

Toward Smart City Business Models

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Abstract

This paper discusses a business model concept in a public smart city context. To date, there is no unified understanding of how smart cities create value for their stakeholders. This study aims to contribute to the research by investigating the content and dynamics of a business model approach for smart cities.

Introduction

Since the 1980s there has been enormous growth in networking between companies as businesses – and now also cities – have realized that they have to concentrate on their own core competencies and use external resources to compliment the competencies they have (Pikka, 2007; Nooteboom, 1999). This kind of network thinking assumes synergies, either positive or negative, indicating that the network is the sum of its components (i.e. public governance and businesses) that interact together (Pikka, 2007), paving the way to ecosystem thinking. According to the seminal work by Moore (1996), business ecosystems comprise organizations and individuals interacting in economic communities, creating value for their customers and users. These ecosystems are characterized by high complexity,

cooperation, independence, competition and coevolution (Moore, 1996). Recently, business model research has also started to expand its viewpoint from a networked view towards an ecosystemic view (Iivari, 2016, p. 3). In practice, this means that value creation and capture – the key features of business models – are embedded within the whole ecosystem of players, and innovations are formed together with businesses and public organizations (Pikka, 2007), basically implying that value is co-created and co-captured (Ahokangas *et al.*, 2015).

Thinking about these realities, it is important for businesses and also cities to understand their situations with regard to other players and to chart plans for the

Keywords: Smart city, business model, business context change

Please cite this paper as: Perätalo S., Ahokangas P. (2018), Toward Smart City Business Models, *Journal of Business Models*, Vol. 6, No. 2, pp. 65-70

future. Hence, business networks, and recently ecosystems, have become more and more important in regional and city development – successful business is usually a target of regional development because traditionally it is seen that regional development enables local business, and firms accumulate in those regions where the factors of production are best available (Pikka, 2007). We can say that there is no doubt that the business model has entered the field of city development. Both the business network and ecosystem can act as a basis when researching a smart city business model that benefits both cities and companies within the cities. This paper discusses the business model concept in a public smart city with a view that it is understood as a business ecosystem that includes a diversity of different stakeholders.

The purpose of this paper is to explore *what kind of business model approach could work for smart city organizations*. So far, academic research has not addressed how smart cities could utilize the business model approach in their development (Díaz-Díaz *et al.*, 2017). Agility and speed are common requirements for businesses in smart cities, and to answer these two challenges, both smart cities and businesses have to concentrate on their core competencies and outsource other activities (Pikka, 2007).

Approach

This conceptual paper builds on a literature review for which we collected a systematic sample of papers about smart cities and business models with combinations of the keywords “smart city” and “business model”. This review was performed between January and February 2018, and it contains outcomes from articles that were published before then. Regional development theories were excluded from this study.

Smart City

Bollier (1998) proposed the term “smart growth”, which evoked new political practices for better urban planning. Later, a new definition for the smart city was presented by Komninos (2006), who argued that smart cities are constructed as multi-dimensional clusters, combining three dimensions: people, collective intelligence, and artificial intelligence. Parallel to this, a city’s

focus of development has changed from competition to cooperation towards a sharing economy.

Even though there is no widely accepted definition of a smart city, some key terms and characters pop up in the definitions found in the literature: 1) Networked infrastructure is a key factor in the concept. 2) Technology is one political and social enabler for a smart city. 3) There is an emphasis on business-led urban development. 4) The aim of a smart city is to change how services are delivered and how residents are included in them. 5) Finally, the vision of a better future is embedded within it (Albino *et al.*, 2015; Pardo *et al.*, 2011). Also, one of the denominators of (smart) cities is that they attempt to prioritize their innovation ecosystems aiming at social and environmental sustainability via urban planning (Zygiaris, 2012). Almost all well-managed smart cities follow a certain architecture regardless of their size or form (Anthopolous *et al.*, 2016). In the perspective of the city and urban planning, there are four dimensions to consider: actors, priorities, resources, and policies (Schaffers *et al.*, 2011). These factors create the basis of an integrated framework that can be used to research how governments predict initiatives aimed at creating a smart city (Afonso *et al.*, 2015).

For the purposes of this paper, we address the smart city as a business ecosystem where city governance is the key player because in the city’s strategy they define how cities create value for different stakeholders. Business ecosystems in smart cities are constantly changing because different services are changing citizens’ daily life and behaviour, as well as that of businesses in an urban context (Díaz-Díaz *et al.*, 2017, p. 6). This is why it is necessary to design innovative business models for the city (Walravens, 2015). New technologies open up new possibilities for multiple business models applied to public services in smart cities (Díaz-Díaz *et al.*, 2017). According to Lappalainen *et al.* (2015), cities have now started to see the benefits of ecosystemic thinking.

Business Model

The term business model has dominated in the managerial literature since the 90’s, especially when it comes to the emergence of the Internet (Demil and Lecocq, 2010). Since the 1960s, the business model and value chain have evolved closely together as a concept (Mulligan *et al.*, 2013). Teece and Pisano (1994) identified a shift from

technological development that happened inside the firm towards a view of the effects of technology and its development as being one of the interactions between firms. Accordingly, the competitive landscape could be seen as changing, and markets as having become complex networks of relationships between different actors. Since then, the focus of business modelling has shifted from single-firm, closed business models that make little use of external ideas and technologies, to a mixed, networked model where some services are private and others are public, and again towards an open, ecosystemic business model view that benefits from the large community (Casadesus-Masanell *et al.*, 2011). Thus, the business model has been seen to change over time (worldview change) and due to market pressure (business context change) (Iivari, 2016).

