

Internet of Things

Smart Waste Management System for Metropolitan Cities

Development of automatic smart waste sorter machine

**Mahmudul Hasan Russel, Mehdi Hasan Chowdhury,
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International Conference on Mechanical, Industrial and Materials
Engineering 1, 2013

At present solid waste management is a major concern in the metropolitan cities of the developing and developed countries. As the population is growing, the garbage is also increasing. This huge unmanaged accumulation of garbage is polluting the environment, spoiling the beauty of the area and also leading to health hazards. In this era of Internet, IOT (Internet of Things) can be used effectively to manage this solid waste. In this paper, we have discussed the definition of Internet of Things and its elements, testing and prototyping tool cooja simulator and finally the study of various literatures available on smart waste management system using IOT.

Managing waste effectively and recycling efficiently, a nation can ahead one step forward. For sorting metal and glass conventional sensors are used and for sorting paper and plastics a sensor using LASER and LDR is developed. A weight sensor and counter is used to find out the amount of sorted materials. By using the proper recycling system, the curse of waste will turn into blessings for civilization. The sorting procedure will make recycling more efficient. By means of this waste sorter, the conventional waste management system will be transformed into a Smart system. This Smart system will help to make our environment more suitable for living,

reducing global warming and making the world healthier.

Smart waste management using Internet of Things: A survey

KN Fallavi, V Ravi Kumar, BM Chaithra

2017 International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC), 60-64, 2017

At present solid waste management is a major concern in the metropolitan cities of the developing and developed countries. As the population is growing, the garbage is also increasing. This huge unmanaged accumulation of garbage is polluting the environment, spoiling the beauty of the area and also leading to the health hazard. In this era of Internet, IOT (Internet of Things) can be used effectively to manage this solid waste. In this paper, we have discussed the definition of Internet of Things and its elements, testing and prototyping tool cooja simulator and finally the study of various literatures available on smart waste management system using IOT.

IoT enabled smart waste bin with real time monitoring for efficient waste management in metropolitan cities

Manju Mohan, R Chetty, Vijay ram Sriram, Mohd

Azeem, P Vishal, G Pranav

International Journal of Advanced Science and Convergence 1 (3), 13-19, 2019

Background/Objectives:

Waste bins are part of our lives for decades and mostly its condition are overflowing due to improper waste dumping, collection and management, which leads in foul smell and unhygienic condition, thus inherently results in environment pollution.

Methods/Statistical analysis: Therefore, in this paper, design of a Waste Bin with real time monitoring is presented and a smart waste management system is proposed using the recent technical advancements of automation and Internet of Things (IoT). Findings: The capacitance sensor in the bin continuously monitors the level of the bin in real time and communicates to the central cloud where the bins are connected. Ultrasonic sensor is used to open and close the lid of the bin whenever the persons are nearby the bin. Such smart bins are connected to the cloud, where the bin status are communicated, recorded and monitored by the local bodies through and android app or a centralized server. Improvements/Applications: Thus the designed smart bin and proposed waste management system have better level of smartness compared to existing ones in metropolitan cities in a centralized manner.

Smart Waste Management using Internet-of-Things (IoT) Gopal Krishna Shyam, Sunilkumar S. Manvi, Priyanka Bharti

To make the cities greener, safer, and more efficient, Internet of Things (IoT) can play an important role. The proposed system is based on the foundation of geographic information systems (GIS), and optimization algorithms. It consists of an IoT based prototype with sensors to measure the waste volume in containers or wastebins, with facility to transmit information over the Internet. The data obtained through sensors is transmitted over the Internet to a server for storage and processing mechanisms. It is used for monitoring the daily selection of wastebins, based on which the routes to pick several of the wastebins from different locations are decided. Every day, the workers receive the updated optimized routes in their navigational devices. The significant feature of this system is that it is designed to update from the previous experience and decide not only on the daily waste level status but also the predict future state with respect to factors like traffic congestion in an area where the wastebins are placed, cost-efficiency balance, and other factors that is difficult for humans to observe and analyze.

