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WASTE MANAGEMENT SYSTEM USING AWS

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Abstract - *In the recent years, Urbanization has increased hugely. At the same time there is an increase in waste production very much. Waste management has been a very necessary issue to be considered. Raising of insects and mosquitoes can create problems around promoting impure environment. This may even cause terrible diseases. In this project of smart waste bin, we presented the smart waste-bin that can managed the waste in a smart city project. Each n every trash can contain a smart device for level detection of the trash can which transmits the garbage/trash level with its token ID, accessed by the concerned municipal/regional authorities through the smart phone application, so that they can take immediate actions to clean the trash once it gets filled with waste. The system consist of Ultrasonic Level sensors to measure the level of waste inside the bin. The Ultrasonic sensor is placed at the top of the dustbin which can be used to measure the ability of the dustbin. Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside. The system also accommodate with network environment, to manage all related information from waste management.*

Key Words: **clean and green environment, sustainable living; smart bin, GSM/GPRS, Internet of Things, wireless network, Arduino Mega, smart city, cloud,**

1. INTRODUCTION

The main idea behind the system is for smart waste bin for having the control and maintaining a sanitation. This system has been tested in a real situation. This system naturally minimized the average cost of maintaining a clean and safe environment in bins by raise the waste bin pick-up schedule and also prevents dangers like _re and germs spread. More importantly, this system uses the existing communication framework. Being wireless the system is easy to deploy and maintain. It may be noted that this system is especially relevant for developing countries, as it presents a profitable, quick and effective implementation. It also fits in nicely with the plans of many governments to not only implement smart cities but also enhanced importance of developing of mobile application which are being included in many countries. The sensors will detect the level of bin and produce result of collect the bin quickly.

2. LITERATURE SURVEY

2.1 A Cloud integrated wireless garbage management system for Smart Cities

Waste management is an issue of serious concern in modern urban scenario with exponentially rising population. Apart from the need to reduce the costs incurred in garbage management, the municipality, at the same time has to ensure a safe and healthy environment for the citizens. This paper presents the development of a cloud integrated wireless garbage management system for smart cities. The proposed system centrally monitors the temperature, humidity, amiable gases concentrations (or smoke), _re detection and garbage full volume in waste bins with the help of wireless sensing nodes placed at remote locations in the city. The communication from the sensor node to the central station is done using TCP/IP protocol via existing GSM/GPRS wireless infrastructure in the city. At the cloud server, the data is monitored, analysed and stored and notification to the service providers is sent for suitable action for _re prevention and waste bin overflow. The experimental results show that the proposed system is a cost-effective and efficient solution for waste management in modern urban scenario.

2.2 Design a Smart Waste Bin for Smart Waste Management

A Smart City is a city development to manage multiple information and communication technology (ICT) in order to make a solution for any problem in the city. Smart city includes many information such as, local department information system, schools, libraries, transportation system, hospital, power plants, law, traffic system, waste management, and others city services. The goal of a smart city is to improve an efficiency of services and connect all information into one system.

Nowadays, development of ICT especially internet of things (IoT) allow the city to be developed into a smart city. The aforementioned concept is being realized through the use of real-time systems and sensors, where

(a) Data are collected from citizens and objects (things), then

(b) Processed in real-time and finally

(c) The gathered information and related extracted knowledge are becoming the keys to tackling inefficiency. In this context, waste management involves numerous waste bins that exhibit significant filling variations (over days and

seasons or location) and diverse requirements for emptying, from sporadic (a few times within a week) to very frequent (several times a day). On the other hand, other waste forms (i.e. agricultural, bio-medical, chemical, electronic, mineral, organic/inorganic, and radioactive, etc.) are characterized by specific collection points, uniform and predictable production, and equal, usually long, filling periods. The detection of the full-level for urban solid-waste-bins presents many difficulties due to the various irregularities of the waste-bin filling process, such as the irregular shape and the variety of the included materials.

2.3 Smart Waste Management Using WSN and IoT

Rapid increase in population, has led to the improper waste management in cities resulting in increased pests and spreading of diseases. Nowadays, the Garbage Collecting Vehicle (GCV) collects the waste twice or thrice in a week. So, the problem is over owing of wastages on the roads. Hence, to overcome this limitation, in this paper a scheme on smart waste management using Wireless Sensor Networks (WSN) and IoT (Internet of Things) is proposed. The garbage bins are deployed with sensors and are networked together using WSN. The sensors deployed in the garbage bins collect the data for every determined interval. Once the threshold is reached, it raises a request to the GCA (Garbage Collector Agent). This agent collects the requests of all the filled vehicles and communicate using IoT framework. The experimental simulation is done in proteus tool. A hardware prototype is developed for the proposed framework. Analysis of the proposed scheme Provides better results in waste management.

