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Information Technology in Tourism & Hospitality Industry: A Review of Ten Years' Publications

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Abstract

Tourism and hospitality industry today, is changing significantly with the application of information technology in its fundamental to strategic activities. It is driven by the competition inherent within the industry as well as the evolving innovative ideas and practices. So, to match the competitive environment and to catch the changing disruption, use of information technology is inevitable. This study reviews the previous research studies related to the information technology (IT) in tourism and hospitality industry with the aim of assessing the recent changes and applications of IT in the industry. Particularly, seven major tourism and hospitality journals published in the last 10 years are reviewed which included 64 research articles relevant to IT in tourism and hospitality industry. The content analysis of the articles is categorized into three major themes, namely: fundamental purpose, internal business process or process redesign and value creation & competitive advantage. The study showed that IT in tourism and hospitality industry is most commonly used in fulfilling information need, studying behavior & performance, managing operation process and innovation process. The use of IT in promotion & marketing, customer management process and value creation & competitive advantage is yet to be explored.

Keywords: *Information Technology, Business Process, Innovation, Competitive Advantage*

Introduction

Technology is changing so rapidly across the industries. Tourism and hospitality industry is also evolving faster with the disruption of information technologies. The development of modern technologies has introduced a series of changes in the tourism market that are manifested on both, tourism offer and tourism demand (Januszewska, M., Jaremen, D. E. & Nawrocka, E., 2015, p. 66); Buhalis & O'Connor, 2005, p. 7). Law and Jogaratnam (2005, p. 11) further suggested that It is important for hoteliers to proactively incorporate IT into their efforts to improve service quality. An ongoing improvement of IT knowledge for all hotel employees can help achieve this goal. However, hospitality traditionally lags other sectors in adopting information technology (Buick, 2003, p. 243).

Technologies have evolved towards mobile and web 2.0 applications which are going from market innovation to applications. Consumer websites are playing a major role in all PR and marketing activities to reach a large number of consumers around the globe. The significant role of social media in pre-trip travel planning, decision making, and for sharing tacit knowledge is increasing. The adoption of ICT is also offering tools for clustering and working together and for globalization and creation of a critical mass (Khatri, 2018a, p. 25). In this way, the adoption of IT has several effects in tourism by changing the competitive scope.

ICT systems are being widely used in these two interrelated sectors-tourism and hospitality. Generally, it is used to optimize the communication between travel service providers, travel agencies and travelers. So, it is being an obvious part of the tourism and hospitality industry that is adopted in different touristic sites, hotels, transportation and also by other associated service providers. Now the practice of e-tourism and digitalized tourism and hospitality activities is in the rise such as online reservation, flashpackers, travel blogs, e-tour guides, online platforms for services and so on.

This paper tries to review the recent changes, development and adoption of information technology in tourism and hospitality industry, particularly over the last one decade. So, the paper attempts to analyze the content of research articles published in the major tourism and hospitality research journals which focused on information technology. It will contribute to the previous researches on IT applications in tourism and hospitality by analyzing the research studies from the last 10 years to understand the recent development and applications of information technology.

Methodology

The paper analyzed research articles that were published by major high impact journals in tourism and hospitality industry. As the study intends to cover the research studies published in the last 10 years or the last one decade, only the research studies published in the period 2009-2018 are taken into consideration. First of all,

I used SAGEPUB, ScienceDirect and Wiley databases to find the 7 major travel and hospitality journals which included the list of *Journal of Hospitality & Tourism Management, International Journal of Tourism Research, Annals of Tourism Research, Tourism Management, Journal of Travel Research, Journal of Hospitality & Tourism Research and Cornell Hospitality Quarterly.* The preliminary search of keyword 'information technology' found in these journals resulted 2,123 articles. To be more specific, I refined the search by finding the term 'information technology (IT) in the abstracts which resulted to 75 research articles. With the thorough content analysis of those 75 articles, only 63 are found to be more relevant to this study.

These articles are reviewed in the following part of the paper by categorizing them into different themes of use of information technology in tourism & hospitality industry. O'Connor and Murphy (2004) reviewed recent research on information technology in the hospitality industry and revealed three broad research areas: the Internet's effects on distribution; on pricing; and on consumer interactions. Similarly, Buhalis and Law (2008, p. 610) grouped the main themes of e-tourism research into: consumers and demand dimensions; technological innovation; and industry functions. These are used in most of the later publications on the subject. In this paper, going through a rigorous content analysis, I identified three main themes in recent use of information technology in tourism and hospitality industry, namely: fundamental purpose; internal business process (adopted from Kaplan & Norton's strategy map, 2004) or process redesign; and value creation & competitive advantage. The paper contributes to the literature; and also provides the implications with the suggestion of operational solutions for the industry.