IoT-Based Smart Waste Bin Monitoring and Municipal Solid Waste Management System for Smart Cities Tariq Ali, Muhammad Irfan, Abdullah Saeed Alwadie, Adam Glowacz

The design of an IoT-based smart waste collection and monitoring system is accomplished with the help of required hardware, software/programming tools and other IoT devices. This system aims to provide support in solid waste management for the municipality of Najran city of Saudi Arabia in order to handle the collection of waste generating at rapid growth. In addition, this system is enabled to detect the fire (faming) inside the bins that would help in saving human life and economic losses. The proposed system is developed based on the waste level data from the smart bins in a city. Three fill-up levels have been defined in the system to check the status of waste in the bins-Full level, Half level and Empty level. It has been observed in the results that waste collected through IoT-based system is more effective as compared to traditional methods. The real-time filling status monitoring improves the efficiency of average waste collection due to same-day collection of bins as it becomes full and by reducing the effect of pollution ratio into the environment.

Smart Garbage Monitoring System Vijayaganth V, Sanjaykumar D, Ravi Varma K,Yukisedhu R

Every year, enormous amounts of plastics and other debris are created that are not currently recycled in any facilities. We created an application called “Smart Garbage Monitoring Application Using IOT” to provide a solution for the garbage. Technology has a critical role in making human life more convenient and comfortable. The environment shall be preserved, and the Swachh Bharat Mission for cleanliness will be supported. We are gathering sensor values for display in the android application in this project. The sensor values are uploaded to the cloud (Think speak), retrieved from the cloud, then the retrieved data are shown in android app. An alert will be

sent to the Android app when the waste reaches the garbage bin's threshold value, or when the weight surpasses the threshold value, or when pollution levels rise within the garbage bin.

IoT Based Smart City Garbage Bin for Waste Management

E Shanthini, V Sangeetha, M Jagadeeshwari, B Shivani, P Selvapriya, K Anandita, D Divyashree U Suryanarayanan

Waste disposal is one of the most strenuous tasks in urban planning. One of the key problems in waste management is negligence which eventually causes the overflowing of the garbage bins. The traditional way of garbage vehicles picking up the trash at a certain is highly ineffective as they are poorly monitored and cause an imbalance in the proper clearing of garbage. The residual garbage that is overflowing is a serious health and societal hazard causing troubles such as bad odor, spreading of diseases, and even pest infestation. To optimize and organize the issue this paper puts forward an “IoT-based smart city garbage bin” as a solution. The smart garbage bin is equipped with a Node MCU microcontroller with open wi-fi and water proof sensors is mounted on the lids of the bin to ensure the status of the bin. To facilitate the entire system to the user, a mobile application is developed for optimal monitoring of garbage.

Smart bin Waste Segregator System

Helen, Karthika, Selvakumar, Thenmozhi

Rapid population growth has led to the daily volume of waste increasing by leaps and bounds A serious problem for local governments is to take prudent measures to manage landfill waste and to classify and transport it. This paper explains the design of a system to properly collect and separate waste from the public trash can, using the Internet of Things (IoT). In this paper, the trash level is measured and monitored with an ultrasonic sensor and the Blynk app. An automatic locking system prevents trash from overflowing. It also submits the garbage level details to the authority using the Blynk app and the Node Microcontroller Unit (NodeMCU). It also

explains the disposal mechanisms using intelligent waste segregator. This smart IOT-based system is accurate, easy to use, and inexpensive.

Smart Waste Monitoring System using IoT Hemangi Lonkar, Shiwali Charjan , Arpit Bansod, Amisha Ganvir

The concept of the Internet of Things (IoT) is something in which surrounding things are connected using wired or wireless communication without manual intervention. Internet of Things as a technology performs sensing, activate, data assembly, storing, and processing by connecting devices to the Internet. This paper aims to plan for a handy solution to the problem that most economies are facing today. The monitoring system enables the period by which the bin will be filled. Ultrasonic sensors will measure the distance between the lid and communicate it to the server and it can also be seen through mobile applications. The proposed waste management is based on a cluster of sensors and controllers. It is done using the moisture sensor and IR sensor where the moisture sensor detects the wetness in the waste only when the wet container is opened. Once the garbage container is filled in a particular area, the garbage collector can locate the filled garbage container and can collect the waste. Two of the important features include is checking the volume that the bin can hold and the other is interpreting the data and sending it to the cloud system for monitoring.

