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Conceptualization of Smart Tourism Destination Competitiveness

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ABSTRACT

This paper aims to develop a conceptual model of smart tourism destination competitiveness to provide implications in terms of smart tourism destination realization and smart tourism destination competitiveness development. A literature review on tourism destination competitiveness and smart tourism destination is performed. A conceptual model is suggested on the basis of the model of destination competitiveness developed by Crouch and Ritchie (1999). The suggested conceptual model integrates the traditional concepts of comparative advantages and competitive advantages, seven core resources and attractors, and five destination management factors. Smart technology is included as a new core resource and attractor in the model. This study is the first to comprehensively conceptualize smart tourism destination competitiveness. Moreover, this study has practical value in the sense that it focused on the convergence between smart technology and other factors.

Keywords: Smart Tourism Destination Competitiveness, Tourism Destination Competitiveness, Comparative Advantages, Competitive Advantages, Smart Technology

Ⅰ. Introduction

With increased attention paid to "smart" as a concept arises interest in and application of the term across different fields. The buzzword is a technology-oriented term and it is often used as a prefix implying specific technological characteristics which are connectivity and intelligence (Gretzel et al, 2015a). The word can be defined originally as resource optimization based on the utilization of information and communication technologies (ICT) (Gretzel et al., 2015b; Werthner et al., 2015). As the concept expands

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in application areas, it has also made its way into tourism, resulting in smart tourism signifying phenomena related to the use of smart technologies across a plethora of travel-related activities and experiences (Gretzel et al., 2015b; Hunter et al., 2015). Specifically, smart tourism has been most extensively explored and investigated in the context of smart tourism destinations due to the close relationship to smart city concepts. Related research studies about different aspects of smart tourism destinations draw from practical cases (Boes et al., 2015), focus on personalized services in smart tourism destinations (Buhalis and Amaranggana, 2015), address general phenomena in smart tourism destinations (Buhalis and Amaranggana, 2013), and provide examples of smart tourism destinations from the perspectives of mobile and cloud computing technologies (Lamsfus et al., 2015). What the current literature does not explore is how smart technology contributes to overall destination competitiveness.

Crouch and Ritchie (1999) created the concept of destination competitiveness, which is a destination's ability to provide higher quality travel experiences to the visitors than other destinations. As the importance of destination competitiveness was recognized academically and practically, some researchers elaborated on the original conceptual model of destination competitiveness (Crouch and Ritchie, 2005; Dwyer and Kim, 2003; Mazanec et al., 2007) and other researchers verified the model empirically (Crouch, 2010; d'Hauteserre, 2000; Enright and Newton, 2004, 2005; Gomezelj and Mihalič, 2008; Kozak and Rimmington, 1999). These academic approaches make practical contributions especially to destination management organizations (DMOs) by enabling them to find their own destinations' competitive resources, to understand the current situation, and to improve the competitiveness of their destinations (Enright and Newton, 2004, 2005). Furthermore, other stakeholders, such as tourism companies, ICT companies, and government, are closely involved because this research can be meaningful practically for these stakeholders (Boes et al., 2015). With the understanding of smart tourism competitiveness, in the case of travel agencies, they can develop the new competitive advantage and strengthen their existing competitiveness, in the case of firms in information technology (IT) industry, they can enlarge their business area, and in the case of government, it can make its country attractive destination with alternative scheme, even though it is not competitive tourism destination because of lack of natural resources (Boes et al., 2015). In this vein, the modeling of destination competitiveness can be considered as an essential tool for the development of tourism destinations. However, the existing model is not perfectly proper to apply it to the smart tourism destinations because Crouch and Ritchie's model (1999) did not consider ICT that was not well-developed and not prevalent in tourism area at that time. As discussed, ICT and smart technologies, including mobile devices or clouding services, are referred as a main sector for realizing the smart tourism (Buhalis and Amaranggana, 2013, 2015; Lamsfus et al., 2015). Thus, with the lack of consideration of smart technologies and the introduction of smart tourism destinations, these models are in urgent need of updating.

The case study methodology employed in existing studies on smart tourism destinations resulted in smart tourism performance definitions that are neither transferrable across levels and types of smart technology adoption nor across destinations. Yet, there is a great academic as well as practical need to be able to conceptualize smart tourism destination success at an overall level and to evaluate and benchmark smart destination initiatives from a holistic

point of view. The focus on the technological side of smart tourism development by countries currently implementing smart tourism policies is problematic because the convergence of smart technologies and existing resources is much more important than the technical improvement (Gretzel et al., 2015b). Therefore, both academic and practical efforts need a conceptual base from which broader views can emerge.

The purpose of this study is to develop a conceptual model of smart tourism destination competitiveness (DestCompST) that can inform smart tourism destination development and management. The importance of the conceptual model lies in its recognition of the interconnection of smart technology and destination management activities, which is necessary to achieve DestCompST.

Ⅱ. Destination Competitiveness

To conceptualize the DestCompST, the Crouch and Ritchie's model (1999) is explored to find out which elements should be selected for the DestCompST. In short, this results in the need of placing smart technologies in the DestCompST as a main element. Based on the investigation, DestCompST is suggested and explained with several examples, including smartphone application.

