**Dynamic Solid Waste Collection and Management System**

# ABSTRACT

Healthy environment is imperative to a healthy and happy community. With the age old system of hiring people to regularly check and empty filled dustbins, the process has been prone to human error and neglect. Additionally, due to different frequency of usage of dustbins in different areas, routine checks which are based on time crevices is inefficient because a dustbin might get filled early and may need immediate attention or there might not be any need of a routine check for a long period of time. This makes present system resource expensive and ineffectual, as overflowing, stinking dustbins become more of a problem than a solution.

In this paper we present a solution about this network of dustbins which integrates the idea of IoT with Wireless Sensor Networks. We also put forward the concept of a network of smart garbage bins based on the Stack Based Front End approach of integrating Wireless Sensor Network with the Cloud computing and discuss how algorithms were applied to the sensor data leveraged by the system to gain useful insights to improve the efficiency of the garbage monitoring.

# INTRODUCTION

# It is become necessary and challenging to manage the solid waste with rapid urbanization and increased population growth. While talking about waste collection and management, the attention can be highly focused towards the common dustbins placed by respective Municipal Corporation at the various area of the each city. As, it is the first stage which plays initial active role to gather the waste generated in society and will ideally fulfill the major aims like, maintaining cleanliness of society, reducing environmental pollution, managing the healthy and hygienic surrounding etc. But such aims will fail to attain practically due to number of causes such as:

# People are not finding themselves responsible to use these dustbins properly and not to throw the garbage outside the dustbin.

# Improper placement of dustbin

# Improper management system which does not contain provision to track real time status of bin fullness

# No system is present that can sense the garbage present outside the dustbin

# No any provision is present to clean the area surrounding to the dustbin automatically in case where people throws garbage outside of the dustbin

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# Up till now, in this field, efforts has taken in such a way that, team who are in a role of collecting a garbage will get the prior information of status of garbage present in particular dustbin so that they can predefine the path of collection of garbage in the city in optimized manner. In similar way, software application is also developed in another invention in which location of the dustbin in nearby area can be shown so that people can find and use it properly and will not go for throwing it anywhere else. Some inventions are going for the GIS for collecting the status of the garbage in the dustbin. Each and every invention that has invented up till date more and more focuses towards the monitoring the status of the dustbin by using number of ways and technologies and provide that status to the respective authority. But one even more major and basic reason for the problems regarding with such common dustbins is still unsolved as it has not taken under consideration by the prior innovations, which is to literate people to use it properly and track and clean garbage present outside the dustbin in a fully atomized way. This paper is focused not only on monitoring the dustbin status and giving its alerts to City Corporation but also focuses on these on-field issues. Because it is the fact that not only the dustbins overflow condition but also improper use of it makes the surrounding area dirty and unhygienic. The objective of giving alert and send location to the Corporation gets achieved by the GSM and GPS system. Sensing garbage present outside the dustbin and monitoring bin fullness status will be achieved by Ultrasonic Sensors. The Ultrasonic sensor which is placed to play role of sensing garbage outside the dustbin will enable the mechanical assembly so as to clean that garbage and put it back into the dustbin properly. Flame sensor is used for safety purpose and alerting through buzzer in case of some fire is detected.

# OBJECTIVES

* + To reduce human effort and time efficiency.
  + Attention of waste alert monitored automatically
  + Cost efficient updatable automated system
  + Safety in case of fire detected

# METHODOLOGY

The proposed framework manages the way toward monitoring and updating information management of waste with the idea of IOT. The working model of Dynamic Waste Collection and Management System contains the accompanying units and sensors:

* + NodeMCU
  + Ultrasonic Sensor
  + Buzzer
  + Servo Motor
  + GPS
  + GSM

**Block Diagram**

Power supply

**Nodemcu**

Buzzer

Indicating LED’s

Flame sensor

Ultrasonic sensor

Servo Motor

GPS

GSM