Results & Analysis

In this section, the comprehensive review of research articles considered for the study is provided. The articles are studied by categorizing them into three thematic areas of use of information technology in tourism & hospitality industry.

Fundamental purpose

Initially, information technology is integrated in the tourism and hospitality industry to facilitate associated service activities. The fundamental activities in tourism and hospitality such as accommodation, transportation, communication etc. are supported by the information technology to benefits both the service providers and travelers. So, the fundamental purpose covered by information technology in the reviewed literature are discussed below:

Information need

The social media, mobile and information technology on tourism and hospitality is widely used for information search, sharing and exchange. As found from the

studies, such as tradeshows for information exchange (Han, H. Y. & Verma, R., 2014, p. 239); as the primary information source for both consumers and business on hotel service performance (Duan, W. et al., 2015, p. 282); role of SNSs' network externalities in sharing information (Kang, J. & Namkung, Y., 2015, p. 739); wikis in knowledge-based digital economy for collaborative learning (Benckendorff, P., 2009, p. 102); for information access in travel planning (Okazaki, S. et al., 2014, p. 191).

The advent of web 2.0 is changing fundamentally the tourist information search and destination choice process (Lo, I. S. et al., 2011, p. 725); new technologies offer easy access to a large amount of tourism information (Rodriguez, B. et al., 2012, p. 926); the increased availability of smartphone and mobile gadgets has transformed the tourism industry and will continue to enhance the ways in which tourists access information while traveling (Jung, T. et al., 2015, p. 75); search engine is one of the frequently used information sources while the PC is the most used device for both searching and booking (Murphy, H. C. et al., 2016, p. 44). Thus, a solution for the information need in the tourism and hospitality industry is fundamentally provided by information technology. The review found a significant amount of articles related to the fundamental purpose of information need.

Promotion & marketing

Tourism and hospitality industry is a competitive industry. There is a big competition within the industry, and many destinations are competing with each-others to attract the visitors (Khatri, 2018a, p. 15). In such a scenario, promotion & marketing of tourism & hospitality products and services is very important. The destination development, management and promotion are important marketing functions of tourism marketing (Khatri, 2018b, p. 70). Liu, S.Q. and Mattila, A.S. (2016, p. 162) studied the way to advertise technology-based hospitality services. Kim, J. et al. (2014, p. 340) indicated informational media (textual vs pictorial) have significant influences regarding the impact of psychological distance on travelers preferred promotional information. ICT enables multilateral communication patterns in destination marketing (Choi, Y. et al., 2017, p. 116); Lately, augmented reality (AR) has been increasingly adopted by various industries as a marketing tool (He, Z. et al., 2018, p. 127; Jung, T. et al., 2015, p. 75). ICTs application in promotion & marketing is yet to be exploited. The review study shows limited studies focused on promotion & marketing.

Behavior and Performance analysis

Information technology is used in many behavior and performance studies. For example, predicting browsers & purchasers of hotel websites (Wu, E. H. C. et al., 2012, p. 38); predicting employees' adoption behavior of new ICT (Cheng, S. & Cho, V., 2010, p. 488); producing psychological effects on a tourist's perceptions (Choi, Y. et al., 2017, p. 116); determining the tourist activities and the temporal preferences for

each activity at different destinations with new type of data called venue referenced social media data (VR-SMD) (Vu, H. Q. et al., 2018,); capturing the movements and travel patterns of tourists at a large scale (Vu, H. Q. et al., 2017b, p. 883); examining the determinants of purchasing flights from low-cost carrier websites (Escobar-Rodriguez, T. & Carvajal-Trujillo, E., 2014, p. 70); finding the online purchase intention of rural tourism services (Martin, H. S. & Herrero, A., 2012, p. 341) and studying usage behavior of hotel information system (Kim, T. et al., 2010, p. 710).

The study of peoples' behavior with information technology seems as an increasing phenomenon in tourism and hospitality industry. It is also revealed by Xiang, Zheng et al. (2014, p. 511) who studied travelers use of the web for trip planning and how they have adopted the internet over time. Similarly, Ying, T. et al. (2014, p. 16) analyzed the networking patterns of different tourism stakeholders in cyberspace. Caber, M. et al. (2012, p. 106) classified the attributes of a tour operator's extranet system in terms of its asymmetric influence on its user (travel agency sales representatives) satisfaction. Sanders, D. & LeClus, M. (2009, p. 94) evaluated tourism marketing students' expectations and experiences of lecture podcasting. No, E. & Kim, J. K. (2013, p. 534) investigated the determinants of travelers' adoption of travel information on smartphone which showed usefulness, ease of use, social influence and satisfaction with travel websites.

