

A Novel Design to IoT Based Waste Management for Smart Cities using Aurdino

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To Cite this Article

V N Sireesha and M Syamili, "A Novel Design to IoT Based Waste Management for Smart Cities using Aurdino", *International Journal for Modern Trends in Science and Technology*, Vol. 05, Issue 02, February 2019, pp.-01-04.

Article Info

Received on 30-Dec-2018, Revised on 20-Jan-2019, Accepted on 31-Jan-2019.

ABSTRACT

In the present day scenario, many times we see that the garbage bins or Dust bin are placed at public places in the cities are overflowing due to increase in the waste every day. It creates unhygienic condition for the people and creates bad smell around the surroundings this leads in spreading some deadly diseases & human illness, to avoid such a situation we are planning to design "A Novel Design To IoT Based Waste Management for Smart Cities Using Aurdino". In this proposed System there are multiple dustbins located throughout the city or the Campus, these dustbins are provided with low cost embedded device which helps in tracking the level of the garbage bins and an unique ID will be provided for every dustbin in the city so that it is easy to identify which garbage bin is full. When the level reaches the threshold limit, the device will transmit the level along with the unique ID provided. These details can be accessed by the concern authorities from their place with the help of Internet and an immediate action can be made to clean the dustbins.

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I. INTRODUCTION

The Internet of things (IoT) is the system of substantial plans, vehicles, house appliance and other embedded by electronics, software, sensors, actuators, and network connectivity which allow these things to bond and exchange data. Each thing is individually specific all the way through its embedded computing system but is able to inter-operate surrounded by the active Internet infrastructure. The IoT allows objects to be sensed or embarrassed remotely transversely active set of connections infrastructure, creating opportunity for added direct integration of the substantial planet into computer- based systems, and consequential in enhanced efficiency,

correctness and economic benefit in addition to reduced human intervention. When IoT is improved by sensors and actuators, the technology becomes an illustration of the added widespread group of cyber-physical systems, which also encompasses technologies such as smart grids, virtual power plants, smart houses, intelligent transportation and smart cities.

"Things", in the IoT sense, can transfer to an extensive diversity of devices such as heart monitoring implants, biochip transponders on top of farm animals, cameras streaming survive feeds of wild animals into coastal waters, automobile among built-in sensors, DNA chemical analysis devices used for environmental or food or pathogen monitoring.

Legal scholars recommend regarding "things" as an "inextricable mixture of hardware, software, data and service". These devices gather useful data with the help of different existing technologies and then autonomously flow the data between other devices. The term "the Internet of Things" was coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Centre, in 1999.

The smart dust bins are connected to the internet to get the information of the smart dustbins. In the recent years there was heavy pollution caused to the environment. Due to the bad odour it spreads the disease to the children. When the garbage is spread in the city the animals eat that wastes and they are affected by the avoidable diseases. Due to lack of resources, ineffective groundwork, some waste is not collected which poses serious health hazard to the surrounding environment. Proper cleaning intervals may provide a solution to this problem. But keeping a track of the status of the bin manually is a very difficult job. There are multiple dustbins are located throughout the city. There dustbins are interfaced with IoT based system with IR sensor. Where the IR sensor detects the level of the garbage in the dustbin and sends the signals to wifi-module, the same signal are encoded and send to the application and the message is displayed. The data has been received, analyzed and processed in the database, which displays the status of the Garbage in the dustbin on the application of authorized person mobile. The concerned authority get alert about dustbin is full and informs person whoever is responsible for collecting garbage from the particular areas. The garbage trucks collect the garbage from the completely full dustbin and dispose it. The authority will check the garbage for every two hours and it will give the alert message the garbage is not cleaned. After cleaning the trash can the ultrasonic sensor checks the trash can whether it is empty or full and if the trash can is empty then it sends the information to the Arduino, then it initiates the cleaning process by switching on the centrifugal pump, it flows the water with a force to clean the trash.

II. LITERATURE SURVEY

[1]. IoT Based Waste Management for Smart City by Parkash, Prabu V. Level of the dustbin is displayed when garbage is full. The drawback of

this paper is time is not shown when the garbage is cleaned.

[2]. Waste Management System Using IoT by Mrs.D.Anuradha , A.Vanitha, S.PadmaPriya, S.Maheshwari. Unique ID of the dustbin is displayed when the level of the dustbin is full and is stored in the mobile application .The drawback of this paper is the time is not shown when the garbage is cleaned.

[3]. Smart Waste Management System using IoT by Prof. S.A.Mahajan, AkshayKokane, ApoorvaShewale, MrunayaShinde , ShivaniIngale. The load sensors will increase efficiency of data related to garbage level and moisture sensors is used to provide the data of waste segregation in a dust bin.

