Smart Tourism Destinations: Ecosystems for destination competitiveness

Abstract

Purpose: The purpose of this paper is to explore the core components of smartness and smart tourism destinations. It also aims to present a framework for the development of smart tourism destinations based on Service-Dominant (S-D) logic.

Design/methodology/approach: The paper explores the core components of smartness through a case study analysis of three well-established smart cities.

Findings: The paper conceptualises smartness and argues that Information Communication Technology (ICT), leadership, innovation, and social capital, supported by human capital, are the core components of smartness. Although ICT is a critical enabler for smart tourism destinations, it is insufficient on its own to introduce smartness. It is argued that the combination of hard and soft smartness components, within a S-D logic ecosystem structure, holds the potential for sustained competitive advantage and enhancement of quality of life of both residents and tourists in smart tourism destinations.

Originality/value: The paper extends the application of S-D logic to the context of smart tourism destinations, specifically to examine the smartness concept as a means for competitiveness in tourism destinations.

Keywords: Smart City, ICT, Smart Tourism Destinations, Tourism Competitiveness

1. Introduction

Economies and societies have always been subject to change. Yet change has never been so intense and come at such a high speed as in recent years (Porter and Heppelmann, 2014). Current global forces influencing the world have never been more complex and challenging and are causing disruptive changes in all aspects of society. To be prosperous in this changing world, it is critical to comprehend how to adapt to these global forces and use them to gain competitive advantage. One way to address societal challenges is the use of cutting-edge technologies (Townsend, 2013). Especially within tourism, technologically driven

innovations have had a large impact on the development of the industry (Hjalager, 2010). Recent ICT developments, initiating smartness and smart places have been recognised to cause a paradigm shift within the tourism industry (Buhalis, 2015).

The notion of smartness finds its origin in the 90s, although it proliferated significantly after 2008 (Hollands, 2008; Hollands, 2015). Initially, the concept was coined as a complex technological infrastructure, embedded within urban areas to foster economic, social and environmental prosperity (IBM, 2014; Meijer and Bolívar, 2015). More specifically, it posited the integration of ICT to improve processes and interconnect sub-systems (Townsend, 2013), to ultimately tackle the economic, social and environmental challenges imposed by urbanism (Caragliu *et al.*, 2011). This implication of cutting-edge technology triggered concepts such as the Smart Planet (IBM, 2015), Smart City (Hollands, 2008) and more recently, the Smart Tourism Destination (Buhalis and Amaranggana, 2014). Recognising the potential of smartness and understanding the need to adapt to this rapid change in technology, governments as well as public and private agencies started to incorporate smartness in new policies and strategies to enhance sustainable development and economic growth (Nam and Pardo, 2011; Cocchia, 2014; Meijer and Bolívar, 2015).

A common aspect in smart places is the reintroduction of the socio-technical paradigm, emphasising the connection between society and technology (Orlikowski, 1992). People and technology are connected and perceived as equal actors (Latour, 2005; Meijer and Bolívar, 2015) collaboratively creating economic, social and environmental prosperity for all (Vargo and Lusch, 2004). While cutting-edge technologies provide the infostructure for the development of a digital ecosystem in smart places (Gretzel *et al*., 2015), it is the interconnectivity of heterogeneous human actors in smart places that populate the ecosystem. This corroborates with the literature on cities and tourism destinations. As contexts for smartness, urban and tourism regions have long been perceived as complex ecosystems amalgamated of a vast range of actors collaborating to create value for themselves and others (McKercher, 1999; Buhalis, 2000; Scott *et al.*, 2008; Gretzel *et al.*, 2015). While smartness incorporates a digital ecosystem of cutting-edge technologies, it also embraces an ecosystem of heterogeneous human actors. Together they form a socio-technical synergy aiming towards co-creating value for all (Meijer and Bolívar, 2015).

Service-Dominant logic (S-D logic) offers a meaningful theoretical framework to address the co-creation of value for all in the context of the smart tourism destination (Vargo and Lusch, 2004). S-D logic posits the collaboration between heterogeneous actors towards value creation (Vargo and Lusch, 2008) and postulates their interaction within a dynamic ecosystem (Wieland *et al*., 2012) through the voluntary exchange of operant resources (Lusch and Vargo, 2014). Even though S-D logic might lack profoundness to acknowledge the

complexity of smart tourism destinations (Wang *et al*., 2013) and has been criticised for the terminology, the stance towards the meaning of information, or the focus on marketing (Campbell *et al*., 2012), it has become a recognised approach towards explaining the concept of value co-creation in different disciplines (Shaw *et al*., 2011; Cabiddu *et al*., 2013). Hence, it can provide an understanding of the process towards value co-creation in smart tourism destinations (Wang *et al*., 2013).

Whereas scholars acknowledged the prominent role of ICT in experience and value co-creation in the smart tourism destination (Wang *et al*., 2013; Buhalis and Amaranggana, 2014; Gretzel *et al*., 2015), it is ultimately the connection between human actors, which is essential to create value (Latour, 2005; Chandler and Vargo, 2011). To date, the understanding of the additional components of smart tourism destinations, such as human actors and their interaction with technology for value co-creation, is limited (La Rocca, 2014). The smart tourism destination concept has recently gained attention from practitioners in Spain and China (Wang *et al*., 2013; Guo *et al*., 2014; Lopez de Avila, 2015). Del Chiappa and Baggio (2015, p. 146) state "the concept itself may be considered still to be emerging, and the work of conceptualizing and defining it still in progress." Enabling tourism destination managers to understand the importance of integrating smartness for value co-creation can enhance competitiveness. Integrating the different components of smartness provides managers with strategic tools to implement innovation within the smart tourism framework in a way so that it creates value for all stakeholders in the destination and the tourism industry in general (Buhalis, 2015, Buhalis, and Amaranggana, 2014). Consequently, the aim of this paper is to (i) conceptualise the core components of smartness, (ii) provide an understanding how these core components are connected to co-create value in smart tourism destinations taking on a S-D logic research stance, and (iii) present a framework to visualise the elements of the smart tourism destination.

2. Smartness and Smart Places

2.1. S-D logic ecosystems

Tourism destinations have been established as amalgamated and complex ecosystems (Buhalis, 2000) in which stakeholder co-opetition and collaboration creates economic, social and environmental value for all (Ritchie and Crouch, 2003; Fyall, 2011). With the rapid development of technological capabilities, the ecosystem approach has also been recognised as suitable to address the topics of smart cities and smart tourism destinations methodologically (Baron, 2013; Gretzel *et al.* 2015).

