

IOT Based Waste Management System

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Abstract - A conceptual network for household as well as industrial waste management in high-rise residential or official buildings in our country is proposed in this system. This experiment is justified based on: (1) the current situation of municipal solid waste management in Malaysia that (hypothetically) has been affected by improper knowledge transfer between resource management agencies due to the lack of technology involvement, and (2) fast urbanization in Malaysia and increasing demand for high-rise residential living lifestyle due to land scarcity, which is more tangible in areas with higher density of population. Additionally, categorization of living quarters has not been considered (by the resource management agencies) in municipal solid waste management planning. This system focuses only on household waste management in high-rise residential buildings. However, possibilities or limitations of implementation of the presented system in other categories of living quarters are discussed at the end. The proposed network aims at facilitating the process of knowledge acquisition, knowledge management, and knowledge transfer in the mentioned area. The outcomes of this study are somehow the current Government's stalled sustainable goals, which were aimed to be achieved through enforcement plan (unsuccessful to date). This system tries to approach the research problem through a more realistic and feasible fashion, considering today's modern lifestyle. This study, however, does not argue over what has (not) been done in the past, but how to use the previous experience(s) towards the future sustainable development. The proposed network presented in this system is accompanied by a conceptual prototype, which has been developed and visualized based on interpretation of the findings of the experiment. So, the prototype can be technically tagged data visualization through IOT.

Keywords: Waste management, Experimental analysis, Internet of Things, IOT.

I. INTRODUCTION

In the recent decades, Urbanization has increased tremendously. At the same phase there is an increase in waste production. Waste management has been a crucial issue to be considered. Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems.

Breeding of insects and mosquitoes can create nuisance around promoting unclean environment. This may even cause dreadful diseases. Once these system are implemented on a large scale, by replacing our traditional place of dump present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside. This system is a way to achieve this good cause. In this system designed to find the level and type of waste products and their ranges. Based on the level it converted into recycling useful product to some other applications.

Though the world is in a stage of up gradation, there is yet another problem that has to be dealt with. Garbage! Pictures of garbage bins being overfull and the garbage being spilled out from the bins can be seen all around. This leads to various diseases as large number of insects and mosquitoes breed on it. A big challenge in the urban cities is solid waste management. Hence, smart dustbin is a system which can eradicate this problem or at least reduce it to the minimum level. The system supports the voice alert unit for warning the wastage throws out from dust bin. Here we introduce new system for finding the waste level and type with the help of poly sensor with internet communication.

II. EXISTING SYSTEM

This study is justified based on: (1) the current situation of municipal solid waste management in Malaysia that (hypothetically) has been affected by improper knowledge transfer between resource management agencies due to the lack of technology involvement, and (2) fast urbanization in Malaysia and increasing demand for high-rise residential living lifestyle due to land scarcity, which is more tangible in areas with higher density of population. Additionally, categorization of living quarters has not been considered (by the resource management agencies) in municipal solid waste management planning. Problem identifications: Solid waste management only analyzed.

III. LITERATURE SURVEY

Paavan Lakshmana Chowdary S, Sai Teja G, Naga Mahesh K Department of Electronics and Communication Engineering National Institute of Technology, Andhra Pradesh an IoT based Smart Garbage Alert System IEEE-2019. With day by day increase in population, number of start-up units,

the average waste generated by an individual is increasing every day which leads to severe waste management issues. Nowadays sanitarieness and cleanliness are one of the agitated issues by any state all over the world. This is mainly caused due to improper waste monitoring and management processes. To overcome these problems a garbage monitoring system is designed which periodically measures the level of trash in the containers and alerts the concerned authorities. This is done by positioning a sensor network to collect the garbage levels in the containers and remotely triggering the required controls using IoT. IoT is one well-known technology which helps in solving many real-world problems. The main objective of this paper is to trigger an alert message to the people concerned when the container is filled thereby avoiding the over spilling of garbage.

Evenet Johar, Rahul mishra Atharva college of engineering, Mumbai IoT based intelligent garbage monitoring system IEEE 2019, Waste management is simple yet effective ways of reducing the amount of waste dumped into our landfills. But there are people who are unaware or even choose to ignore the fact that waste segregation and recycling are environment friendly solutions to the problem of wastes management and disposal. In the Philippines, there are recycling centers but the process is tedious and done manually. There are guidelines implemented by the government with regards to recycling but these efforts have yet to touch the mindset of the people. Escalating amounts of recyclables that are not maximized and indifference in proper waste segregation has led to the group in developing a solution to this. This project IOT Based Intelligent Garbage Monitoring system is a newfangled system which will keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. This system uses two ultrasonic HC-SR04 sensors placed over the bins to track down the garbage level and correlate it with the garbage bins depth.

Prof. Dr. Sandeep M. Chaware¹, Shriram Dighe², Akshay Joshi³, Namrata Bajare⁴, Rohini Korke⁵ Faculty, Computer Engineering Dept, TSSM'S BSCOER, Narhe, Pune Smart Garbage Monitoring System using Internet of Things (IoT), The Internet of Things (IoT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. Building a general architecture for the IoT is hence a very complex task, mainly because of the extremely large variety of devices, link layer technologies, and services that may be involved in such a system. One of the main concerns with our environment has been solid waste management which in addition to disturbing the balance of the environment also has adverse effects on the health of the

society. The detection, monitoring and management of wastes is one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies in any way. This an advanced method in which waste management is automated. This project IoT Garbage Monitoring system is a very innovative system which will help to keep the cities clean.

