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Urban Solid Waste Management System using IOT Devices and AWS services

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Abstract

The concept of Solid Waste Management is one of the biggest challenges throughout the world. It is increasing becoming difficult to maintain waste in developed as well as the developing countries. Large amount of resources have been allocated by the countries to meet the needs of waste management. A lot of time is spent on these things but still the solution is yet to be found. In this project I have tried to overcome this problem by building an application with the help of cloud so that people can easily access this and help maintain trash. Once the program is executed, people can open this with the help of any browser can locate the nearest trash bin.The main idea behind this project is to make people more responsible, vigilant and actively take part in waste management. While travelling outside it becomes difficult for the people to locate the trash bin so they simply throw the trash out. In order to overcome this, we create an application which helps us locate the nearest trash bin and throw away the trash.

Keywords: *Sensors, Ultra Sonic Sensors, GPS, GPRS, Hydrophone Sensors.*

INTRODUCTION

The collection of waste has always been a critical issue in the ever growing environment. In the olden days things were less complicated as the population was very less and the environment was always kept clean. But nowadays things have

changed As the population keeps increasing the need to maintain waste and demand for different solutions also keeps increasing.

The IoT is one the methods that can be used to control and regulate waste. It is a network of different devices like washing machines, toaster and many other appliances which are connected together with the help of sensors and they use connectivity i.e. internet to communicate with each other and exchange information. Each and every thing in them is unique.

The IOT allows objects to use from remote places across different networks, infrastructure and help to create new opportunities through which we can integrate physical world objects with the systems. In this project, the use of sensors and various IOT related things are used in an extensive manner. There are several sensors used like force sensor, weight sensor and many other things. These sensors interact with the real world objects and give information to the control module which in turn converts them into things which can be easily processed by the system and efficient result can be obtained. The „Things" in IOT refers to the sensors which collect information. These things can be anything like microchip, animals with microchips on their collars, kitchen appliances and many other things.

LITERATURE SURVEY

In [1] the authors Vincenzo Catania and Daniela Ventura came up with the idea of maintaining waste with the help of elaborate methods m-3 platforms and many such things. In this method the problems are solved by providing high degree of scalability and decoupling. Real time monitoring is done on the waste collection bins through the help of the sensors which are placed inside the containers. By using this method they can avoid collection of waste which are not empty or which are semi-empty. This method had significant impact on both the users and the vendors. The vendors could reduce the cost of the projects by not going again and again to collect wastes whereas the users were happy that the waste was getting collected on time. A new mechanism called Green points [1] was introduced in this paper which helped to create awareness among people to recycle waste.

The main drawback of this was that there were no locks on the bins which made the waste to overflow and graphical features were not shown clearly.In [2] Srikanth and many other authors propose a way smart

parking management using the wireless sensors and also help with new technologies. This paper provides a different way with which parking can be implemented and also they provide a simulation for learning purposes.

A full-fledged prototype is shown so that it easy to understand the role of sensors. From this paper we will be learning how to use sensors effectively. This helps in project which we are working now. Different ways on which we can use the sensors, how they should be arranged, how they can be used are learnt through this paper. In this pramod shows us how the systems are connected in a new way and also what type of systems are used i.e. whether WSN is used or not. Parking or vehicles done in real time is shown using simulation.

In [3] Wang proposes a way maintain traffic with the help of cloud. He tells us that by using real time and archived data and by using cloud the traffic can be easily controlled and maintained. The cloud platform provides a way through which more data can be handled elastically and can provide unlimited storage and resources for the applications which are hosted.

In this paper Map –reduce framework is use to handle parallel and distributed data. Obtaining the data of the real-time traffic is a bit difficult so more caution is taken to analyse, compute and give an accurate result. The data can also be collected from the phones of the users who are present near the traffic lights. A prototype is shown to determine how cloud is used to change the traffic lights based on the conditions and maintain them.

In [4] Angelis proposes a way through which sensors can be used to talk to humans and it can be reciprocated to build a smart and awareness framework for the city. In this Sen2soc technology is used to experiment with the users and with a new city.A prototype is created with which the user can interact in the framework. This helps to build a trust between the user and the people who created the smart city framework. Reporting and to develop collective aware applications.

