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Research Paper

Knowledge transfer in smart tourism destinations: Analyzing the effects of a network structure

Giacomo Del Chiappa^{a,*}, Rodolfo Baggio^b^a Department of Economics and Business, University of Sassari and CRENoS, Via Muroni 25, 07100 Sassari, Italy^b Master in Economics and Tourism, Dondena Center for Research on Social Dynamics, Bocconi University, Italy

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ABSTRACT

In academia, as well in the industry, there is currently an increasing interest in the concept of smart tourism destinations. Specifically, there is widespread recognition of the role that ICTs, the Internet of Things and Cloud Computing play in providing instruments and platforms to facilitate the dissemination of information and knowledge among stakeholders, thus enhancing innovation and destination competitiveness. Despite that, not much research exists that aims at understanding the processes of information and knowledge transfer, sharing, and conversion in smart tourism destinations. This paper seeks to deepen the scientific debate around this topic by applying a network analytic approach to the cases of three tourism destinations. Findings reveal that effective knowledge-based destination management studies should consider both the virtual and the real components of the network structure of the destination. Contributions to the body of knowledge and managerial implications are discussed and suggestions for further research are given.

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1. Introduction

In recent decades, information and communication technologies (ICTs) have radically and unforeseeably changed our society as a whole, with travel and tourism being one of the sectors that has been most transformed, especially since the Internet of Things emerged (Atzori, Iera, & Morabito, 2010), making available a multidimensional dataset known as 'big data'. The progress to a higher socialization of ICTs, along with the advent of the Internet of Things and Cloud Computing, has made (and fashionable) the recent concept of digital business ecosystems (Nachira, Dini, Nicolai, Le Louarn, & Rivera Lèon, 2007) much more relevant and has provided the venue for the emergence of the new concept of the 'smart city' (Giffinger et al., 2007). Based on this strand of research, the idea of tourism destinations as digital business ecosystems (Baggio & Del Chiappa, 2014a) in search of strategies to become smarter (Buhalis & Amaranggana, 2014) is rapidly emerging in the literature. The digital revolution and the convergence of ICTs have been igniting the development of new communication grids, thus challenging the traditional technological scenarios, rendering smart cities and smart tourism destinations the basis for urban and tourism competitiveness (Batty et al., 2012;

Branchi, Fernández-Valdivielso, & Matias, 2014) and sustainability (Morelli et al., 2013).

In an increasingly globalized and extremely dynamic environment, innovation is the key element for cities and tourism destinations to be competitive. Organizations of any type should consider location and spatial information as a common goods, thus meaning that they should do as much as they can to make such information available within the network, thus stimulating innovation at both the individual and collective levels (Roche, Nabian, Kloeckl, & Ratti, 2012). Sensing, analyzing, and integrating information and knowledge can thus be considered a core aspect of any smart city or smart tourism destination (Su, Li, & Fu, 2011). Despite this, academic research has rarely examined or discussed how this process can occur and how it can be assessed, measured and predicted (Baggio & Cooper, 2010). This paper uses and mixes epidemic diffusion models and other network analytic methods, applying them to the case of three Italian tourism destinations and considering the enabling role that ICTs can exert in this process (Roche et al., 2012). The aims are twofold. First, the paper attempts to establish the extent to which technological association has affected the structural configuration of the tourism system. Second, the paper examines the nature of networks and how their analysis can contribute to understanding the processes of knowledge transfer among stakeholders. To this end, the paper seeks to extend the analysis discussed in the preliminary work by

* Corresponding author. Tel.: +39 0789642184.

E-mail addresses: gdelchiappa@uniss.it (G. Del Chiappa), rodolfo.baggio@unibocconi.it (R. Baggio).

Baggio and Del Chiappa (2014b) (presented at ENTER2014, 21st International Conference on Information Technology and Travel & Tourism, January 21–24, 2014 – Dublin) in order to show and estimate, by simulation, how an increase in the virtual connectivity improves the diffusion process within a tourism destination. Specifically, the study employs a spectral analysis of the networks and uses it to assess the extent to which the digital ecosystem is able to speed up the diffusion process. A simulation shows how important the effect of the digital component is on the whole ecosystem behavior.