Smart and Integrated Garbage Management Application using IoT

Kuntan Paul, Arpan Mukherjee, Debarita Debnath, Tiya Dey Malakar

One of many burning problems of our society now is littering, even in the circumstances where sufficient garbage disposal measures are implemented. This is caused due to poorly maintained dustbin management system and irregular cleansing of the bins. This problem alone is resulting in lots of other issues, as well, which can sometimes cause harm to our social aesthetics. So, this paper is a proposal of an IoT-

based smart and easy-to-implement-in-any-place solution, consisting of hardware, software, database and communication in between them, to optimize this problem with real-time analysis of data and responding to them accordingly. This smart garbage management system will fetch data from its hardware systems installed in the critical end-points and upload all the data received to the database which can be easily accessible to user (or customer) end. The data collected by each hardware will be checked against a threshold to send logical commands which dustbin is to be emptied and when—which will solve the unwanted littering problems caused due to unnoticed filling of bins.

An IoT Based Approach in Automatic Garbage Segregator

Amara Aditya Manikanda, Rohit Tanwar, Aviral Kumar Srivastava, Kratika Arora

Effective waste management is a major problem across the world. The lack of dumping space, less awareness among people and requirement of high economical resources are some of the issues that add on to the criticality of the problem. Segregation of waste is the preliminary step to manage waste. Scarcity of adequate knowledge on the same makes most of the population unable to segregate and store waste at the domestic level or while dumping. Generally, the waste is segregated at dumping sites manually, and from there different types of waste are scheduled to their destinations. This uses more workforce and money for providing daily wages to the workers. In this paper, a brief study of smart bins has been done. A smart device has been proposed to segregate garbage using an IoT-based approach. The main aim of the project is segregation of the waste into biodegradable and non-biodegradable.

SMART GARBAGE DISPOSAL SYSTEM

Prof. Vaibhav Anil Kamble, Shivaraj Manik Gaikwad, Ganesh Sanjay Misal

Waste collection and management is often discerning as a low tech undertaking. However, IoT- and ML- based solutions have the power to

transform individual waste containers into a web of smart, connected objects. A dumper truck database has been generated in the given system so that data and details of dumper truck ID, meeting date, meeting time of garbage collection, and so on are collected. 'is technique keeps track of all the truck driver's activities and the waste gathering system of waste management. 'Is system allows on-time waste gathering and allows automobile trace through database making use of Global Positioning System (GPS) automation. 'e system proposed

Garbage Level Monitoring Device Using Internet of Things with ESP8266

Jubin Dipakkumar Kothari

Jubin Dipakkumar Kothari (2018). Garbage Level Monitoring Device Using Internet of Things with ESP8266. International Journal of Innovative Research in Computer and ..., 2018

Generally, in metropolitan cities, we see that the refuse repositories or dustbins put at public spots are over-trouble. It makes unhygienic conditions for people similarly as unpalatable to that Place, leaving a horrible odor. To avoid every such situation, we will execute an IoT-based Smart Garbage and Waste Collection canisters. These dustbins are interfaced with a microcontroller-based structure having IR remotesystems close by the central structure showing the current status of waste on portable web programs with HTML page by wi-fi. In this manner, the status will be invigorated onto the HTML page. A critical part of our endeavor depends on the wi-fi module's working, fundamental for its utilization. This current endeavor's central point is to diminish HR and attempts close by a smart city vision's overhaul.

Trash Management for Smart Cities-An Intelligent Approach for Garbage Collection

Amit Sinha, Kanika Gupta, Rajnesh Kumar Singh, Aatif Jamshed

Proceedings of the International Conference on Innovative Computing & Communication (ICICC), 2021

The paper proposes a new approach for trash management in the form of

intelligent Garbage Bins. The bins are assembled with different sensors and handled by a mobile application. The input signals received from different sensors and properties of image processing are the two significant features of the proposed model. In today's environment, the amount of solid waste is increasing day by day. It is a big concern for municipal persons also. The initiative of Government of India to develop smart cities contains trash management (Garbage collection and monitoring) in the priority list. This must be handled in the initial phase of the development of smart cities. The existing garbage collection and disposal system need lots of improvement as they are unable to handle real life problem. The present paper proposes an intelligent model for garbage collection with automatic features which is very useful for smart cities. It uses GPRS theory and works through communication network technology. The formation of intelligent garbagebins, its positioning system and overflow monitoring system are the major points of the proposed work. A unique identifier is assigned to every bin that helps to locate the bin and to reach at the specified position of the bin.

