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Research Paper
A Typology of Technology-Enhanced Tourism Experiences

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ABSTRACT:
Experiences constitute the essence of the tourism industry. While literature has recognised the recent impact of technology on experiences, its empirical exploration remains scarce. This study addresses the gap by empirically exploring five leading industry cases to generate a holistic understanding of technology enhanced tourism experiences. The main contribution of this paper lies in the development of a nine-field experience typology matrix based on the increasing intensity of co-creation and technology implementation. The final contribution of this study is the development of an experience hierarchy and discussing its relevance for experience enhancement in tourism research and practice.

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A Typology of Technology-enhanced Tourism Experiences

Abstract

Experiences constitute the essence of the tourism industry. While literature has recognised the recent impact of technology on experiences, its empirical exploration remains scarce. This study addresses the gap by empirically exploring five leading industry cases to generate a holistic understanding of technology enhanced tourism experiences. The main contribution of this paper lies in the development of a nine-field experience typology matrix based on the increasing intensity of co-creation and technology implementation. The final contribution of this study is the development of an experience hierarchy and discussing its relevance for experience enhancement in tourism research and practice.

Keywords: Tourism experiences; co-creation; technology; best practice; case study; experience typology;

1 Introduction

In recent years consumers have been increasingly in search of experiences (Pine and Gilmore, 1999). Due to its dynamic nature, the tourism experience is undergoing constant change characterised by the growing importance of consumer involvement, co-creation and the implementation of technology. The strategic adoption of information and communication technologies (ICTs) in tourism per se is not new (Buhalis, 1998). Tourism, as a service-intense industry has gone for many decades hand in hand with technology and embraced the potential inherent in its latest developments (Buhalis and Law, 2008). However, what has changed significantly is that technology has not only become an integral part of tourism but has revolutionised the way travel is planned (Buhalis, 2003), business is conducted (Buhalis and Licata, 2002) and tourism services and experiences are created and consumed (Stamboulis and Skayannis, 2003). This has opened new opportunities, challenges and potential in the field (Gretzel et al., 2006a).

The integration of ICTs has particularly benefited the facilitation of experiences. With new technologies being developed, new types of tourist activities are emerging that can both transform conventional experiences and result in the emergence of new types of tourism experiences. These new experiences, manifested as immersive virtual (Guttentag, 2010), augmented-reality (Yovcheva et al., 2013) or technology-mediated experiences, are predicted to be richer, more participatory and facilitated through multiple media (Gretzel and Jamal, 2009). In these experiences, technology can function either as a mediator or become the core experience itself (McCarthy and Wright, 2004). Thus, Gretzel and Jamal (2009) question the traditional understanding of tourism experiences. It is necessary to capture the current changes (Huang and Hsu, 2010), whereby it is not the technological development itself but the integration of technology into the experiences which is of interest (Darmer and Sundbo, 2008). Existing literature however appears to have insufficiently addressed these changes, as scholars still report a major gap in understanding the role of technology in experiences (Beeton et al., 2006; Tussyadiah and Fesenmaier, 2007). Many studies to date have discussed the impact of single types of technologies, such as the Internet, virtual worlds (Binkhorst and Den Dekker, 2009), blogs and micro-blogging (Wang and Fesenmaier, 2004) as well as social media and networking platforms (Fotis et al., 2011), while lacking to recognise multiple technologies in transforming the nature of tourism experiences.

To date only a few studies have attempted to discuss tourism experiences and the impact of technology from a more complete perspective. Neuhofer and Buhalis (2012) introduce the concept of technology enhanced tourism experiences and provide a conceptualisation for developing an integrated understanding of experiences by combining the elements of experiences, co-creation and technology. They argue that there is a major gap in researching, understanding and managing technology enhanced experiences in tourism research and practice alike. Given the insufficiencies in the literature and these recent claims, this study aims to provide a first empirical exploration of the technology enhanced tourism experience concept by means of a case study approach. This paper first provides a theoretical review of tourism experiences, co-creation and ICTs developments, followed by the outline of the methodological approach and the data collection process employed. In conducting a cross-case analysis, the paper presents findings in terms of level of co-creation and technology, allowing for a two-fold theoretical contribution. It develops an experience typology matrix offering a tool for categorisation in which the single cases are pinpointed and discussed. In developing the matrix further, an experience hierarchy is presented as a useful instrument for differentiation of four main levels of technology enhanced tourism experiences.

2 Theoretical framework

2.1 Tourism experience theory

Experiences constitute a renowned notion with multiple meanings inherent. According to Jennings et al. (2009) the term experience is not novel for understanding human interactions with people, space, products, services or cultures. The term experience was first noted in the 1960s and since then, there has been a wide discussion of its meanings and understanding in literature. The English word "experience" can be understood as a neutral, vague and highly ambiguous term, which generally describes all kind of things that a person has ever undergone (Aho, 2001). With its discussion in different scientific disciplines, distinct definitions of an experience have evolved over time (Caru and Cova, 2003). The sociological and psychological views coincide by portraying the experience as a subjective and cognitive activity of an individual human being (Larsen, 2007), in which knowledge and skills are acquired in the involvement in or exposure to a specific event and the emotions, feelings and sensations triggered during that experience (Ismail, 2010). The emphasis on experience in tourism and marketing is relatively recent (Jennings et al., 2009). From a marketing perspective, experiences have been defined as a personal occurrence with highly emotional significance obtained by the consumption of products and services (Holbrook and Hirschman, 1982). In the context of tourism, experiences represents a complex construct, which has been postulated as distinct from everyday life experiences (Cohen, 1979; MacCannell, 1973; Turner and Ash, 1975).

