

Waste Management in Smart Cities: A Survey on Public Perception and the Implications for Service Level Agreements

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Abstract

INTRODUCTION: Waste management in cities has not advanced at the same rate as technology in general. Furthermore, there is little evidence that citizens are satisfied with services in smart cities.

OBJECTIVES: The objective of this paper is therefore to capture citizen perspectives in relation to smart city services and, specifically, that of waste management.

METHODS: An online survey was disseminated using Google Forms to twenty-five homeowners within the Tourism Ireland office in Coleraine, Northern Ireland. The objective was to gather the typical citizen perspective of smart cities, their views on the meaning of ‘smart waste management’, and any features which they would like to experience with regard to their waste collection process and/or schedule in a future smart city.

RESULTS: It was found that a common perception of a smart city exists, it being one concerned with efficiency and recycling; fewer citizens are, however, familiar with the term ‘smart waste management’. Homeowners generally acknowledge that improvements to their current bin collection schedule are necessary.

CONCLUSION: The paper concludes with a discussion of the ways in which citizens believe that a bin collection schedule which they are in control of would be an improvement on a council-defined one. We correlate this with extensions necessary to service provisioning processes, and Service Level Agreements (SLAs), to support future smart city services.

Keywords: smart city, waste management, citizen perspectives, survey, Service Level Agreements (SLAs).

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1. Introduction

Published in 2018, it is noted in [1] that, “... *the literature of IoT still lacks studies on the behavioural aspect that explain the customers’ perception towards IoT adoption and focuses more on technological aspect*”. This is significant, recognising that we, as developers, do not generally know if citizen needs are being met in the solutions provided. This is compounded by the fact that, despite smart cities being put in place for citizen convenience, it is recognised that, “*smart city initiatives are launched without the citizens’ evaluation of the improvements made to their city*” [2]. This is also

important, given that, “*the most valuable resource of a city is its residents*” [3]. The Eden Strategy Institute acknowledges this and, when ranking the top 50 smart cities worldwide, they evaluate using factors which include, “*A sincere, people-first design of the future city*” [4]. “*When people live in close proximity, everyone and everything must work together*” [5]. It is therefore critical that the systems put in place respond to the needs of a city’s citizens.

Waste management in cities has not advanced at the same rate that technology has in general, and it continues to rely on a more traditional approach of collecting bins on a set schedule and route. Given recent advancements in the use of technologies to make decisions in a more