From the S-D logic perspective, an ecosystem has been outlined as a relatively self-contained, self-adjusting system of resource-integrating actors connected through shared institutional logics and mutual value creation through voluntary service exchange (Wieland *et al*., 2012, p.15). Through this lens, tourism destination stakeholders are resource-integrating actors interconnected through the organisational premises of the tourism destination and the mutual and voluntary service-for-service exchange (Vargo and Lusch, 2008). It is the interaction and interrelation between the different actors forming a specific whole (i.e. the tourism destination) as well as the interaction of the 'whole' with the environment (von Bertlanffy, 1972), which forms the philosophy of S-D logic. A prerequisite of service-for-service exchange is resources. Within the S-D logic terminology traditional *goods* are described as tangible or *operand resources* and *services* as intangible or *operant resources* (Constantin and Lusch 2004). The intangible or operant resources consist of skills and knowledge and it is this that is at the basis of all exchange. Consequently, value "is obtained through the application and exchange of specialized knowledge and skills" (Vargo and Lusch, 2004, p.7) where "all social and economic actors are resource integrators" (Vargo and Lusch, 2008, p.6). In this vein, S-D logic explores the interaction between all ecosystem actors, the social norms present within the ecosystem, and the reintegration of operand and operant resources for value co-creation (Akaka and Vargo, 2014). Within the context of tourism destinations, Scott et al. (2008) emphasise the importance of integrating all actors within the value creation process. Therefore S-D logic is central to value co-creation within smart tourism destinations.

2.2. The Smart Tourism Destination

The ultimate goal of smart places is to increase competitiveness and enhance quality of life of all stakeholders, including residents and tourists (Caragliu *et al*., 2011; Buhalis and Amaranggana, 2014). To reach this outcome a broad range of aspects should be included. To date, the majority of research on the smart tourism destination is conceptual and mainly focused on the emphasis of tourism business-led development and co-creation activities to enhance the tourist experience (Wang *et al*., 2013; Buhalis and Amaranggana, 2014; Gretzel *et al*., 2015). Implementing smartness within tourism destinations has become critical since the connected, better informed and engaged tourist is dynamically interacting with the destination, co-creating tourism products and adding value for all to share (Neuhofer *et al.* 2012). Interconnected tourism organisations provide tourists with real-time and personal services, and simultaneously collect data for the optimisation of their strategic and operational management (Wang *et al.* 2013; Gretzel *et al.* 2015). Thus, smartness has become a vital component in tourism destination management and marketing. The smart tourism destination ultimately "aims at revolutionizing tourist experience creation, as well as tourism business

and destination marketing practices" (Wang *et al.* 2013, p.61). This is reflected in the definition by Gretzel et al. (2015, p.3) positing the smart tourism destination "can be defined as a tourism system that takes advantage of smart technology in creating, managing and delivering intelligent touristic services/experiences and is characterized by intensive information sharing and value co-creation." Buhalis (2015: n. p.) suggests:

> "smartness takes advantage of interconnectivity and interoperability of integrated technologies to reengineer processes and data in order to produce innovative services, products and procedures towards maximising value for all stakeholders. This reengineering enables shaping products, actions, processes and services in real-time, by engaging different stakeholders simultaneously to optimise the collective performance and competitiveness and generate agile solutions and value for all involved in the value system. Smartness is therefore the glue of interconnected and mutually beneficial systems and stakeholders and provides the infostructure for the value creation for all."

A commonly agreed upon aspect of the smart tourism destination is ICT, identified as *hard smartness*. Buhalis (2015: n. p.) suggests that "interoperability and ubiquitous computing ensure that everybody is interconnected and processes are integrated towards generating value, through dynamic co-creation, sustainable resources and dynamic personalisation and adaptation to context." He further specifies that all suppliers and intermediaries, the public sector, as well as consumers and various interested parties are networked and dynamically co-produce value for everybody interconnected within the ecosystem. Hence, current developments in technology and particularly the Internet of Things (IoT) have enabled the collection, transfer and analysis of datasets larger than ever before, providing real-time insights of digital and physical worlds (De Filippi, 2015). Often referred to as Big Data and stored in data warehouses called the Cloud, these data streams provide novel and powerful insights regarding behaviour, business transactions and human impacts, enabling real-time decision-making (Kitchin, 2013). This increases the efficiency and effectiveness of processes and thus provides the ability to develop competitive advantage for smart tourism destinations (Wang *et al*., 2013; Buhalis and Amaranggana, 2014). Hence, hard smartness takes advantage of interconnectivity and interoperability of integrated technologies to reengineer processes and data in order to produce innovative products and procedures (Kitchin, 2013; Piro *et al*., 2014; Porter and Heppelmann, 2014).

While hard smartness puts emphasis on the essence of ICT in the strategy of smart tourism destinations (Harrison *et al*., 2010), their usage does not imply a tourism destination is smart already (Cohen, 2012; Townsend, 2013). Hard smartness "on itself, has no power, does nothing. Only in association with human agency, social structure and organisation does

technology fulfil functions" (Geels, 2002, p.1257). Thus, to enhance competitiveness, *soft smartness* components, deduced from soft infrastructure (Wakelin, 1992), are essential to give meaning to hard smartness. Buhalis (2015: n. p.) suggests that "based on Smart Cities research and methodologies, a Smart Tourism Destination successfully implements smartness which is fostered by open innovation, supported by investments in human and social capital, and sustained by participatory governance in order to develop the collective competitiveness of tourism destinations to enhance social, economic and environmental prosperity for all stakeholders."

Recognising this complexity of smartness, scholars increasingly focus on the additional components of the ecosystem structure of smart places (Albino *et al*., 2015; Hollands, 2015; Meijer and Bolívar, 2015). Components such as the presence of a knowledgeable workforce (Berry and Glaeser, 2005) and integrating all members of society (Cohen, 2014a; Malek and Costa, 2015) contribute to the success of smartness in smart tourism destinations. Further, institutional logics in the form of dynamic leadership (Spencer *et al*., 2012; Akaka and Vargo, 2014) play a vital role in the development of the smart tourism destination. Still, smartness remains a fragmented concept (Meijer and Bolívar, 2015) illustrated by the disparity in definitions of smart cities (Table 1). Current perspectives range from a sole techno-centric and centralised concept (Harrison *et al*., 2010; Piro *et al*., 2014) to a dynamic, open, collaborative and social-centric view (Thite, 2011; Albino *et al*., 2015; Meijer and Bolívar, 2015).

Insert Table 1 here

Increasingly a more mature perspective of smart places and especially the smart city is induced. This calls for the development of a holistic framework or theory in which co-creation is recognized as a common practise (Albino *et al*., 2015; Hollands, 2015; Meijer and Bolívar, 2015). However, soft components for smart tourism destination development are to date under explored and need to be researched further.

3. Methodology

Smart tourism is an emerging research topic and needs to be developed by exploring some of the forefront destinations. Therefore, given the exploratory nature of this paper and the contemporary character of the research topic, a case study approach was adopted (Yin, 2009). This approach has frequently been implemented in tourism (Beeton, 2005) when research is

still in its early, formative stage (Benbasat *et al.*, 1987). Smartness has only recently gained momentum in different disciplines and is still rather young (Albino *et al*., 2015; Carvalho, 2015; Meijer and Bolívar, 2015). Adopting the case study approach offers holistic insights regarding the core components of smartness, through the analysis of reports, studies, news articles and other text sensitive documentation. A comprehensive coverage of complementary material is required to explore all aspect of smartness.