2.1. Comparative Versus Competitive Advantages in Tourism

Crouch and Ritchie (1999) propose a conceptual model of destination competitiveness with considerations of comparative advantages and competitive advantages in a tourism context. Destination competitiveness is explained as a destination's ability to provide high quality travel experiences to tourists and a high quality of life to residents based on the identification and management of various tourism resources. The comparative and competitive advantages, distinguishing among resource status and resource utilization, are adopted as foundations of the destination competitiveness (Crouch and Ritchie, 1999). According to Porter (1990), comparative advantages address resource endowment, meaning the resource availability, for example, infrastructure, capital resources, knowledge resources, physical resources and human resources. While comparative advantages focus on the available resources themselves, competitive advantages imply the ability to utilize those resources effectively. Porter (1990) notes that competitive advantages have to be estimated for measuring competitiveness, because competitiveness cannot be fully described only with resource-based comparative advantages. Especially, the composition-based competitive advantages demonstrate their effects in the tourism sector, which is a completely tradeable global market as all destinations over the world are in open competition based on a fully liberalized institutional environment (Richardson, 1987). For example, although Singapore and South Korea are not considered as destinations owning abundant natural resources, they rank in the top ten countries regionally, i.e. in the Asia-Pacific region, in terms of the travel and tourism competitiveness index (TTCI) due to their competitive advantages, which are the positive agglomeration effects of Singapore resulting from a recent investment in a resort complex based on international openness and the attraction effect of South Korea created from cultural contents, such as the Korean wave (World Economic Forum, 2015).

In the conceptual model of destination competitiveness, the core resources and attractors are

<Table 1> Comparison between Comparative Advantages and Competitive Advantages

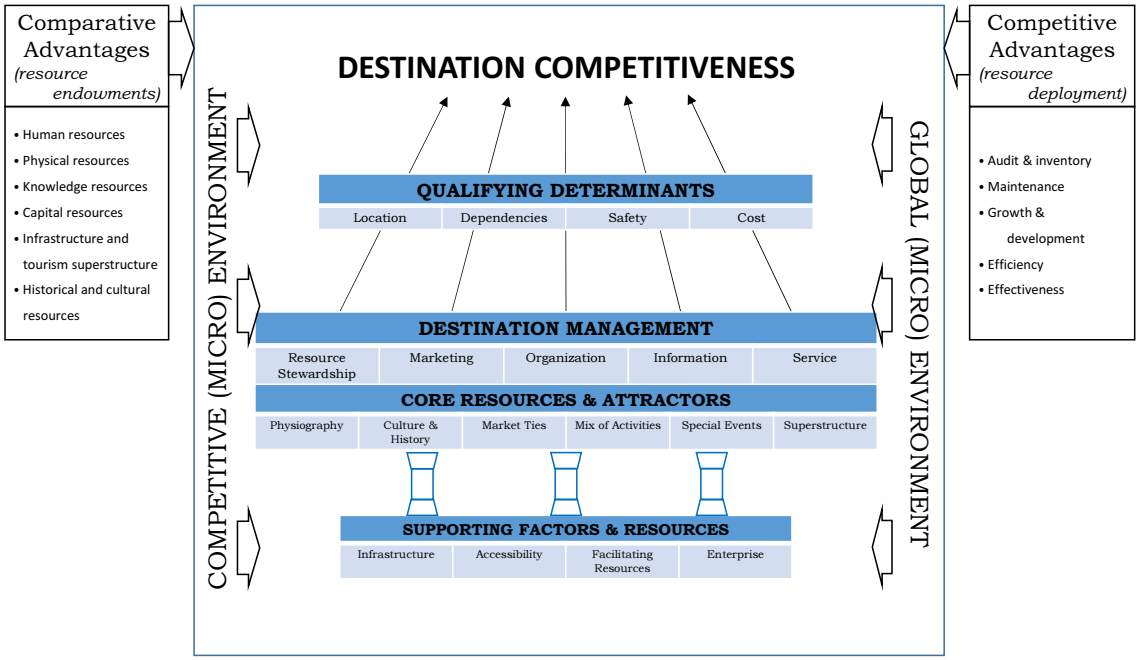
	Comparative advantages	Competitive advantages
Notion	Available resources itself	Resources utilization or management
Focus	Resource endowments	Resource deployment
Core resources & attractors	• Physiography • Culture & history • Tourism superstructure	• Market ties • Mix of activities • Special events

viewed as main factors influencing the attractiveness of destinations and prompting travelers to visit the destinations. A total of six core resources and attractors are presented: physiography, culture and history, tourism superstructure, market ties, mix of activities, and special events (Crouch and Ritchie, 1999). Physiography refers to the overall natural circumstances of a destination, such as location, landscape, and climate and tourism superstructure describes major facilities closely related with the tourism industry, such as a hotel, restaurant, and theme park. Out of the six factors, the first three components (physiography, culture and history, and tourism superstructure) are closely related with comparative advantages due to the definitions of comparative advantages and resource-oriented aspects of those three attractors. On the other hand, the other three components of core resources and attractors (market ties, mix of activities, and special events) can be connected with competitive advantages in the sense that the three attractors are structured by the proper allocation of available resources (Crouch and Ritchie, 1999).

