

Utilizing mobile based technologies in monitoring solid waste in Sri Lanka: A case study

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Abstract

An exponential increase in solid waste is a crucial concern for all citizens including policy makers. This issue has been building up over a period of time due to inadequate planning and implementation of measures to segregate, collect, transport and dispose solid waste in the country. Despite many initiatives being taken to resolve the problems associated with the collection of waste, the issue of piled up garbage has been a common site. Though technology has advanced and unlike previously many people have access to it and use it, the use of such resources to solve day to day problems of citizens is poor. Therefore, the current study was focused towards the technological approaches over the collection of solid waste that accumulates more in urban areas, especially in Sri Lanka. IoT, GPS, Geo-fencing and RFID is incorporated to design a model for the successful collection of solid waste on a timely efficient manner. It is expected that the solution will enable customers and policy makers the ability to address this important issue and ensure that the environment is kept clean. In addition, this model will function with minimum cost and will take only minimum to time for customers to use.

Keywords: Geo-fencing, GPS, IoT, RFID, Solid waste

Introduction

It is significant that the rapid urbanization seen in most developing countries are directly associated with the increased tons of solid wastes generated from households and industries. However, disposal is not carried out in an environmentally acceptable manner in both spatial and temporal basis. Due to this improper mechanism and lack of concern of people, they face issues of loss of bio-diversity, land and water pollution, ground water pollution and spread of diseases. Currently, monitoring and collection of solid waste from various sites are quite tough as the generation of solid waste has grown exponentially. Additionally, on special days such as when ceremonies, functions, festivals and holidays take place, the generation of waste is at a peak. Schools, NGOs, hospitals, factories and companies are the places where such generation is at a peak. Unless regular supervision is carried out at frequent intervals, wastage can pile up in public places and cause inconvenience to the public. Although, the local authority is faulted for improper collection, the effects of such inefficiency is a threat to everyone. For the municipalities, the difficulties as well as challenges of solid waste management are continuously increasing due to this urbanization (Cheng and Hu, 2010). Disposal of solid waste is an urgent environmental issue in Sri Lanka and at present it has become a national concern, as well. Hazardous solid waste disposal has been identified to be one of the major causes for environmental degradation. However, in the National Action Plan of Sri Lanka, the most common method of municipal solid waste (MSW) disposal still remains to be open dumping (Bandara, 2010). The issue of MSW is most acute in the Colombo municipal area and in the suburbs of Colombo. The residents should take responsibility for their own