Experiences have constituted an important concept in tourism studies and the industry (Uriely, 2005) since the establishment of early literature in the 1970s (e.g. Cohen, 1979; Csikszentmihalyi, 1975; MacCannell, 1973). This is because tourism is determined by a high level of interactions of the tourism system, its people and the individual human being as the tourist (e.g. Larsen, 2007). These interactions lead to the formation of individual tourist experiences (Mossberg, 2003), which are obtained at the moment of value creation when tourism production and consumption meet (Andersson, 2007). The current body of literature confirms the persistent relevance of this topic (Cutler and Carmichael, 2010; Kim et al., 2011; Morgan et al., 2010; Darmer and Sundbo, 2008; Tung and Ritchie, 2011). While a lot of work has been dedicated to the theoretical advancement of experiences, further exploration is still needed (Ritchie and Hudson, 2009). Considering the dynamic nature of the tourism industry, experiences are subject to constant evolvement and change. Two of the most significant advances in the area of experiences constitute the increasing level of co-creation and integration of ICTs.

2.2 Co-creation theory

Co-creation, defined as the "joint creation of value by the company and the customer" (Prahalad and Ramaswamy, 2004a, p.8) has become a key notion in experience creation. With consumers having becoming more powerful and actively involved, the traditional creation of experiences has undergone a transformation (Prahalad and Ramaswamy, 2004a). Until recently, tourism experiences were mainly designed, created and staged as suggested by the principles of the experience economy (Pine and Gilmore, 1999). The process of staging and delivering experiences has widely been revised due to its business-oriented, one-directed and superficial nature. As consumers are more empowered, particularly since the emergence of the Internet, consumers are recognised in a more active role in the creation of experiences. The notion of co-creation builds on these very principles.

Prahalad and Ramaswamy (2004a), one of the first to establish this concept, claim that experience creation is characterised by active consumers who play the primary part in co-creating their experiences. This movement has changed the traditional roles between companies and consumers. Co-creation advocates the individual human being, rather than the company, as the starting point of the experience (Binkhorst and Den Dekker, 2009). Thus, it has become an essential task for companies to recognise consumers and their needs to co-create experiences and value together. Recently, this movement has been widely discussed in literature indicating the high relevance of co-creation experiences in both theory and practice (Huang and Hsu, 2010; Prebensen and Foss, 2011; Ramaswamy, 2011; Vargo and Lusch, 2004). In addition to the amount of studies discussing co-creation experiences, authors have recognised the impact of ICTs as a major change of tourism experiences. With experiences being increasingly mediated by technology (Tussyadiah and Fesenmaier, 2007), the recent developments of ICTs in the tourism industry and tourism experiences are reviewed in subsequence.

2.3 Information and communication technologies: From Web 1.0 to Social Networks

There exists a great amount of ICTs available to potentially influence and enhance tourist experiences (Law et al., 2009). ICTs can generally be understood as a wide range of technologies including hardware,

software, groupware, netware and humanware (Buhalis, 2003). These different systems are accumulated under the umbrella of ICTs, while distinctions between hardware equipment and software often blur (Werthner and Klein, 1999). The synergies of these systems build tools for communication and information and render ICTs an integrated system of networked systems (Buhalis and Jun, 2011). Accordingly, Buhalis (2003, p. 7) defines ICTs as "the entire range of electronic tools, which facilitate the operational and strategic management of organisations by enabling them to manage their information, functions and processes as well as to communicate interactively with their stakeholders for achieving their mission and objectives".

The Internet, as the most important innovation since the printing press (Hoffman, 2000), provides a technology which has not only changed how individuals interact with each other but has altered the role of human beings in society (Barwise et al., 2006). As such, it has impacted on the nature of the tourism industry like any other industry (Schmallegger and Carson, 2008) arguably as main determinant for the competitiveness of tourism organisations (Buhalis, 1998; Poon, 1993; Sheldon, 1997). The development of the tourism industry has gone hand in hand with the progress of ICTs for more than three decades and shown a high interest in the strategic exploitation of ICTs to manage information, enhance efficiencies and communicate more effectively (Law et al., 2009). ICTs have become key elements in all operative, structural, strategic and marketing levels to enable interactions among suppliers, intermediaries and consumers on a global basis (Buhalis and Law, 2008; Egger and Buhalis, 2008).

With the proliferation of the Internet, new forms of communication have appeared (Ramaswamy and Gouillart, 2008). The shift from the Web 1.0 to the Web 2.0 and its inherent social networking has been one of the most significant technological developments over the past few years (Dwivedi et al., 2012; Fotis et al., 2011; Hays et al., 2012; Sigala, 2009; Xiang and Gretzel, 2010). The variety of tools in the Web 2.0 comprising blogs, videos, wikis, chat rooms or podcasts have empowered individuals to generate content and share and experiences on an unprecedented scale (Tussyadiah and Fesenmaier, 2009). Encouraged by the interactive nature of the Web 2.0, users are enabled to take part in designing services with the company (Sigala, 2009), influence the online reputation as well as branding of organisations around the world (Inversini et al., 2010). ICTs have had enormous effects on the way in which the tourism experience is created (Stamboulis and Skayannis, 2003; Tussyadiah and Fesenmaier, 2007). While technology can function in multiple roles as a creator, enhancer or destroyer of the experience (Stipanuk, 1993), its integral part of many contemporary tourism experiences cannot be ignored. In leading to more personalised, meaningful and intense co-creation experiences (Prahalad and Ramaswamy, 2004a), the main interest of tourism subsequently lies in exploring the potential of ICTs, and particularly social networking, as strategic instruments to positively enhance tourism experiences.