Smart waste management paradigm in perspective of IoT and forecasting models

Mohd Anjum, Sana Shahab, Mohammad Sarosh Umar

International Journal of Environment and Waste Management 29 (1), 34-79, 2022

Municipal solid waste management has evolved as a major component of smart city services that encompasses a variety of tasks from household collection to final disposal/recycling. This paper critically discusses, firstly, mathematical and statistical aspect of solid waste management services in the direction of smart city development. Secondly, it proposes novel and intelligent waste management architecture through adoption of state-of-art internet of things (IoT) technologies. Mathematical and statistical aspect covers the comprehensive information of forecasting models. This paper classifies the models on the basis of influencing factors (socio-economic and demographic), planning period (short, medium and long) and ranking methods in order to foresee the amount of waste generated. Paper also emphasises on adoption of IoT technologies in proposed waste

management architecture and a comprehensive and thorough survey of IoT technologies is also presented to explore their characteristics and applications in waste management system. Further, an intelligent waste management architecture is proposed for real-time monitoring of smart bin, collecting vehicle, dynamic scheduling, and route optimisation.

Garbage Collection System using IoT for Smart City

Mohit Badve, Apoorva Chaudhari, Palak Davda, Vinal Bagaria, Dhananjay Kalbande

2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC), 138-143, 2020

In today's world, one of the major environmental problems is the collection, management and disposal of the garbage. The current process of garbage collection does not consider real-time garbage level in dustbins while generating routes for garbage trucks. Collecting garbage in an unordered way leads to overfilling of bins, rotting garbage smell, more fuel consumption of trucks and hence has adverse effects on the environment. Moreover, the capacity of garbage trucks is not utilized. With the development of smart cities around the globe, there is an increasing need for IoT based technological solutions for solid waste management which will help in promoting a clean and sustainable environment. The proposed system gathers the real-time garbage level of every bin with the help of ultrasonic sensors. This data is then used to generate dynamic routes for garbage trucks while considering several factors like capacity of trucks and bins, the distance between bins, and the level of garbage.

Artificial Intelligence Based Smart Waste Management—A Systematic Review

Nusrat Jahan Sinthiya, Tanvir Ahmed Chowdhury, AKM Haque

Computational Intelligence Techniques for Green Smart Cities, 67-92, 2022

Smart waste management is an approach that utilizes modern technology to manage waste materials in effective, efficient, and economical way.

Artificial intelligence offers various approaches which can help to construct smart waste management systems. AI based systems are used to tackle complicated problems, handle uncertainty, and exhibit the efficiency of smart systems. This article aims to conduct systematic literature review on artificial intelligent-based smart waste management systems. In this study, we have identified and analyzed 40 research papers published between the years 2001 to 2021. These papers have proposed various frameworks and smart models for different types of waste management. The main goal of this study is to summarize the findings of selected research papers, provide comprehensive analysis and identify the future research avenues of waste management. This chapter has addressed various waste management domains like municipal solid waste management, smart bin management, domestic waste management, medical waste management, construction and industrial waste management, and so on. Furthermore, categorical representation of most extensively used machine learning and deep learning algorithms along with their contribution have been elaborately discussed as well.

Smartbin: Smart waste management system

Fachmin Folianto, Yong Sheng Low, Wai Leong Yeow

2015 IEEE Tenth International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 1-2, 2015

In this paper, we present the Smartbin system that identifies fullness of litter bin. The system is designed to collect data and to deliver the data through wireless mesh network. The system also employs duty cycle technique to reduce power consumption and to maximize operational time. The Smartbin system was tested in an outdoor environment. Through the testbed, we collected data and applied sense-making methods to obtain litter bin utilization and litter bin daily seasonality information. With such information, litter bin providers and cleaning contractors are able to make better decision to increase productivity.

Intelligent Sensors based Waste Disposal system for Smart Cities

Chinmai Shetty, B Dhananjaya, N Rashmi

Municipal solid waste administration has loomed to be a considerable threat faced by environment conservation departments in developing countries. In the present scenario, waste administration is outlined by feeble collection mechanism and deficient canopy of the compilation system. Imprudent management of ruins creates an unhygienic environment and leads to many health issues. An intelligent waste administration system is built to overcome these problems. The major purpose of the planned structure is to implement a smarter way of managing waste using an intelligent sensor. The sensor helps in identifying the quantity of garbage in the trash bin and real-time information collected from the various dustbins located at different places. This system can be implemented with the thought of smart cities in mind. The drivers would make use of an android application to find the shortest and fastest path to collect the garbage. Once the garbage is collected the information would be updated on the web page. The system would even ensure that there is no waste thrown around the trash bin. The intelligent sensor would make a beeping sound if any person negligibly throws it around the trash bin and not into the trash bin. This system ensures a clean and hygienic environment with optimum resources.