2.2. Conceptual Model of Destination Competitiveness

Destination competitiveness is defined as the ability of destinations to deliver better travel experience for tourists and to create a better living environment for local residents than other destinations (Crouch and Ritchie, 1999; Dwyer and Kim, 2003). Along with the definition, a conceptual model of destination competitiveness was developed to explain the concept with a holistic approach primarily through literature reviews of broadly related research fields (Crouch and Ritchie, 1999). The conceptual model of Crouch and Ritchie (1999) is regarded as the best approach to understanding destination competitiveness, hence a number of studies investigated destination competitiveness quantitatively and qualitatively in various settings based on the conceptual model (Crouch, 2010; Dwyer and Kim, 2003; Enright and Newton, 2004, 2005; Gomezelj and Mihalič, 2008). For that reason, this study proposes the conceptual model of smart destination competitiveness to be based on the destination competitiveness developed by Crouch and Ritchie (1999).

The conceptual model is composed of four basic elements for destination competitiveness (core resources and attractors, destination management, qualifying determinants, and supporting factors and resources), two environmental elements defining the boundaries of competition (competitive (micro) environment and global (macro) environment), and two fundamental concepts for destination competitiveness (comparative advantages and competitive advantages). Among the four basic elements, the two elements, core resources and attractors and destination management, can be recognized as direct determinants of destination competitiveness. In the



Source: Crouch and Ritchie (1999)

<Figure 1> Crouch and Ritchie (1999)'s Conceptual Model of Destination Competitiveness

case of core resources and attractors, the key components of destination competitiveness represent the destination appeal, thus the six factors included in this category act as tourist attractors. Additionally, the effects of core resources and attractors are improved by destination management elements (Crouch and Ritchie, 1999). As for the comparative advantages and competitive advantages, they are the backbone of the diamond of national competitiveness framework, which served as the base for the destination competitiveness conceptualization (Crouch and Ritchie, 1999; Porter, 1990; Enright and Newton, 2005). Therefore, comparative advantages and competitive advantages have to be the focus to understand destination competitiveness.

As for global (macro) environment, their factors are uncontrollable forces that destinations should monitor and overcome to be or remain competitive (Crouch and Ritchie, 1999). However, these issues can be a cause of opportunities for each destination to make innovation and to enable market exploitation (Crouch and Ritchie, 1999). On the other hand, competitive (micro) environment directly forms destination's immediate field of competition (Kotler et al., 2015). To compete as a destination, micro environment factors should be adapted based on destination's condition (Crouch and Ritchie, 1999). Core resources and attractors represent the fundamental ingredients of destination attraction (Crouch and Ritchie, 1999). Most visitors or travelers go to a destination mainly because of the destination's core resources and attractors. Compared to core resources and attractors, supporting factors and resources do not have a significant effect on travelers' motivation, but they amplify the motivations to inbound tourism (Crouch and Ritchie, 1999). Without supporting factors and

resources, the impact of core resources and attractors cannot be maintained for a long time. The factors of destination management, like those of supporting factors and resources, complement the appeal of core resources and attractors, yet they also supplement the roles of supporting factors and resources (Crouch and Ritchie, 1999). However, the elements of destination management have to adapt to the situations that qualifying determinants make. Qualifying determinants give an impact to other three segments, core resources and attractors, supporting factors and resources, and destination management (Crouch and Ritchie, 1999). Refining the power of the other three groups, qualifying determinants alter destination competitiveness (Crouch and Ritchie, 1999). Thus, they are considered as situational conditions and, likewise global (macro) environment, they are usually out of destination's control (Crouch and Ritchie, 1999).