2.4 Enhancement of experiences

In reviewing the advances in co-creation and technology, it appears that both developments are critical potential contributors to the enhancement of experiences. With increasing competition in the domain of tourism experiences, the main potential for improvement will lie in the exploration of maximising both parameters of co-creation and technology. Numerous studies have confirmed the opportunities in using ICTs to support experience co-creation in several different ways (Gretzel and Jamal, 2009; Tussyadiah and Fesenmaier, 2007; Tussyadiah and Fesenmaier, 2009). The latest technological advances, such as online booking tools or virtual tourist communities, mobile devices or virtual life enable companies and consumers to enhance experiences. For instance, by adopting mobile devices on the move, tourists can construct new experiences by attaching personal meaning to them (Gretzel and Jamal, 2009), while the use of social networks allows tourists to engage, communicate and co-create in the online world. Interactive tourism organisation websites and their social media presence moreover enable tourists to personalise services and experiences by giving them the possibility to change settings, adapt to personal preferences and determine information for their specific needs and requirements. As a result, ICTs empower tourists and facilitate the co-creation (Prahalad and Ramaswamy, 2004a) of richer (Tussyadiah and Fesenmaier, 2007) and more personalised tourism experiences (Niininen et al., 2007; Sandström et al., 2008). Hence, technologies are not only altering current experiences but also lead to new types of tourist experiences (Darmer and Sundbo, 2008; Gretzel and Jamal, 2009).

Literature confirms the significance of ICTs in the tourism experience (Cho et al., 2002; Green, 2002; Gretzel et al., 2006b; Huang et al., 2010; Mossberg, 2003). Yet, the majority of the existing work has merely emphasised the impact or role of technologies (e.g. Binkhorst and Den Dekker, 2009), while theoretical and empirical investigations remain scarce. This is exemplified by studies naming

technologies influencing the tourist experience, such as the Internet, virtual communities or Second Life (Binkhorst and Den Dekker, 2009), social networking platforms, blogs or microblogging like Twitter (Wang and Fesenmaier, 2004), Facebook, YouTube or Wikipedia (Ramaswamy, 2009) or virtual worlds and social networking sites (Shaw et al., 2011). Empirical work to date has predominantly focused on the examination of specific technologies in tourism experiences, such as media (Gretzel et al., 2011), mobile guides (Tussyadiah and Fesenmaier, 2007), videos (Tussyadiah and Fesenmaier, 2009) or smartphones (Wang et al., 2012). A holistic exploration of experiences through the combination of co-creation and technology is however missing. Only recently, the conceptual work by Neuhofer and Buhalis (2012) has raised the need to not only recognise single technologies influencing the tourist experience, but to develop a more holistic understanding. By unifying the three elements of the tourism experience, experience co-creation and multiple ICTs, technology enhanced tourism experiences can emerge as a new framework for tourism research (see Figure 1). This study therefore aims to investigate this concept empirically and adopt a holistic perspective that seeks to understand a) what types of technologies are used in the experience, b) how does the increasing intensity of technology and co-creation determine the experience, c) what constitutes a technology enhanced tourism experience and d) what levels of technology enhanced tourism experiences can be differentiated, by adopting a case study methodology.
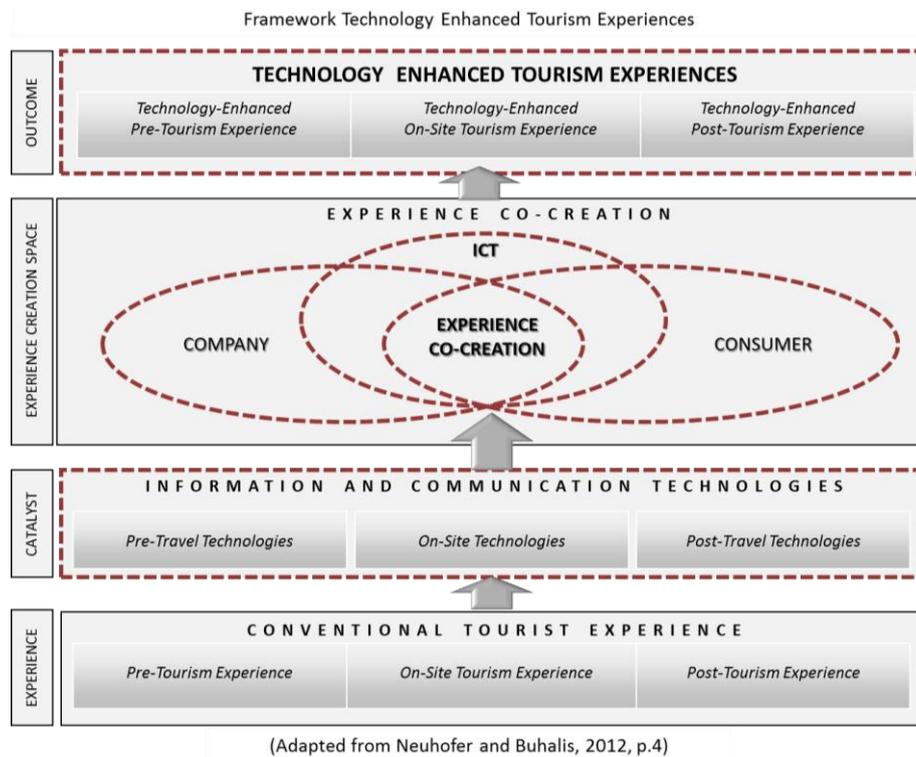

Figure 1. Framework technology-enhanced tourism experiences.

