Smart Dustbin for Smart Cities

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Abstract:-*In the current day scenario, repeatedly we see that the garbage bins or Dust bin are placed at public places within the cities are overflowing because of increase within the waste each day It creates unsanitary condition for the individuals and creates dangerous smell round the surroundings this leads in spreading some deadly diseases & human sickness, to avoid such a scenario we tend to area unit planning to style "Garbage Level Indicator". When the dustbin is filled up to the very best level, the output are going to be given to micro-controller to send the warning message to the municipality.*

I. INTRODUCTION

In our city, we see that the rubbish bins or dustbins placed at public places are overloaded. It creates unhygienic conditions for people also as ugliness to that place leaving a foul smell. To avoid all such situations we are going to implement a project called "Garbage Level Indicator" Bad waste disposal management can easily end in pollution and soil contamination. they have effects on human health. it's learned from the primary survey in Guwahati, a city in Assam that garbage accumulation causes 41% of the air pollution, which generally results in various respiratory problems like COPD, asthma etc. Breeding of mosquitoes and houseflies occur mainly within the garbage which may be a major explanation for various diseases like malaria, dengue etc. There are about 235 million people currently affected by asthma that foul smelling of garbage is also a significant reason.

Implementation of this smart dustbin is prevent lumping of the waste for a extended period of time thereby preventing the widespread of diseases to an excellent extent and promising a clean environment within the city.

Our proposed system is employed to detect the extent of the rubbish within the bin and if it reaches threshold level then it'll be informed to municipality, collected from garbage collecting vehicle as fast as possible before it overflows. The person in vehicle and residents of that specific region will get information via message or call to aware status of the bins in nearby areas.

Smart garbage pickup helps to cut back the diseases in our city which are spreading because of overflowing of bins and excruciating toxic gases from the dustbins. Such bins, which are unhygienic to society should be immediately emptied before reaching a threshold level. These dustbins are going to be recognized by the central room and therefore the message are going to be sent to the rubbish collector to gather the rubbish from respective bin immediately.

II. LITERATURE REVIEW

Paper 1: Smart Garbage Monitoring System For Waste Management – Norfadzlia Mohd Yusof, Aiman Zakwan Jidin, and Muhammad Izzat Rahim Faculty of Engineering Technology, University Technical Malaysia Melaka, Malaysia.

This paper has described the event of a sensible garbage monitoring system, which is predicated on Arduino Uno microcontroller. it's very useful in improving the efficiency of solid waste disposal management especially within the flat residential areas, where the rubbish piles at the bins are one among the residents' major concerns owing to its ability to continuously measure the rubbish level within the bin and altering the municipality for immediate collection. The outputs from the conducted tests show that each one of the functionality of the system has performed correctly. The proposed system is suitable to be implemented in all flat residential areas, thanks to its practically, reliability and reasonable cost**.**

Paper 2: Garbage monitoring system using IoT - Anita A, School of Information Technology and Engineering, VIT University, Vellore- 632014, Tamil Nadu, India.

A Smart Dustbin proposed by, based on IoT during which the smart bin was built on a platform which was based on Arduino Uno board which was interfaced with a GSM modem and an ultrasonic sensor. The sensor was placed on the top of the bin. A