EXISTING SYSTEM

In the existing system, they have proposed an approach based on Smart-M3 platform through which it was possible to manage the sharing of data between devices very heterogeneous and achieve a high degree of scalability and flexibility, important features for the management of highly

dynamic and heterogeneous environments typical of smart city context. The smart system described focuses on two aspects: first of all, it is addressed to governments and private companies in order to plan a better management of resources to be deployed in city‟s areas and an optimal planning of waste collection; secondly, it is aimed at giving citizens the opportunity to know the position and conditions of the nearest bins and encourage them to recycling. Only a single system contains all the data related to the garbage collection. Android app is not fully completed

PROPOSED SYSTEM

In the proposed system, a complete android application is implemented and instead of using one system which has all the information, we will be making use of cloud services to store and retrieve information. We will be implementing new sensors which can differentiate between dry waste and organic waste. An automatic lock is also to be included which locks the dustbin automatically when the garbage is completely filled so that no extra load can be included.

In the proposed system, the level of waste in the dustbins is detected with the help of Ultrasonic sensor. Force sensor is used to measure the weight of the dust bin. Red and Green LEDs are used to indicate filled and empty level of dustbin respectively. What time the restrained value of sensor go beyond a confidentdawn value, this statisticsby means of GPS whereaboutssomewhere the earthcontainer is to be bring into beingwillpowerbe situatedconducted to member of staff serving at tableover and done withto from side to side GSM/GPRS classification.

Android meansmotivationraise the material from server, in which expansewastepaper picnic basket is to be found, by associatingsynchronizes and bring up-to-date the whereaboutsin addition inform the one-to-onemeans of transportation to pull together the waste. Microcontroller is hand-me-down to crossing point the measuring device system with GSM/GPRS system. This will comfort to bring about the debrisassemblageresourcefully. Numerous inserted frameworks have generously unique outlines as indicated by their capacities and utilities. In this task configuration, organized particular plan idea is embraced and the framework is predominantly made out of microcontroller, Ultrasonic sensor, drive sensor, GPS, GPRS, LCD, Amazon cloud web server and Android application .

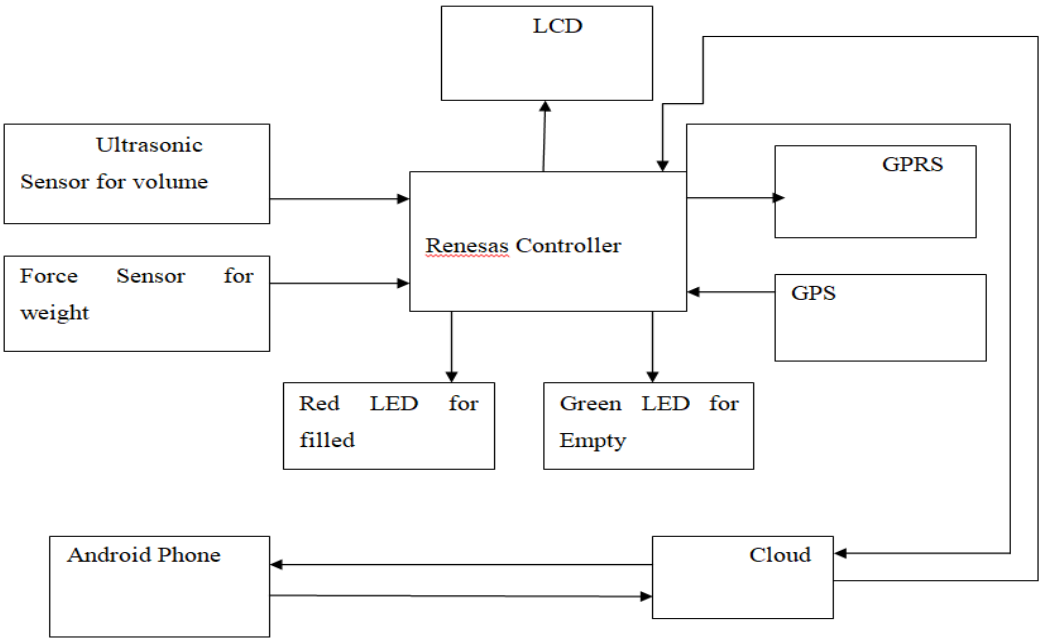

Figure1: Proposed Architecture

The microcontroller situated at the focal point of the square chart shapes the control unit of the whole undertaking. Installed inside the microcontroller is a program that causes the microcontroller to make a move in view of the data sources gave by the yield of the sensors. We are utilizing Ultrasonic sensor and power sensor to checking the loss in the dustbin.