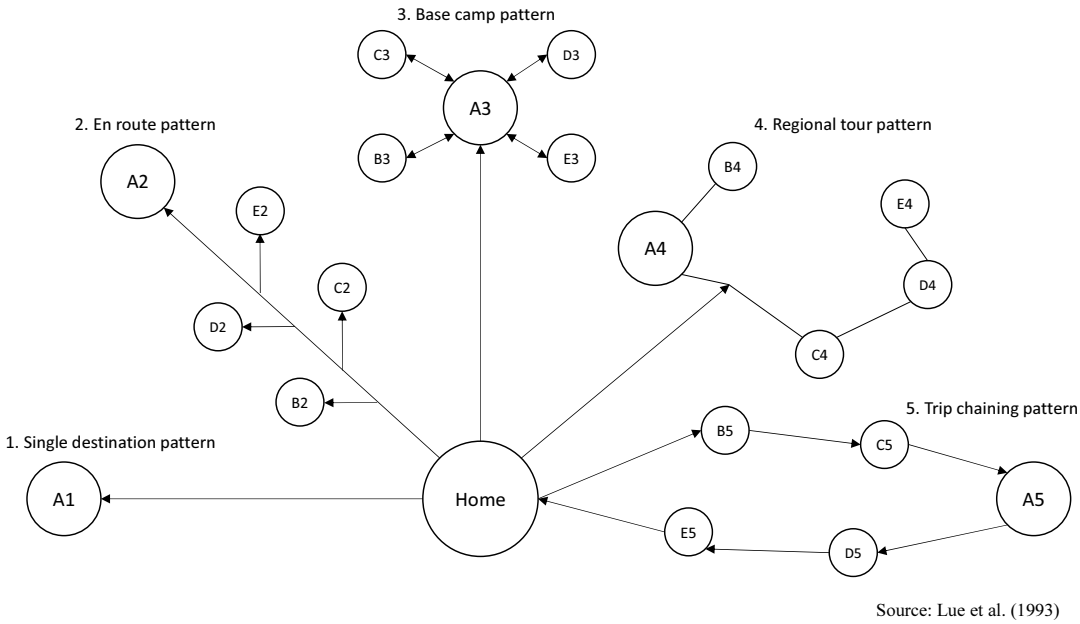
Ⅲ. Smart Tourism Destinations

Smart destinations are grounded in situation-based optimization on the basis of seamless connections between high quality information technology and physical infrastructure through sensors, smart devices, and big data management employed within a certain geographical area (Gretzel et al., 2015b; Werthner et al., 2015). Since the tourism industry is one of the well-suited areas where information technology is used extensively from operational and business perspectives, it is not surprising that the idea of smart tourism destinations has developed fairly quickly.

Destinations are complex combinations of attractions and locales. Lue, et al. and Fesenmaier (1993) divide the tourists' travel tendencies into five distinctive spatial patterns, single destination pattern, en route pattern, base camp pattern, regional tour pattern, and trip chaining patter. Among them, the single destination pattern, representing a travel to a single destination, is the least selected pattern by travelers because only a few destinations stand alone without any other related attractions (Lue et al., 1993). This implies that tourists stop by a number of attractions/points of interest on the way to or from the main attraction (en route pattern) or visit various attractions sequentially in the destination before they return to their origin (regional tour pattern) (Lue et al.et al., 1993). This travel tendency, which travelers visit a number of attractions, places, and destinations, indicates the prevalence of multi-attraction travel and multi-attraction travel is an influential trend for ICT development, because it increases the need of improving ICT and stimulates realization of smart destination. The ICT for smart destinations primarily focuses on connection of various platform, including attractions, places, or destinations, so the value of ICT's development and smart destination has increasing with the prevalence of multi-attraction travel (Gretzel et al., 2015b; Werthner et al., 2015).

The phenomenon of multi-attraction travel is increasingly promoted through the developments of ICT that facilitate information distribution and navigation. In this vein, a destination concentrating on only a key attraction will have difficulty to be competitive in relation to destinations utilizing the complementary strengths generated from diverse attractions (Ewing et al., 1983; Gunn, 1988).

Since a smart tourism destination provides unique personalized experiences derived from real-time data based on the convergence of ICT and the existing environment, each visitor can get heterogeneous experiences even at the same attraction (Lamsfus et al., 2015; Lopez de Avila, 2015). Additionally, many



Source: Lue et al. (1993)

<Figure 2> Lue et al. (1993) and Fesenmaier's Five Spatial Patterns of Travel Tendencies

different attractions at a destination can be integrated as complementary components of the whole destination by analyzing the real-time data primarily collected from the tourists, for example using demand forecasting, visitor behavioral analysis, and feature analysis (Gretzel et al., 2015b). Therefore, the smart tourism destination concept can be especially important for destinations where one attraction dominates or where attractions are so varied that making and marketing connections among them is difficult.

Most researchers define smart tourism destinations by putting the primary emphasis on the information technology (Boes et al., 2015; Buhalis and Amaranggana, 2013; Lamsfus et al., 2015; Lopez de Avila, 2015). In particular, the researchers emphasize the operational role of ICT for applying the 'smart' concept to tourism destinations (<Table 2>). Boes et al. (2015) argue that a smart tourism destination is a specific place using related technologies and techniques to achieve the goals of tourism destinations. Buhalis and Amaranggana (2013) state that a number of stakeholders should be interconnected in a smart tourism destination through ICT. In some cases, the application of ICT to existing infrastructure is introduced as a key factor for smart tourism destinations (Lamsfus et al., 2015; Lopez de Avila, 2015). It shows that these studies assume the original value of smart tourism destinations is created by collaboration of entities based on the self-operation and automation characteristic of ICT. Three kinds of ICT, cloud services, internet of things (IoT), and end-user internet service system, are typically recognized for their indispensable roles in realizing smart tourism destinations (Zhang et al., 2012). The three technological approaches have advantages due to their differentiated effects fitted with the specific needs of smart tourism destinations (Wang et al., 2013). The cloud services enable the multiple entities, such as applications, programs, or data, to share the information by providing scalable access (Dikaiakos et al., 2009).

<Table 2> Definitions of Smart Tourism Destinations

Authors	Definitions
Boes et al. (2015)	"Places utilizing the available technological tools and techniques to enable demand and supply to co-create value, pleasure, and experiences for the tourist and wealth, profit, and benefits for the organizations and the destination."
Buhalis and Amaranggana (2013)	"Bringing smartness into tourism destinations meaning that destinations need to interconnect multiple stakeholders through a dynamic platform mediate by ICT in order to support prompt information exchange regarding tourism activities through machine-to-machine learning algorithm which could enhance their decision making process."
Lamsfus et al. (2015)	"A tourism destination is said to be smart when it makes intensive use of the technological infrastructure provided by the smart city in order to: (1) enhance the tourism experience of visitors by personalizing and making them aware of both local and tourism services and products available to them at the destination and (2) by empowering destination management organizations, local institutions and tourism companies to make their decisions and take actions based upon the data produced in within the destination, gathered, managed and processed by means of the technology infrastructure."
Lopez de Avila (2015)	"An innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life."