2.4 National Reporting to CSD 18/19 WASTE MANAGEMENT

The tradition of developing and using environmental technologies especially for waste management has existed in Switzerland for a long time. As early as the 1960s the country became a pioneer in this domain by rigorously installing treatment and incineration plants with stringent emission standards. Today it can be acknowledged that Switzerland has succeeded in moving from basic waste removal to an environmentally friendly process of waste disposal and recycling. Now, incineration plants are efficient power plants which produce clean heat and electricity. However, Switzerland will soon be faced with new considerable challenges which it will not be able to master alone. If the objective is to sensibly reduce the environmental impacts due to the huge flow of goods worldwide, it will not be sufficient to act at the end of the Production supply chain. Therefore, in order to work towards sustainable development, it will be even more necessary to improve social and environmental criteria all along the life cycle of goods and services.

3. METHODOLOGY

We proposed cloud integrated wireless garbage management system framework whose implementation includes following elements:

3.1 Wireless Sensing Node

This unit is located in each smart bin in the city. It comprises sensors that collect ambient data from the bins, a microcontroller that samples the sensed data, a wireless module that transmits the data to the central station.

3.2 Cloud based server

This is a connected Web entity that receives, Stores, displays and analyses the information provided by the various wireless sensing nodes in real time. It also notifies the workers for suitable action.

3.3 Software Android App

This is an application software system. The workers install it on their smart phones for mobile live monitoring of bins and hence take suitable action.

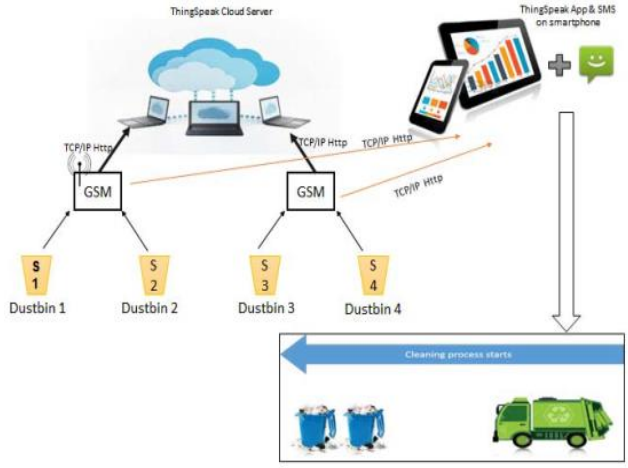

Figure 1: Architecture diagram

We are using different hardware and software resources for developing this application.

3.4 Hardware Resources Required

3.4.1 Ultrasonic Sensor

The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to use package from 2 cm to 400 cm or 1 to 13 feet. The operation is not affected by sunlight or black material, although acoustically, soft materials like cloth can be difficult to detect. It comes complete with ultrasonic transmitter and receiver module.

Figure 2: Ultrasonic Sensor

3.4.2 Arduino:

It's a single-board microcontroller, designed to make the application of interactive objects or environments more accessible. Sense the environment by receiving input from variety of sensors. Can be programmed with the Arduino software IDE. The Atmega328 on the Arduino Uno comes pre burned with a boot loader that allows us to upload new code to it, without the use of an external hardware programmer.

Figure 3: Arduino

3.5 Software Resources Required

3.5.1 Cloud

The cloud refers to software and services that run on the Internet, instead of locally on your computer. The advantage of the cloud is that you can access your information on any device with an Internet connection. In this Project we can prefer Amazon Web Services (AWS).

3.5.2 AWS

Amazon Web Services (AWS) is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow. Amazon Web Services provides a highly reliable, scalable, low-cost infrastructure platform in the cloud. Amazon Web Services is low cost .AWS is secure. Amazon packages AWS with scalable and virtually unlimited computing, storage and bandwidth resources.

4. CONCLUSION

We have been implemented the real time waste monitoring garbage system with the smart bin to check the levels of garbage in dustbin whether the dustbins are full or not. In this system the information of dustbin can be accessed by the user/authorities from anywhere by using android app. When garbage levels reached the condition details of bin will be sent to the authorities via email and this system will reduce the monitoring system of cleaner to check the garbage levels as result this will reduce the solid waste. Our model designed with low cost, high accuracy sensors, cloud database to get the data with high accuracy and we used Arduino hear to give the constant internet connection to the system to update the data in cloud database and android app will give the details of bin from cloud database. And further we implement this model to connect all the dustbin together by using own cloud database and web portal will give the information all full dustbins as result it will be easy to monitor the system.

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