[4]. Design and Implementation of IoT Based Waste Management System by J. Kokila, K. Gayathri Devi, M. Dhivya and C. Haritha Jose. This paper focused on the implementation of an IoT based embedded system which integrates Radio Frequency Identification (RFID), Sensors, Arduino controller and GSM for solid waste bin. [5]. A Smart Waste Management and Monitoring System using Automatic Unloading Robot by Nithya.L, Mahesh.M. The robot is used to collect the garbage when it reaches high level. To move the robot from garbage area and unload the wastage by Using DC Motor. The overcome of this paper is that recycling the plastics automatically.

[6]. Smart Waste Management System by Dr. S. Anand, Pradeep.R, AhamedSathik. I . The waste bins are equipped with sensors and connected to cloud with push mechanism. The stack holders are able to get the all data from the cloud.

III. PROBLEM DEFINITION

The existing system would be able to monitor the level of the dustbin and send the level of the dustbin to the authorized person. The proposed system is implemented with the time stamp in which real-time clock shown to the concern person at what time dust bin is full and waste is collected from the smart dustbins. The smell of the trash is sensed and buzzer is alarmed. The extension of our project is to automatically clean the trash can with the force of water when the trash can is empty. The trash can will be automatically open and close when a person is near by the trash can.

IV. BLOCK DIAGRAM

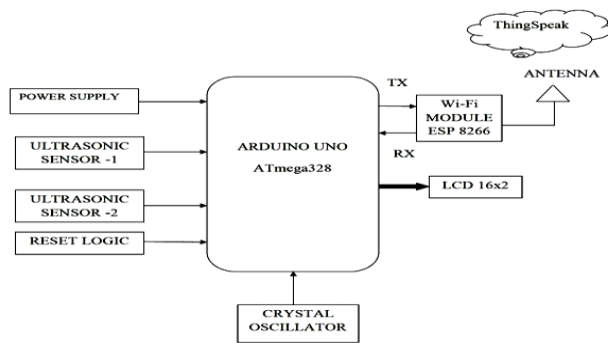


Figure 1: Proposed Block Diagram

V. EXISTING SYSTEM

When the dustbin is over flown, there will be heavy pollution in the environment. Due to this bad odor is spreader which causes various diseases to the children. When the garbage is thrown outside across the city, th animals eat those wastes and they are affected by the avoidable diseases.

In the existing system it will help to avoid the overflow of dustbin. [1]It gives the information about the level of the dustbin using ultrasonic sensor. [2]It will send the message immediately when the dustbin is full by their unique ID. Then warning message will be displayed. The cost of this existing system is low. The resources are available easily. Improves environment quality by reducing the odor and make the cities clean. It has effective usage of dustbins. It will also reduce the wastage of time and energy for truck drivers.

DISADVANTAGE

- If containers are not maintained properly they quickly corrode and get damaged.
- Adjacent residents complain about the smell and its appearance.
- If collection services are delayed, waste may not be collected or some time it causes considerable nuisance.

VI. PROPOSED SYSTEM

The proposed system of our project is implemented with the time stamp in which real-time clock shown to the authorized person at what time dust bin is full and the garbage is collected from the smart dustbins. If the garbage is not cleaned within the time it gives another alert message to the responsible person and the garbage is checked for every two hours. So the environment will be

cleaned and it will avoid the spreading of the diseases. It will also indicate the presence of any toxic gases in the bin by alarm sound. The proposed system is implemented, after cleaning the trash can, the ultrasonic sensor checks the trash whether it is empty or full, if the trash is empty, then it sends the information to the arduino, the it initiates the cleaning process by switching on the centrifugal pump by which the water with a force is applied to clean the trash. It will be very useful and can be installed in the Trash Cans at public places as well as at home. The trash can will be automatically open and close when a person is near by the trash can.

ADVANTAGES

- Ecological and save country.
- Don't want to problem the elders by conveying the task of searching particle buyers. Lazy to leave and retail your rubbish.