3 Methodology

In order to understand how to create successful experiences, tourism providers currently rely on best practice examples of the industry (Binkhorst and Den Dekker, 2009). Whilst the concept of best practice is generally vaguely defined, it has become a popular term in business to describe leading industry cases as role models to increase success (Hallencreutz and Turner, 2011). Accordingly, best practice is understood as business excellence in a particular benchmark, award winning, the most popular or widespread practice or an evidence for a success story (Todaro, 2002). Given the dearth of businesses creating technology enhanced experiences in practice, this study investigates outstanding tourism best practice companies in order to develop an empirically-grounded understanding of technology enhanced tourism experiences. For this purpose, a case study approach is adopted, which is particularly useful when exploring a contemporary phenomenon within its real-life context for which multiple sources of evidence are needed (Yin, 2003b). The rationale for using case studies moreover lies in its suitability as an ideal

methodology in both tourism (Gray and Campbell, 2007) and the field of information systems when technology is dynamic, changing and newly implemented (Pare, 2001).

To address this enquiry, the study favoured multiple over single case studies to examine the full complexity of the phenomenon and enhancing the generalisability of the theory to propose (Yin, 2003b). Purposive sampling was employed, which proved to be particularly suitable, as the goal was to gain an in-depth understanding of what is taking place in the particular context of tourism experiences. The main focus thereby lay on the "process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation" (Merriam, 1998, p. 19). In terms of the number of cases, the study followed Yin (2003a) who argues that the sample size represents a matter of judgmental choice. While traditional sampling logic aims to yield representativeness across the population, in case study logic it is not a large sample size but the number of cases determined by theoretical saturation, which is critical (Yin, 2003a). For the case selection, companies meeting a set of pre-defined criteria were eligible to be included in the study, such as to a) represent the context of the tourism and hospitality industry, b) represent a best practice example in showing evidence of successful current realisation of technology enhanced tourism experiences. In line with Flyvbjerg (2011) who suggests a maximum variation of cases, organisations reflecting a distinct mix of characteristics were identified to allow for diverse perspectives and in turn increased generalisability of the results. Organisations were researched online and identified based on the prerequisites for a total period of two months in autumn 2011. In this process, 17 suitable companies were contacted via email and invited to participate in a workshop on the research topic. Due to geographical distance, unavailability on the specific time or date, the recruitment process resulted in a total number of five companies agreeing to participate in a half-day workshop in London, UK.

The selected cases encompass various industry sectors, including a destination, restaurant and hospitality businesses and an online tourism platform. Each company was represented by its top-management, including founders, CEOs, general managers and departmental managers who all showcased their respective approach to experience creation to an expert audience of 25 people. The workshop started with an introductory presentation to set the scene for the subject, followed by 30-minute company presentations and an interactive discussion with the present audience. Informal interviews with the representatives followed to elicit key information about the company's background, role in experience creation, rationale for ICTs use, specific ICTs use in different travel stages, potential customer value as well as future plans for experience creation. As the major strength of case study research, multiple sources were integrated (Yin, 2003b) including documentary information, informal interviews and participant observation. Documentary information, comprising company reports, business plans, press releases, and conference presentations, fulfilled the purpose to understand the companies' efforts of experience enhancement. Informational interviews with the representatives allowed for an in-depth understanding of leading real life cases, while direct observations through visits to the case study sites and online-spaces allowed getting a technology-enhanced experience firsthand. Through the use of multiple sources of evidence, rich data was obtained and the construct validity could be enhanced significantly. In the analysis process, data were triangulated, allowing for a convergence of evidence and a cross-case analysis by means of a qualitative template analysis (Miles and Huberman, 1994) to categorise findings based on the conceptual framework presented above (Figure 1). Table 1 below outlines the best practice companies, their respective industry sector and the rationale for the choice.

Table 1. Case study outline

Case Nr.	Company	Industry Sector	Rationale Choice
1	PixMeAway	Web 2.0	Picture-based search and recommendation engine for travel inspiration
2	Inamo Restaurant	Hospitality	Interactive ordering system for a digital dining experience
3	VisitBritain	Destination	Engagement and experience co-creation through social networking and mobile applications
4	Hotel Lugano Dante	Hospitality	Mobile Happy Guest Relationship Management tool for experience personalisation
5	Sol Meliá Hotels	Hospitality	Engagement and one-to-one co-creation through social networking

4   Findings and discussion

Having undertaken five case studies, this section presents the findings of the study, offering two main contributions, an experience typology matrix and an experience hierarchy. More specifically, the case studies uncover the role of technology in the experience in terms of a) which types of technologies come into use, b) the intensity of technology in the experience and c) the intensity of technology for co-creation. Based on the five cases analysed, types of technology enhanced tourism experiences are differentiated and a nine-field experience typology matrix is developed to graphically pinpoint the respective experience types. This work takes the discussion further and proposes an experience hierarchy with four overall levels of experiences to provide a succinct understanding of technology enhanced tourism experiences.

4.1 Technology in the experience

The analysis of the technology utilised, as the instrument transforming a conventional tourist experience into a technology-enhanced experience, is critical. Despite a plethora of technologies mentioned in literature, such as the Web 2.0, blogs, videos and social networking sites (Tussyadiah and Fesenmaier, 2009), it was essential to explore what types of ICTs and how these are used by leading companies to enhance experiences in practice. Technologies range from interactive websites, interactive ordering systems (eTable technology) to interactive mobile platforms (iPads), diverse social media channels (Facebook, Twitter) and mobile applications (Destination Apps). The findings from the case studies hence reveal that different technologies come into use, indicating a multiplicity of possible technologies and varying technological intensity for experience enhancement.

Technology – Intensity in the experience

The findings from the cross-case analysis indicate the need to distinguish between two main types of technologies for experience enhancement. In the first scenario, technology has the supplementary role to support the tourism experience, while in the second scenario, technology constitutes the integral part of the experience in becoming the experience itself.

