IOT BASED SMART DUSTBIN FOR GARBAGE COLLECTION

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Abstract

The uncollected waste material when the waste bin is full is a common problem nowadays. Therefore, in order to effectively handle waste materials, effective waste management is necessary. Ensuring a green and clean climate. This paper introduces a Smart Waste Collection Control and Warning System focused on the Internet of Things (IoT) to track the waste material at the chosen garbage collection location. The scheme is implemented using an Arduino UNO-connected ultrasonic sensor to track the amount of waste bin garbage. The waste bin depth level in this device will be transmitted through the Arduino Ethernet Shield with an Internet link to the IoT Cloud. The database stores the collected waste bin level data into an IoT database and displays the waste bin depth level on an online dashboard for real-time visualization. The IoT database manager invokes a notification alert to garbage collector mobile phones via a SMS when the waste bin is nearly filled for immediate waste collection. Therefore, the waste collection became more effective and systematic.

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I. INTRODUCTION

Today the main issue for pollution is Garbage Overflow. It creates an unhygienic condition for the people and creates a bad smell around the surroundings that leads to spreading some deadly diseases & human illness. People are going to incorporate a project called IoT Based Waste Management with Smart Dustbin to prevent all such situations. Implementation is achieved with the assistance of the definition of IoT. The Internet of Things (IoT) is a term in which, without user interaction, surrounding objects are linked via wired and wireless networks [1]. Objects share information and exchange it.

Several dustbins are placed in the city or the campus in this method, these dustbins are provided with a sensor that helps to measure the level and weight of the garbage bins and a unique ID will be provided for each dustbin in the city so that it is easy to identify which garbage bin is complete. When the level and weight of the bin reaches the threshold limit, the device will transmit the reading along with the unique ID provided. In order to avoid the decaying smell around the bin harmless chemical sprinkler is used which will sprinkle the chemical as soon as the smell sensors detect the decaying smell. Users will not be able to reach the bins until the bins are complete. In such cases, if the consumer positions the waste on the floor, the bin shows the location of the surrounding bins on the LCD display also produces the voice messages. The status of the bin shall be accessed from its location by the authorities concerned, with the assistance of the Internet, and immediate action shall be taken to replace overflowing bins with empty bins.

All around the world many urban areas are developing, with the development of urban areas, the population of the urban area is also increasing. Thus, with the increase in population density, an unhealthy environment chance increases because there is an increase in the quantity of garbage and waste products. The issue with the current developing society, mainly in India, is that most of the people have less responsibility, and many of the people in society throw the garbage around the society surroundings [2].

To overcome all these problems, this proposed system is designed, which main aim is to provide a healthy environment condition and keep the particular society clean. First method for garbage collection is the traditional method or use of Dustbin in the normal manner of daily life. Each and every person throws the garbage in the dustbin and if the dustbin is full, they empty the garbage from the dustbin and again use the particular Dustbin. This is the basic use of a traditional dustbin where no electronics devices are used, no coding is done and everything is manual i.e. everything is carried out by hand. The second method is the use of dustbin with different colours of dustbin like green and blue dustbins which are kept together or the dustbin where only recyclable waste should be disposed. In this dustbin also not any electronics devices are used, no coding is done and everything is manual i.e. everything is carried out by hand. Only the dustbins are segregated in many types indicating which garbage should be thrown in a respective dustbin.

It is a universal truth that any type of garbage is harmful for Country and Society. The eventual need of any nation which is in the developing phase is key for "smart city". The pollution due garbage causes serious health issues. IOT generates opportunities to develop smart cities by developing the smart garbage system for management of wastage; this research paper provides an innovative idea towards developing a smart city. Dustbin for garbage is placed in cities which are periodically monitored by authorized local authorities. There are different types of wastage all thrown in dustbins and all types of garbage dumped together. This proposed system

provides the new concept for management of garbage; This proposed system provides information about dustbin and location of dustbin where it is placed in the city.