3.1. Case selection

Smart cities initiated the notion of smart tourism destinations (Buhalis and Amaranggana, 2014). Cities have to deal with a large number of interconnected organisations and technologies to serve citizens and other stakeholders at a large scale. Hence, they are more mature in implementing smartness and thus provide the context for this research. Currently a variety of cities have developed smartness and innovation by developing comprehensive initiatives. To justify the selection of the cases, two international ranking schemes were used. First, the smart city classification by Cohen (2014b) was used to inform case selection since this classification syndicates a variety of global and regional rankings. This selection identified a list of the top ten smart cities. In order to narrow down these cases, the study on smart cities undertaken by the European Union (European Union, 2014) was also taken into account. This particular study, "Mapping Smart Cities in the EU", conducted an in-depth analysis of the cities within the EU28 with at least 100,000 residents. A selection of 240 cities was identified as 'smart'. After a quantitative analysis of the characteristics and contributions of these cities, six top performing cities where identified, namely: Amsterdam, Barcelona, Copenhagen, Helsinki, Manchester and Vienna. Out of these six, Barcelona, Amsterdam and Helsinki were ranked as the three cities yielding the most innovative smart solutions in Europe and were selected as cases for this research.

3.2. Data collection

To collect information about the selected cases, three main databases/research strategies were used to search for relevant documents (i.e. Google, Google Scholar and EBSCO) following a five steps methodology (Denyer and Neely, 2004): (1) key phrase identification, (2) document identification, (3) quality assessment, (4) data extraction, and (5) data analysis. Each step is described in more detail in the following sections.

Within the first step of this systematic process key phrases were identified for the document identification carried out in the second step. The key phrases identified were *'Barcelona smart city case study'*, *'Barcelona smartness concept'*, '*Barcelona smart city analysis'*, *'Barcelona smart city strategy'*, and *'Barcelona smart city initiative'* respectively. The same key phrases were utilised for Amsterdam and Helsinki.

In the second step, the described key phrases were used to identify documents on the selected cases. The identification took place over a three-week period between 24 September and 15 October 2014. Google was used to query the key phrases and the documents presented on the first three result pages were chosen for further selection. Search results from Google, Google Scholar and the EBSCO database were also used to identify further academic sources. The document identification resulted in a wide data collection stemming from existing government reports, academic case studies, online news articles, and smart city project descriptions and presentations. Although the analysis of any case study cannot be fully exhaustive, the majority of the in-depth published documents on the cases researched were included in this study.

The third step focused on the quality assessment of the selected documents. Three academic articles were included due to their peer-review assessment. The European Union report, used for the selection of the cases for this research, was the most comprehensive document identified, with an in-depth analysis of Barcelona, Amsterdam and Helsinki. In addition, four smart city projects were included as well as one presentation document, a presentation transcript and one online news article. Commercial documents or reports delivered by technology companies have been excluded to avoid bias. An overview of the various sources used for the empirical research of this study is depicted in Table 2.

Insert Table 2 here

The fourth step of the data collection concentrated on the data extraction. An iterative thematic content analysis was carried out in which a bottom-up coding scheme was adopted. The identified codes were deduced from the analysed content (Yin, 2009). A three level coding scheme was used (Bryman and Bell, 2011) and the three selected cases were separately coded. In the first level, a very basic coding was applied in which paragraphs were analysed for the research. Within this phase content describing, for example, the demographics of the cities was excluded from further analysis. The second level comprised a more in-depth approach in which codes such as ‘innovation’, ‘collaboration’, ‘work together’ and ‘human skills’ were used to characterise the units of text. After this level 58 codes were deduced from the content on Barcelona, 44 on Amsterdam and 52 on Helsinki.

Data extraction and data analysis were the two intertwined steps within the context of this research. Consequently, the data analysis initiated in the data extraction phase. The third level of coding took a more analytic approach. A cross-case examination (Yin, 2009) of the codes identified in the separate cases on the second level was conducted. Interconnections and differences were identified which provided more compelling and robust outcomes (Gillham, 2000) and consequently 28 codes have been deduced from the analysis. Further engagement

with the content and codes identified four main themes, which have been selected as the core components of smartness. The results of this analysis are presented in the following section.

4. Findings

Technology developments have been acting as a catalyst for the development of smartness. The results of the case studies demonstrate the presence of an advanced technological info/infrastructure utilised for the management of information and the connection of all social and economic actors within the urban area. Besides the apparent presence of technology or hard smartness, four additional soft smartness components coalesced out of the analysed data sets, (1) innovation, (2) social capital, (3) human capital and (4) leadership. These four components strongly intertwine with hard smartness. Consequently, the role of this info/infrastructure shall be discussed in connection to innovation, social and human capital, and leadership instead of separately. The following sections present the in-depth exploration of the identified components of smartness from the smart city case studies on Barcelona, Amsterdam and Helsinki.

4.1. Innovation

When exploring the cases it becomes obvious that smartness is driven by innovation and innovation drives smartness. The S-D logic ecosystem provides a more compelling and encompassing perspective to study innovation (Akaka and Vargo, 2014) by introducing the involvement of all actors within the ecosystem rather than solely focusing on the innovation abilities of private actors. Innovation as a core component can be perceived as an outcome within S-D logic where it flourishes when all actors collaborate on its development (Wieland *et al*., 2012). Innovation has always been significant to competitiveness (Porter, 1998) and is vital for the competitiveness of smart cities (Hielkema and Hongisto, 2013) and tourism destinations (Hjalager, 2010). In Barcelona, Amsterdam and Helsinki, innovation is the outcome of all practises undertaken and is highly promoted and strongly empowered by ICT capability (Brinkman, 2011; European Union, 2014).

One way of encouraging innovation is through the establishment of Living Labs. Such "user-centric innovation milieus" are "built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values" (Bergvall-Kåreborn *et al*., 2009). Living Labs are critical for innovation (Cosgrave *et al*., 2013) and their implementation in smart cities has been greatly emphasised (Bakici *et al*., 2013). In this study, Barcelona, Amsterdam and Helsinki recognise the importance of Living Labs and have implemented the concept within different urban areas.

One example of a Living Lab in Barcelona is the 22@ Innovation District. In this geographical area various public, private and academic organisations collaborate and cooperate on the development of urban innovations. Especially challenges related to economics, mobility, green infrastructures and inclusiveness are emphasized. The ICT info/infrastructure is widely perceived as the backbone for the development of the innovation within the district (Bakici *et al*., 2013). In Amsterdam, examples of successful Living Labs are the "Nieuw-West" and "IJburg" districts. Sustainable practices, green energy, urban planning, new media, and tourism are topics of interest in these two Living Labs (Dameri, 2014). Both areas are supported by a substantive technology layer, which is endorsed by the Amsterdam Smart City initiative. However, whereas the 22@ Innovation District is primarily based on the collaboration between various organisations, the Living Labs in Amsterdam also emphasise the integration of citizens in the innovation process. Also the Arabianranta Living Lab in Helsinki embraces an innovation process integrating the public and private sector as well as citizens. It stimulates innovation in the field of citizen-centric services, by implementing demand and user-driven innovations in which open data is used to address the needs of all stakeholders (GSMA, 2012; Hielkema and Hongisto, 2013).

