

Waste Management System

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Abstract

Urban India generates tonnes of wastes annually. Our country faces major challenges associated with waste management. Conventional garbage collection is not efficient since the authorities are not notified until the waste bin is full, and this leads to overflow of waste material. Efficient way of waste disposal and collection of disposed garbage is essential for a sustainable and clean India. This paper presents smart waste management using IoT based waste bin for collection and monitoring the level of waste inside bin. The system is implemented using two ultrasonic sensors which is being controlled by Node MCU. One of the ultrasonic sensor detects the level of the waste in the bin and other detects the person approaching the bin to dispose the waste. This detection helps in automatic opening and closing of the lid. Servo motor is connected to the lid which serves the action of closing and opening of the lid. In this system, level of waste in the bin will be sent to concerned authorities. The IoT data is stored and monitored using Blynk app. The proposed system is reliable, cost effective and can be easily implemented.

Introduction

Internet and its applications have become an integral part of today's human lifestyle. It has become an essential tool in every aspect. Due to the tremendous demand and necessity, researchers went beyond connecting just computers into the web. These researches led to the birth of a sensational gizmo, Internet of Things . The world is in a stage of upgradation, there is one stinking problem we have to deal with. Garbage! In our daily life, we see the pictures of garbage bins being overfull and all the garbage spills out. This leads to the number of diseases and insects and mosquitoes breed on it. A big challenge in the urban cities is solid waste management not only in India but for most of the countries in the world. Hence, such a system has to be build which can eradicate this problem or at least reduce it to the minimum level .

LITERATURE SURVEY

- I) **Adil Bashir, Shoaib Amin Banday, Ab.Rouf Khan and Mohammad Shafi**, "Concept, Design and Implementation of Automatic Waste Management System", in this paper authors integrated to use as Smart Trash System embodies an electronic device known as Smart Trash Bin which consists of Sensors (Load sensor and IR proximity sensor) and a Radio Frequency (RF) transmitter
- II) **Dr. K. R. Nataraj and Meghana K. C**, "IOT Based Intelligent Bin for Smart Cities", The proposed system concentrates on eradicating the issue of ignorance of cleanliness which is spoiling our environment and then reduce it. The smart trash consists of two sensors namely IR and gas sensors. The IR sensor placed inside the trash to sense the level of trash and gas sensor will sense the toxic gases. Once the trash is filled, alarm rings.
- III) **Vishesh Kumar Kurre**, "Smart Garbage Collection Bin Overflows Indicator using IOT", in this a sensor (Infrared sensor/proximity sensor) Is placed under the dustbin. When the sensor signal reaches the threshold value, a mail notification (like email, twitter, WhatsApp message) will be sent to the respective Municipal / Government authority person. We can also see the density of the Dustbin through the internet on a Dashboard, this is a GUI (Graphical User Interface) dashboard so any of the authenticate person will easily check the present condition of the dustbin. So then that person can send the collection vehicle to collect the full garbage bins or dustbins

PROBLEM STATEMENT

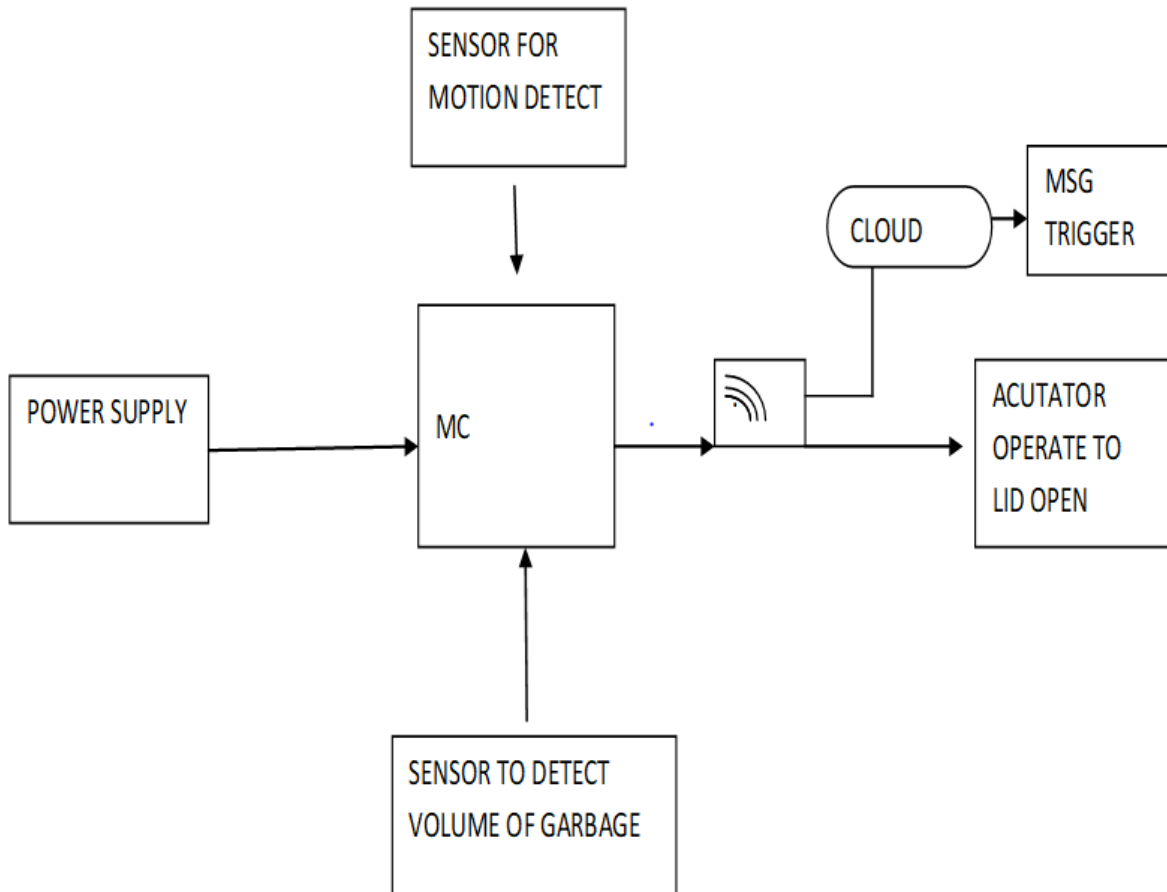
The nation and world are facing a huge problem today of disposal, segregation, and recycling of solid waste and improper management of these wastes are hazardous and dangerous to human health and ecological system. The generation and disposal of waste in large quantities has created a greater concern over time for the world which is adversely affecting the human lives and environmental conditions. Wastes are the one which grows with the growth of the country. A voluminous amount of waste that is generated is disposed of by means which have an adverse effect on the environment. The common method of disposal of the waste is by unplanned and uncontrolled open dumping at the landfill sites. This method is injurious to human health, plant and animal life. This harmful method of waste disposal can generate liquid leachate which can contaminate the surface and ground waters; can harbor disease vectors which spread harmful diseases, can degrade the aesthetic value of the natural environment and is an unavailing use of land resources. Segregation of waste is important for proper disposal of the vast amount of

