Waste Management and Monitoring System using IOT

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Abstract:- **Many times, in our city we see that the garbage bins or dustbins placed at public places are overloaded. It creates unhygienic conditions for people as well as ugliness to that place leaving bad smell. To avoid all such situations we are going to implement a project called IoT Based Smart Garbage and Waste Collection bins. These dustbins are interfaced with microcontroller-based system having IR wireless systems along with central system showing status of garbage, on mobile web browser with html page by Wi-Fi. Hence, the status will be updated on to the html page. Major part of our project depends upon the working of the Wi-Fi module; essential for its implementation. The main aim of this project is to reduce human resources and efforts along with the enhancement of a smart city vision.**

I. INTRODUCTION

"There are few things certain in life – one is death, second is change and the other is waste." No one can stop these things to take place in our lives. But with better management we can prepare ourselves. Here we will talk about waste and waste management. Each of us has a right to clean air, water and food. This right can be fulfilled by maintaining a clear and healthy environment. What is waste? A "anything that does not create value" However scientifically speaking there is no waste as such in the world. Almost all the components of solid waste have some potential if it is converted or treated in a scientific manner. The aim of this study is to analyses the evolution of the municipal solid waste management system of Dehradun city. The state capital has scored low in a countrywide cleanliness index, bagging 316th position out of 400 cities surveyed. For further I have been taking some homework of the last findings and research that have been done for this.

The aim of this study is to analyses the evolution of the municipal solid waste management system of João Pessoa (Brazil), which was one of the Brazilian pioneers cities in implementing door-to-door selective collection programmers. The main aim of this paper was to see the basic change in environmental state after this process of door to door collection process. An estimated 400,000 tons of food is wasted every year by households. To address the complex food waste problem, we therefore propose a "food-waste-systems" approach to optimize resources within the FEW nexus. Such a framework may be applied to devise strategies that, for instance, minimize the amount of edible food that is wasted, foster efficient use of energy and water in the food production process, and

simultaneously reduce pollution externalities and create opportunities from recycled energy and nutrients.

Now taking in consider all these research we come to a new concept in which our main aim is to divide the city in sectors and then placing these (IOT) bins their now as we get the message of the bins full then one of the vehicle go and collect it and put it to the ware house .Now these ware house should be at places where we have huge land areas for the irrigation purpose.

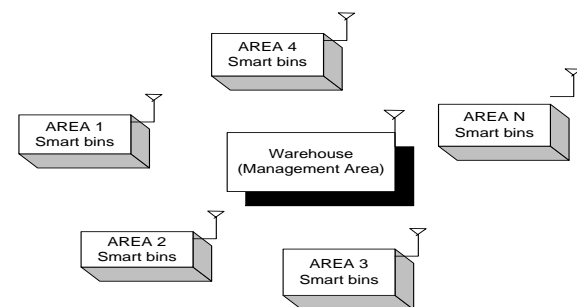## II. HARDWARE AND SYSTEM DEVELOPMENT

Fig1. Generalized Block diagram of waste management System

The above fig. shown is the structural diagram of the project .In this we establish the different areas in Dehradun as a sub units and then it's been connected to a hub were the whole process of recycling is been forwarded.
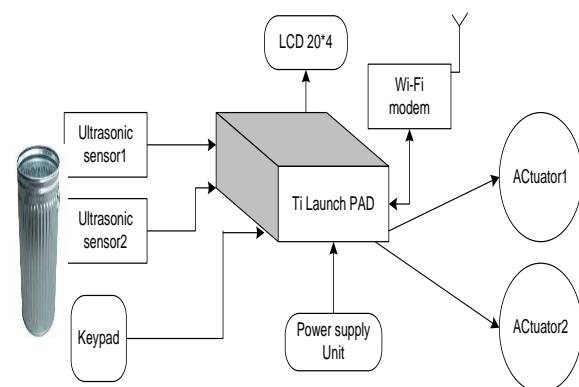

Fig2. Architecture of Smart Bin using Wi-Fi modem

In present day the dustbin is overflown, the proposed system will help to avoid the overflow of dustbin and

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dustbin that can automatically open the lid when it detects the people who want to throw out their trash. These dustbins are been design in such a manner that according to the waste category it's been dump in two different compartments one for organic and the other for inorganic waste. It will give the real time information about the level of the dustbin. It will send the message immediately when the dustbin is full with the help of wifi modem /GSM modules to the ware house their message been transferred to the particular area garbage collector from where the garbage is been collected out and been further dumped in to the recycling hub area. From where the further processing is been done on that garbage to make it in use in one or the manner.

III. SOFTWARE DEVELOPMENT

Fig5 shows the flow chart of the system using Node MCU/ESP8266 and GPRS modem. Initially the system initializes the sensors and serial communication in the microcontroller. The data form location will be sending using either Node MCU or GPRS device.
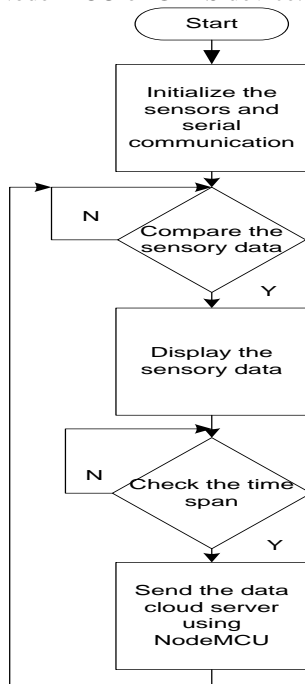

Fig5. Flow chart of the System with Node MCU and GPRS modem

IV. RESULT

In this, the result is displayed in the virtual form. The information about the level of the dustbin and the area where it is located is send to the municipality office with the unique ID that is given to the dustbin. The waste level inside the dustbin is detected by this system. This will transmit the information to the concerned person wirelessly. Everyone can access the data at anytime from anywhere in the world. Continuous and immediate data transmission. This system will avoid the overflow of dustbin .It will also avoid the emission of toxic gases from the dustbin. Due to this the ratio of health hazard's will be reduced out .so as the land fertility will also get improved as the dumping on land will get in to reduce.

V. CONCLUSION

The objective of the project is for the real time access of information about the dustbin. This waste Management System using IOT has implemented the management of waste in real time using smart dustbin to check the fill level of dustbin to check if it is full or not.This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system. This reduces the total number of trips of garbage collection vehicle and hence reduces the overall expenditure associated with the garbage collection. It ultimately helps to keep cleanliness in the society. Therefore, the smart garbage management system makes the garbage collection more efficient. Such systems are vulnerable to plundering of components in the system in different ways which needs to be worked on.

VI. FUTURE SCOPE

Further in this we can add up the cost management portion and by the virtue of which we can place them in an individual's home. So that they can use them and can manage the day- to-day garbage by their own and as the bin hits on alarm of filling its further recycled and can be used in kitchen garden in homes. That would be a good practice in field of environment safety. Smart dustbin helps us to reduce the pollution. Many times garbage dustbin is overflow and many animals like dog or rat enters inside or near the dustbin. This creates a bad scene. Also some birds are also trying to take out garbage from dustbin. This project can avoid such situations. And the message can be sent directly to the cleaning vehicle instead of the contractor's office

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