Smart Bin – Odour Detection

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Abstract:-The main cause of the disease that affects the human health is due to improper cleaning of waste which provides unhygienic conditions. By cleaning the waste properly, we can avoid the maximum causes of disease [1]. This is so because the waste which gets dumped over a long period of time leads to a multiplication of germs of various kinds. These germs, in turn, produce bad gases while decomposing the waste. Each kind of germs causes certain diseases. When cleaning of the waste is done in a proper manner, one half of spreading diseases can be avoided. This paper is based on smart-bin which detects the emission of gas inside it. Here, the gas sensors which are connected to Arduino is placed inside the bin. Whenever the sensor detects gas emission GSM module connected with Arduino sends an alert message to the specified user. [5]

Keywords—Gas Sensor; GSM Module.

I. INTRODUCTION

In rapidly populating, urbanizing globe, public awareness towards the waste management is merely very less. [3] The most significant priorities should be given to ensure a clean, protective and healthy global environment. For the past few years, the operational cost for management of solid waste has been increased linearly. In the total cost of solid management, 80-95% of expenditure is needed for the collection as well as transportation of the solid waste. In this busy world, we have no time to clean waste properly. Making bin a smart bin may help in this case. In this paper, the idea is to connect the gas sensors with GSM module interfaced Arduino. So that the user gets the information that the waste has to be cleaned immediately. The user gets information through his mobile phone.

II. GARBAGE GASES

In order to detect an odour from garbage, it is important to know the gases emitted from garbage. The main gases emitted from garbage are Methane (fruit peels, decomposing organic matter), Carbon dioxide, Nitrogen, Oxygen, Ammonia (spoiled meat, leaves), Sulphides (rotten egg), NMOC's, Carbon monoxide, etc.,[2]
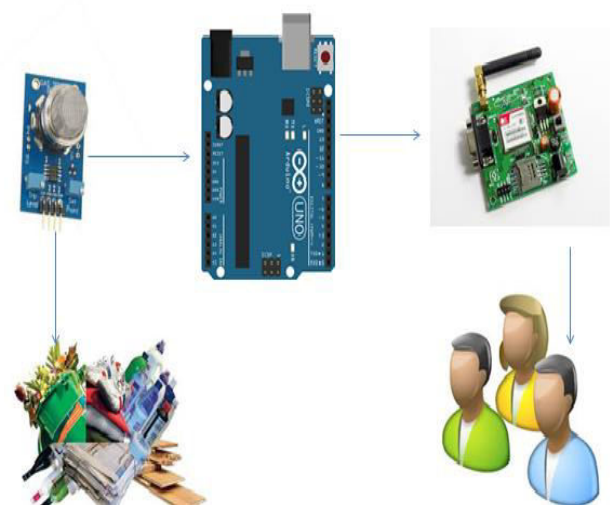
III. PROPOSED METHODOLOGY

Figure.1 Block Diagram of Proposed Method

When we clean the waste properly we can avoid one half of spreading diseases. Here we will do it by fixing a gas sensor in the place or bin where we dump waste, it indicates that hazardous gas is being spread everywhere. It gets indicated to us, by the use of GSM Module. The sensor gets interfaced with an Arduino board and this combination gets interfaced with GSM Module. As soon as sensor shows the reading of Hazardous gas rising level it sends the message to the user. The mobile phone number of the user is declared in the program so that the module sends the message to the respective user. So that he notices it and clean the waste at a proper time. By this way, the spreading of hazardous gas gets limited.[4] In another case, when the user is not home, he will be indicated the cleanliness status.

IV. EXPERIMENTAL SETUP AND TESTING TECHNIQUE

The experimental setup consists of the garbage can with domestic vegetable waste. The sensors connected with GSM module interfaced Arduino is exposed to the normal atmosphere for five minutes. Then exposed to the

environment of waste for five minutes. In the first case, the values of resistance of gas sensor tend to remain in low values and in the latter case there exists sudden increment in the resistance and so in the output values of analog output. The values in former and last cases differ from sensor to sensor.

Thus, the inherent values of a particular sensor are noted and the program is made in such a way that whenever the output resistance value of the sensor exceeds the set value the integrated GSM module sends an alert message to the specified user.

V. SELECTION OF SENSING ELEMENT

The selection of sensing element is vital because there are numerous things used as a sensor. Gas sensors like MQ-135, MQ-7 are preferred for this kind of application. Even though these gas sensors detect any type of gas emission and suffer from cross-sensitivity. It can be converted as an advantage here because gas detection is more important than the type of gas detected at domestic level.

VI. FUTURE SCOPE

- Data logging for future analysis and air quality prediction.
- Pollution monitoring in roads.
- Wearable sensor to detect the level of gas exposure of an individual.
- To detect dead rat in grain stored area.

VII. CONCLUSION

The smart bin is a step towards the smart city and important thing in the idea of smart buildings. The alternatives can be in place of Arduino as PIC, sensors like ultrasonic sensors for level detecting can be added advantage, and for communication, ZigBee can be used instead of GSM module. Introducing the concept of IoT can also be very helpful in monitoring the garbage status.

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