II. IMPLEMENTATION OF SMART DUSTBIN

IoT was first introduced in 1999 at auto-ID centre and Kevin Ashton first used it. This latest technology promises to join all the surrounding things to a wireless network and start communicating with each other with less involvement of human beings. Things based on the internet are in the starting stage and there is no particular design still exists today. IoT Provide a solution for collection of garbage, which checks the level of garbage with the help of sensors placed over the dustbin. Once sensors sense the level of garbage in the dustbin immediately this proposed system sends an alert to authorized authority through GSM model, Web application is designed for the particular information. Many urban cities and towns of India are not well developed to ease proper garbage disposal and collection apparatus. Also, the existing infrastructure of cities is not expanding at the same pace as urbanization [3].

There has been rapid growth in the number of electronics devices which is being connected with the Internet in a few years. All these electronics devices connected to the internet are part of the IoT system which can transmit the data with each other. The IoT network consists of electronics devices, sensors and software which allows these devices to transmit and receive data among each other. It is helpful to use such an existing system for designing the proposed smart dustbin system. The disadvantages of the existing system are that the authorized person has to go and check the dustbins on a daily basis whether they are filled or empty, which results in high cost. If the dustbin doesn't get emptied at the right time then the environment becomes unhealthy and disease spreads in the environment. To overcome all these disadvantages, the proposed system will help. The real-time data can be collected regarding the level of the smart dustbin filled on the web server itself. It will also help in reducing the cost as the employees will have to go only at that time when the bin is full. This will also help in optimization of resources and if the dustbins will be emptied at the right time then the environment will remain healthy and free from all kinds of diseases. The cities will become cleaner and the smells of the wastage will be much less [4].

In this project is to design and build a prototype for an automatic open dustbin that can automatically open the lid when it detects the people who want to throw out their trash. The level of the trash inside the dustbin can also be detected. If the dustbin at a certain stage is full of garbage, and though there are people who want to throw out their trash, the lid won't open. A sensor is provided for dustbins that help to monitor the level and weight of the garbage bins, and each dustbin in the city will be given a unique ID so that it is easy to recognize which garbage bin is complete. To prevent the decaying odor around the bin, harmless chemical sprinklers are used to sprinkle the chemical as soon as the smell sensors sense the decaying odor. Waste Management is all the activities and actions required to manage waste from

inception to its final disposal. So this can be done by implementing IoT based waste management using smart dustbins.

Solid waste management is one of the major aspects which has to be considered in terms of making the urban area environment healthier. Managing solid waste with rapid waste management is important and challenging. Urbanization and increased growth in the population. If the waste material is not handled and collected in time, the air would be contaminated and dirty. A better approach for waste management will help to improve the general. A community's well-being and the development of a safer neighborhood. Numerous IoT-based waste management systems are now being introduced to enhance garbage collection to ensure a safe, more productive atmosphere for life on this green planet. An IoT based approach can be introduced by communities looking to create healthier urban environments. When the garbage bin hits its maximum potential for immediate waste collection, some of the IoT related waste management solutions include a warning message. A cost-effective IoT-based system that can track the daily IoT-based solid waste management system that allows the tracking, dynamic scheduling and routing of garbage collector trucks in a smart city. In order to put together the state-of-the-art solution, for example in terms of self-powered solution, an analysis of existing IoT-enabled solutions in the waste management of smart cities is done here [5].
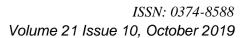
III. CONCLUSION & DISCUSSION

This implementation of smart garbage Bin indicator receptacle, gives a solution for unsanitary environmental conditions in a city. This Smart Garbage collection bin implementation uses the internet, IR sensor, and raspberry pi. This device ensures that when the waste level exceeds its limit, mail notification and status can be sent to the dustbin dashboard. If the dustbin is not washed at a specific time, the record shall be forwarded to the higher authority which may take appropriate action against the contractor concerned. Fake reports are often tracked by the system and can also minimize corruption in the overall management system. This decreases the total amount of garbage collection vehicle trips and therefore decreases the overall waste collection budget. In the end, it helps to preserve cleanliness in society. The smart waste management system therefore makes the storage of waste more effective by using solar panels in such systems, which can minimize energy consumption. These systems are vulnerable in various ways to the plundering of components in the system that need to be operated on. These dustbin models can be applied to any of the smart cities around the world. A waste collecting and monitoring team which is deployed for collection of garbage from the city can be guided in a well manner for collection.

IV. REFERENCES

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