Level of waste in the dustbins is distinguished with the assistance of Ultrasonic sensor. Power sensor is utilized to gauge the heaviness of the residue receptacle. Red and Green LEDs are utilized to show filled and void level of dustbin separately. At the point when the deliberate estimation of sensors surpasses a specific limit esteem, this data with GPS area where the dustbin is found will be refreshed specifically to Amazon cloud web server through GPRS(IoT). Android gadget can get information from server, and can be seen on Google delineate. Android gadget will distinguishes, in which territory dustbin is situated, by contrasting directions and updates the area and educate the individual vehicle to gather the waste.

Microcontroller is utilized to interface the sensor framework with GSM framework. This will deal with the waste gathering effectively. In an android application, a GUI is created like when client logs to PDA the menu will be given, which holds the charges to hold information and view information

RESULTS

As the name suggests, remote connection is made through virtual system. Separate space is provided so that the execution happens smoothly while connecting through the virtual system a login page is provided. We have to login.

Only then a instance is created.The correct address has to be selected while creating account and it should be stored. If there are any changes in the ip address then obtaining the correct result is difficult .After the credentials are checked the user can run an instance through which the program is runIn this state as the name suggests the instance is implemented. We can determine how many devices are connected and whether they are running successfully or no. In this stage we can execute the project and obtain the simulated result.

Before that we must make the connection to the hardware by logging inwe show the hardware part of the project i.e. how the bin is connected to various iot devices and how it provides the result.

