A Literature Survey on Smart Waste Management System for Metropolitan Cities

Abstract:

Waste management is one of the complicated challenges in cities, the system which is currently used in cities is not much more efficient, we continue to use an old and outmoded paradigm that no longer serves the entail of municipalities, Still find over spilled waste containers giving off irritating smells causing serious health issues and atmosphere impairment. The Smart Waste Management System will simplify, with the Web applications and mobile phone, the solid and hydric waste inspecting process, and the management system of this presentation's total collection process. The proposed system is a GPS based one. The suggested device and implementation will track waste storage and monitoring. This method helps to make the customer aware of accountability behind the job such as the system for solid waste inspection and management, integrating communications technology for truck control systems such as GPS.

Introduction

Day by day the population is rapidly growing and the economy is broadening in our country and also there is a very vast growth of waste being generated. There is no actual right way of its solution or proper chain system to track and monitor the waste and disposal system. And cities are getting smart nowadays, but waste is not. Regardless of all the cities, the dustbins and waste are not getting tracked, sometimes the garbage in the bins gets to above the point, where it blemishes outside the garbage pail and opens out in whole areas and causes so many health issues to the citizens. In this work, the prototype schema which we are trying to address the waste management issues with several solutions like by using the smart bins which will indicate the level of the garbage inside the bins and will alert the admin to pick the garbage from the particular region. Next, as it is a smart waste management system, we are giving some approach to society. People can also trail the waste in its particular society or close by it. And regardless of the garbage collector not attending to the particular society or particular area, the society member can record the issue through the user app, and that can be reached directly to the admin. The motive of making this prototype is to put one step into the solution of waste management.

There is no proper management of waste management process in some areas

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Related Project

The problem of waste management is getting worse day by day. The attention to this problem needs to be addressed to avoid further problems and issues in society. The prototype consists of smart bins with RFID tags, garbage collector vehicle tracking using GPRS module, and the User App apart from this there is another side of the prototype is the Admin Panel where the admin can have track of all the details in one go and able to generate the report on the daily basis. The prototype goes in this way, basically, the smart bins will be tracked using the sensors, the level of the bins will be generated and monitored

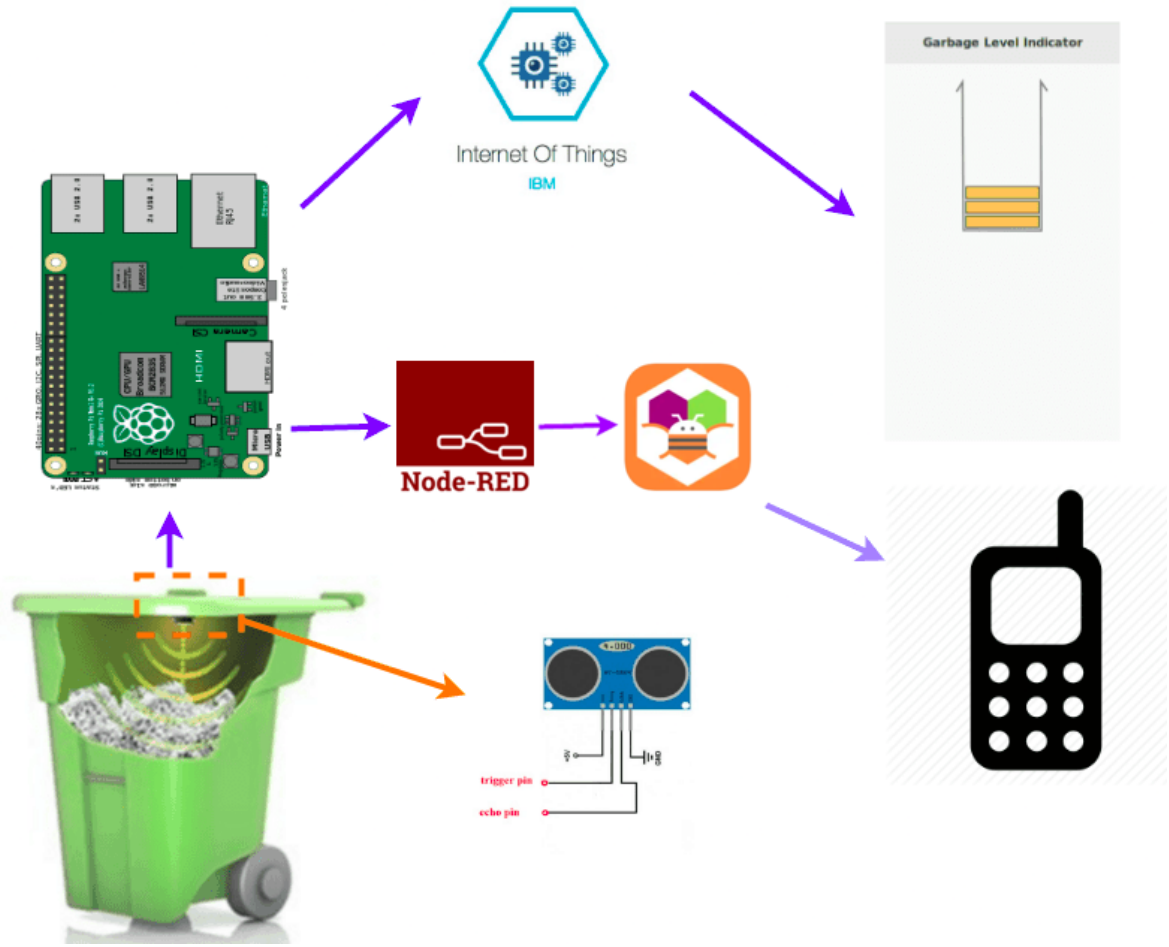
to the garbage collector and will be alert to the admin also. Next, the garbage vehicle will be tracked using the GPRS module and RFID tags, when the garbage vehicle comes in contact with the particular dustbins, the RFID tag on the dustbins will be activated and it will store the results in the cloud database, that the garbage has been collected from the particular region or the society. Next, the results of this will be reflected back to the user app and to the admin also. Users also can track the vehicle details and other information related to the waste.