Innovation is both a critical input and outcome of the integration of smartness within smart places. Traditionally innovation was a process practised by the few bright, mostly big corporations (Clarysse *et al*., 2014). However, the case studies indicated communities typically develop smartness innovations collaboratively. Therefore, Living Labs function as real-life experimental and creative spaces. Developing Living Labs also encourages the innovation process to take place amongst all levels of the community, since ICT acts as the catalysts for bringing various actors together as the backbone of innovation. The efficient and effective dissemination of data in Living Labs, supported by ICT, exhilarates the innovation process (Cosgrave *et al*., 2013). Through the S-D logic lens, this possession of "information-processing and communication capabilities as well as distinct resource-based capabilities" is required for innovation and value co-creation (Maglio and Spohrer 2013, p.666). This implicates for the smart tourism destination that technologies such as sensors, mobile applications and information systems identified from the analysed smart cities are implemented for collecting, processing, and transferring large amounts of data. This data is accessible to all stakeholders and provides analytics to entrepreneurs, creative communities and research institutions in order to encourage further innovation and to contribute to the success of smart cities.

4.2. Human Capital

Human capital is a core component is essential in smart places. S-D logic places knowledge and skills to the core of value creation and competitiveness (Vargo and Lusch, 2008). Human

capital as “the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being” (Keeley, 2007, p.29). It is closely related to social capital where the two are often referred to as intertwined concepts (Keeley, 2007). The research demonstrates that the connection between human and social capital is also prominent in Barcelona, Amsterdam and Helsinki. The case studies suggested that innovative developments, crucial for the success of smart cities (Hielkema and Hongisto, 2013), are underpinned by well-developed human capital (European Union, 2014).

To support the development of human capital the cases support and enable different educational systems. Barcelona facilitated the integration of the Smart City Campus within the 22@ Innovation District. This campus promotes cooperation and synergies between local, national and international companies, universities, research centres, SMEs and local entrepreneurs. Located within the 22@ area it is supported by comprehensive ICT info/infrastructure as well as a network of different companies utilising their collective knowledge and creating new business opportunities (Bakici *et al*., 2013). In this vein, human capital is supported via the presence of social capital and vice versa.

Whilst Barcelona developed a Smart City Campus, Amsterdam set up the Amsterdam Institute for Advanced Metropolitan Solutions (AMS). This offers different learning programs, such as a Master degree, to encourage the education of residents on smart solutions for metropolitan areas. The institute conforms to smartness by empowering the collaboration of different public, private and academic partners (Cohen, 2014a). The academic partners consist of the TU Delft, Wageningen UR (two Dutch universities), the Massachusetts Institute of Technology (MIT) and the independent research group TNO. Different public partners such as Amsterdam Smart City, the City of Boston and Waag Society, and industry partners like KPN, IBM, CISCO and Shell have supported the educational programs (van Veen, 2014). Interlinking collaboration and cooperation practises, AMS is built upon these premises, which have been identified as the core components of smartness. Further, Helsinki is taking a similar approach to the development of collective knowledge. It recognises that the success of innovative developments is reinforced by the city’s human capital (Hielkema and Hongisto, 2013). In line with this, Helsinki established the knowledge hub Arabianranta, which also aims at attracting knowledgeable and creative people (Forum Virium Helsinki, 2014).

The case studies posit that enhancing human capital through educating and attracting creative and knowledgeable people is at the core of the smartness success. Smart cities shall be perceived as hubs where human capital is developed in a virtuous circle. Networks of connected people collaborate, cooperate, innovate and co-create to become smarter (Albino *et al*., 2015). This corroborates with Berry and Glaeser (2005) indicating that areas with an

educated work force and a large number of entrepreneurs, constantly driving innovation, show a higher economic growth rate. Further, Del Chiappa and Baggio (2015) emphasise the importance of information and knowledge exchange in smart tourism destinations for innovation and competitiveness. Hence, enhancing human capital propels collective intelligence and the cross-linking of knowledge ultimately creating a smart (in the sense of intelligent) city or tourism destination.

4.3. Social Capital

Social capital has been defined as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups" (Keeley, 2007, p.103). Rich social capital in geographical areas includes the presence of different networks between people, organisations and communities (Lin, 2001); Collaboration and cooperation between such networks support collective knowledge and competitiveness (Michaelides *et al*., 2013). Thus, collaboration and cooperation are at the forefront in smart cities, especially recognised in Living Lab areas (Bakici *et al*., 2013; Dameri, 2014; European Union, 2014).

To enhance the collaboration between all stakeholders, Barcelona, Amsterdam and Helsinki present themselves as cities implementing a "triple helix" model, a "quadruple helix" model and an "ecosystem" structure respectively (Bakici *et al*., 2013; Baron, 2013; Forum Virium Helsinki, 2014). In particular, these cities encourage the collaboration between what Boyd Cohen (2014a) recognises as 5P "public-private-professor-people partnerships". Helsinki is a prime example of a rich social capital structure, where the Forum Virium Helsinki places social capital and innovation at the core of smartness as two intertwined concepts (Forum Virium Helsinki, 2014). Further, collaboration, co-creation and co-development are vital for the participative approach in Amsterdam and are perceived as the drivers for value creation for all (European Union, 2014). The analysed smart cities question the linearity of the innovation and value co-creation process. In line with S-D logic, a complex and dynamic process emerges in which the creation and usage of value can happen simultaneously. The interactions within the smart city ecosystem imply an interdepending and interactive model of innovation value co-creation with a dynamic, non-deterministic and non-equilibrium relationship of exchange.

The analysis indicated that Barcelona, Amsterdam and Helsinki put great emphasis on the establishment of social capital and on the enhancement of collaboration between the various stakeholders. It is recognised that short-term benefits of individual competition will have a severe negative effect on the long-term development of the city (Jamal and Jamrozy, 2006). Smart cities understand competition between stakeholders with the same vision should be eliminated (Fyall, 2011). Instead there should be co-opetition, where a combination of

collaboration and competition offers greater opportunities (Buhalis, 2000, Ritchie and Crouch, 2003). Barcelona, Amsterdam and Helsinki recognise how human and social capital enhance collective intelligence and co-creation through the development of collaborative spaces and by sharing open data. Consequently, the rich interactions identified in the analysed smart cities hold the ability to create value for all and enhance the competitiveness of the smart tourism destination.