Parveen Sultana VIT University IoT garbage monitoring system IEEE 2017, the aim is to cover all the rural and urban areas of the country to present this country as an ideal country before the world. With the proliferation of the Internet of Things (IoT) modules such as smart phones, sensors, cameras. It is possible to collect massive mount of garbage. In the metropolitan cities it is not possible to check each and every place where the garbage dump yard is full or not. So we have introduced a new concept using load cell.

This is a sensor which intimates about the load placed on it. So that the garbage can also be checked in this way. Here we are using AT89S52 as our controller. A threshold value is set in the controller. Controller will monitor the status load cell. When that value is met then an intimation will be sent to the officials through IoT about the over load and also to clear the garbage as soon as possible.

IV. PROPOSED SYSTEM DESIGN

With day by day increase in population, number of start-up units, the average waste generated by an individual is increasing every day which leads to severe waste management issues. Nowadays sanitarieness and cleanliness are one of the agitated issues by any state all over the world. This is mainly caused due to improper waste monitoring and management processes. To overcome these problems a garbage monitoring system is designed which periodically measures the level of trash in the containers and alerts the concerned authorities. This is done by positioning a sensor network to collect the trash levels in the containers and remotely triggering the required controls using IoT.

IoT is one well-known technology which helps in solving many real-world problems. Internet of Things (IoT) strongly supports the notion of interfacing and observing the real world objects (things) through the Internet. The detection of bin parameters in the container is carried out using the Node MCU ESP8266 microcontroller board. This system also includes sensor network for finding the solid, chemical, gas waste products and environmental condition.

3.1 Functional Blocks

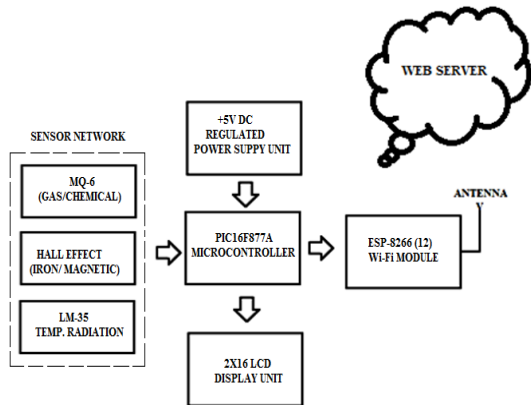


Figure 1: Functional block diagram of proposed

3.2 Description

The system consists of different sensors like MQ-6, LM35, Hall effect and PIC 16F877A microcontroller, ESP8266 Wi-Fi module and +5V DC regulated power supply unit. The MQ-6 sensor is used to sensing the all kind of gases coming from solid and chemical wastes or products. The Hall Effect sensor is used to detect the iron as well as magnetic materials. Each sensor unit produces the electrical signal according to their input sensing parameters. The LM35 transistor is used to measure the temperature level of the waste as well as environment. The entire output signal from each sensor as in the form of analog and it applied to the input of ADC (Analog to Digital Converter) port of the PIC microcontroller. The ADC port is inbuilt function of the controller which is used to convert the analog signal into digital values. The controller calculates the percentage of waste product values.

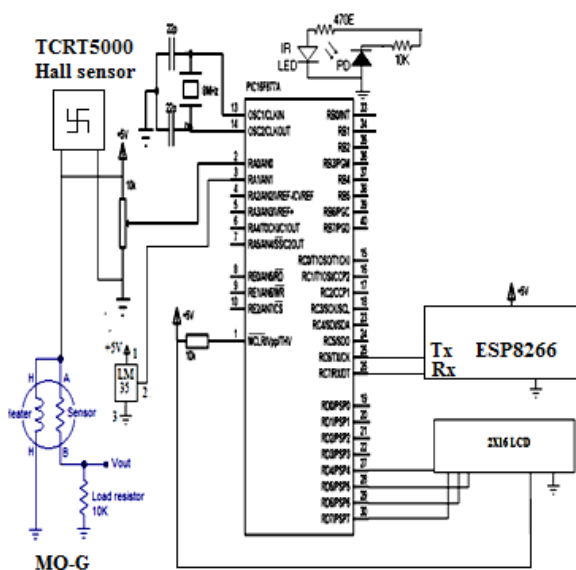


Figure 2: Circuit Diagram

These values are transmitted to web server called Internet of things (IOT) through UART pin of microcontroller. The ESP8266 is a Wi-fi module and it act as an IOT module. Each ESP device has own IP address. We can able to monitor the data about the waste management around the world by using the IP (Internet Protocol) address. The regulated power supply unit is used to supply the DC power (+5V X1A) for system operation.

V. RESULT AND DISCUSSION

This is mainly caused due to improper waste monitoring and management processes. To overcome these problems a garbage monitoring system is designed which periodically measures the level of trash in the containers and alerts the concerned authorities. This is done by positioning a sensor network to collect the trash levels in the containers and remotely triggering the required controls using IoT. IoT is one well-known technology which helps in solving many real-world problems. Internet of Things (IoT) strongly supports the notion of interfacing and observing the real world objects (things) through the Internet. The detection of bin parameters in the container is carried out using the Node MCU ESP8266 microcontroller board. This system also includes sensor network for finding the solid, chemical, gas waste products and environmental condition. The proposed network aims at facilitating the process of knowledge acquisition, knowledge management, and knowledge transfer in the mentioned area. The outcomes of this study are somehow the current Government's stalled sustainable goals, which were aimed to be achieved through enforcement plan (unsuccessful to date). This system tries to approach the research problem through a more realistic and feasible fashion, considering today's modern lifestyle.

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VI. CONCLUSION

The system uses a more powerful and efficient microcontroller and the data is uploaded to the cloud only when leftover space and waste level in the dumped area cross thresholds. The collected data is stored in the server and can be used for predicting the waste generation. The automated execution of commands and triggering helps in providing exact values of the waste levels resulting in efficient monitoring and management.

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