VII. PROPOSED CIRCUIT DIAGRAM

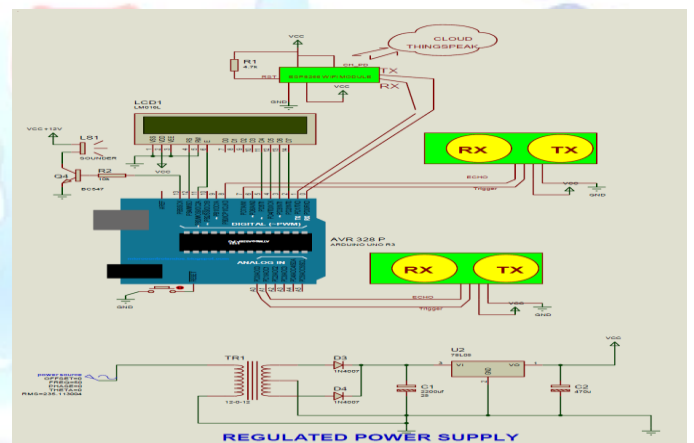


Figure 2: Proposed Circuit Diagram

VIII. RESULTS AND CONCLUSIONS

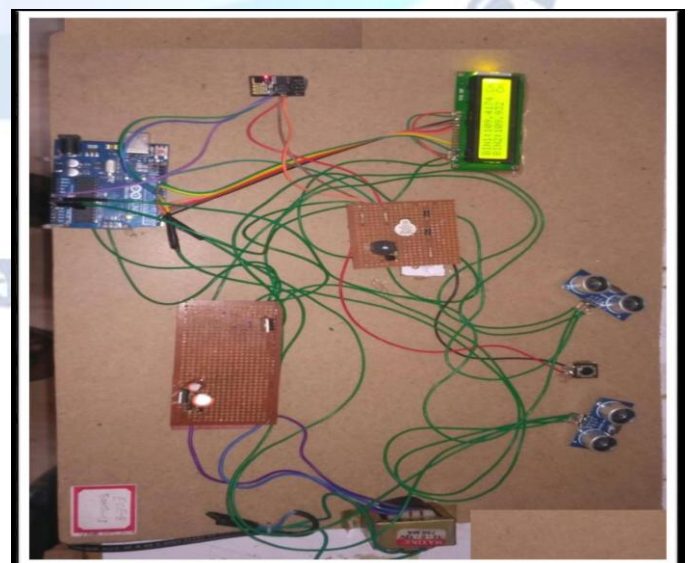


Figure 3: Over all proposal Model

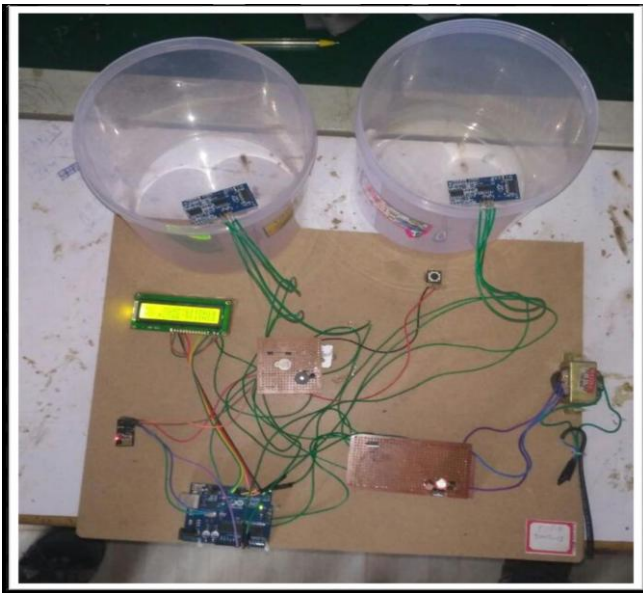


Figure 4: Smart Dust Bin

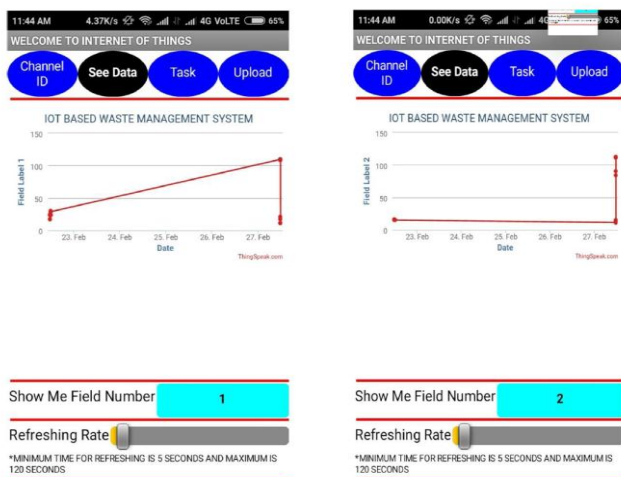


Figure 5: GARBAGE LEVE IN DUSTBIN

We have implemented real time waste management system by using smart dustbins to check the fill level of smart dustbins whether the dustbin are full or not. In this system the information of all smart dustbins can be accessed from anywhere and anytime by the concern person and he/she can take a decision accordingly. By implementing this proposed system the cost reduction, resource optimization, effective usage of smart dustbins can be done. This system indirectly reducing traffic in the city. In major cities the garbage collection vehicle visit the area's everyday twice or thrice depends on the population of the particular area and sometimes these dustbins may not be full. Our System will inform the status of each and every dust bin in real time so that the concerned authority can send the garbage collection vehicle only when the dustbin is full.

The scope for the future work is this system can be implemented with time stamp in which

real-time clock shown to the concern person at what time dust bin is full and at what time the waste is collected from the smart dustbins.

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