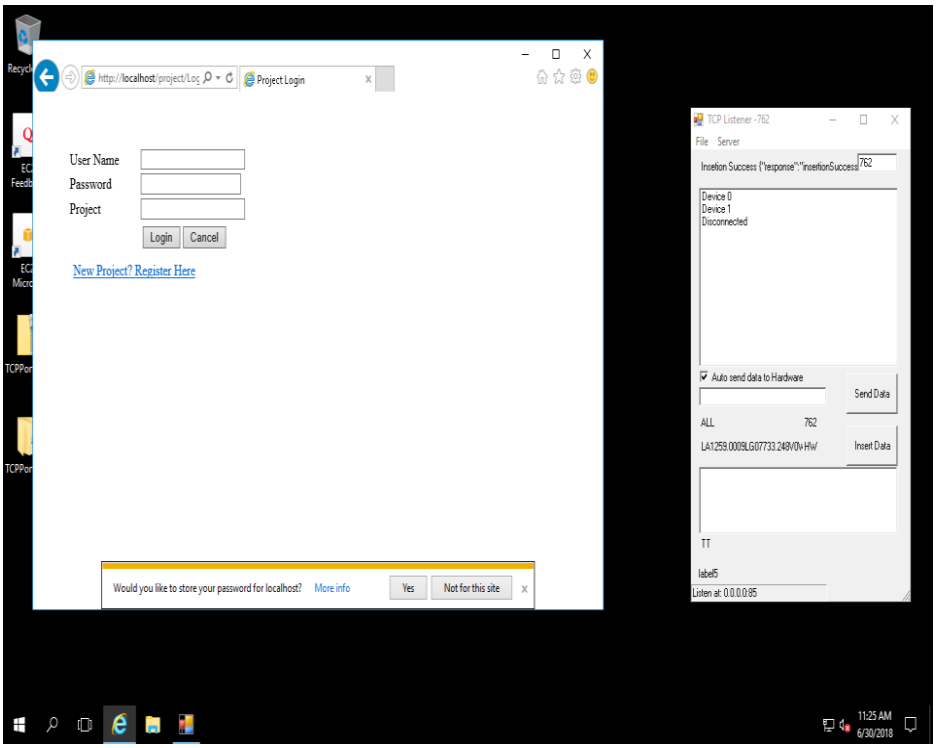

Figure:1

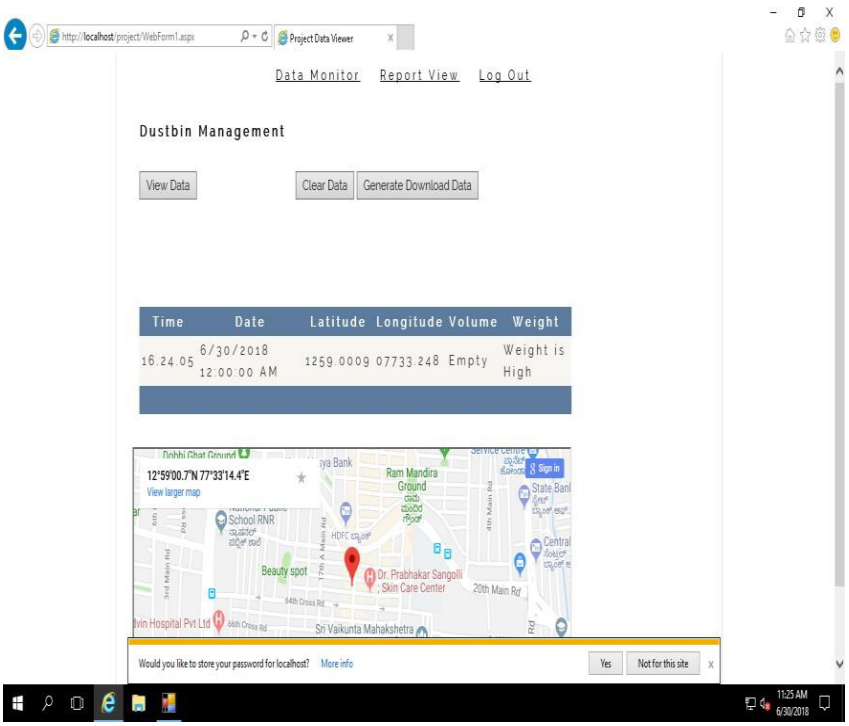

Figure:2

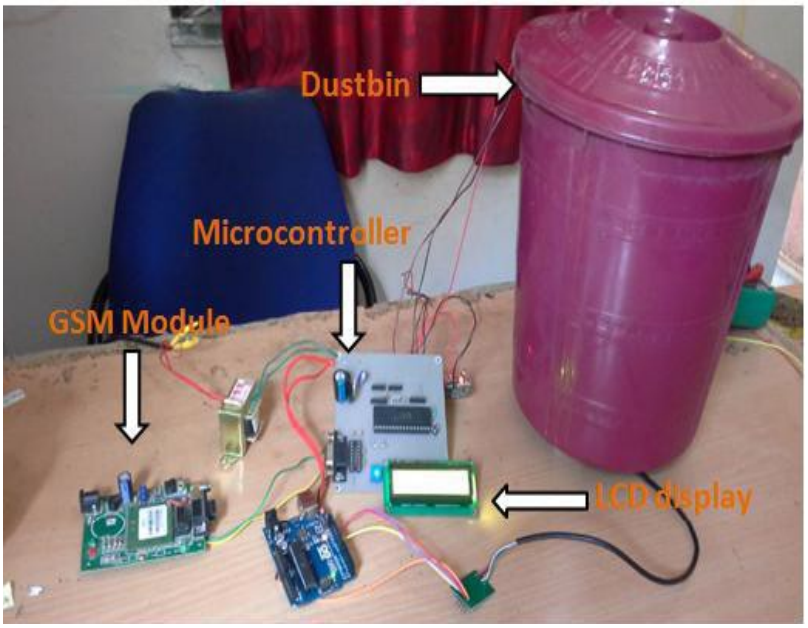

Figure:3

CONCULSION

As the system turns out to be substantial and administrators loses the control of the frameworks that are associated in the system. Host revelation check causes the head to find the frameworks that are as of now associated with the system and the administrations that are running on those

frameworks. Host revelation filter encourages the client to analyze the system resources by giving the unique mark data like IP address, have name, FQDN, area, netbios name, netbios space name and macintosh address. Host disclosure examine likewise gives the administrations that are running in the framework with data, for example, convention, port and program name.

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