Internal business process or process redesign

Internal business process includes many processes operating in an organization at the same time, each creating value for the products or services. The change in the process to optimize the value is called process redesign.

Operation management process

Berne, C. et al. (2012, p. 205) indicated that the restructuring process of the tourism sector and of the distribution channels caused by Information and Communications Technologies (ICT) may have altered the power positions in the channels. Leung, R. & Law, R. (2012, p. 25) examined information technology applications, the adoption of electronic data interchange among hotel systems, and management support for IT departments which have significant effect in operation process. Similarly, Noone, B. M., & Coulter, R. C. (2012, p. 122) studied modern robotics technologies which can augment workers' cognitive capacity in addition to replacing direct labor. Web based self-service technology (SST) in airline industry (Lee, L. Y., 2013, p. 162) is also affecting the operating process of the industry.

Customer management process

The emergence of the internet has changed the traditional relationship between hotels and travel agents as business partners (Lee, H. A. et al., 2012, p. 95). CRM

is widely used in the tourism industry, with loyalty programs keeping customers returning and travel websites yielding a large volume of e-transactions (Vogt, C. A., 2010, p. 356). Tourist kit which creates customer loyalty by utilizing smart technology aimed at collecting accurate tourist information (Angeloni, S., 2016, p. 187). ICT may offer support to establishing hospitality networks that shape a physical and virtual environment for the delivery of services to developing client demands (Breukel, Ad & Go, F. M., 2009, p. 184); smart tourism is regarded as an individual tourist support system within the context of information services (Li, Y. et al., 2017, p. 293). However, Customer Relationship Management (CRM) systems, when addressed by using emerging Big Data techniques for efficient client profiling, is still in its early stages (Talon-Ballestero, P. et al., 2018, p. 187).

Innovation Process

Rapid technological change is leading to the introduction of new ways of providing services in the tourism industry (Arana, J. E. et al., 2015, p. 772). E-capability of visitor information centers (D'Ambra, J. & Mistilis, N., 2009, p. 206; Lyu, S. O. & Hwang, J., 2015, p. 54); water use technology of a destination (Sun, Ya-Yen & Hsu, Ching-Mai, 2018, p. 1); use of registered travelers' biometric systems in air travel as an innovativeness and security (Morosan, C., 2011, p. 436); e-lienation as a specific form of alienation in ICT-enabled tourism (Tribe, J. & Mkono, M., 2017, p. 105); geo-based technology in place experiences (Tussyadiah, I. P. & Zach, F. J., 2012, p. 780); usefulness of podcast tours as an interpretative media (Kang, M. & Gretzel, U., 2012, p. 440); tourists' mobility using GPS (Zheng, W. et al., 2017); Aerial digital imagery in combination with Light Detection and Ranging (LiDAR) data and geographic information system (GIS) mapping and analysis (Yang, B. et al., 2012, p. 840); and so on are the recently adopted innovative process in the tourism and hospitality industry as found by this review study.

Paris, C. M., (2012, p. 1094) provides some interesting insights into contemporary backpacker culture and the continuing convergence of physical travel with information and communication technologies. Divisekera, S. & Nguyen, V. K. (2018, p. 157) studied the innovation inputs in tourism and found one major input is information technology. Aldebert, B. et al. (2011, p. 1204) highlighted the intensity of innovation activity in tourism and gave evidence about the rapid evolution of the tourism industry as well as the substantial impact of ICT on this evolution. In one study, Liu, J. & Nijkamp, P. (2018, p. 1) showed that though the inbound tourism may be a new and powerful driving force for regional innovation, while the effect of inbound tourism on technological innovation appears to be weaker than that on social innovation.

Regulatory and social process

Social and regulatory process emphasizes the social, environmental and legal part of the business. In many cases, information technologies facilitate the compliance to social and regulatory process. Fuchs, M. et al. (2009, p. 165) indicated that the majority of today's information and communication technology (ICT) impact studies disregard infrastructural, organizational and environmental factors typically responsible for successful e-business adoption. Use of e-participation for sustainable cultural tourism management is yet to be utilized (Chiabai, A. et al., 2011, p. 35). In this regards, a study revealed that satellite images or remote sensing data enable the investigation of eco-environmental changes (Wu, S. & Chen, Y., 2016, p. 23). Sharing practices through social media appear as valuable articulations of sociability and emotional support (Munar, A. M. & Jacobsen, JKS, 2014, p. 46). The study finds limited studies related to this issue.

