

# **Literature survey**

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# **Smart Waste Management in meteropolitan cities**

To make the cities greener, safer, and more efficient, Internet of Things (IoT) can play an important role. Improvement in safety and quality of life can be achieved by connecting devices, vehicles and infrastructure all around in a city.

We present a waste collection management solution based on providing intelligence to wastebins, using an IoT prototype with sensors. It can read, collect, and transmit huge volume of data over the Internet. Such data, when put into a spatio-temporal context and processed by intelligent and optimized algorithms, can be used to dynamically manage waste collection mechanism. Simulations for several cases are carried out to investigate the benefits of such system over a traditional system. Intelligent waste collection system t is responsible for measuring the waste level in the wastebins and later send this data (through Internet) to a server for storage and processing. This data helps to compute the optimized collection routes for the workers. In future, we would like to enhance the system for different kind of wastes, namely solid and liquid wastes.

## **Smart Waste Management System using IoT**

Mrunaya Shinde , Shivani Ingale

With rapid increase in population, the issues related to sanitation with respect to garbage management are degrading immensely. It creates unhygienic conditions

for the citizens in the nearby surrounding, leading to the spread of infectious diseases and illness. To avoid this problem, IoT based “Smart Waste Management” is the best and trending solution. In the proposed system, public dustbins will be provided with embedded device which helps in real time monitoring of level of garbage in garbage bins. The data regarding the garbage levels will be used to provide optimized route for garbage collecting vans, which will reduce cost associated with fuel. The load sensors will increase efficiency of data related to garbage level and moisture sensors will be used to provide data of waste segregation in a dust bin. The analysis of ceaseless data gathered will help municipality and government authorities to improve plans related to smart waste management with the help of various system generated reports.

## **Analysis of IoT-enabled Solutions in Smart Waste Management**

Nosipho Dladlu, Adnan M. Abu-Mahfouz

Internet of Things (IoT) has attracted widespread applicability not only limited to smart cities and communities but also in water, waste management and so on. Its strength lies in the high impacts it created in the daily life and the potential user's behavior. However, for it to be more effective and increase its adoption, it is required to be energy efficient, able to communicate and share information across extended coverage. IoT communication paradigm have provided the capability for devices to communicate and share information in long range distances while utilizing less power.

## **Waste Management System Based On IoT**

**Authorss:**Sapna Suryawanshi, Rohini Bhuse, Megha Gite , Dhanashri Hande

Waste management is one of the primary problem that the world faces irrespective of the case of developed or developing country. The key issue in the waste management is that the garbage bin at public places gets overflowed well in advance before the commencement of the next cleaning process. It in turn leads to various hazards such as bad odor & ugliness to that place which may be the root cause for spread of various diseases. This waste Management System using IOT has implemented the management of waste in real time using smart dustbin to check the fill level of dustbin to check if it is full or not. The novel cloud-based system for waste collection in smart cities. Providing the services

for the different kind of stake holders involved in this area. On-board surveillance cameras and reporting system.

## **MONITORING THE SMART GARBAGE BIN FILLING STATUS**

Manoj Kumar, K. S. Parimala, N. Aruna Jyothi

Garbage bins play a vital role in the waste collection process at the primary level itself. But the collected waste in the garbage bins must regularly be monitored, and from there it must be delivered to processing plants. This practice of continuous monitoring, transporting and processing contributes to the waste management. But the process of monitoring garbage bins would become difficult for the ones placed at inaccessible and remotely located sites. If such situations were prevailing continuously then the waste deposited in the bins will be increasing than to the accommodative levels resulting in spillover. Hence, there is a need for continuous monitoring of the garbage bins. In this paper, 'Smart Garbage Bin' (SGB) enabled with 'Internet of Things' (IoT) is developed. SGB's generally embedded with the ultrasonic sensors used for sensing the garbage levels, information and communication devices that help in networking, interconnection, and data transfer.

## **IoT-Based Solid Waste Management Solutions**

, Neeraj Kumar and Vasco Furtado

With the increase of population density and the rural exodus to cities, urbanization is assuming extreme proportions and presents a tremendous urban problem related to waste generation. The increase of waste generation has been considered a significant challenge to large urban centers worldwide and represents a critical issue for countries with accelerated population growth in cities. The Internet of Things (IoT) and cloud computing offer an automation possibility through cyberphysical systems that will change the way solid waste management is performed. To achieve the transformation of traditional cities into smart cities, waste management becomes a critical element in achieving sustainability, efficiency in public spending, improving urban mobility, and preserving natural resources. . Using IoT, it is possible to track the location of waste containers, monitoring the level of garbage deposited, identify locations with the highest demand, suggest the shortest route for collection optimization of solid waste, or even interface with citizens to encourage disposal at times when the container can receive waste, which promotes citizenship and avoids

significant problems resulting from the accumulation of garbage outside garbage collectors.

## **Smart Waste Management System using IOT**

Tejashree Kadus, Pawankumar Nirmal , Kartikee Kulkarni

The paper is based on the concept of Automation used in waste management systems under the domain of Cleanliness and Hygiene. Dumping garbage onto the streets and in public areas is a common synopsis found in all developing countries and this mainly ends up affecting the environment and creating several unhygienic conditions. Smart netbean uses multiple technologies firstly the technology for measuring the amount of trash dumped secondly the movement of the waste and lastly sending necessary signals and connecting the user to the WiFi system. Improper disposal and improper maintenance of domestic waste create issues in public health and environment pollution thus this paper attempts to provide practical solutions towards managing the waste by collaborating it with the use of IOT.

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## **IoT-Enabled Citizen Attractive Waste Management System**

Muhannad Al-Jabi, Mohammad Diab

Current cities worldwide have a goal to be smarter cities, but one of the most important challenges that faces cities nowadays is the waste processing. And there are two factors directly affect this challenge are: the increasing of urban areas and the rapid growth of population. So, it seems evident, the investment in involving the citizens in the interaction with any future waste management system will save a lot of money and efforts. Especially, in the developing countries, citizen needs some encouragement to interact with modern systems and make him use it in everyday life. Due to the growth of IoT technology, there is an increasing need and importance to design and implement waste management systems that attract and involve the citizens in the waste management process. The aim of this paper is to present the design of attractive