The IoT system takes charge of data collection, information analysis, whole system automation and system control based on a host of sensors, chips, and actuators integrated extensively in the physical infrastructure of the destination (Atzori et al., 2010). As for the end-user internet service system, it supports the cloud services and IoT through applications and devices (Huang and Li, 2011). The smart technologies represented by cloud services, IoT, and end-user internet service systems have main values in interacting at all levels of stakeholders in the tourism context, hence symbiotic relationships among various tourism and non-tourism stakeholders can be achieved (Gretzel et al., 2015b). Therefore, it can be concluded that there are particular technologies especially important for the construction of smart tourism destinations and that those smart technologies are essential requirements for the realization of smart tourism destination success. Furthermore, smart technologies have a key role to conceptualize DestCompST as a big difference between the existing destination competitiveness model of Crouch and Ritchie (1999) and the DestCompST, thus this also can be a main difference between previous related studies and this research.

Ⅳ. Conceptual Model of Smart Tourism Destination Competitiveness

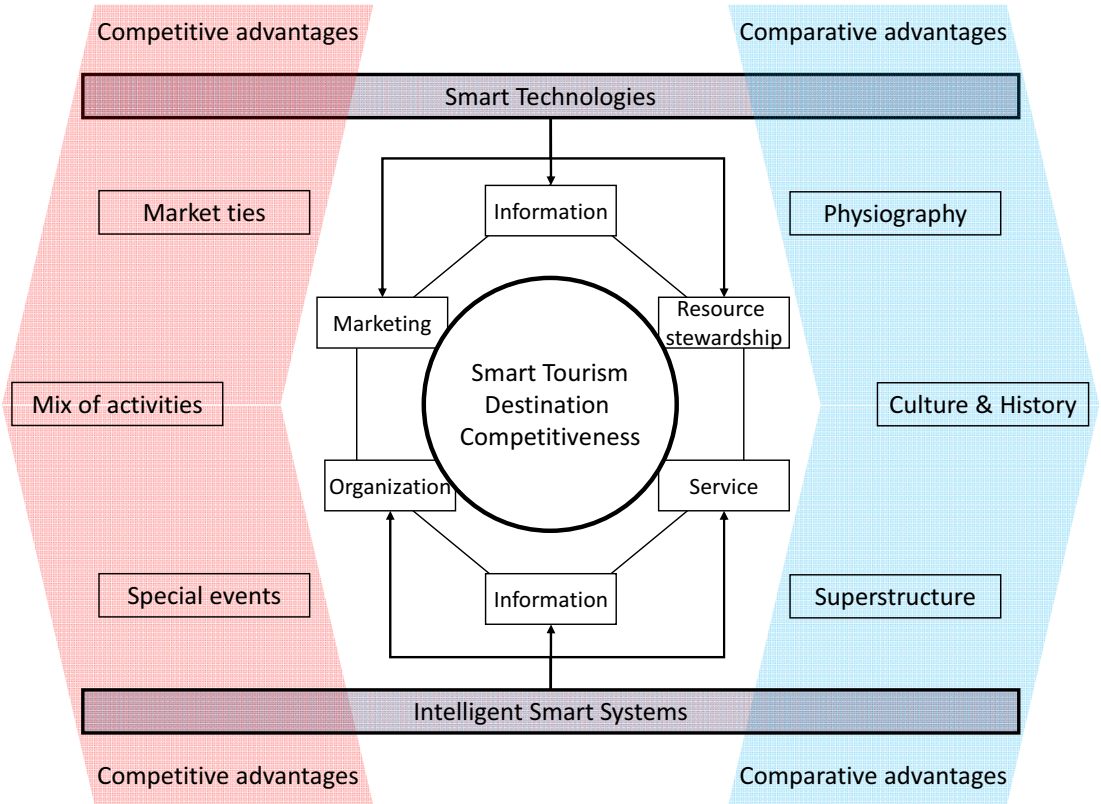
The conceptual model of DestCompST is based on the destination competitiveness model of Crouch and Ritchie (1999) due to its recognition as the best framework in the field of destination competitiveness research (Enright and Newton, 2004). The current model expanded the framework to the smart tourism context through literature reviews and brainstorming based on adaptations of the questions originally asked by Crouch and Ritchie (1999). These questions were designed based on a number of previous studies and

academic conference papers (Crouch, 1996; Crouch and Ritchie, 1994; Crouch and Ritchie, 1995; Glaser and Strauss, 1967; Kirker and Crouch, 1994; Ritchie and Crouch, 1993; Ritchie and Crouch, 1995).