In the case of *PixMeAway*, the company takes the role of an interactive online platform. PixMeAway is a picture based search engine which provides a new kind of travel inspiration, as consumers select appealing pictures, define their personal travel type and receive destination suggestions matching their criteria. In providing for a high interactivity, pictures and trip suggestions, the platform provides an innovative way to enhance the early stages of travel inspiration and planning and becomes the experience itself. Similarly, the *Inamo Restaurant* provides an example in which the technology is a core part of the experience. The Inamo Restaurant has pioneered in introducing a fully digitalised dining experience and interactive ordering system. This system, developed by E-Table™, uses a combination of table touchpads and overhead projection to allow customers to see the food and drinks menu projected onto the table surface. The system further allows customers to change table clothes to the current mood and preferences, watch their food being prepared in the kitchen through a webcam in real time, manage the waiter and bills, explore the local neighbourhood for activities afterwards, or order a cab home. By doing so, the restaurant provides the physical technology (interactive tables) without which the unique dining experience could not occur, rendering the technology the central element of the experience creation.

Contrastingly, the three other best practice cases show a predominant focus on the core tourism experience. Technology takes on a complementary role, which can be used but does not constitute an integral part of the experience. *VisitBritain, Sol Meliá* and *Hotel Lugano Dante* represent examples in which the destination, the hotel product, service and experience offered remains the core function. If the tourist chooses to, technology can become part of the experience through active involvement, social media engagement pre/during/post travel, provision of personalised information or use of mobile applications on-site. The extent to which technology is used to engage and co-create with the company is defined by the tourist at discretion. The more engagement tourists have with the technologies and platforms the richer their physical experience can be. As a result, the difference to the above mentioned examples with technology being the center of the experience, in these cases the experience varies from a lightly-technology-assisted to a strongly-technology-empowered experience in the pre-, during- and post-travel stages. This means that it is not sufficient to recognise technology as a generic facilitator of the experience. Rather, there is a clear need to differentiate technology in terms of core or supplementary element of the experience. In addition to examining the intensity of different types of technologies, it is equally important to shed light on the intensity of technology-facilitated co-creation in the experience.

Technology – Intensity of co-creation

The case studies reveal that all technologies identified share the characteristic of a high level of interactivity. Interactive ICTs adopted allow tourists to interact, engage and act with the different stakeholders, such as the company, members of staff, other consumers, destination resources or the overall experience space. Interactivity and social engagement on different levels appears to be a key requirement of technologies used for the enhancement of experiences. For instance, the interactive website of *PixMeAway* allows consumers to interact with the interface, select appealing travel motifs, the traveler type and define their travel personality, based on which relevant destinations are suggested.

The case of the hospitality context shows that mobile platforms can come into play to facilitate and enhance the level of interaction between the company and the guest throughout the entire hotel experience. *Hotel Lugano Dante* has developed a unique concept called HGRM, Happy Guest Relationship Management. This system, which is accessible to all staff through a mobile platform, enables the company to amalgamate all interactions of staff and guests on one level throughout the whole guest's journey, before, during and after the stay. Guests provide personal information and preferences, such as room temperature, favourite beverages, preferred newspapers etc. while members of staff retrieve this specific information. By accessing the platform on a mobile device, the hotel and guests co-create through exchanging information in real time, which are used to facilitate encounters on multiple touch points. This leads to more personalised interactions, more valuable service encounters and on overall enhanced experience for the guest. In a similar vein, the case of *Inamo Restaurant* confirms that technology constitutes an important instrument to allow for customer-centric co-creation of the experience. The eTable technology enables guests to adapt the colour scheme of the electronic table cloths, control the dining experience, manage the ordering process, waiters, bills and discover the local area. These examples demonstrate that technology constitutes an essential part of a co-created experience between the restaurant, hotel and its guests.

Besides using technology for enhancing co-creation between companies and customers, the findings from the case studies indicate that technology is also used to facilitate customer-to-customer co-creation. In the case of Sol Meliá and VisitBritain, technology in form of social media comes into play. For instance, *VisitBritain* engages a large number of tourists, fans and followers from all around the world throughout all stages, pre-, during- and post-travel. By doing so, they build relationships between overseas tourists and UK visitor attractions as well as allow tourists to engage among themselves to commonly co-create a digital global guest book on social media. Moreover, the mobile application Top 50 UK Places is a best practice example of customer-to-customer co-creation. Tourists are encouraged to generate content in terms of photography and videos and share them with others through the LoveUK Flickr and Facebook platforms. This enables the organisation to show the destination through the eye of the real customer. According to VisitBritain, customer involvement has become paramount and the mobile application 50 UK Places reflects this trend by ranking popular attractions purely on tourists' check-ins in Facebook places. In that VisitBritain steps back in its role as the dominant experience provider, it places the control in the hands of the consumers, who are encouraged to co-create the experience among each other.

Furthermore, the case of *Sol Meliá* reveals how to use the increasing power of the Web 2.0 and social media to create active conversations with and among customers. By exploiting the full potential of the collective space of the Web 2.0 and social media (Sigala, 2009), Sol Meliá can be considered as an industry leader in guest engagement by developing a system called ME Ecoystem. Unlike most examples advocating the need for company-to-customer or customer-to-customer co-creation, this system extends co-creation to a one-to-one basis on all levels. The ME Ecosystem allows for a person-to-person engagement through encouraging a circle of wide-ranging interactions between single members of staff of Sol Meliá, including managers, employees, guests, twitter-followers who are all interconnected and conjointly co-creating the tourism experience. Through the use of diverse social media and mobile applications, such as Facebook, Twitter and location based services, they advocate that interaction must not only take place between the company as an entity but rather on a personal level where all people related to Sol Meliá are connected and encouraged to co-create among themselves. In the destination and hospitality context, this unifies people who advocate, have already visited, are planning to or are currently visiting the respective destination, hotel or attraction.