intensity was set as 10cm. as the garbage reaches the amount of threshold, the sensor triggers the GSM modem which alerts the associated authority till the rubbish within the bin is emptied. At the end a conclusion was made that various issues like affordability, maintenance and sturdiness were addressed when these smart bins were designed. It also contributed towards a hygienic and clean environment within the process of building a smart city. The author proposed a way for organizing the collection of the rubbish within the commercial and residential areas of the cities. In this system, the extent of garbage within the bin was detected by the ultrasonic sensor which will send the info to the control room using the GSM module. A GUI was also developed to examine the information that was associated with the rubbish for various locations; GUI was based on 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 control room. The sensor will check the extent of garbage and 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 support system which might be used for garbage pickup within the cities. This system handled the ineffective waste collection within the inaccessible areas of the town. The cameras were placed in those parts of the cities which were facing the foremost problems. The system worked in two parts, the primary part was to find the businesses 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 pass on the town dumps or the recycling organizations. The second part was to form a system which could handle all the communications of all the people involved and will also maintain the info which can be collected while working around within the city.
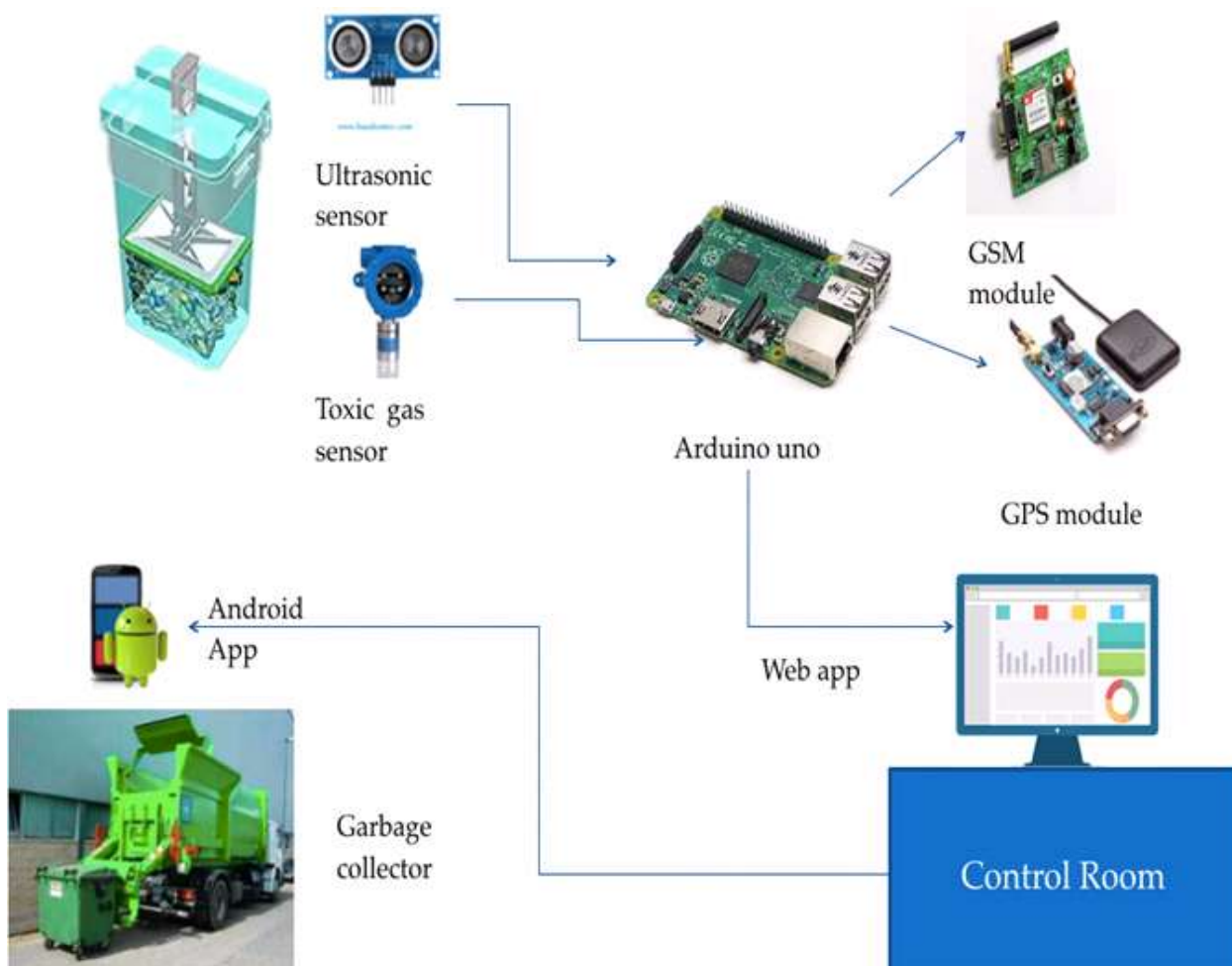
III. PROPOSED SYSTEM

Figure: - Proposed architecture

In the architecture of Garbage Level Indicator System there's ultrasonic sensor which is connected to Arduino Uno which sense levels and send to the Arduino. It displays the output on serial monitor. When level reaches to threshold value, system gives message to the authority using GSM module.