- *What are the factors that determine the success or competitiveness of a major smart tourism destination? Is it possible to prioritize these factors?*
- *What criteria can be used to assess success or competitiveness?*
- *What are the greatest competitive strengths of existing smart tourism destinations?*
- *What are the main determinants of the notion of "smart" for a destination?*
- *How does a destination improve its competitive position? In the short-term? In the long-term?*

Each question intends to employ important factors of each section, sections presented in destination competitiveness model. The first (*What are the factors that determine the success or competitiveness of a major smart tourism destination? Is it possible to prioritize these factors?*) and second (*What criteria can be used to assess success or competitiveness?*) questions are related to the elements of three segments, supporting factors and resources, destination management, and qualifying determinants, which represent destination's success and profitability. The third question (*What are the greatest competitive strengths of existing smart tourism destinations?*) is about elements of global (macro) environment, competitive (micro) environment, and core resources and attractors, segments representing destination's current situation and original resources. The forth question (*What are the main determinants of the notion of "smart" for a destination?*) is for deciding core factors to define or represent smart destination, which is especially important for DestCompST. The last question (*How does a destination improve its competitive position? In the short-term? In the long-term?*) is linked to the relationship among core resources and attractors, supporting factors and resources, destination management, and qualifying determinants. This process resulted in the DestCompST model presented in <Figure 3>. While it is firmly grounded in the traditional destination competitiveness model, it takes the peculiarities of smart tourism into account.

Since smart technology is fundamental to realizing smart tourism (Gretzel et al., 2015b), smart technology is added as a new factor that links core resources and attractors. Smart technology has a central role in building a smart destination and, at the same time, improving the quality of the smart destination. In terms of comparative advantages and competitive advantages, the smart technology therefore can fall into both categories. On the one hand, the cloud services, IoT, and end-user internet service systems are technological tools or intangible resources like human resources and knowledge resources; on the other hand, the actual effects of smart technologies are generated through a combination of technology and existing infrastructure (Lamsfus et al., 2015; Lopez de Avila, 2015). For example, the Project LIVE implemented in Barcelona as an initiative for smart tourism destinations was established by applying smart technology to the existing transportation infrastructure, which consequently created an innovative platform for electronic vehicles. Also, the smartphone application called Street Museum launched by the Museum of London provides unique experiences to visitors by showing the streets of London through time on the smartphone's screen and this can be possible based on the connection between the city environment and a new type of ICT, namely augmented reality. Therefore, the smart technology delivers both characteristics of comparative advantages



<Figure 3> Conceptual Model of DestCompST

and competitive advantages.

The five components responsible for destination management become to be involved with smart technology in the smart tourism destination context. The smart tourism destination enhances the traveler's experience by making it personalized, context-based in real time (Buhalis and Amaranggana, 2015) and progresses the tourism industry through demand forecasting, process automation, and value co-creation (Sigala, 2011, 2012; Werthner, 2002; Wöber, 2003; Yoo et al., 2015). All the performances are possible by collecting, analyzing, and creating the information which is a core ingredient as well as product of smart technology (Gretzel et al., 2015a). Through the smart technology, the past role of information in the tourism sector, such as figuring out visitor needs, developing new products, and monitoring service performances, is increased and the augmented effects are expanded to other destination management factors sequentially (Crouch and Ritchie, 1999). A smartphone application called "google trips" is a good example. This application provides not only basic travel information, such as famous restaurants, climate of destination, or transportation timetable, but also day plans for each traveler. There are many day plans for each destination and these day plans are created based on previous travelers experience, including location information collected by GPS and online reviews written by actual travelers. Unlike the recommendation plan made by

travel agencies or travel books, these functions are operated by a huge number of actual traveler data, thus more useful and effective information can be provided to travelers. In the case of resource stewardship, the real time data derived from visitors as well as from residents allows resources to be checked for their receptive capacity and informs crisis management. Such evidence-based management improves the overall resource management and also the quality of life at the destination (Crouch and Ritchie, 1999; Gretzel et al., 2015a, 2015b). The service component, meaning the overall travel experience of tourists, is the most privileged part among the destination management factors. Primarily with location-based services and sensor technology, customized information on each visitor's context can be created and the tourist is able to enjoy personalized services in real time (Lamsfus et al., 2015). This leads to enhancements in the traveler's experience, especially the on-site experience, by offering the customer desired information (Crouch and Ritchie, 1999; Gretzel et al., 2015a, 2015b). The tourist's quality of experience is considered as a crucial antecedent of traveler satisfaction, thus the influence of smart technology on the traveler's on-site experience deserves to be emphasized in terms of visitor satisfaction at the destination (Baker and Crompton, 2000). In the case of day plans of "google trips," the whole plan is modified and altered in real-time and based on the user's situation, for example, if the lunch time is delayed, the next route and plan is automatically changed or if the user do not want to visit specific place in the plan, the application recommend other places based on the user's preferences. In this way, travelers do not have to follow the plans which made by others' experiences and can get unique experience by making his or her own day plans and these new day plans can be another data sources of the application, which enables the application to give better experience for other travelers.

The smart technology also contributes to the organizational structure of destination. The benefits of smart tourism destinations lie not only in serving the tourists but also helping the citizens by improving the quality of their residential environment through smart technologies (Piro et al., 2014). The ICT systems optimize the production and consumption of limited resources based on the destination circumstances (Piro et al., 2014). Additionally, the real-time monitoring makes it possible to manage a variety of problematic situations immediately and efficiently (Buhalis and Amaranggana, 2015). Indeed, sustainability is a major component of smart tourism destination conceptualizations (Gretzel et al., 2015a). For instance, a kind of accommodation sharing service, "Airbnb", promotes a village in Japan, Yoshino, economically and sustainably. The small village was declining because of population aging. Furthermore, the village was not famous for travel destination because of lack of attractions. However, after "Airbnb" built some traditional houses in the village and made villagers hosts of the houses who accommodate visitors, young travelers who find a new destination for their travel started to visit this village through the "Airbnb" online website and, now, the village has been improved economically and villagers believe this development will be maintained. At the same time, the smart technology allows for new "plug-and-play" business interactions among the various commercial and governance entities at the destination, leading to a more viable/adaptable industry structure. In terms of marketing, since the visitors' information, such as individual location, messages of social network service (SNS), and payment information, is collected in real time through the individual smart devices, the promotional efforts have

the potential to be more effective by targeting relevant potential tourists and the strategies of channel distribution or pricing are able to be more customer-oriented (Crouch and Ritchie, 1999; Gretzel et al., 2015a).