The cross-analysis of the different cases leads to the suggestion that technology is revolutionising experience creation by offering high level of interactivity, personalisation and social engagement. This is in line with literature, such as Gretzel et al. (2006b) who argue that consumers today expect marketers to

provide personalised and customised experiences by meeting the latest technological standards. In this context, social media, such as Facebook, YouTube, Twitter or Flickr play an important role in empowering for enhanced levels of interactions among multiple parties. Fotis et al. (2011) confirm the importance of social media throughout the entire journey as a platform for tourism providers and tourist consumers to engage, interact and share experiences (Dwivedi et al., 2012).

4.2 Experience typology matrix

The findings from the five cases indicate varying intensities of technology and co-creation in experiences, leading to varying types of technology-enhanced tourism experiences. The cases have revealed that technology unquestionably represents a central element in the enhancement of experiences. However, what differs is the intensity of technology and co-creation which determines the nature of a particular experience. Based on the peculiarities of the experiences analysed, this work highlights that there is not one single technology-enhanced tourism experience but the need to take a more differentiated view. In drawing from literature and analysing the cases, this study establishes an experience typology matrix, classifying nine major types of experiences, shown in Figure 2. The matrix contains two axes, namely intensification of co-creation (vertical axis) and intensification of technology (horizontal axis). The vertical axis recognises three levels of co-creation including company-centric staging, company-consumer co-creation and multiplier co-creation. The horizontal axis comprises three levels, including low technology use, technology use to enhance the experience and technology as the core of the experience. Consequently, the varying intensities lead to the combination of nine-field experience typology matrix.
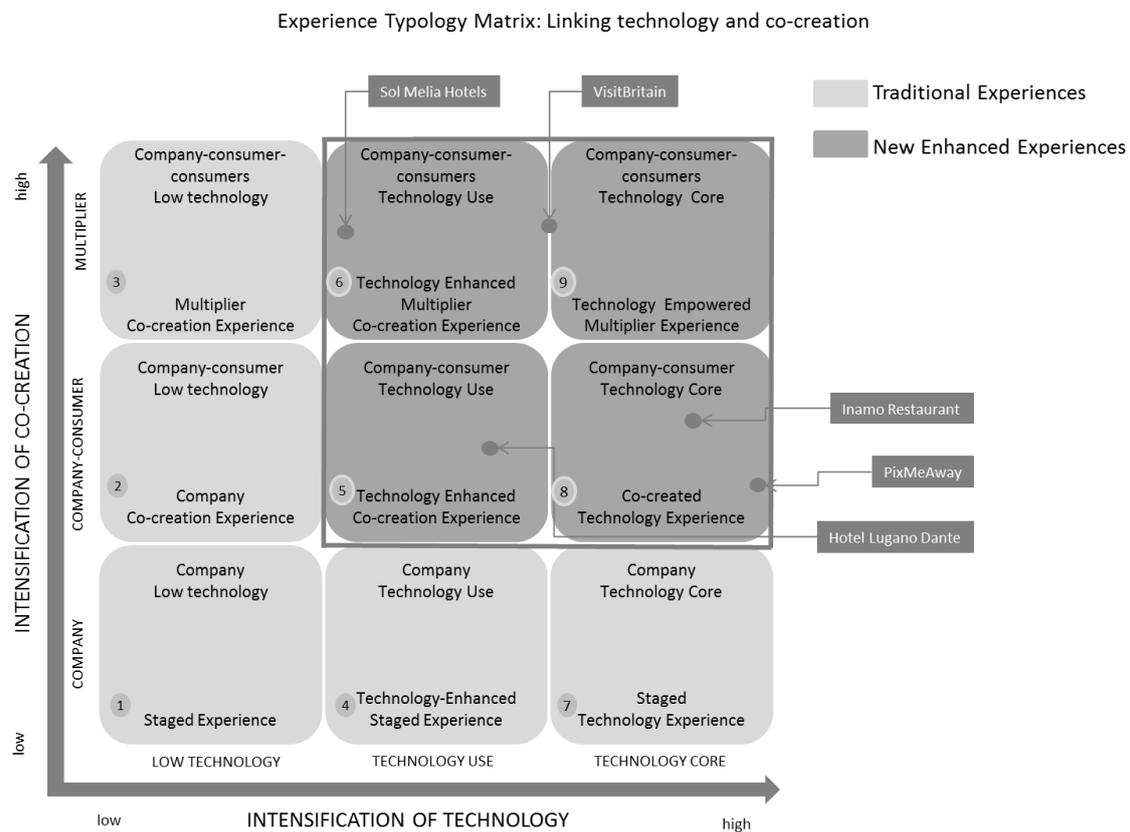

Figure 2. Experience typology matrix: linking technology and co-creation.

In analyzing the characteristics of the five case studies, it was found that all cases can be located in the four upper right fields (*5,6,8,9*) reflecting a high intensity of technology and co-creation respectively. This work, in attempting to offer a holistic perspective, embraces the lower ends of the axes and discusses nine fields to provide for a complete understanding of traditional (*light grey fields*) and new enhanced (*dark grey fields*) tourism experiences.

1-4, 7: Traditional Tourism Experience: These experiences, found on the lower end of the continuum, are characterised by limited levels of technology and co-creation. Examining the horizontal axis, these include staged experiences, as prevalent in the experience economy (Pine and Gilmore, 1998), which are determined by a company-centric experience delivery with technology facilitation to different extents (*see fields 1, 4, 7*). The vertical axis represents co-creation experiences, as proposed by Prahalad and Ramaswamy (2004b), reflecting an increasing level of co-creation between companies and consumers as well as among consumer communities, while technology plays a minor role in facilitating these processes.