A business model is a key factor when studying smart city development, as the term is commonly used also in (open) innovation ecosystems (Mulligan *et al.*, 2013). Open innovation requires that the organization defines the ways to create, deliver and capture value in cooperation with partners that are part of the open innovation economy (Saebi and Foss, 2015). Thus, we rely on the definition where the business model is defined as the content, structure and governance transactions made inside an organization and between it and its external partners who support the organization's value creation, delivery and capture (e.g. Zott and Amit, 2010). Currently, however, there is no widely accepted definition or conceptualization of the business model for the city context, but we can say that in cities, a particular business model describes the architecture or design of value creation, delivery, and capture mechanisms it employs (Teece, 2010).

Key Insights

Smart City Business Model Approach

Based on smart city and business model concepts, we can see that both of them have gained a lot of interest since the 1990s, and the view has shifted towards a networked, and later ecosystemic, focus. Digitalization and technological developments drive both the evolution of smart cities and business models in regional city contexts. We identify three steps in the understanding development of business context change, based on

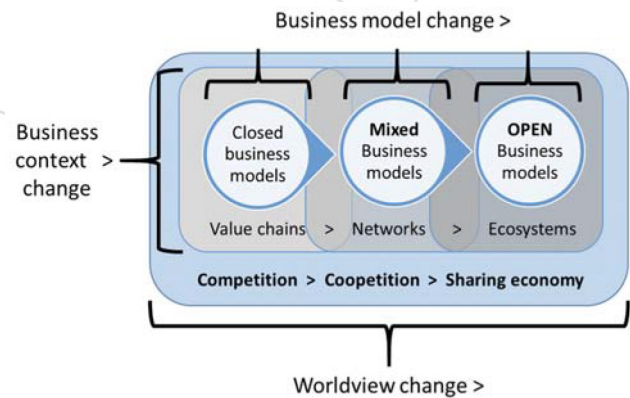


Figure 1: Business model evaluation in the city context.

changes in the competitive landscape and worldview resulting in three different types of business models: closed, mixed and open. Closed business models are rooted to value chain thinking, mixed business models to the network approach, and open business models to the sharing economy. Parallel to this, it can be said that competition characterizes closed business models, coopetition mixed business models, and the sharing economy open business models. This evolution is depicted in Figure 1 above.

According to Schaffers *et al.* (2012), for the smart city concept, ecosystemic thinking is particularly relevant because cities themselves can and should act as innovation drivers. The city may strive for new market creation in the ecosystemic business model approach if the city enables evolution of the innovation ecosystem and adopt the rapid shift of organizational and industrial boundaries that can create new kinds of business opportunities (Hirvonen-Kantola *et al.*, 2016; Iivari, 2016). From an innovation perspective, new markets are created because of the co-creation activities of the ecosystem actors, and the context of the business ecosystem is changing (Hirvonen-Kantola *et al.*, 2016).

Urban areas are able to build a sustainable competitive advantage through the business model approach (Hirvonen-Kantola *et al.*, 2016) and a maturity model is a useful tool in the guidance of regional network development (Pikka, 2007). When we want to study a city's business model, the main factor we should focus on is the maturity of the smart city's ecosystem, which includes e.g. governance, strategy, people, and skills, but also how the different players in the ecosystem see the smart city's opportunities, values, and advantages.

Practical Implications

The practical implications of this paper relate to alternative business models in the context of the smart city. The aim is to develop an approach to understanding smart cities from the point of view of the business model, but also to bring the smart city concept into the business model discussion.

Discussion and Conclusions

The worldview change has changed the business context, and thus affected business model evolution.

Networked and ecosystemic thinking is a way to understand modern business in the smart city context where different types of drivers of globalization, and also digitalization, are changing the boundaries of industries, because a diversity of different players (for example, public organizations, small and large companies, and citizens working together) are characterizing the modern ecosystemic context (Iivari, 2016). To work well, the open ecosystemic approach needs to develop its capability to manage the knowledge processes, such as the exploitation, exploration and retention processes that take place between businesses and their environment (e.g. Saebi and Foss, 2015). Business opportunities, which are born via a shift of industrial and organizational boundaries, are the core of the business model in an ecosystemic view.

Smart cities – and also businesses located in the cities – should concentrate on their core competencies and outsource other activities to answer the challenges of the rapidly changing world. The open ecosystemic approach in smart cities creates value for all city entities, including for businesses, when different pieces of knowledge and skills are brought together via lowering the boundaries to different industries working in a city. However, it should be noted that the reality in this research is complex, and it is based on a social network system that is evolving all the time; thus, it is not possible to speak about simple cause-effect relationships.

When cities want to use business models, a new way of thinking and approach to city development is needed. This is not just adding a new tool to the repertoire. It is also noticeable that cities' maturity is an important

denominator when it comes to business model, because cities differ from each other and they can have rather differing stages of development and roles when researching them in the global scale (Iammarino et al., 2018). Hence, for future research, it is important to take a closer look at the maturity of a smart city's ecosystem.

In conclusion, both the smart city and business model concepts are multi-faceted, and this causes some limitations to this research. Both concepts are descriptive in nature, and thus do not provide empirical validity. One limitation – to which this paper aims to contribute – is that there is no ready-made theory for city business models. Thus, several implications for future research are provided. This short paper gives some preliminary thoughts on what a smart city business model could be and what kinds of possibilities there are in the smart city business model approach.

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