Importantly, like the original model, DestCompST can be applied across all types and levels of destinations. In addition, it is not dependent on specific smart technology but, rather, captures the underlying qualities of smart tourism. Most notably, it emphasizes the connections of smart technology with different destination management components and both the resulting competitive and comparative advantages.

Ⅴ. Concluding Remarks

The smart tourism destination has become a new paradigm in the tourism field and its development is already under way (Boes et al., 2015; Gretzel et al., 2015a; Wang et al., 2013). This study suggests a conceptual model of DestCompST to provide a framework for the smart tourism destination's conceptualization and development. Through a literature review on destination competitiveness and smart tourism destinations, the conceptual model was developed. It is based on the successful destination competitiveness model of Crouch and Ritchie (1999) but critically scrutinized and the applicability of traditional assumptions in the smart tourism destination context and made necessary adjustments.

In the suggested DestCompST model, the smart technology is added as a key factor representing the core of smart destination competitiveness, and its central role across all destination management activities is recognized. From a theoretical point of view, DestCompST provides a much needed basis to guide future research in the smart tourism destination arena. Practically, DMOs as well as policy-makers can refer to the suggested model to comprehend the constructs of smart tourism destinations and adopt the model as a guideline for strengthening the competitiveness of their particular smart tourism destinations. Some destinations and countries have already launched initiatives and try to realize smart tourism destinations but most of them are not focused on the systematic flow and integration among smart technologies and other components of destination competitiveness because they emphasize the technical tools (Gretzel et al., 2015a). Such techno-myopia can lead to tremendous failure as smart tourism consists of multiple layers (technology, management and experience layers see Gretzel et al., 2015a) that need to build on each other in order to realize smart tourism success. In this vein, this research can provide a blueprint for destinations by describing the relationships among the multiple factors of smart tourism destination competitiveness. However, the developed DestCompST will need to be evaluated further through feedback from practitioners. Additionally, empirical studies and case studies verifying the usefulness of DestComST in comparing smart tourism destinations need to be performed in the future.

Ⅵ. Acknowledgement

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<References>

[1] Atzori, L., Iera, A. and Morabito, G. (2010). The internet of things: A survey. *Computer networks, 54*(15), 2787-2805.

[2] Baker, D. A. and Crompton, J. L. (2000). Quality, satisfaction and behavioral intentions. *Annals of tourism research, 27*(3), 785-804.

[3] Boes, K., Buhalis, D. and Inversini, A. (2015). Conceptualising Smart Tourism Destination Dimensions. in *Information and Communication TechNologies in Tourism* 2015 Springer, 391-403.

[4] Buhalis, D. and Amaranggana, A. (2013). Smart tourism destinations. in *Information and Communication TechNologies in Tourism* 2014 Springer, 553-564.

[5] Buhalis, D. and Amaranggana, A. (2015). Smart Tourism Destinations Enhancing Tourism Experience Through Personalisation of Services. in *Information and Communication TechNologies in Tourism* 2015 Springer, 377-389.

[6] Crouch, G. I. (2010). Destination competitiveness: An analysis of determinant attributes. *Journal of Travel Research*, available at: http://jtr.sagepub.com/content/early/2010/03/19/0047287-510362776.full.pdf (accessed 20 October 2015).

[7] Crouch, G.I. and Ritchie, J.B. (1999). Tourism, competitiveness, and societal prosperity. *Journal of business research, 44*(3), 137-152.

[8] Crouch, G. I. and Ritchie, J. B. (2005). Application of the analytic hierarchy process to tourism choice and decision making: A review and illustration applied to destination competitiveness. *Tourism Analysis, 10*(1), 17-25.

[9] d'Hauteserre, A. (2000). Lessons in managed destination competitiveness: the case of Foxwoods CasiNo Resort. *Tourism Management, 21*(1), 23-32.

[10] Dikaiakos, M.D., Katsaros, D., Mehra, P., Pallis, G. and Vakali, A. (2009). Cloud computing: Distributed internet computing for IT and scientific research. *Internet Computing, IEEE, 13*(5), 10-13.

[11] Dwyer, L. and Kim, C. (2003). Destination competitiveness: determinants and indicators. *Current issues in tourism, 6*(5), 369-414.

[12] Enright, M.J. and Newton, J. (2004). Tourism destination competitiveness: a quantitative approach. *Tourism management, 25*(6), 777-788.

[13] Enright, M.J. and Newton, J. (2005). Determinants of tourism destination competitiveness in Asia Pacific: Comprehensiveness and universality. *Journal of Travel Research, 43*(4), 339-350.