4.4. Leadership

Leadership corroborated with the presence of institutional logics in S-D logic and is perceived as the shaper of value co-creation (Wieland *et al*., 2012). Spencer *et al*. (2012) argue that the adoption of technology as the backbone of smartness depends on the leadership approach. The case studies demonstrate that different leadership styles are implemented within the three cases. Whilst Barcelona takes a top-down management approach, Amsterdam and Helsinki implement a bottom-up approach.

Relating to the initiation of Barcelona as a smart city, the Urban Habitats group was developed. Situated under the third deputy major, it has an umbrella function incorporating previously independent departments (e.g. environment, human services, energy, water). Further, the city created the Smart City Personal Management Office (SmartCityPMO), responsible for coordinating the projects related to the smart city. Even though Barcelona emphasises the collaboration between public, private, academic organisation and citizens, especially in the 22@ Innovation District, the management and initiatives are often introduced by top-management (Bakici *et al*., 2013). On the contrary, Amsterdam and Helsinki take on a bottom-up management style, where they both set up platforms based on partnerships between public, private, academic and citizen groups. People living and working in the area commence different smart city activities and initiatives. Even though a common leadership style responsible for the success of smart cities cannot be identified, strong leadership and determination of authorities are critical to implement smartness (Dameri, 2014; Meijer and Bolívar, 2015).

While the bottom-up approach is perceived as more typical for smart cities (Baron, 2013), this is questionable since the smart city initiatives of Amsterdam and Helsinki, promoted as bottom-up approaches, include a variety of top management and community based organisations. A particular example of this is the initiation of the Amsterdam Smart City platform. Here stakeholders such as the telecommunications provider KPN, grid manager Liander, the Amsterdam Economic Board and other governmental agencies, research institutes and universities set up the smart city initiative. While citizens are increasingly

playing a prominent role, the smart city embraces and facilitates bottom-up approaches but is not a sole bottom-up concept. In line with this, Dameri (2013) argues a bottom-up approach often disregards the importance of governmental bodies. Still, governments play a crucial role in developing the vision and in providing a quality ICT infrastructure. This would not be feasible without the financial support of city administrations (Dameri, 2014; Meijer and Bolívar, 2015). Consequently, it is evident that a combination of top-down and bottom-up approaches is more suitable for successful smart city (Caragliu *et al*., 2011; Baron, 2013). As an example, the development of central offices, such as the Smart City PMO in Barcelona, the Amsterdam Smart City and the Forum Virium Helsinki act as a go-between for ideas and initiatives (European Union, 2014).

The analysis indicates Barcelona, Amsterdam and Helsinki implement a combination of top-down and bottom-up leadership in which participatory governance is promoted. The central smart city offices guide and monitor smart city projects to empower the community to co-create and co-develop innovations to real-life problems and issues. They provide a supporting role and enable the usage of open data and ICT infrastructures to ensure collaboration between various smart city stakeholders and the creation of value for all involved. While innovation, social and human capital have been discussed in research on smart tourism destinations (Del Chiappa and Baggio, 2015; Gretzel *et al.* 2015), there is little research on leadership. Smart tourism destinations should therefore consider alternative leadership styles to take full advantage of smartness and enhance innovation and competitiveness. The role of the Destination Management Organisation (DMO) should be taken into account and legislation and incentives should be available to support smartness.

5. Discussion

This research underpinned the presence of hard smartness and identified four soft smartness components that are critical for developing smart places ecosystems. The case studies clearly illustrate that smartness is being developed on revolutionary technology as well as innovation, social and human capital, and leadership. S-D logic states that “all social and economic actors are resource integrators” and “operant resources are the fundamental source of competitive advantage” (Vargo and Lusch, 2008, p.7). The findings of this research indicate that smart places take on an S-D logic ecosystem structure to co-create value for all involved. They involve all stakeholders, exchanging knowledge and skills, co-create value contributing to the success of the smart tourism destination. Still, the core components take on different roles within the S-D logic ecosystem. To take full advantage of smartness in tourism destinations it

is essential to comprehend the connections between the core components and to facilitate synergies between them.

In line with the S-D logic lens, human capital and people are identified as operant resources and thus as integrators of knowledge and skills within the smart tourism destination ecosystem. It is the human capital that drives innovation that creates the conditions for value co-creation. The dual role of ICT is more complex and has been identified as an operand resource and as an operant resource. In its former role, ICT is an artefact for the input and output of collecting, analysing and storing data. However, in the latter role ICT is an active and dynamic factor facilitating innovation via agile mediation through the capability of integrated, interoperable and interconnected systems (Akaka and Vargo, 2014). ICT supports improvement of efficiency and effectiveness of processes between all actors involved improving the collective competitiveness at the smart tourism destination. ICT also facilitates human interaction and sharpens the focus on collaboration within the ecosystem. This underpins the assumption that cutting-edge technology in smart tourism destinations is an active and dynamic resource enabling, triggering and enhancing competitiveness (Akaka and Vargo, 2014).

Further, the analysis of the case studies indicates a unique interdependency of people and technology, in which ICT has become an essential facilitator, next to social and economic actors. Such a socio-technical structure facilitates collective intelligence (Orlikowski, 1992), in which social capital plays the facilitation role. Smart places emphasise the dynamic interaction between key actors as essential to simultaneously increase competitiveness and enhance quality of life. Since the co-creation of value is at the core of smart tourism destinations, human capital, ICT and social capital are intertwined components, identified as operant resource and facilitator respectively.

To enhance the development of collective intelligence through the integration of operant resources in the ecosystem, institutional logics or leadership is required. Within the context of smart tourism destinations, leadership should ensure the development of an innovation-fostering environment where all stakeholders have access to big data and agility in order to develop their competitiveness. For example through the development of Living Labs, people are empowered by a bottom-up management approach to initiate smart ideas and co-create value through dynamic innovation. Simultaneously, the top-down approach ensures development of an environment in which innovation is fostered and new ideas can be taken forward.

Overall, from a S-D logic lens and smart city perspective human capital and ICT, as core components, take on the role of resources within smart places and are critical to value co-

creation and competitiveness. The unique interaction between the two components enhances collaboration facilitated by social capital. The connection of the different components is enhanced through shared institutional logics and leadership that enables the co-creation of the innovation component, identified as the outcome of service exchange between ecosystem actors.

After conceptualising the core components of smart places, Figure 1 illustrates the conceptual framework for the development of smart tourism destinations. Perceiving the smart tourism destination as an S-D logic ecosystem indicates that ICT, people and leadership (illustrated in the funnel) are contributors to development. However, separately they are solely individual concepts and only intertwined and interconnected within the ecosystem, becoming meaningful contributors to the smart tourism destinations. Within the ecosystem interactions, illustrated at the centre of the framework, the core components identified as the contributors of smart places become intermingled to co-create innovations and value. ICT, as an operant and operand resource, interacting with and supportive to people, is represented by for example sensor and ambient technology, the Internet of Things, edge and cloud computing, and big/open data interoperability. However, insights and agile processes are a valuable resource for innovation only when they are brought into contact with human interaction. Grounded in the philosophy that society shapes technology and technology simultaneously shapes society (Bijker and Pinch 1987), a circular relationship between ICT and people at the centre of the ecosystem can be recognised. Therefore, smart tourism destinations should focus on attracting knowledgeable people and educate employees in different disciplines to enhance the intelligence of the destination (Scott *et al*., 2008).