5: Technology Enhanced Co-creation Experience. Hotel Lugano Dante can be associated with this type of experience as the HGRM platform is used as an important instrument to enhance the core hotel experience. Enhanced co-creation thereby predominantly occurs on a company-consumer level. By allowing for a high level of guest-involvement it is distinct from a technology-enhanced staged experience (*4*) in which a company uses technology to assist the delivery of staged experiences.

6: Technology Enhanced Multiplier Co-creation Experience. Sol Meliá represents this type of experience due to its use of social networking technologies to facilitate co-creation with multiple stakeholders, including the tourist consumer, the hotel, single members of staff, other guests as well as followers and fans. By doing so, a multiplier effect of co-creation through technology is achieved, making it distinct from technology-enhanced co-creation experience (*5*).

8: Co-created Technology Experience. Inamo Restaurant and PixMeAway facilitate this type of experience creation. Technology constitutes the core element of the experience while co-creation is provided through personalisation and interaction with the company. This makes it distinct from a staged technology experience (*7*), in which technology is merely functional and lacks in the characteristic co-creation elements, such as traditional booking platforms or reservation systems.

9: Technology Empowered Multiplier Experience. This experience type requires technology as the core part of the experience while allowing for a multiplier level of co-creation. VisitBritain represents a highly intense experience on both levels of technology and co-creation. While technology itself is not the core part of the experience, the pervasive implementation of different social engagement channels and mobile applications throughout all three stages of travel, renders VisitBritain close to a fully technology-empowered multiplier experience.

4.3 Experience hierarchy

The experience typology matrix provides a useful tool for tourism practice to analyse and identify both the type of experience they currently provide and plan to provide in the future. Most importantly, it allows them to understand which specific parameters need to be improved in order to enhance the experience further and in turn create higher value for the tourist. It is necessary to get a complete view and capture experience types on both the lower and high end of the experience continuum. While the analysed best practice cases represent the highest level of experiences, the majority of tourism organisations, whether hotels, destinations or airlines, yet have to achieve the full potential of co-creation (Binkhorst and Den Dekker, 2009) and ICTs application (Buhalis and Wagner, 2013). In seeking to develop the matrix further and make it more valuable for tourism theory and practice, this work develops an experience hierarchy. This hierarchy, like with any technology adoption hierarchy, provides a major theoretical contribution in that it depicts four overarching levels of experiences in terms of technology and respective increase of co-creation. These levels include the following:

- Conventional Experience (1)

- Technology-Assisted Experience (2)

- Technology-Enhanced Experience (3)

- Technology-Empowered Experience (4)

1 Conventional Experience

The first experience level represents the conventional tourism experience, which is widely known in tourism research and practice, as experience mainly associated with the experience economy (Pine and Gilmore, 1998). This type of experience is characterised by a mostly one-directional creation and delivery of the experience by the company. Accordingly, the consumer's level of involvement in the creation of

the experience remains low and only occurs at the consumption limited of the experience. The adoption and integration of technology at this level is non-existent or restricted. As such, experiences lacking technology-facilitation provide tourists with the basic value proposition while much potential for connecting, engaging and co-creating the experience, is still to be exploited. Given the limited realisation of technology and co-creation of experiences in the tourism industry (Binkhorst and Den Dekker, 2009), this experience level still represents one of the most common types of tourism experiences in practice.

2 Technology-Assisted Experience

Technology-assisted experiences need to be understood as experiences with increasing implementation of technology. At this level, technologies mainly provide a facilitating role of the tourism experience in assisting the consumer to access websites, booking systems, use mail and technologies for communication. This experience is characterised by Web 1.0 technologies, such as non-interactive websites, distribution systems, reservations systems among many technological applications (Buhalis and Jun, 2011), which are useful in assisting the tourism experience while however not allowing for tourists to interact or to co-create their experiences. With customer engagement and co-creation remaining relatively low, this experience has mostly been prevalent prior to the advent of the Web 2.0 and social media.

3 Technology-Enhanced Experience

Technology-enhanced experiences succeed the technology-assisted experience in taking advantage of technologies available in the Web 2.0 to make consumers actively participate and shape the creation of their experiences. Consumers use social media, such as Facebook, Twitter, Flickr or TripAdvisor to interact with organisations, use review sites, comment and use media to share their experiences (Tussyadiah and Fesenmaier, 2009). Characterised by the interactivity of Web 2.0 technologies, the level of customer involvement of the experience is high, rendering the experience creation a dynamic process between the company, the tourist consumer and other consumers. Considering the potential of social networking tools to enhance co-creation, the levels of co-creation can be intensified in multiple spaces and between multiple parties resulting in higher value for the tourist.

4 Technology-Empowered Experience

In considering both the literature and the findings highlighted in this work, it is evident that successful experiences incorporate high levels of technology and co-creation of an experience. In contrast to technology-assisted and enhanced experiences, in which technology plays a supporting role, the fourth level of experience is characterised by a combination of both elements of technology empowering and being integral part of the experience. At this level, technology needs to exist for the experience to happen. The main difference to other experiences is that technology is pervasive throughout all stages of travel, service encounters and touch points in the physical tourism destination or online space with multiple stakeholders. In taking full advantage of the plethora of different ICTs available, technology becomes the key element and epitome of an innovative contemporary tourism experience.

