

Chapter 16

IoT for Waste Management: A Key to Ensuring Sustainable Greener Environment in Smart Cities

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ABSTRACT

Smart cities incorporate information and communication technology to enhance the quality and performance of urban services. The element of smart cities includes physical infrastructure and IoT technology, which gives a framework, methodology, technology, and management solution and efficient waste handling and reduction with the assistance of software analysis tools. It provides effective environmental resource flow integration. IoT system provides a digital access to waste management. This system uses online smart monitor sensors that monitor the performance of water supply and effluent handling system utilizing a cloud-based platform. This enhances real-time planned performance and increases life-cycle equipment. This technique enhances the synergistic use of resources due to climate mitigation and adaptation for sustainable growth and this technology also uses air quality sensors across the city to collect open data platform for monitoring and reducing primary and secondary pollutants and systematically instruct the pollutant-causing sources to maintain ambient air quality.

INTRODUCTION

Now a day's cities is changing to the more complicated ecosystem due to rapid increase of India's Economy and a steady shift of strategically culture from Rural to Urban. By 2030, over 60% of the world's population will be surviving in cities. The vast urban growth results in pollution, traffic congestion, and social inequality. This modifies the urban center as a stage of convergence of social, demographic, eco-

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nomic and environmental risks (Ramaprasad et al., 2017). In recent times, the population explosion has resulted in a number of environmental problems. The usefulness of resources in the environment is primarily damaged by pollution and causes illness to humans, plant and animal life. Depending upon the area of the environment affected and developmental activities such as construction, manufacturing and transportation not only deplete the natural resources, but also produces large amounts of wastes that lead to pollution of air, water and soil. This causes ill health and loss of crop productivity. Hence, smart systems are evolving to overcome such difficulties and concoct cities as smarter one. As a fashion label, the term smart city is used by the researchers and governments since 1990 (Ramaprasad et al., 2017). The invention of World Wide Web and wireless communication to mankind are now subjected to the most unmanageable juncture of the Internet rebellion—the “Internet of Things” (IOT) which is familiarly termed as “Ubiquitous Computing. Smart cities bring smart system using IOT for governing smart living, smart economy and smart environment for the benefit of both human and the ecosystem. The conceptualization of smart city depends on the level of development, reform, resources, and aspirations of the city residents towards their willingness to commute. Smart city primarily focuses on inclusive and sustainable development. The main infrastructure elements of smart city include sufficient supply of water, non intermittent electricity supply, sanitation that includes management of solid waste, good urban mobility and public transport, affordable housing, robust communication, information flow using connectivity, digitalization, improved governance and citizen participation, sustainable environment, safety and security of citizens, health and education. As a result of modernization, there is a patulous progress in Internet technologies and wireless sensor networks. The Internet of things (IOT), which is a newfangled archetype bedecked with transceivers, micro controllers, and suitable concordant stacks for digital communication. With a service of sensors, IOT expedite an environmental protection by keeping track of air quality, water quality, atmospheric and soil conditions.

SMART CITY

Smart Cities is an innovative city that uses ICTs to improve quality of life characterized by development in economic condition, sustainability, and a high quality of life. This innovation integrates conditions of all of its critical infrastructures through monitoring. It should engage with all the services on offer and connects people, information and city elements using new technologies in order to achieve the efficiency of urban operation and services. Also it should satisfy the needs of present and future generations with respect to social, economic, and environmental aspects Smart City is persistently dominated by new modes. As a consequence, in order to keep up with rapid development the city must be susceptible and adaptable. The modes which make smart cities possible will also put higher demands on the underlying communications infrastructure. The modes in communications technology and other related technical advances such as 5G, big data and cloud services are entered in technical modes. The applications or tools that help citizens, businesses and city administrations develop services including health care and transport in new and existing areas comes under the application mode. Further, how a city chooses to organize and procure its solutions and how these affect the city’s role as the facilitator of an efficient Smart City is discussed by market model modes. The figure 1 represents the modes of smart city.

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