International Journal of Science, Engineering and Technology
An Open Access Journal

IOT Based Waste Management Using Smart Dustbin

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Abstract

Today garbage bins or Dust bin are placed at public places in the cities are overflowing due to increase in the waste every day. It creates unhygienic condition for the people and creates bad smell around the surroundings this leads in spreading some deadly diseases & human illness, to avoid such a situation we are planning to design "IoT Based Waste Management Using Smart Dustbin". Here we have considered multiple dustbins located throughout the city or the Campus, these dustbins are provided with sensors which help in tracking the level of the garbage bins and an unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. When the level reaches the threshold limit, the device will transmit the level along with the unique ID provided. Once the bins are full then user will not be able to access the bins. In such circumstances the bin displays the direction of the nearby bins on LED display also generate the voice messages if the user place the waste on the floor. The status of the bin is accessed by the concern authorities from their place with the help of Internet and an immediate action taken to replace overflowing bins with the empty bins.

KEYWORDS: IR Sensors

Introduction

Today main issue for pollution is Garbage Overflow. Unhygienic condition, deadly diseases & human illness.To avoid all such situations we are going to implement a project called IoT Based waste management using smart dustbin. Implementation is done with the help of IoT concept. The Internet of Things (IoT) is a concept in which surrounding objects are connected through wired and wireless networks without user intervention. Objects communicate and exchange information Objective of this project is to design and build a prototype for an automatic open dustbin that can automatically open the lid when it detects the people who want to throw out their trash. It also can detect the level of the trash that inside the dustbin. If the dustbin is full of trash at the certain level, the lid will not open even when there are people who want to throw out their trash.

Curbside collection is the most common method of disposal in most countries, in which waste is collected at regular intervals by specialised trucks. Waste collected is then transported to an appropriate disposal area

The smart, sensor based dustbin will judge the level of waste in it and send the message directly to the municipal corporation. It can sense all the type of waste material either it is in the form of solid or liquid. According to the filled level of the dustbin, the vehicles from the municipal corporation will choose the shortest path with the help of the "TRANSPORTATION SOFTWARE", which will save their time.

It emphasizes on "DIGITAL INDIA". The system is simple. If there is any problem with any equipment in the future, that part is easily replaceable with new one without any difficulty and

Existing System

In our city many times we see that the garbage bins or dustbins placed at public places are overflowing. It creates unhygienic conditions for people. Also it creates ugliness to that place. The universal truth is that wastage of anything is harmful for the society.

[1]IoT Based Smart Garbage and Waste Collection Bin *S.S.Navghane1, M.S.Killedar2, Dr.V.M.Rohokale3.* 1,2: SKN-SITS, Dept. of E&TC, Lonavala 3: Asst. Professor, SKN-SITS, LonavalaThis systems architecture would be based on context of operations and processes in real-time scenarios.

Advantages: This project work is the implementation of smart garbage management system using IR sensor, microcontroller and Wi-Fi module.

Disadvantages: Major part of this project depends upon the working of the Wi-Fi module which is operable only in small distances.

[2]IOT Based Intelligent Bin for Smart Cities: Meghana K C, Dr. K R Nataraj

Sensors are connected to the all the bins at different areas. It senses the level of garbage in bin.

Advantages: Weight sensor, this is not efficient because it doesn't identify the level of waste in the bin. Hence Infrared sensor (IR sensor) is used.

Disadvantages: high cost

[3]Vikrant Bhor, PankajMorajkar, MaheshwarGurav, DishantPandya "Smart Garbage Management System" International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Vol. 4 Issue 03, March-2015 Here there are multiple dustbins located throughout the city these dustbins are provided with embedded device which helps in tracking the level of the garbage bins. And an unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full

Advantage : Low Cost .

[4] Adil Bashir, Shoaib Amin Banday"Concept, Design and Implementation of Automatic Waste Management System" International Journal on Recent and Innovation Trends in Computing and Communication ISSN 2321 – 8169 Volume: 1 Issue: 7, JULY 2013This paper proposes an advanced method in which waste management is automated. Radio+ frequency identification (RFID) is one of the most promising and anticipated technologies in recent years.

Advantage: The system makes use of radio frequency (RF) tags and web support. This work presented here certainly provides a novel approach in handling and disposing off the day to day solid wastes in an efficient and easy way.

Disadvantage: High Cost.

Proposed System

In the proposed approach we are implementing a raspberry pi based automated dustbin status imitator. We have observed that the municipal officer or the government authorized person will monitor the status of dustbin.

Or generally we see that they have a regular schedule of picking up these garbage bins or dustbins. This schedule varies as per the population of that place.

It can be once in a day or twice in a day or in some cases once in two days. If bin is overflowing then, system displays details of empty bins nearby**.** If in such cases the garbage dustbin gets immediately full and then it overflows which creates many problems.

So in such situations, with help of our project the government authority person can get SMS immediately

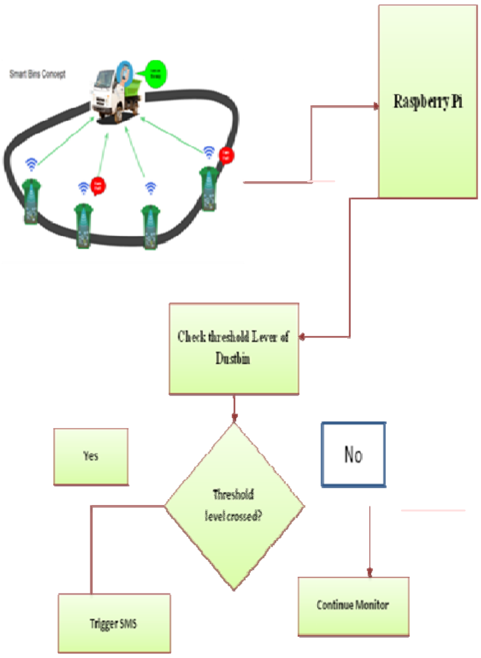

Fig. System Architecture

The above diagram indicates the rough idea of the system designed. Here, design explains that different dustbins are placed in the nearby places where, each dustbin has sensors connected to it. Here raspberry pi is the one which acts as a small CPU. Sensors will send the signals to the monitoring unit via raspberry pi. Also the levels of the threshold will be continuously checked out. Once the level crossed message will be triggered to monitoring unit. If not monitoring process will be continued.

Conclusion

Implementation real time waste management system by using smart dustbins to check the fill level of smart dustbins whether the dustbin are full or not. In this system the information of all smart dustbins can be accessed from anywhere and anytime by the concern person and he/she can take a decision accordingly. If bin is overflowing then, system displays details of empty bins nearby. If in such cases the garbage dustbin gets immediately full and then it overflows which creates many problems. So in such situations, with help of our project the government authority person can get SMS immediately**.** By implementing this proposed system the cost reduction, resource optimization, effective usage of smart dustbins can be done. This system indirectly reducing traffic in the city. In major cities the garbage collection vehicle visit the area's everyday twice or thrice depends on the population of the particular area and sometimes these dustbins may not be full. Our System will inform the status of each and every dust bin in real time so that the concerned authority can send the garbage collection vehicle only when the dustbin is full. The scope for the future work is this system can be implemented with time stamp in which real-time clock shown to the concern person at what time dust bin is full and at what time the waste is collected from the smart dustbins.

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[5] Vikrant Bhor, "Smart Garbage management System International Journal of Engineering Research & Technology (IJERT),Vol. 4 Issue 03, March-20152000.

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