An Arduino Uno board is connected to the HC-SR04 ultrasonic sensor via digital I/O pin. Besides, the SIM900A GSM Module is serially connected to the Arduino Uno board, where the TX port of the GSM Module is connected to the RX port (PIN 10) of the Arduino Uno, while RX port of the previous is tied to the TX port (PIN 9) of the latter.
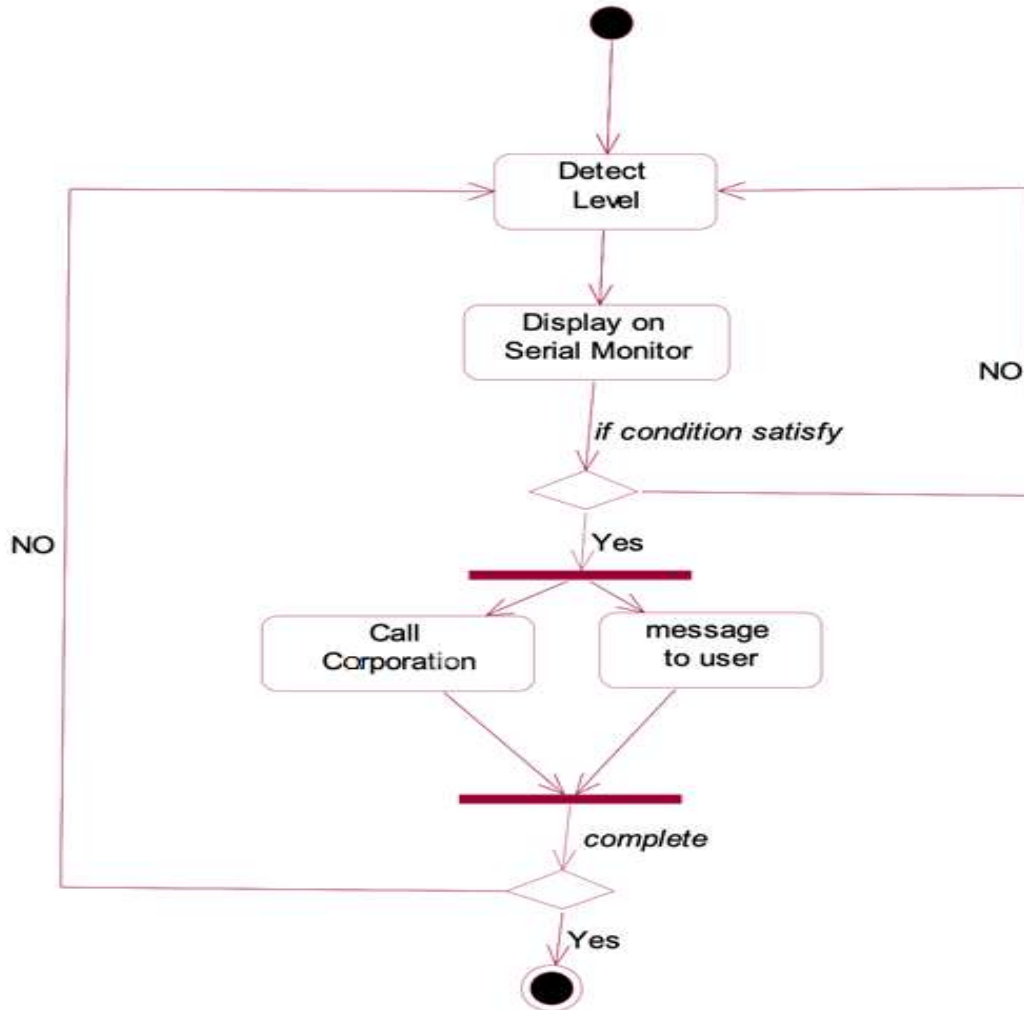

Figure: - Flow Chart

The first test conducted is that the situation where the rubbish bin is empty or its garbage level is extremely low. Then the message sends to residents of society. Then, the bin is rammed with more garbage until its level has surpassed the primary threshold value, which is about to 70%. The first warning SMS is being sent to municipality. Next, the bin is fully filled and thus, the garbage level is now exceeding the second threshold level, which is about to 90% of the bin height. Then system calls to the municipality to notify.

CONCLUSION

In this report we've presented the proposed work and design methodology of Smart Garbage Level Monitoring System. It's very useful in improving the efficiency of solid waste disposal management especially within the flat residential areas, where the rubbish piles at the bins are one among the residents' major concerns due to its ability to continuously measure the rubbish level within the bin and altering the municipality for immediate collection. The outputs from the conducted tests show that each one the functionality of the system has performed correctly. One drawback of the proposed system is that system isn't completely automatic. The rubbish collector has got to come and manually collect the rubbish. But the proposed system is suitable to be implemented altogether flat residential areas, due to its practically, reliability and reasonable cost.

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