Enhancing collective intelligence is essential in smart tourism destinations. This can be fostered through the development of Living Labs and creative hubs where people from different disciplines can come together to co-create innovation and value (Cosgrave *et al*., 2013). With knowledge and skills at the base of all exchange, knowledge management is an important practise in the smart tourism destination (Yigitcanlar *et al*., 2008). Hence, transfer of tacit knowledge through the development of Information and Knowledge Systems (Negre and Rosenthal-Sabroux, 2015) can support knowledge management. Still, collective intelligence also relies on the availability of data provided by ICT for novel insights. Leadership enabling the provision of open data to all people within the smart tourism destination ecosystem to foster innovation co-creation through collective intelligence is essential (Berry and Glaeser, 2005). Tourism destination managers therefore should take the lead in fostering smartness and in guiding all stakeholders through the changes required for success. They must also understand the central role of tourists and residents in the process of

data creation, sharing, processing and empower a bottom-up approach to leadership once the smart tourism destination enters a more mature phase.

However, ecosystems cannot be created (Gretzel *et al*., 2015); they evolve over time (Moore, 1993). Becoming a smart tourism destination requires leadership, vision, patience, strategic management and continuous evaluation and change. Perceiving the smart tourism destination as an ecosystem is essential and a vision and a clear set of goals for innovation are key facilitators for developing smart tourism destinations as a collective whole.

Insert Figure 1 here

The final stage of the framework depicts the innovative outcomes of the S-D logic ecosystem approach towards the smart tourism destination. The Smart City Wheel dimensions are a defined set of outcomes for any smart place (Cohen, 2011). It ensures the development of innovations by enabling and fostering sustainable practises with environmental, social and economic goals. It is within these six dimensions that the co-creation of innovation and value is established. Smart tourism destinations are amalgamations of products and services often intertwined with the products and services provided by the city or geographical area it is situated in. Hence, the development of a smart tourism destination takes advantage of innovations established in the context of the Smart City Wheel dimensions focusing on supporting the 6A components of tourism destinations (Buhalis, 2000). However, destination managers should also acknowledge their role in the development of innovation within these six dimensions for smartness to succeed in enhancing economic, social and environmental prosperity in smart tourism destinations. While S-D logic and the co-creation ecosystem can meaningfully address the micro level of the smart tourism destination, tourism destinations are placed within the larger macro environment and consequently affected by larger political, cultural, economical and social factors. Beyond the scope of the theoretical lens of this research, it is recommended future research on the smart tourism destination to explore how to enhance the micro level study with a macro level perspective.

6. Conclusion

Smart tourism destination management has become more complex since current developments in technology have empowered the collective integration of resources for value co-creation by all actors within the smart tourism destination ecosystem. This unique combination of interconnected and interoperable technological systems and knowledgeable people enhances the potential for sustained competitive advantage in tourism destinations. To

take full advantage of the current possibilities provided by smartness, destination managers have to integrate the entire range of smartness components and ensure interoperability and interconnectivity of both soft and hard smartness.

The results of this study suggest the sole integration of technology within a tourism destination will not suffice for becoming a smart tourism destination. Destination managers have to acknowledge the multi-facet construct of smartness to create value for all and enhance competitiveness. S-D logic has been postulated as a meaningful theoretical approach towards the development of smart tourism destinations and can provide an underpinning for understanding the value co-creation process at the core of every smart initiative.

Whilst the focus of smart cities is on its residents, smart tourism destinations need to emphasise ways to enhance the tourist experience, whilst simultaneously improving the quality of life for residents. This twofold attention requires an inclusive ecosystem design, which can solely be achieved by dynamic leadership and by integrating all actors within the development of the smart tourism destination. Thus, the conceptualisation of smartness enables destination managers to comprehend the different components and supports the implementation and utilisation of this concept. Ultimately, smart tourism destination managers should understand the complexity between the different core components of smartness and how they are interlinked. This study conceptualised a holistic overview of the core components contributing to smartness. Still, more research is suggested to understand the interconnections between the different components and especially the interaction between people and hard smartness. Fostering the development of an inclusive ecosystem is essential to innovation and value co-creation.

7. References

Akaka, M. and Vargo, S. (2014), "Technology as an operant resource in service (eco)systems", *Information Systems & e-Business Management*, Vol. 12 No. 3, pp. 367-384.

Albino, V., Berardi, U. and Dangelico, R. M. (2015), "Smart Cities: Definitions, Dimensions, Performance, and Initiatives", *Journal of Urban Technology*, Vol. 22 No. 1, pp. 3-21.

Bakici, T., Almirall, E. and Wareham, J. (2013), "A Smart City Initiative: the Case of Barcelona", *Journal of Knowledge Economy*, Vol. 4, pp. 135-148.

Baron, G., (2013), ""Smartness" from the bottom up a few insights into the Amsterdam Smart City Programme", available at: http://amsterdamsmartcity.com/data/file/MeteringInternational_BottomUp_GB.pdf (Accessed 24 September 2014).

Beeton, S. (2005), "The Case Study in Tourism Research: a Multi-method Case Study Approach", in Ritchie, B. W., Bums, P. and Palmer, C. (Eds.), Tourism Research Methods: Integrating Theory with Practise, CABI Publishing, Wallingford, pp. 37-48.

Benbasat, I., Goldstein, D. and Mead, M. (1987), "The Case Research Strategy in Studies of Information Systems", *MIS Quarterly*, Vol. 11, pp. 369-386.

Bergvall-Kåreborn, B., Ihlström Eriksson, C., Ståhlbröst, A. and Svensson, J. (2009), "A Milieu for Innovation: Defining Living Labs", *2nd ISPIM Innovation Symposium*, New York, December 6-9.

Berry, C. R. and Glaeser, E. L. (2005), "The Divergence of Human Capital Levels Across Cities", *Regional Science*, Vol. 84 No. 3, pp. 407-444.

Brinkman, J. (2011), "Supporting sustainability through smart infrastructures: the case of Amsterdam", *Network Industries Quarterly*, Vol. 13 No. 3, pp. 22-25.

Bryman, A. and Bell, E. (2011), Business research methods, 3rd ed., Oxford University Press, Oxford.

Buhalis, D. (2000), "Marketing the competitive destination of the future", *Tourism Management*, Vol. 21, pp. 97-116.

Buhalis, D. (2015), "Working Definitions of Smartness and Smart Tourism Destination", available at: http://buhalis.blogspot.co.uk/2014/12/working-definitions-of-smartness-and.html (Accessed 2 March 2015).