[14] Ewing, G. O., Lieber, S. R. and Fesenmaier, D. R. (1983). Forecasting recreation trip distribution behavior. *Recreation planning and management*, 120-140.

[15] Gomezelj, D.O. and Mihalič, T. (2008). Destination competitiveness－Applying different models, the case of Slovenia. *Tourism management, 29*(2), 294-307.

[16] Gretzel, U., Sigala, M., Xiang, Z. and Koo, C. (2015a). Smart tourism: foundations and developments. *Electronic Markets, 25*(3), 179-188.

[17] Gretzel, U., Werthner, H., Koo, C. and Lamsfus, C. (2015b). Conceptual foundations for understanding smart tourism ecosystems. *Computers in Human Behavior, 50*, 558-563.

[18] Gunn, C. A. (1988). *Tourism planning* (No. Ed. 2). Taylor & Francis.

[19] Huang, C. and Li, Y. (2011). In the 12th five-year plan, the system research of smarter tourism under the background of smarter cities. *Proceedings of annual conference of tourism tribune*, 55.

[20] Hunter, W. C., Chung, N., Gretzel, U., & Koo, C. (2015). Constructivist research in smart tourism. *Asia Pacific Journal of Information Systems, 25*(1), 105-120.

[21] Kotler, P., Keller, K. L., Manceau, D., & Hémonnet-Goujot, A. (2015). *Marketing management (Vol. 14)*. Englewood Cliffs, NJ: Prentice Hall.

[22] Kozak, M. and Rimmington, M. (1999). Measuring tourist destination competitiveness: conceptual considerations and empirical findings. *International Journal of Hospitality Management, 18*(3), 273-283.

[23] Lamsfus, C., Martín, D., Alzua-Sorzabal, A. and Torres-Manzanera, E. (2015). Smart Tourism Destinations: An Extended Conception of Smart Cities Focusing on Human Mobility. in *Information and Communication TechNologies in Tourism* 2015 Springer, 363-375.

[24] Lamsfus, C., Wang, D., Alzua-Sorzabal, A., and Xiang, Z. (2014). Going mobile defining context for on-the-go travelers. *Journal of Travel Research*, 0047287514538839.

[25] Lopez de Avila, A. (2015). Smart destinations: XXI century tourism. *ENTER2015 Conference on Information and Communication TechNologies in Tourism*, LugaNo, Switzerland.

[26] Lue, C. C., Crompton, J. L. and Fesenmaier, D. R. (1993). Conceptualization of multi-destination pleasure trips. *Annals of Tourism Research, 20*(2), 289-301.

[27] Mazanec, J.A., Wöber, K. and Zins, A.H. (2007). Tourism destination competitiveness: from definition to explanation? *Journal of Travel Research, 46*(1), 86-95.

[28] Piro, G., Cianci, I., Grieco, L.A., Boggia, G. and Camarda, P. (2014). Information centric services in smart cities. *Journal of Systems and Software, 88*, 169-188.

[29] Porter, M.E. (1990). The competitive advantage of nations. *Harvard business review, 68*(2), 73-93.

[30] Richardson, J.B. (1987). A sub-sectoral approach to services trade theory. *The emerging service ecoNomy*, 59-82.

[31] Sigala, M. (2011). Social media and crisis management in tourism: Applications and implications for research. *Information TechNology and Tourism, 13*(4), 269-283.

[32] Sigala, M. (2012). Social networks and customer inVolvement in new service development (NSD) The case of www. mystarbucksidea. com. *International Journal of Contemporary Hospitality Management, 24*(7), 966-990.

[33] Wang, D., Li, X.R. and Li, Y. (2013). China's "smart tourism destination" initiative: A taste of the service-dominant logic. *Journal of Destination Marketing and Management, 2*(2), 59-61.

[34] Werthner, H. (2002). Intelligent systems in travel and tourism. *IJCAI 2003: 18th International Joint Conference on Artificial Intelligence*, available at: http://195.130.87.21:8080/dspace/bitstream-/123456789/589/1/Intelligent%20systems%20in%20travel%20and%20tourism.pdf (accessed 20 October 2015).

[35] Werthner, H., Alzua-Sorzabal, A., Cantoni, L., Dickinger, A., Gretzel, U., Jannach, D., Neidhardt, J., Pröll, B., Ricci, F. and Scaglione, M. (2015). Future research issues in IT and tourism. *Information TechNology and Tourism, 15*(1), 1-15.

[36] Wöber, K.W. (2003). Information supply in tourism management by marketing decision support systems. *Tourism Management, 24*(3), 241-255.

[37] World Economic Forum. (2015). *The Travel & Tourism Competitiveness Index 2015: T&T as a Resilient Contribution to National Development* . available at: http://www3.weforum.org/-docs/TT15/WEF_Global_Travel&Tourism_Report_2015.pdf (accessed 20 October 2015).

[38] Yoo, K., Sigala, M. and Gretzel, U. (2015). "Exploring TripAdvisor" in *Open Tourism – Open InNovation, Crowdsourcing and Collaborative Consumption challenging the tourism industry*, ed. R. Egger, I. Gula, D. Walcher, Springer Verlag.

[39] Zhang, L., Li, N. and Liu, M. (2012). On the Basic Concept of Smarter Tourism and Its Theoretical System [J]. *Tourism Tribune, 5*, 66-73.

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