Given that staged experiences generate high value for consumers (Pine and Gilmore, 1999) and co-creation yields higher value for consumers (Binkhorst and Den Dekker, 2009), the consumer value through technology-empowerment can be maximised. This argument is substantiated in literature that the implementation of ICTs enhances experiences (Arnold and Geser, 2008), as it allows for active participation (Prahalad and Ramaswamy, 2004a), customisation and personalisation of the experience (Niininen et al., 2007), provides more satisfaction due to access and availability of services (Law et al., 2009) and creates more meaningful interrelations between the consumer and the experience environment (Binkhorst and Den Dekker, 2009). This work thus highlights the technology-empowered experience as the most distinct and valuable experience, which can be achieved by integrating immersive technological solutions to allow the tourist to become highly involved, actively participate and co-create with multiple stakeholders throughout all stages of travel.
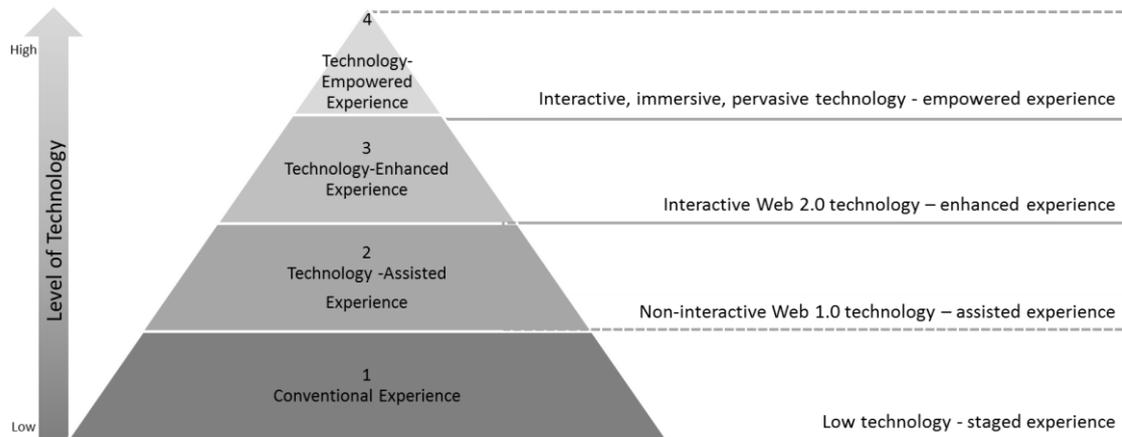
Figure 3
Experience Hierarchy

Figure 3. Experience hierarchy

This classification suggests that the integration of ICTs leads to enhanced experiences and an increase of value. Considering the difficulty to create the highest levels of experiences and their limited evidence in practice to date, it can be argued that the numbers of companies realising high-level experiences are still low. However, with technological developments and the penetration of ICTs to everyday life, especially for young generations, it is evident that tourism organisations will be progressing through the different levels in the hierarchy and gradually integrate technology to all aspects of their business for the enhancement of experiences. As the constant increase of value for the tourist is the utmost priority in experience creation, it is crucial for tourism organisations to evaluate their current experience and value created in seeking to progress to the next level. In this process, ICTs will play the key role. Emerging technological developments, such as near field communications, SoLoMo, augmented reality and gaming will provide a range of innovative technologies that will drive more adoption of technology for the creation of fully technology-empowered experiences. The contribution of this hierarchy is that it provides a valuable instrument for company experiences and competitiveness, as to understand the current and future experience levels and value propositions alike.

5 Conclusion and implications

Technology is significantly changing the tourist experience. The notion of technology enhancing the tourism experience is not new, however a holistic understanding on both a conceptual and empirical level represents a major gap. In conceptually building on the framework of Technology Enhanced Tourism Experiences by Neuhofer and Buhalis (2012), this is the first study to take an integrated approach of converging technology and co-creation in experiences and exploring this concept empirically. The findings from the case studies reveal that technology and co-creation are both key parameters to allow for the development of enhanced experiences. Depending on the relative intensity of these elements, the work has concluded to recognise not only one single technology enhanced experience, but to differentiate between several types of technology enhanced experiences. In that, this work makes two main contributions. This study has developed an experience typology matrix, which by recognising the differentiation between nine types of experiences, provides for an understanding of co-creation and technology and how the intensification of these two lead to technology enhanced experiences. By advancing the matrix conceptually, the second main contribution is an experience typology hierarchy, which distinguishes four main levels of experiences to provide a useful instrument for companies to understand their current experience position and prospective experience levels to be achieved.

This study is novel in having undertaken a first empirical exploration of technology enhanced tourism experiences leading to critical implications for both tourism theory and practice. Theoretically, it provides four main contributions to our current understanding of experiences. It has a) provided a first empirical investigation into technology enhanced tourist experiences, b) analysed leading cases to understand different types of experiences, c) developed an experience typology matrix and an experience typology

hierarchy, and d) empirically as well as conceptually developed the highly needed understanding of technology enhanced experiences in the context of tourism. From a managerial perspective, a number of implications emerge from this study for the creation and enhancement of tourism experiences through invaluable insights into leading best practice examples of the tourism industry. This provides a critical practical understanding of how experience leaders are realising technology enhanced experiences. For tourism companies this knowledge is critical as to a) understand leading examples and understand why these create enhanced and high-value experiences, b) assess the own experience proposition by means of the matrix, understand unexploited potential and maximise the experience enhancement through the intensification of technology and co-creation. This allows companies which are not yet fully embracing technology enhanced tourism experiences to evaluate their own position and advance their competitive advantage.

In presenting a first empirical exploration of the technology enhanced tourism experiences concept, this work hopes to stimulate further research in the area. In advocating a holistic approach, it is suggested that further research would be needed to complement this study with a consumer perspective. This could provide further implications for companies to this knowledge to facilitate technology enhanced experiences. Further research is needed to a) expand on the theoretical contributions of this research and apply both the experience matrix and hierarchy b) strengthen and validate the findings with further studies and c) extend the scientific discourse emerging in this area both conceptually and empirically.

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