Buhalis, D. and Amaranggana, A. (2014), "Smart Tourism Destinations", in Xiang, Z. and Tussyadiah, L. (Eds.), Information and Communication Technologies in Tourism 2014, Springer, Dublin, pp. 553-564.

Cabiddu, F., Lui, T. W. and Piccoli, G. (2013), "Managing value co-creation in the tourism industry", *Annals of Tourism Research*, Vol. 42, pp. 86-107.

Campbell, N., O'Driscoll, A. and Saren, M. (2012), "Reconceptualising Resources: A Critique of Service-Dominant Logic", *37th Macromarketing Conference*, Dublin Institute of Technology, Berlin.

Caragliu, A., Del Bo, C. and Nijkamp, P. (2011). "Smart Cities in Europe", *Journal of Urban Technology*, Vol. 18 No. 2, pp. 65-82.

Carvalho, L. (2015), "Smart cities from scratch? A socio-technical perspective" *Cambridge Journal of Regions, Economy and Society*, Vol. 8, pp. 43-60.

Chandler, J. D. and Vargo, S. L. (2011), "Contextualization and value-in-context: How context frames exchange", *Marketing Theory*, Vol. 11 No, 1, pp. 35-49.

Clarysse, B., Wright, M., Bruneel, J. and Mahajan, A. (2014), "Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems", *Research Policy*, Vol. 43 No. 7, pp. 1164-1176.

Cocchia, A. (2014), "Smart and Digital City: A Systematic Literature Review", in Dameri, R. P. and Rosenthal-Sabroux, C. (Eds.), Smart City: How to Create Public and Economic Value with High Technology in Urban Space, Springer International Publishing, Heidelberg, pp. 13-43.

Cohen, B. (2011), "Smart Cities Wheel", available at: http://www.boydcohen.com/smartcities.html (Accessed 16 October 2014).

Cohen, B. (2012), "6 Key Components for Smart Cities", available at: http://www.ubmfuturecities.com/author.asp?section_id=219&doc_id=524053 (Accessed 14 November 2014).

Cohen, B. (2014a), "Leading Smart Cities Promote 5P Collaboration", available at: http://www.ubmfuturecities.com/author.asp?doc_id=526721 (Accessed 28 September 2014).

Cohen, B. (2014b), "The 10 Smartest Cities In Europe", available at: http://www.fastcoexist.com/3024721/the-10-smartest-cities-in-europe (Accessed October 16 2014).

Constantin, J. and Lusch, R. F. (1994), Understanding resource management, Burr Ridge, Irwin Professional.

Cosgrave, E., Arbuthnot, K. and Tryfonas, T. (2013). "Living Labs, Innovation Districts and Information Marketplaces: A Systems Approach for Smart Cities", *Journal of Procedia Computer Science*, Vol. 16, pp. 668-677.

Dameri, R. P. (2013), "Searching for Smart City definition: a comprehensive proposal", *International Journal of Computers & Technology*, Vol. 11 No. 5, pp. 2544-2551.

Dameri, R. P. (2014), "Comparing Smart and Digital City: Initiatives and Strategies in Amsterdam and Genoa. Are they Digital and/or Smart?", in Dameri, R. P. and Rosenthal-Sabroux, C. (Eds.), Smart City, Springer International Publishing, Cham, pp. 45-88.

De Filippi, P. (2015), "Community Mesh Networks: Citizens' Participation in the Deployment of Smart Cities", in Vesco, A. and Ferrero, F. (Eds.), Handbook of Research on Social, Economic, and Environmental Sustainability in the Development of Smart Cities, IGI Global, Hershey, PA, pp. 298-314.

Del Chiappa, G. and Baggio, R. (2015), "Knowledge transfer in smart tourism destinations: Analyzing the effects of a network structure", *Journal of Destination Marketing & Management*, Vol. 4, pp. 145-150.

Denyer, D. and Neely, A. (2004), "Introduction to special issue: Innovation and productivity performance in the UK", *International Journal of Management Reviews*, Vol. 5/6 No. 3/4, pp. 131-135.

European Union (2014), "Mapping Smart Cities in the EU", European Union, (PE 507.480).

Forum Virium Helsinki (2014), "Smart City Innovation Unit", available at: http://www.forumvirium.fi/en/smartcityinnovationunit (Accessed 27 September 2014).

Fyall, A. (2011), "Destination Management: Challenges and Opportunities", in Wang, Y. and Pizam, A. (Eds.), Destination Marketing and Management: Theories and Implications, Cabi Publishing, Oxfordshire, pp. 340-358.

Geels, F. W. (2002), "Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study", *Research Policy*, Vol. 31, pp. 1257-1274.

Gillham, W. E. C. (2000), Case study research methods, Continuum, London.

Gretzel, U., Werthner, H., Koo, C. and Lamsfus, C. (2015), "Conceptual foundations for understanding smart tourism ecosystems", *Computers in Human Behavior*, Vol. 50, pp. 558–563.

GSMA (2012), "Finland: Forum Virium Helsinki", available at: http://www.gsma.com/connectedliving/wpcontent/uploads/2012/12/cl_forum_virium_12_12.pdf (Accessed October 14 2014).

Guo, Y., Liu, H. and Chai, Y. (2014), "The embedding Convergence of Smart Cities and Tourism Internet of Things in China: An advance perspective", *Advances in Hospitality and Tourism Research*, Vol. 2 No. 1, pp. 54-69.

Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Paraszczak, J. and Williams, P. (2010), "Foundations for Smarter Cities", *IBM Journal of Research and Development*, Vol. 54 No. 4, pp. 1-16.

Hielkema, H. and Hongisto, P. (2013), "No Developing the Helsinki Smart City: The Role of Competitions for Open Data Applications", *Journal of Knowledge Economy*, Vol. 4 No. 2, pp. 190-204.

Hjalager, A.-M. (2010), "Progress in Tourism Management: A review of innovation research in tourism", *Tourism Management*, Vol. 31, pp. 1-12.

Hollands, R. G. (2008), "Will the real smart city please stand up? Intelligent, progressive or entrepreneurial?", *City*, Vol. 12 No. 3, pp. 303-320.

Hollands, R. G. (2015), "Critical interventions into the corporate smart city", *Cambridge Journal of Regions, Economy and Society*, Vol. 8, pp. 61-77.

IBM (2014), "Smarter Cities", available at: http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/?lnk=fkt-scit?lnk=fkt-smci-uken (Accessed 30 November 2014).

IBM (2015), "A Smarter Planet", available at: http://www.ibm.com/smarterplanet/uk/en/overview/ideas/index.html (Accessed 27 October 2015).

Jamal, T. and Jamrozy, U. (2006), "Collaborative Networks and Partnerships for Integrated Destination Management", in Buhalis, D. and Costa, C. (Eds.), Tourism management dynamics : trends, management, and tools, Elsevier Butterworth-Heinemann, Amsterdam; Boston, pp. 164-172.

