Chapter 3
What Is the Source of Smart City Value?
A Business Model Analysis

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ABSTRACT

Smart cities have attracted an increasing international scientific and business attention and an enormous niche market is being evolved, which engages almost all the business sectors. Being engaged in the smart city market is not free-of-charge and corresponding investments are extensive, while they usually concern innovation development and always demand careful planning. However, until today it is not clear how the smart city creates value to its stakeholders or simply how profit is being created. To this end, this paper performs an investigation on the smart city business models and utilizes decision making process with the contribution of smart city experts in order to conclude on the most appropriate one. This paper's findings demonstrate that business models that are followed in practice by smart cities are different to the ones suggested in literature. Moreover, the decision making processes that were followed showed that the optimal choice is the ownership business model group and from its contents preferred the Open Business Model (OBM), with the Municipal-Owned-Development (MOD) as an alternative option.

1. INTRODUCTION

A novel smart city market evolves radically and it is estimated to reach US $3 trillion by 2020 and exceed the size of all traditional business sectors (Amarnath, 2010; Kohno et al., 2011). Giles (2012) located the source of this money on embedded operational efficiency, as well as on new entrepreneurship. Many vendors have entered this market and develop either end-to-end or focused solutions, like IBM (2012);

Alcatel-Lucent (2011); Schneider (2014); Hitachi (2013); Huawei (2014); Siemens (2014); Oracle (2014); Microsoft (2014); Fujitsu (Hisatsugu, 2014); SAP (2014), CISCO (2014) etc.

However, most corresponding investments are still based on public funding. Anthopoulos and Fitsilis (2014a; 2014b) demonstrated that smart cities (34 and 100 examined respectively) mainly concern public projects, with only 2 cases representing private investments and about 10 concerning PPPs. These findings question the reluctance of the private sector to place own funding on smart cities. CISCO (Falconer and Mitchell, 2012) justified this phenomenon due to city complexities (multiple parties, stakeholders, and processes) and different interests. Another potential reason for this reluctance is described by Giles (2012), who claimed that the value of the smart city market is still under development and enterprises prefer to secure their involvement with government support, standardization and business models. To this end, various smart city standards are under development by standardization bodies (i.e., PAS180 (BSI, 2014), ISO 37120:2014 (ISO, 2014) etc.), which reduce smart city uncertainties, but they do not provide information about the source of smart city profit and other potential values. This paper addresses this fact and aims to answer the following research questions:

RQ1: What smart city business models exist and are followed by smart cities?
RQ2: Which are the most appropriate business models for a smart city?

These research questions are very important to be answered due to the above observation, but also due to the continuous transformation of smart city approaches, which require careful planning (Anthopoulos and Fitsilis, 2014a). Moreover, the answers to these questions will be useful to clarify who must undertake a smart city initiative; why such an initiative must be implemented (value proposition); and how a smart city can sustain in economic terms. From the answers of these questions both the smart city industry and local governments will be benefit, since they will realize the roadmap for smart city success, from corresponding requirements (key-resources); to the value that the smart city proposes to its customers; and to the relationship management processes that must be taken care. Additionally, RQ2 is very important to be answered for a smart city planner, since he has to select the optimal business model and as well as to be familiar of the selection process.

A business model analyzes the sources and processes that contribute to an organization's value (Osterwalder and Pigneur, 2010) and in this respect its application in a smart city can demonstrate its value(s) source(s). Although smart cities concern innovative solutions within the urban space and corresponding business model innovation is expected to appear or has already appeared, traditional business models have been applied in smart cities too.

In an attempt to answer the above questions, this paper follows three research methodologies: literature review; case studies; and multi-criteria decision making with the contribution of smart city experts. First, literature findings are explored regarding business modeling, their classification and patterns. Then existing smart city business models are demonstrated according to literature findings (Alcatel-Lucent, 2012; Turban, 2002) and the outcomes from case studies. All the identified smart city business models are assigned to patterns presented by (Osterwalder and Pigneur, 2010). Finally, the identified models have been given to smart city experts, who decided regarding the optimal for a smart city, with multi-criteria decision making processes.

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