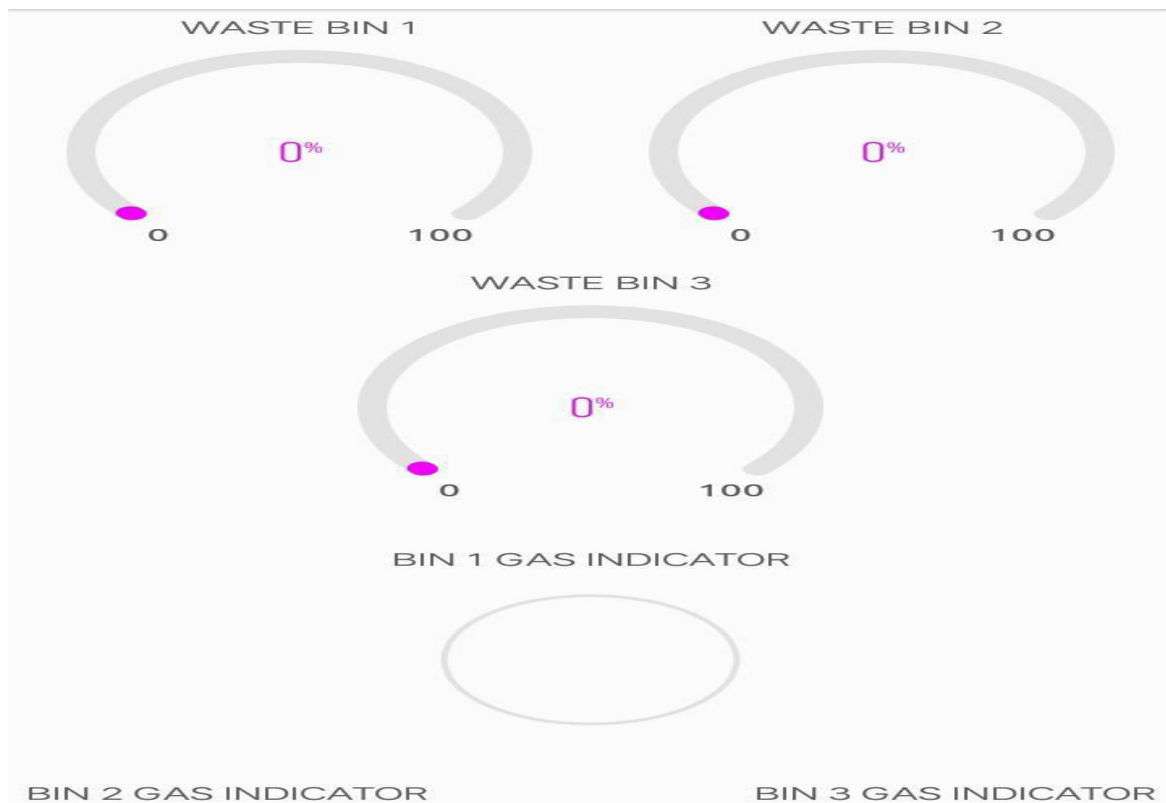


FIGURE 2:Initialization of the program

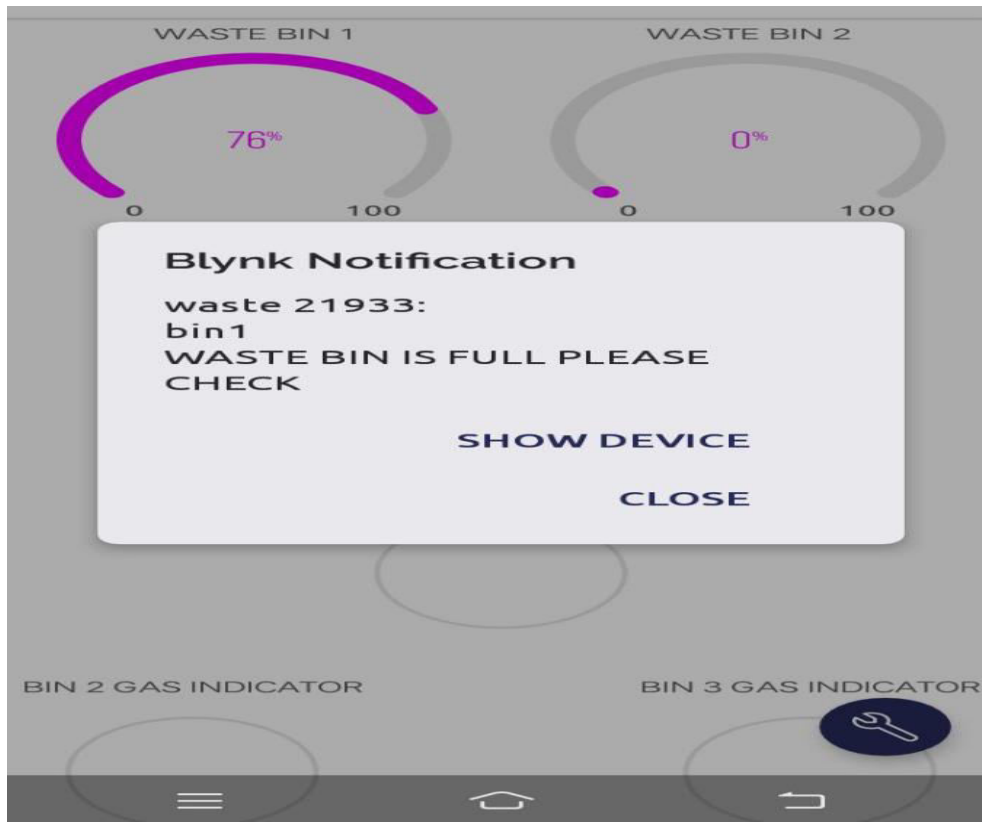


FIGURE 3:Final Output

V. CONCLUSION

As mentioned in the report, the main objective of the project is to monitor the garbage level, to sense whether the waste is wet or dry and to monitor if any garbage is spread outside the dustbin. All the 3 sensors collect the respective information and fed to the microcontroller (here Esp32 MCU).The vehicle has a provision to collect and dump separate dry and wet waste using conveyor belt and h-bridge motor driver circuit controlled by vehicle node. After collecting the waste in each and every area .It can continuously monitor every location updates the details about waste collection. In day to day life in our surrounding environment the waste collection will increases or decreases. The collection of waste material under the well control by the municipal body can easily done through by using smart dustbin. Smart dustbin constantly check the waste material level, when it is reached to its maximum level , it notify the controller and then there will be a RED LED blinking and an alarm sound will be there when the bin will be full. This kind of smart dustbin can help the society in terms of reduction of germs produced by the waste materials. It also makes the surroundings clean so it can make green environment

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