garbage modern society produces in an environmentally sensible mode. People became adapted to tossing things away and never realize the consequences of their action. The common method of disposal of the industrial waste is by uncontrolled and unplanned and exposed dumping at the river sites and open areas. This method is injurious to plants, human health, and animal life. There is a rapid increase in capacity and categories of solid waste as a result of urbanization, constant economic growth, and industrialization. Global Waste Management Market reported that the amount of waste generated worldwide produced is 2.02 billion tonnes. “Wastes are not always waste if it is segregated as it was”. To properly manage the waste, it has to be handled, segregated, transported and disposed of so as to reduce the risks to the public lives and sustainable environments. The economic value of waste is best comprehended when it is segregated. There is no such system employed of segregation of glass, plastic and metallic wastes at the industrial level. Dry waste consisting of cans, Aluminium foils, plastics, metal, glass, and paper could be recycled. If we do not dispose of the waste in a more systematic manner, more than 1400 sq. km of land, which is the size of the city of Delhi, would be required in the country by the year 2047 to dispose of it.

OBJECTIVE

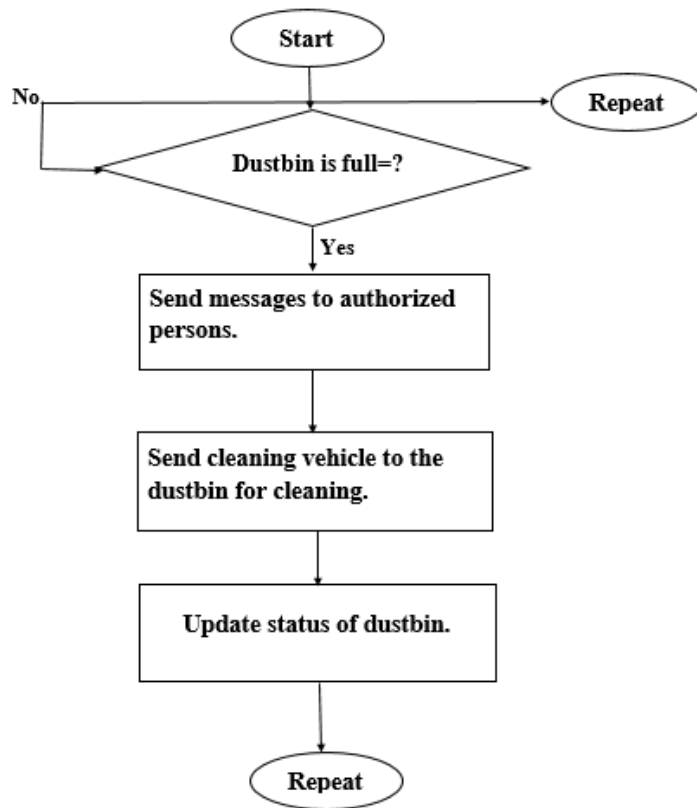
The waste collection process is a critical aspect for the service providers. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies. In order to overcome all these problems, we are proposing the idea of a waste management system which helps in the management of waste with the least human interaction in order to maintain a clean environment. The people who need dust bins near their location can request it through logging onto our website. IoT Garbage Monitoring System monitors the garbage bins and informs about the level of garbage collected in the garbage bins via an SMS

Block Daigram



Methodology

Waste is pushed onto a conveyer belt for detection with the inductive sensor to detect it is metal or nonmetal. If it is detected metal, Servo motor rotates to in a direction to collect the metallic waste, for nonmetal it moves further to fall into the non-metallic bin



CONCLUSION

Rapid population and the increasing industrialization are considered to be the major causes of pollution. Garbage left in the streets and overflowing dustbins pose extreme health hazards to the surrounding people. Advancement in technology can be utilized to overcome these problems.

This project is initialized to aid smart city concept and swatch Bharat Abhiyan. It uses cheap and reliable Raspberry pi as central control board and is interfaced with Arduino and sensors for smoke detection, Dustbin status, GPS module for identifying location and all the sensors data are stored in online database in real time, it also makes use of web and SMS notification in order to make the system more efficient and reliable.

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