Value Creation and Competitive Advantage

Value creation is associated with the activities by which a firm is able to increase the value of goods or services to consumers. Competitive advantage enables the firm to create superior value for its customers that of customers get from its customers.

Value creation

Value is created by lowering cost such as Diaz-Chao, A. et al. (2015, p. 862) analyzed new co-innovative sources of firm labor productivity or by adopting differentiation as Yepes, M. F. (2014, p. 58) studied the restaurant tablet menus with color, light and other graphic features which showed a significant correlation to its perceived influence on food choices and also for attractiveness ranking. An appropriate diffusion of the ICTs in this sector can improve the social and economic impacts demonstrate how these factors affect the capacity of markets and destinations to meet and interact effectively in a global tourism environment (Minghetti, V. & Buhalis, D., 2009, p. 267). Cabiddu F. et al. (2013, p. 86) suggested that operators that achieve superior performance in terms of appropriating value do so because of superior strategic fit with the objectives of the value co-creation initiative, synergy with other members of the network, and IT readiness to conduct business electronically.

Competitive advantage

Lin, S. (2016, p. 126) stated Current application service provider (ASP) is an emerging type of information technology outsourcing service that offer a comprehensive of information technology services for small and medium-sized enterprises (SMEs) to obtain information capabilities and maintain competitive advantage. Similarly, airline companies have increasingly employed electronic commerce (eCommerce) for strategic purposes, most notably in order to achieve

long-term competitive advantage and global competitiveness by enhancing customer satisfaction as well as marketing efficacy and managerial efficiency (Kim, H. et al., 2009, p. 266); the growth in digital channel adoption has allowed airports to gain competitive advantage through innovative offerings to passengers (Straker, K. & Wrigley, C., 2018, p. 82). Number of visitors is another reason to increase the profitability and competitive advantage of the destination. So, Taiwanese National Park Headquarters employ advanced information technologies to attract travellers, researchers, and other visitors (Tsai, W. et al., 2010, p. 936). The discourse in the digital age is directed to competitive advantage by which tourism and hospitality industry can sustain and attract increasing tourist flows.

Discussion & Conclusion

Since there is competition prevalent in the tourism industry as well, adapting the industry's offerings to best match the changing tourism patterns with new marketing strategies is at the central of gaining success in the marketplace (Khatri, 2018a, p. 15). In this regard, information and communication technologies (ICTs) play a significant role whether by fulfilling information need for planning and strategies or by creating value with business process management & redesign. Versichele, M. et al. (2014, p. 67) indicated that the rapid evolution of information and positioning technologies, and their increasing adoption in tourism management practices allows for new and challenging research avenues.

The post-modern world has witnessed a revolution in Information and Communication Technology (ICT) especially in the realm of smart tourism where its advocates talk eagerly of the internet of everything (Tribe, J. & Mkono, M., 2017, p. 105). MacKay, K. & Vogt, C. (2012, p. 1380) stated wireless access to Internet became more common and increasingly IT was brought or available on a trip and the decision of tourists to be off or on the Internet while vacationing became more pronounced. Similarly, the increased availability of smartphone and mobile gadgets has transformed the tourism industry and will continue to enhance the ways in which tourists access information while traveling (Jung, T., Chung, N. & Leue, M. C., 2015, p. 75). Social network sites (SNSs), instant messaging, online photo albums and personal blogs were the most popular media used (Lo, I. S. et al., 2011, p. 725).

The study showed that information technology (IT) is most commonly used for the fundamental purpose of information need and behavior & performance study. Limited study focused on promotion and marketing strategies with information technology. When studying the internal business process design, information technology is found highly used in operation management process and innovation process. Some studies focused on customer management process but very few addressed social and regulatory process of the industry. It is seen that the use of information technology in

value creation and competitive advantage is increasing. Since it is a new area of study for tourism and hospitality industry, the IT in this regard is yet to be studied further to exploit the full potential of technologies.

The review study has some limitations, such that it includes only seven journals in the area published between the period 2009 to 2018 (last 10 years); and only the English research articles are included. This study also focuses on the adoption and diffusion of information technologies in creating value and gaining competitive advantage. So, the future research study could be directed in the realm of value creation and competitive advantage with ICTs in tourism and hospitality industry.

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