SMART WASTE MANAGEMENT SYSTEM FOR METROPOLITAN CITIES

ABSTRACT

One of the most significant issues associated with smart city applications is solid waste management, which has a negative impact on our society's health and the environment. Mainly there are three types of sources where garbage is generated viz. residential, commercial and industrial. The garbage produced in the residential area can be collected directly from home or by making an arrangement for mass collection in that area and can be lifted using vehicles. In case of restaurants, malls and other commercial establishment garbage can be collected directly from the unit using vehicles. To overcome this situation an efficient Smart Waste Management System For Metropolitan Cities has to be developed using Internet of Things. Internet of Things (IOT) can be used effectively to manage this waste as many effective methods can be found out easily.

LITERATURE SURVEY

The garbage management in cities should be effectively and efficiently implemented. The various proposals were put forward and some of them are already implemented. But we cannot considered it as an effective one. So a survey was done among different proposals and this survey paper includes survey among different methods for smart

garbage management in cities using IoT. This section discusses about the existing approaches in the field of smart waste management.

Insung Hong et.al [1] has suggested that replacing SGS(Smart Garbage Sensor) instead of RFID garbage collecting system helps to improve their energy efficiency up to 16% and can reduce the food waste reduction .Inside the SGS they have installed SGBs (Smart Garbage Bins) to control the energy efficiency of the system.

Dario Bonino et.al [2] has suggested that it provides end – to - end security and privacy that is built upon dynamic federation smart city platform. Its benefits is that it has good dependability and has resilience on failure of a system over a particular month. It focuses on the collection of wastages and accomplishment of ontology method.

A lvaro Lozano Murciegoet.al [3] has suggested that to collect the dustbins that are been filled using a truck. The main advantage is that it reduces the fuel cost of the trucks rather than travelling a long distance it makes the path simpler and easier to reach the dustbin using route optimization.

Theodoros Anagnostopoulos et.al [4] has suggested that it first starts with an assumption that the smart city must include the IoT base. It uses dynamic scheduling. It is based on the fact that the garbage will be collected only when it is fully filled or the maximum capacities of the dustbins are filled.

Rachael E. Marshall et.al [5] outlines that the smart waste management system in the high salaried countries and a developing countries.

Lilliana Abarca Guerrero et.al [6] outlines the fact that the developing countries undergo a prominent factor of affecting the waste

management systems due to rising population levels and rapidly growing urbanization. The collaborator of the waste management are many such as household, industry sectors, educational and research intuitions etc.produces huge number of wastages. Collecting, transferring, Transportation of the wastages and they are finally disposed in an open land.

Ala Al - Fuqaha et.al [7] proposed that sketch of the IoT with a stress on technology, application and protocol concern. It explains about the differences between IoT and developing technologies like cloud computing and data analytics.

Jose M. Gutierrez et.al [8] proposed the functional smart city and the use of an smart waste management .It uses IoT for sensing the wastage level in the dustbins, processes the data and sends it to the server for storing and process the data. The process is carried out by the Geographical Information system.

Vikrant Bhor et.al [9] has suggested that when the system ensures that the garbage bins are fully filled up to their maximum it must be cleaned using IR sensor, GSM mode and microcontroller. When it is not filled it must be reported to the higher authority of a particular contractor. It concludes that it has a clean environment and it decreases the total number of trips the garbage collector vehicle rounds.

Fachmin Folianto et.al [10] has suggested that it uses mesh network. It is used to produce data and deliver it to the mesh network. Whenever the bins are filled they need to be cleaned. The bin collector gives the route to collect the bins.In the routing protocols and the failure detection in sensor nodes are discussed.

Mohd Helmy Abd Wahab, Aeslina Abdul Kadir, Mohd Razali Tomari and Mohamad Hairol Jabbar (2014) [11] proposed a Smart

Recycle Bin that caters for recycling glass, paper, aluminum can and plastic products. It automatically evaluates the value of the wastes thrown accordingly and provide 3R card. The recycle system enables collection of points for performing a disposal activity into designated recycle bins. Such system encourages recycling activities by allowing the points to be redeemable for products orservices. The system records the data related to the disposal activities, disposed material, identification of the user and points collected by the user. The user has to touch his card to the specified RFID reader at the recycle bin. Recycle bin doors open and user puts waste one by one. A microcontroller processes information about his user ID and number of wastes and send to a database server. The data base server calculates the user points and updates it. The system provides user login to an online system to check his total points