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Project Name	SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES
Maximum Marks	2 Marks

Abstract

In today's world, one of the major environmental problems is the collection, management and disposal of the garbage. The main theme of the work is to develop a Smart intelligent garbage alert system for a proper waste management. This paper proposes a Garbage level detection in bins. Getting the weight of the garbage in the bin. Alerts the authorized person to empty the bin whenever the bins are full. Garbage level of the bins can be monitored through a web App. We can view the location of every bin in the web application by sending GPS location from the device.

Introduction

Smart waste management is an idea where we can control many problems, which disturbs the society in pollution and Diseases. The Smart waste management is compatible mainly with concept of smart cities. Waste management is one of the primary Problem that the world faces irrespective of the case of developed or developing country. The key issue in the waste management is that the garbage bin at Public places gets overflowed well in advance before the commencement of the next cleaning process. It In turn leads to various hazards such as bad odor & Ugliness to that place which may be the root cause for spread of various diseases. To avoid all such Hazardous scenario and maintain public cleanliness and health this work is mounted on a smart garbage System. The main theme of the work is to develop a Smart intelligent garbage alert system for a proper Garbage management .This paper proposes a smart Alert system for garbage clearance by giving an alert Signal to the municipal web server for instant Cleaning of dustbin with proper verification based On level of garbage filling.

This process is aided by The ultrasonic sensor which is interfaced with Arduino UNO to check the level of garbage filled in The dustbin and sends the alert to the municipal web Server once if garbage is filled . After cleaning the Dustbin, the driver confirms the task of emptying the garbage with the aid of RFID Tag. RFID is a Computing technology that is used for verification Process and in addition, it also enhances the smart Garbage alert system by providing automatic Identification of garbage filled in the dustbin and Sends the status of clean-up to the server affirming that the work is done. The whole process is upheld by an embedded module integrated with RF ID and IOT Facilitation. The real time status of how waste Collection is being done could be monitored and Followed up by the municipality authority with the Aid of this system. In addition to this the necessary Remedial / alternate measures could be adapted. An Android application is developed and

linked to a Web server to intimate the alerts from the Microcontroller to the urban office and to perform the remote monitoring of the cleaning process, done by the workers, thereby reducing the manual Process of monitoring and verification. The Notifications are sent to the Android application Using Wi-Fi module.

Literature Survey

[1] Authors have considered two garbage bins, for waste Segregation, and sensors are attached to bins for garbage Data collection to avoid Overfilling. Overfilling of the bins is prevented using Sensors, but no Mechanism for waste Collection is proposed

[2] The proposed system uses Ultrasonic sensors to collect Real-time garbage level which takes the garbage Readings every time the lid of the bin is opened and Closed. Ease of the users is taken into Consideration. But there is no mechanism to assign routes to trucks for the collection Process.

[3] This paper focuses on the Real time garbage level and the level of toxicity present in it and uses the air quality Sensor CCS811 for measuring the toxicity level. The routes are generated Using Dijkstras algorithm. The system rewards the Points in virtual wallets Based on waste Disposed to encourage People to keep the city Clean, but the algorithm Used for routing is not explained in detail.

[4] The system uses real-time Garbage data and calculates the shortest path using Google API.The capacity of the Truck is not considered while generating shortest routes.

[5]Waste collection problem is a set-covering and vehicle routing problem (VRP) involving inter-arrival time constraints, bi-level optimization formula to model the split delivery VRP with several trips to decide the shortest path. Developed an ACO algorithm for route improvisation. It lacked service for vehicles of a particular category to traverse small streets or bridges that have weight constraint.

[6]Waste collection routing Problem is included in a Mixed-integer nonlinear Programming model after which garbage is unloaded to find out the optimal route for all the garbage trucks. Aimed to avoid the combined collection of Waste which differed in Quality. Instead, it focused on the Collection of Homogeneous trash cans Owing to the same Quality of waste for higher rate of recovery and lower rate of Disposal.

[7]The primary components of IoT are accompanied with Intelligent Transportation Systems and surveillance Systems which enhance Quality of Service in waste Collection. It has proposed an advanced Decision Support System model. Covered an important Aspect of waste Collection which is Access to areas which are not feasible to visit.

[8]The paper discussed Different variations of Vehicle Routing Problem (VRP) and mainly focuses on the variation of VRP which is used for reduction of fuel the generation of Routes focuses on the Distance and fuel Consumption. The Vehicle capacities are not considered.

Reference

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