Keeley, B. (2007), Human Capital: How what you know shapes your life, OECD, Paris.

Kitchin, R. (2013), "The real-time city? Big data and smart urbanism", *GeoJournal*, Vol. 79 No. 1, pp. 1-14.
La Rocca, R. A. (2014), "The Role of Tourism in Planning the Smart City", *Tema. Journal of Land Usre, Mobility and Environment*, Vol. 7 No. 3, pp. 269-283.
Latour, B. (2005), Reassembling the Social: an Introduction to Actor-Network-Theory, Oxford University Press, Oxford.
Lin, N. (2001), Social capital: a theory of social structure and action, Cambridge University Press, Cambridge.
Lopez de Avila, A. (2015), "Smart destinations: XXI century tourism", presented at the ENTER2015 Conference on Information and Communication Technologies in Tourism, Lugano, Switzerland, February 4-6, 2015.
Lusch, R. F. and Nambisan, S. (2015), "Service Innovation: A Service-dominant Logic Perspective", *MIS Quarterly*, Vol. 39 No. 1, pp. 155-176.
Lusch, R. F. and Vargo, S. L. (2014), Service-Dominant Logic: Premises, Perspectives, Possibilities, Cambridge University Press, Cambridge.
Maglio, P. P. and Spohrer, J. (2013), "A service science perspective on business model innovation", *Industrial Marketing Management*, Vol. 42, pp. 665-670.
Malek, A. and Costa, C. (2015), "Integrating Communities into Tourism Planning Through Social Innovation", *Tourism Planning & Development*, Vol. 12 No. 3, pp. 281-299.
McKercher, B. (1999), "A chaos approach to tourism", *Tourism Management*, Vol. 20, pp. 425-434.
Meijer, A. and Bolívar, M. P. R. (2015), "Governing the smart city: a review of the literature on smart urban governance", *International Review of Administrative Sciences*, April 25, pp. xx
Michaelides, R., Morton, S. C., Michaelides, Z., Lyons, A. C. and Liu, W. (2013), "Collaboration networks and collaboration tools: a match for SMEs?", *International Journal of Production Research*, Vol. 51 No. 7, pp. 2034-2048.
Moore, J. F. (1993), "Predators and prey: a new ecology of competition", *Harvard Business Review*, Vol. 71 No. 3, pp. 75-86.
Nam, T. and Pardo, T. (2011), "Conceptualizing smart city with dimensions of technology, people, and institutions", *Proceedings of the 12th Annual International Digital Government Research Conference on Digital Government Innovation in Challenging Times - dg.o '11*, ACM Press, New York, pp. 282-291.
Negre, E. and Rosenthal-Sabroux, C. (2015), "Smart Cities: A Salad Bowl of Citizens, ICT, and Environment", in Vesco, A. and Ferrero, F. (Eds.), Handbook of Research on Social, Economic, and Environmental Sustainability in the Development of Smart Cities, IGI Global, Hershey, PA, pp. 61-78.
Orlikowski, W. J. (1992), "The duality of technology: Rethinking the concept of technology in organizations", *Organization Science*, Vol. 3 No. 3, pp. 398-427.
Piro, G., Cianci, I., Grieco, L. A., Boggia, G. and Camarda, P. (2014), "Information centric services in Smart Cities", *The Journal of Systems & Software*, Vol. 88, pp.169-188.
Porter, M. E. (1998), The competitive advantage of nations, Macmillan Business, Basingstoke.
Porter, M. E. and Heppelmann, J. E. (2014), "How Smart, Connected Products Are Transforming Competition", *Harvard Business Review*, Vol. 92 No. 11, pp. 64-88.
Ritchie, J. R. B. and Crouch, G. I. (2003), The competitive destination : a sustainable tourism perspective, CABI Pub, Wallingford.
Scott, N., Baggio, R. and Cooper, C. (2008), Network analysis and tourism : from theory to practice, Channel View Publications, Clevedon; Buffalo, NY.
Shaw, G., Bailey, A. and Williams, A. (2011), "Progress in Tourism Management: Aspects of service-dominant logic and its implications for tourism management: Examples from the hotel industry", *Tourism Management*, Vol. 32, pp. 207-214.
Spencer, A. J., Buhalis, D. and Moital, M. (2012), "A hierarchical model of technology adoption for small owner-managed travel firms: An organizational decision-making and leadership perspective", *Tourism Management*, Vol. 33 No. 5, pp. 1195-1208.
Thite, M. (2011), "Smart Cities: Implications of Urban Planning for Human Resource Development", *Human Resource Development International*, Vol. 14 No. 5, pp. 623-631.
Townsend, A. M. (2013), Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia, W. W. Norton & Company, New York.
van Veen, A. (2014), "Measuring the Smart City", available at: http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/files/documents/events/slidesvanveenamsterdam.pdf (Accessed 27 September 2014).

Vargo, S. L. and Lusch, R. F. (2004), “Evolving to a New Dominant Logic for Marketing”, *Journal of Marketing*, Vol. 68 No. 1, pp. 1-17.

Vargo, S. L. and Lusch, R. F. (2008), “Service-dominant logic: continuing the evolution” *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 1-10.

Vargo, S. L., Lusch, R. F. and Akaka, M. A. (2010), “Advancing Service Science with Service-Dominant Logic: Clarifications and Conceptual Development”, in Maglio, P. P., Kieliszewski, C. A. and Spohrer, J. (Eds.), Handbook of Service Science, New York, Springer US, pp. 133-156.

Vargo, S. L., Wieland, H. and Akaka, M. A. (2015), “Innovation through institutionalization: A service ecosystems perspective”, *Industrial Marketing Management*, Vol. 44, pp. 63-72.

von Bertlanffy, L. (1972), “The history and status of general systems theory”, *Academy of Management Journal*, Vol. 15 No. 4), pp. 407-426.

Wakelin, M. (1992), Globalization of regional development, in Gibson, D. V., Kozmetsky, G. and Smilor, R. W. (Eds.), The Technopolis phenomenon : smart cities, fast systems, global networks, Rowman & Littlefield Publishers, Savage, pp. 43-52.

Wang, D., Li, X. and Li, Y. (2013), “China's “smart tourism destination” initiative: A taste of the service-dominant logic”, *Journal of Destination Marketing & Management*, Vol. 2 No. 2, pp. 59-61.

Wieland, H., Polese, F., Vargo, S. L. and Lusch, R. F. (2012), “Toward a Service (Eco)Systems Perspective on Value Creation”, *International Journal of Service Science, Management, Engineering, and Technology*, Vol. 3 No. 3, pp. 12-25.

Yigitcanlar, T., Velibeyoglu, K. and Martinez-Fernandez, C. (2008), “Rising knowledge cities: The role of urban knowledge precincts”, *Journal of Knowledge Management*, Vol. 12 No. 5, pp. 8-20.

Yin, R. K. (2009), Case study research: design and methods, 4th ed., Sage, Los Angeles.