Proposed System

We are using IoT, Android Application, Web Application and IBM Cloud to create a solution for the problem.

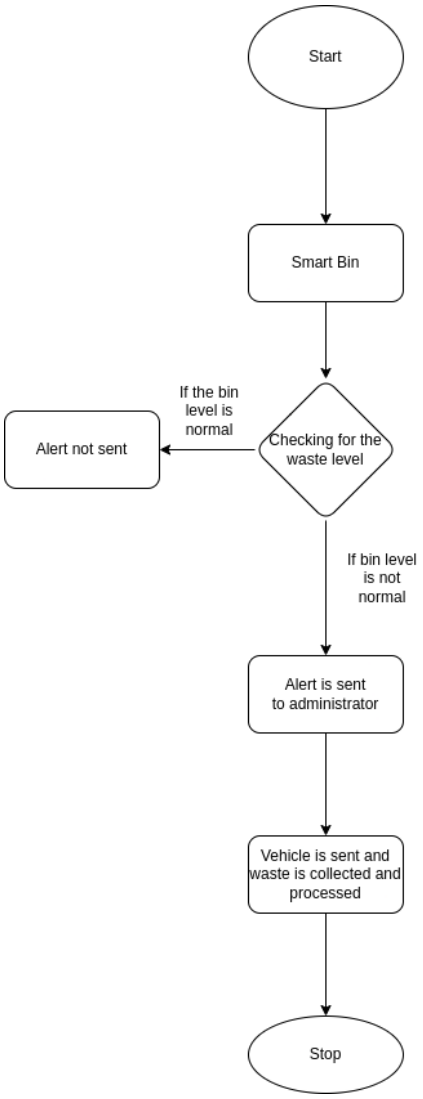
☐ System Architecture

1. **Smart Bins:** The bins which are going to be used in our system are smart. They are created by using sensors which are helpful to share the information about the waste bin.
2. **Sensors:** The sensors which we used in our bins will monitor the waste each time after the waste disposal if the bin is going to be filled means it will send an alert message to the administrator based on the bin details and the nearby bin data administrator will arrange the vehicles to collect the waste.
3. **Android Application:** In android application we can monitor the waste based on the location it will be available in longitude and latitude way based on that admin can understand the location and arrange the vehicle for collection of waste.



☐ Flow Chart

1. **Smart Bins:** The bins which are going to be used in our system are smart. They are created by using sensors which are helpful to share the information about the waste bin.
2. **Administrator:** The data is received from smart bins by using the location administrator will make arrangements to collect the waste.



☐ Components Required

1. **Hardware Components**
    a. **Sensor:** To send the information regarding the bin
2. **Software Components**
    a. **Python 3.7**
    b. **Node Red**
    c. **Google Chrome**
    d. **IBM Cloud**
    e. **MIT App**

☐ Discussion and Result

By using our waste management system the waste collection will become very simple and accurate and saves a lot of fuel time and manpower. And also we will collect the waste in various manners so that the waste can be processed and disposed of efficiently.

We will try to implement the best techniques for recycling, regenerate and compost. We will try to reduce dumping of waste and make the waste eco-friendly.

We found out that there is a new way of generating electricity from waste. Some waste can be burnt without emitting harmful gaseous waste and it will take a lot of time to decompose. Such types of waste will be used for generating electricity. By using this method we can reduce the place needed for landfill .

This makes our mission possible to make our earth go green and safe from hazardous and toxic waste.

☐ Conclusion

Analysis has been carried out and results indicate that urban solid waste comprises mostly biodegradable and non-biodegradable materials. Furthermore, this is not done often by the department responsible for the evacuation of this waste. Furthermore, it was observed that due to the rapid municipal situation in India, rise in unexpected slums and residential buildings, and absence of sustainable waste management technology in India, the current waste disposal situation is likely to worsen. The bulk of the waste comes from the private industries and recycling in the metropolis is technically not officially carried out. This paper will help to solve the waste management system in India and also other developing countries.

☐ References

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