Implementation of IOT Based Smart Garbage and Waste Collection System

**Gaurav Makde, Ashutosh Bele, Vaibhav Khapekar,
Nidhi Gajarlwar, Sakshi Gajbhiye, Kunal Purohit**

International Research Journal of Engineering and Technology (IRJET) 6 (03), 2019

Many times, in our city we see that the garbage bins or dustbins placed at public places are overloaded. It creates unhygienic conditions for people as well as ugliness to that place leaving bad smell. It creates bad health condition for the people by spreading some deadly diseases, to avoid all such situations we are going to implement a project called IOT Based Smart Garbage and Waste Collection bins. These dustbins are interfaced with Node MCU based system using Ultrasonic Module, WIFI Module which

is present in the Node MCU along with central system showing current status of garbage, on mobile web browser with html page or in android app by Wi-Fi. Hence the status will be updated on to the html page. Major part of our project depends upon the working of the Node MCU; essential for its implementation. The main aim of this project is to reduce human resources and efforts along with the enhancement of a smart city vision. Each bin is given a particular ID it will in display in the screen of the respected admin and they can take immediate action. We are designing a smart bins means it contains some sensors, Ultrasonic Module. Thus this scheme helps to maintain the city sparkling by informing about the trash levels of the bins via a web page.

An IoT enabled smart waste management system in concern with Indian smart cities

Pooja Devi, Wajge Shubham Ravindra, SKLV Sai Prakash

2018 2nd international conference on trends in electronics and informatics (ICOEI), 64-69, 2018

The Indian population is rapidly growing especially in the urban area. The most of the rural population is shifting to the urban area leads to the construction of new municipalities and rehabilitation of existing cities. The Indian Government as a result of this committed to the development of “Smart cities mission”. The increase in population leads to an increase in generation of waste and this may impact on public and environment health. The key factors responsible for the generation of this waste are industrialization, urbanization, and growth in an economic way. The current systems of waste management in India are not that much efficient which may lead to an overflow of waste in most of the places. A clean and hygienic environment is essential for health and provides clean living space. The remedy for this problem is a “Smart bin”. Hence, an IoT enabled Smart waste management system is proposed and its performance is analyzed.

Intellectual trash management using Internet of

Things

A Sathish, M Prakash, SAK Jainulabudeen, R Sathishkumar

2017 International Conference on Computation of Power, Energy Information and Commuincation (ICCPEIC), 053-057, 2017

Internet of Things

Minhaz Uddin Sohag, Amit Kumer Podder

Proper waste management is one of the major problems for densely populated urban areas. It is getting difficult day by day to lead a healthy, sustainable living in urban areas because of environmental contamination. Due to the lack of proper waste management approach, problems like an overflow of waste occurs that badly harm our environment. Polluted surroundings result in the spread of various kinds of diseases in an epidemic form. For developed and developing countries, waste management is a challenge to longterm development. Proper management of waste is getting tougher because of increasing population, urbanization, and industrialization.

Solid waste collection as a service using IoT-solution for smart cities

Sangita S Chaudhari, Varsha Y Bhole

2018 International Conference on Smart City and Emerging Technology (ICSCET), 1-5, 2018

There has been tremendous increase in solid waste generation in last few years. Solid waste management is a key and challenging issue of environment in the whole world. Hence, there is a need to develop an efficient system which can eliminate this problem or at least reduce it to the minimum level. In today's era, every government across the globe is planning to build smart cities or try to transform existing cities into smart cities. Collection of solid waste is a crucial point for environment and its

impact on society should be considered seriously in smart cities infrastructure. Internet of Things (IoT) technologies can efficiently handle such services in smart cities.

IoT based smart garbage detection system

**Abhishek Dev, Maneesh Jasrotia, Muzammil Nadaf,
Rushabh Shah**

Int. Res. J. Eng. Technol 3, 12, 2016

Owing to a paradigm shift toward Internet of Things (IoT), researches into IoT services have been conducted in a wide range of fields. As a major application field of IoT, waste management has become one such issue. The absence of efficient waste management has caused serious environmental problems and cost issues. We here propose a probable solution to this problem for urban cities. Using IoT technologies for waste management is one probable solution that we have proposed through our work.