2. Theoretical background

A smart city can be defined as 'a city in which ICT is merged with traditional infrastructures, coordinated and integrated using new digital technologies' (Batty, Fosca, Bazzani, & Ouzounis, 2012); its main goals are 'developing a new understanding of urban problems, effective and feasible way too coordinate urban technologies; models and methods for using urban data across spatial and temporal scales; developing new technologies for communication and dissemination; developing new forms of urban governance and organization; defining critical problems relating to cities, transport, and energy; and identifying risk, uncertainty and hazards in the smart city' (Batty, Fosca, et al., 2012). According to Komninos, Pallot, and Schaffers (2013) the main pillars of smartness for any city are human capital, infrastructure, and information (Komninos et al., 2013). Similarly, Nam and Pardo (2011) consider technology, people, and institution to be being pivotal factors for smart cities. Broadly speaking, smart cities are cities well performing in the following six aspects: smart economy, smart people, smart mobility, smart environment, smart living and smart governance (Giffinger et al., 2007; Lombardi, Giordano, Farouh, & Yusef, 2011). In particular, the latter requires a thorough consideration of stakeholder participation in decision-making, public and social services, transparency, and political strategies and perspectives (Giffinger et al., 2007). In the last few years, the idea of ICTs and social media as tools that are able to play an important role in the destination-governance processes and in the processes of stakeholder involvement and engagement has been attracting huge attention from both the industry and academia (e.g. Fuchs, 2006; Munar, 2012; Presenza, Micera, Splendiani, & Del Chiappa, 2014; Sigala and Marinidis, 2012), thus generating the concept of 'e-governance' or 'e-democracy' (Giffinger et al., 2007). According to Nam and Pardo (2011), learning and knowledge have central importance for smart cities and smart tourism destinations, with knowledge management also being one of the main dimensions of the destination governance (Ruhanen, Scott, Ritchie, & Tkaczynski, 2010).

The concept of the smart tourism destination arises from that of smart city. Actually, the concept itself may be considered still to be emerging, and the work of conceptualizing and defining it still in progress. In applying the concept of the digital business ecosystem (Nachira, 2002) to the tourism sector, Baggio and Del Chiappa (2014a) defined a tourism destination as a networked system of stakeholders delivering services to tourists, complemented by a technological infrastructure aimed at creating a digital environment which supports cooperation, knowledge sharing, and open innovation. In such a context, the physical and virtual components are strongly structurally coupled and co-evolve to form a single system, implying that all modifications, changes or perturbations originating in any one of them rapidly propagate to the whole system (Baggio & Del Chiappa, 2014a). Tourism researchers concur that effective and efficient information and knowledge exchange, sharing, and development among all the stakeholders involved within a destination network is crucial for

tourism competitiveness (Otto & Ritchie, 1996; Argote & Ingram, 2000; Komninos, 2008). In such a context, ICTs, information systems, and social media can be considered to be important coordination mechanisms (Bregoli & Del Chiappa, 2013) that allow information and knowledge to flow more easily through the destination, more contextual data to be transmitted, and opinions to be shared (Breukel & Go, 2009). Moreover, the idea that ICTs are among the factors that may influence knowledge sharing the most is well established in the strategic management literature (Yang, 2010). This view is coherent with what Buhalis and Amaranggana (2014, p. 557) have recently noted when stating that 'bringing smartness into tourism destinations requires dynamically interconnecting stakeholders through a technological platform on which information relating to tourism activities could be exchanged instantly'. The top priorities of any smart tourism destinations can be analyzed by adopting a demand-side or a supply-side perspective. That means enhancing the tourist's travel experience, providing intelligent platforms to gather and distribute information among local stakeholders (Nam and Pardo, 2011), facilitating the efficient and effective allocation of tourism resources, and integrating tourism suppliers to ensure that the benefits of tourism are equitably distributed among the local society (Buhalis and Amaranggana, 2014). To sum up, and based on Edvinsson's (2006) concept of learning city, it can be argued that smart tourism destination should purposefully be designed and managed with the objective of encouraging the nurturing of knowledge (Roche & Rajabifard, 2012), thus contributing to the shaping and operation of an open innovation ecosystem (Schaffers et al., 2011). In other words, a smart tourism destination can be considered to be a knowledge-based destination, where ICTs, the Internet of Things, Cloud Computing and end-user internet service systems (Buhalis & Amaranggana, 2013) are used to provide instruments, platforms (Toppela, 2010) and systems (Morelli et al., 2013) to make knowledge and information accessible to all the stakeholders in a systematic and efficient way, and to make available mechanisms that allow them to participate as much as possible in the innovation process (Racherla, Hu, & Hyun, 2008). In line with this perspective, it has recently been argued that social media can 'facilitate the transformation of the stakeholders' tacit knowledge into an explicit codified knowledge, which can be stored, shared, and consequently combined with relevant knowledge to ultimately enable better decision making' (Sigala & Marinidis, 2012). In addition, Funilkul and Chutimaskul (2009) argue that the Web has become the medium through which users and stakeholders interact and collaborate, exchange and share information and knowledge, and share opinion in attempting to converge toward a common vision (Funilkul & Chutimaskul, 2009).

Given the still scarce research which that analyzes how the process of knowledge sharing can be assessed, this paper aims to contribute to filling this gap by applying and mixing epidemic diffusions models and other approaches to network analysis in the cases of three Italian tourism destinations.

3. Methods

The ecosystems examined in this study are those of the Italian destinations of Elba, Gallura, and Livigno. These are three well-known destinations. Elba is an island off the coast of Tuscany (central Italy), Gallura-Costa Smeralda is the north-western region of Sardinia and Livigno is a mountain district in northern Italy, close to the Swiss border. The destinations are quite typical. Elba and Gallura are marine areas, while Livigno is an Alpine zone. Each destination, for the purpose of this study, is considered bounded by its respective administrative borders. The size of the three destination, in terms of tourism firms operating, is similar, about

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