SMART DUSTBIN FOR SMART CITIES

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ABSTRACT

The Indian government has lately started a smart city initiative, which requires that the waste collection system be smarter, as well as that individuals have simple access to the waste management process and that waste disposal locations be effective in terms of time and fuel cost. In India most of the cities are not well designed to facilitate the proper garbage disposing and collection system.

In this smart dustbin system ultra-sonic Sensor is check the garbage fill status of the dustbin. When the dustbin is full WIFI model send the message to cloud that Dustbin is full. Then management system sends that message to the collection van through WIFI module so Van can reach that particular location and collect the garbage. If the all cities are used these smart dustbins for garbage collection then it will solve the social issue of waste disposal. And make healthy and clean environment. Smart Dustbin will help to keep the surrounding clean and garbage free.

Keyword:

INTRODUCTION

The most of Cities are not properly built to allow effective waste disposal and collection. Cities are fast growing, increasing strain on existing infrastructure, which is not going to grow at the same rate as urbanisation.

So because Government of India has started a smart city strategy to use IT-enabled solutions, there is an implicit need to clean up the city. Our proposed system is an IT-based garbage collection system that allows for improved availability, better planning of the disposal process, and the collection of garbage generation data.

A smart city needs a smart lifestyle and for smart lifestyle, cleanliness is a basic need. Thus, it is necessary to develop smart waste management system it will make cities cleaner, healthier, greener, smarter.

Our suggested method addresses three issues:

1) Improved access to garbage disposal places (public dustbin).

2) Cost-effective in terms of the time and energy.

3) Provide a data gathering facility to assess how much garbage a city creates and plan the disposing statute allows.

DESCRIPTION

This system has been divided into three layers:

Fig.1.1 Different Layer

1) **Dustbin Layer:**

This layer consists of internet and Wi-Fi enabled dustbins. Every contains a sensor which senses the fill up status of dustbin and sends the data to the server. It also sends it current GPS location to the server at regular intervals.

2) **Server Layer:**

Server collects the fill up status and location of dustbins. It processes the clients query and it responds with nearest dustbin location and with direction to access dustbin.

3) **Client Layer:**

Clients request for the nearest location of the IT enabled dustbin to the server using Mobile App designed for this purpose.

Working Principle of a Smart Dustbin

X is current fill up status, T is time duration between generation of wave and wave received by receiver and C is the speed of light. And we will calculate the value of X using formula given below

$X = L - (CL)/2$ And similarly percentage of fill up is calculated using formula given below $P = (X/L) * 100$ Where P is the % fill up here we are assuming the wave path is almost vertical.
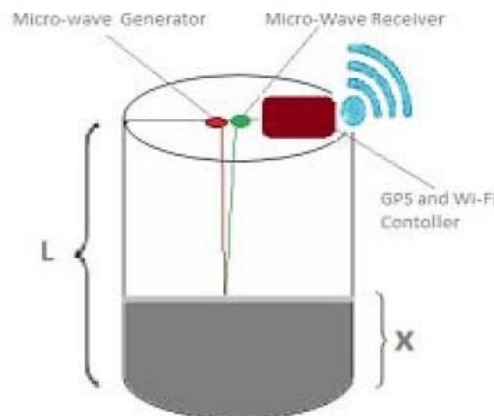

Fig.1.2 shows the working principle of the dustbin

LITERATURE REVIEW

- In Himachal Pradesh Dharamshala city has become the first city in India to have installed sensor-based bins at 140 locations.

- This bin is also using in cities Bangalore, Chennai, Mumbai, Nagpur and kochi.

- New Delhi one smart dustbin is developed which name is Ally, it is an interactive dustbin. Which follows voice commands and moves along predefined paths to collect waste, it has been developed by the Researcher's at Punjab's lovely professional university.

- Some researchers are working to develop waste bin will now be seen moving along designated tracks to detect and collect garbage.

- It is a track following dustbin which follows a particular track to collect waste.

PROBLEM DEFINITION

- As there is rapid growth of population in many of the cities and states, there are lots of problems faced by the people like environmental issues in which increasing garbage waste increases various types of diseases and creates health problem and many more.

- Now a day's garbage waste collection and its management is a very critical issue.

- The sensors could be damaged by harsh use by the users.

- In smart Garbage system battery –based smart garbage bins they exchange information with each other using router and server collect this information and this information is analysed for service provisioning.

- So, the main Problem of collection process and management system is lack of the information about the collecting time and area.

- Lack of proper system for monitoring, tracking the trucks and trash bins that have been collected in real time.

OBJECTIVE

The objective of this paper is:

- To ensure the protection of environment through effective waste management.

- To protect the health and wellbeing of people by providing and affordable waste collection service.

- To keep environment clean and enhance hygiene.

- Preventing Pollution and ecological degradation.

- It uses green energy.

RESEARCH METHODOLOGY

This research is all about the whole concept of smart dustbin

Which is already developed. The aim of this research is to collect the information about the smart dustbin actual concept and how it is working.

Method:

The method is used for this research paper is secondary data collection method.

Information collection sources are various research papers, articles and news.

CONCEPT OF SMART DUSTBIN SYSTEM

- The waste management system to check the fill level of dustbins whether the dustbins are full or not.

- It will inform the status of every dustbin so that concerned authority can send the garbage collection vehicle.

- The level of waste in the dustbin is detected with the help of ultrasonic sensor.

- Force sensor is used to measure the weight of the dustbin.

- The measured value of sensors exceeds a certain threshold value then red LED becomes ON.

- The Android Device Will Detects, in which area dustbin is located and status of that.

Fig.1.3 Collection Process of garbage

ANALYSIS FINDINGS

- We see many times Dustbins is placed near public places in the cities/villages are filled due to increase in the waste every day.so this type of smart dustbin is required now a days.

- In last few years there is rapid growth in urban development plans, the concept of smart cities. The thought comes up for smart cities there is a requirement for smart waste management.

- This research is covered the information about the smart dustbin and it is an interrelated solution for the current waste disposal problem.

- Now a days many of the cities started to use the smart dustbin and try to make healthy environment.

LIMITATION

- IOT Devices are Costly.
- Sustainability of IOT device.
- Sensor nodes used in the dustbins have limited memory size.

FUTURE SCOPE:

- Smart Dustbin help us to reduce the pollution.
- It can be made durable, by making it compact and cost effective.
- Two bins can be placed to collect wet and dry waste separately.

- The Wet garbage can be decomposed and used for making biogas.

- The An automated system can be developed which is able to pick up waste in and around the bin, segregate them and put them in respective bins.

CONCLUSION

- The System is an attempt to improve current waste collection system.

- The system is implemented properly it will really make the cities cleaner and greener and makes the smart city a reality.

- This Systems work is the implementation of Automatic Garbage Fill Alerting system using Ultrasonic sensor and Wi-Fi module.

- This system assures the cleaning of dustbins soon when the garbage level reaches its maximum then it will send the report to authority.

- This reduces number of trips of garbage collection vehicle and also reduces the overall expenditure associated with the garbage collection.

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