Implementation of IoT based waste segregation and collection system

**Bhupendra Fataniya, Aayush Sood, Deepti Poddar,
Dhaval Shah**

International Journal of Electronics and Telecommunications 65, 2019

Waste management is a challenging problem for most of the countries. The current waste segregation and the collection method are not efficient and cost-effective. In this paper, a prototype is presented for smart waste management. It is also capable of waste segregation at the ground level and providing real-time data to the administrator. Impact and cost analysis of the deployment of smartbin is also presented considering one ward of Ahmedabad Municipal Corporation.

Location based garbage management system with iot for smart city

**Shashika Lokuliyana, Anuradha Jayakody, GSB
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2018 13th International Conference on Computer Science & Education (ICCSE), 1-5, 2018

Smart cities integrate multiple ICT and IOT solutions to build a comfortable human habitation. One of these solutions is to provide an environmentally friendly, efficient and effective garbage management system. The current garbage collection system includes routine garbage trucks doing rounds daily or weekly, which not only doesn't cover every zone of the city but is a completely inefficient use of government resources. This paper proposes a cost-effective IOT based system for the government to utilize available resources to efficiently manage the overwhelming amounts of garbage collected each day, while also providing a better solution for the inconvenience of garbage disposal for the citizens.

Smart trash: An efficient way for monitoring solid waste management

**Ujwala Ravale, Anindita Khade, Namrata Patel,
Suvarna Chaure**

2017 International Conference on Current Trends in Computer, Electrical, Electronics and Communication (CTCEEC), 1135-1137, 2017

Solid waste management is primary issue in modern cities due to increase

population, change in our lifestyle and increased in number of industries. As we have seen number of times the dustbins get overflowed and the concerned people don't get the information within a time and due to which filthy condition formed around the surroundings, at the same time bad smell spread out due to waste, bad look of the city which paves the way for air pollution and to some harmful diseases around the locality which is easily spreadable. It creates unhygienic condition for the people and creates bad ugliness around the surroundings. This leads in spreading some deadly diseases & human illness, to avoid such a situation we are planning to design Solid Waste Management using Smart Bin.

Smart solid waste management

Ravi Kishore Kodali, Venkata Sundeep Kumar

Gorantla

2017 3rd International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT), 200-204, 2017

The rapid growth in the population automatically demands better infrastructure and more facilities. Employment and attaining balance in economy is an important concern for a nation having such rapid increase in its population, which finally results into evolution of new urban areas and cities. A smart city is created upon various particular components and strong waste administration is one of these crucial viewpoints. For example, today, to address the rising issue of carbon emissions in construction process, contractual workers are obligatorily made a request to use supplies according certain standards.

A survey of smart environment conservation and protection for waste management

E Ramya, R Sasikumar

2017 Third International Conference on Advances in Electrical, Electronics, Information, Communication and Bio-Informatics (AEEICB), 242-245, 2017

In many areas, the municipal garbage bins are overflowing and get down some places they are not cleaned at proper time in garbage bin, if the garbage bin is overflowed it's defects is spread pollution and people affect disease. In this paper to propose a smart garbage bin, once if it fill the garbage bin it will send the notification to authorized person by using a GSM then the garbage is dumped into waste land.

IoT based smart garbage collector for smart cities

**MN Rajaprabha, P Jayalakshmi, R Vijay Anand, N
Asha**

International Journal of Civil Engineering and Technology 9 (12), 435-439, 2018

Smart cities are the emerging cities that provide essential services for people to have a comfort and quality life. These cities are designed using various sustainable practices. Increase in the population and the essence of comfortable living gave a tremendous growth in the urban areas which results in the generation of huge amount of solid wastes. Improper disposal mechanism leads to pollute the land, water and air. To avoid such a situation and to improve the cleaning, 'IoT based smart garbage collector' is proposed. In this paper we propose a garbage collector which makes use of the technologies like IoT and Cloud Storage for efficient solid waste management in smart cities.

IOT Smart garbage monitoring system in cities-An effective way to promote smart city

Palaghat Yaswanth Sai

International Journal of Advanced Research in Computer Science and Software Engineering 7 (2), 99-102, 2017

This is a very innovative system which will help to keep the cities clean. 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. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. For this the system uses waterproof ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. smart bin is built

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