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In

Electronics and Communication Engineering

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**SMART WASTE MANAGEMENT SYSTEM FOR METROPOLITAN CITIES**

**ABSTRACT**

Indiscriminate disposal of solid waste is a major issue in urban centers of most developing countries and it poses a serious threat to healthy living of the citizens. Access to reliable data on the state of solid waste at different locations within the city will help both the local authorities and the citizens to effectively manage the menace. In this paper, an intelligent solid waste monitoring system is developed using Internet of Things (IoT) and cloud computing technologies. The fill level of solid waste in each of the containers, which are strategically situated across the communities, is detected using ultrasonic sensors. A Wireless Fidelity (Wi-Fi) communication link is used to transmit the sensor data to an IoT cloud platform known as ThingSpeak. Depending on the fill level, the system sends appropriate notification message (in form of tweet) to alert relevant authorities and concerned citizen(s) for necessary action. Also, the fill level is monitored on ThingSpeak in real-time.

**Keyword**s: solid waste, Internet of Things, cloud computing, smart and con-

nected communities, smart city.

1. **SMART DUSTBIN:**

Municipality takes many measures to maintain the cleanliness of the city. One of which is establishing dustbins in regular distance for the convenience of public to discard items. Cleaning this garbage is an important function of municipality which is directly related to health issues. We have designed a model for a „Smart Dustbin‟ which indicates directly that the dustbin is filled to a certain level by the garbage and cleaning or emptying them is a matter of immediate concern. This prevents lumping of garbage in the roadside dustbin which ends up giving foul smell and illness to people. The design of the smart dustbin includes a single directional cylinder and an Arduino Uno. The circuit to power up the mechanical devices is also assembled to obtain the desired simulation. The design of the smart dustbin includes the pneumatically automated compressor for compressing the garbage, electrical circuit to control the garbage compressor and a microcontroller which is used to intimate the central hub of the municipality.

**2.** **EFFICIENT GARBAGE DISPOSAL MANAGEMENT IN METROPOLITAN.**

Rapid increase in population, has led to improper waste management in metropolitan cities resulting in increased pests and spreading of diseases. An efficient method to dispose this waste has been designed with Wireless Sensor Networks (WSN) using VANETs. IEEE 802.11p has been adopted and multicast routing has been proposed to be implemented in Garbage Collecting Vehicle‟s (GCV) On Board Units (OBU) for effective communication. Road Side Units (RSU) and sensors have been made use of in the response system. Filling up of multiple bins at the same time and usage of reserve GCVs has been considered. The prototype VANET based efficient garbage disposal system is induced in a metropolitan city environment and has been simulated in NS2and the results are encouraging for implementation. The system can be laid out in a large number in monitoring area to form monitoring sensor network. It also exhibits the function of forecasting by analyzing the obtained data neural network technology. Real time monitoring of status of bins, estimation of amount of waste in and around them, surveillance for monitoring the movement of vehicles, optimization of routes and reallocation of bins according to the estimated waste, availability of Management Information System (MIS) reports for effective planning of resource schedule and providing transparency in civic administration are dealt with.

1. **SMART GARBAGE COLLECTION SYSTEM IN RESIDENTIAL AREA.**

Solid waste management is a big challenge in urban areas for most of the countries throughout the world. An efficient waste management is a pre requisition for maintain a safe and green environment as there are increasing all kinds of waste disposal. There are many technologies are used for waste collection as well as for well managed recycling. The Information gathering is big and cumbersome. The concurrent effects of a fast national growth rate, of a large and dense residential area and a pressing demand for urban environmental protection create a challenging framework for waste management. The complexity of context and procedures is indeed a primary concern of local municipal authorities due to problems related to the collection, transportation and processing of residential solid waste today the garbage collection is manual which takes a lot of efforts and is time consuming.

**CONCLUSION**

This project work is the implementation of smart garbage management system using sensors, Raspberry pi and IOT module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum.

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